THAI RETAIL CUSTOMER BEHAVIOR ON INTENTION OF USING MOBILE BANKING ACCORDING TO A PANDEMIC OF COVID19

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ABSTRACT

In Thailand, mobile banking has been introduced to Thai people for many years. It is an important financial digital platform for customer doing financial activities instead branch and ATM machine. Customer can't deny that mobile banking creates convenience for users. The aim of this study would to understand Thai customer behavior and experience on using banking channels especially mobile banking according to the pandemic of COVID-19. And also, it would to understand the factors that effect on the behavior intention to use mobile banking in Thailand. The total of respondent is 247. The result found that compatibility is the strongest positive effect on the intention to use.

For this research, it may useful for bank industry for planning mobile banking improvement on feature and function that meet with the customer needed. And also, plan for business or migration strategies from branch to mobile banking application, which intend to developed and upgrade performance and capability on mobile banking equality to traditional branch.

KEY WORDS: Perceived Usefulness / Perceived Ease of Use / Perceived Risk / Perceived Trust / Compatibility / Self-Efficacy / Behavioral Intention to Use

46 pages

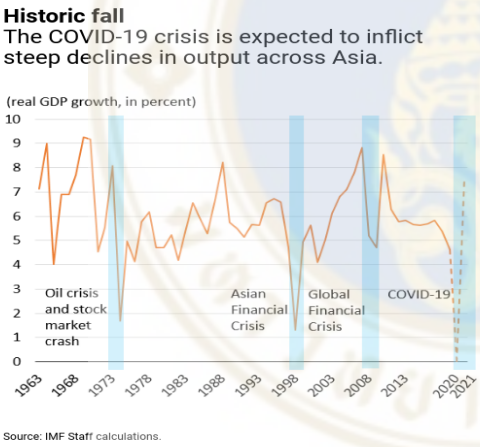
CONTENTS

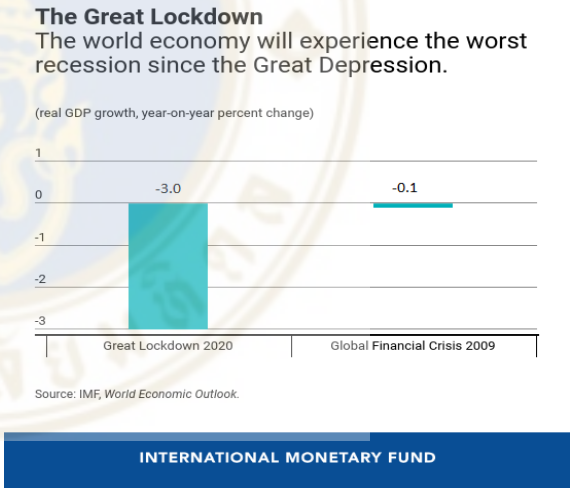
CONTENTS (Cont.)

CHAPTER I
INTRODUCTION

1.1 Impact of COVID-19

A pandemic of COVID-19, it creates an enormous global economic crisis in the history. It impacts on consumer lifestyle which lead to Macro and Micro Economic levels such as declining in GDP, Oil Price Fluctuations, Interest Rate Policy, Shrinking Stock Market and etc. During the great lockdown 2020, IMF forecasts, that the World Real GDP Growth, YOY percentage will dramatically decline and touch to level of minus three (GDP : -3.0).





Over the world can't deny on this enormous changing in consumer behavior to become a lifestyle that we called "New Normal". Most of Countries are facing with the spread of the virus and testing vaccines with patients, cities lockdown, limiting travel, quarantining citizens, and social distancing (United Nations Development Program, 2020).

With the new normal lifestyle, it makes short-term and long-term consequences. In the short-term, many countries have to strict quarantine policies. Most of economic activities are freezing. Business are driven under condition and regulation. In the long-term, many insinuations forecast that business will take time to recovery. Some said, it will return with L graph shape, which mean slightly turn back. Some said, it will return with W or V graph shape which mean economic rely on some factors especially a successful in vaccine production. However, it makes a million people losing the job and unemployment. Business industries are facing with shortage on monetary cash flow and potential to unable to paid loan which they will become NPL or potential to collapse at the end such as tourism and aviation, will certainly face hardships (Dayong Zhang, Min Hu, Qiang Ji, 2020).

According to the pandemic timeline, the World Health Organization (WHO) officially declared the coronavirus or COVID-19 outbreak to be a global pandemic on March 11th (WHO, 2020) After WHO announcement for several days and number of confirmed cases in Thailand surpassed over 1,000, Thai Government has released an emergency decree to be a strictly regulation for over the country on 25th March 2020 (Thailand Ministry of Interior, MOICOVID).

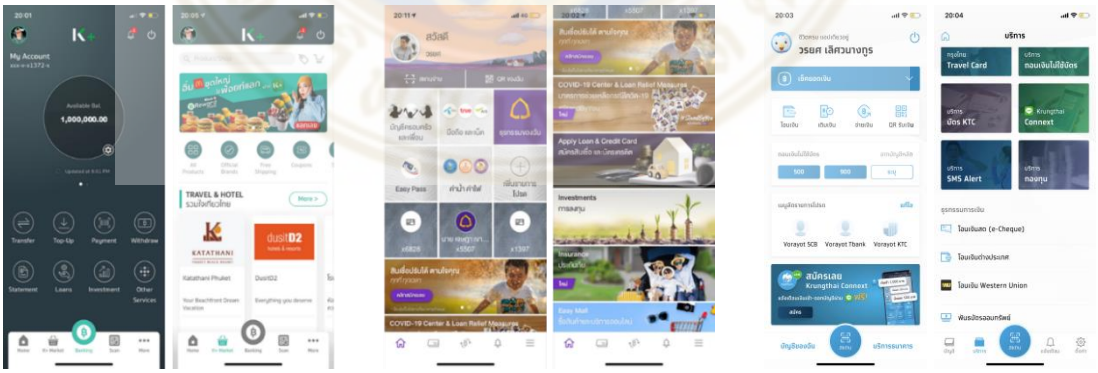
Thai emergency decree and Lockdown the country regulation are definitely direct affected to all businesses. It's caused of freezing almost business activities. No matter large company or small business entrepreneur have to find a solution for survival. Digital Technology, is a consideration for business solution. It will become a key success factor most of all business at this time.

One of a fundamental business, that affect from the pandemic of COVID-19, is Banking and Financial Business. All financial analyst forecast that Bank has a high potential risk of increasing in NPL from freezing business activities and low ability of business to payback. And also, they couldn't provide new booking loan which is a major revenue income. Moreover, all branches have been temporary closed for several months. With this reason, it makes some customer couldn't do some of financial transaction at branch like before. Therefore, most of branch visited customer migrate themselves to digital service especially mobile banking.

1.2 Mobile Banking in Thailand

In Thailand, despite of many people inclined towards the traditional banking system which is familiar to completed teller transactions or financial activities at branch with service staffs, even machine (ATM/CDM). On the other hand, the mobile banking penetration is increasing rapidly and now digital disruption to create an invisible banking as corporate strategy for almost every banking institution in Thailand, which is an idea that banking transactions and services should be invisible as if they are noticeable, as invisible, then that means you have pain and friction which should have been removed (Chris, 2018).

Recently, every bank in Thailand has their own mobile banking application for smart phones through which the customers can easily do the financial activity and transaction anytime and anywhere. Features and functions have been great developed based on customer persona and customization concept of mobile banking development, which user can see their financial portfolio and status, and also doing a transaction similarly as a mini branch. And also, planning with continuous development to build up performance to become ONE STOP SERVICE application in near future.



Source: K PLUS, SCB EASY, Krungthai NEXT Mobile Banking Application.

“According to Master Card’s Mobile Shopping Survey, it was found that 61.1% of Thai consumer use mobile phone to purchase goods and services and the figure shows that Thailand ranked fourth among fourteen Asia-Pacific market surveyed by Master Card. Research revealed that 397 million baht worth of value of transaction is done via mobile banking in Thailand as of June 2016” (Kacharoen, N. and Thanabordeekij, P. (2019).

From Bank of Thailand recording, mobile banking usage in Thailand is increasing around 53% on No. of agreement and 26% on transaction volume from 2017 to 2019 (YOY). The value of transactions jumps over 39% from 9,539 TRN to 24,408 Billion Baht as well. Mobile Banking transactions processed through their bank systems. The table presents volume and value of use of mobile banking, and also shows the number of agreements (BOT, 2020).

Mobile Banking	MAR 2020	FEB 2020	JAN 2020	2019	2018	2017
No. of agreements 2/	62,788,691	61,682,877	60,679,606	60,084,145	46,004,931	32,143,467
Volume of transactions (Thousand Transactions)	593,059	529,879	514,379	4,925,109	2,839,368	1,308,465
Value of transactions (Billions of Baht)	24,408	17,501	9,539	24,408	17,501	9,539

Source: PS_PT_009 : Use of Mobile Banking and Internet Banking 1/, BOT

1.3 Research Objectives

1. To understand Thai customer behavior and experience on using banking channels especially mobile banking according to each period 1. Before 2. During, and 3. After the pandemic of COVID-19.

2. To understand the factors that effect on the behavior intention to use mobile banking in Thailand.

This study employed the unified theory of Technology Acceptance Model (TAM), selected factor from Innovation Diffusion Theory (IDT) and combinate with demographic as moderating effects to elaborately investigate what affecting individuals to intention to use mobile banking according to the periods. To understand factors and explore some of customer needed on mobile banking's feature and function for upgrading application in near future.

1.4 Research Implications

According to, this research is focused on variable factors on customer behavior with mobile banking usage. It will benefit to financial initiation and banking sector or related. To understand customer behavior and experience on using banking channels especially mobile banking according to each period 1. Before the pandemic of COVID-19, 2. During the pandemic of COVID-19, and 3. After the pandemic of COVID-19. And also, to understand factors that effect on customer behavior intention to use on mobile banking in Thailand. In order to, plan for mobile banking upgrading on feature and function that meet with the customer needed in order to consistence with customer centric idea. And also, plan for business or migration strategies from branch to mobile banking application, which intend to developed and upgrade performance and capability on mobile banking equality to traditional branch. It's consequence to reduce in cost of cash management and fixed cost at branch and forecasting or developing a branch closure and consolidation plan or turning asset to be more valuable in near future.

CHAPTER II
LITERATURE REVIEW

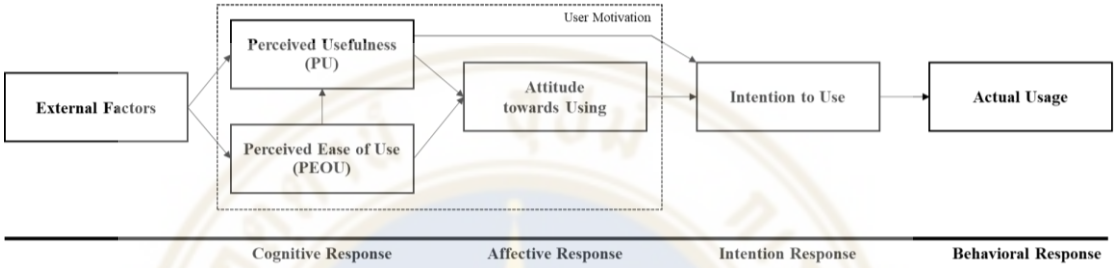
Nowadays with advancements in mobile banking technology, it has led many customers to use mobile banking application as a banking assistant device to complete transaction and payment in anywhere and anytime. Mobile banking application is quite similar to every technology, which mostly customers are concerned in some influence factor for intention to use. Therefore, it represents a challenge for financial and banking services providers to develop or upgrade performance on mobile banking to meet a customer need especially under the limitation of pandemic of COVID19. There are factors that would enable banks to use this technology to influence their customers to conduct banking transactions on mobile banking application.

The theoretical framework of this study is based on a fundamental of Technology Acceptance Model (TAM), and Innovation Diffusion Theory (IDT), which found in a previous study "The intention to use mobile banking" (Ibrahim, 2015).

2.1 Technology Acceptance Model (TAM)

TAM was proposed by Fred Davis. It shown external stimulus comprises actual system's features and capabilities govern the users' motivation to use the system, which predicts the usage of the system. TAM model shown external factors effect to user perception and create attitude which lead to using intended. TAM was regulated by three factors of user motivation which were perceived usefulness, perceived ease of use and attitude towards using a system which lead behavioral to intention to use. Perceived usefulness was explained a perception that using a particular system would enhance on performance and benefit. Perceived ease of use was explained a perception that using a particular system would be simple and easy for using (Davis et al., 1989).

The previous research found the moderating effect of gender with intention of using mobile banking in Singapore. It found that perceived ease of use and perceived usefulness has a significant influence on the intention to use mobile banking (Riquelme and Rios, 2010). Consistently, some research found that intention to use internet banking significantly anticipates actual use of mobile banking application. The results also found that perceived usefulness significantly influences the intention to use mobile banking application



(Yousafzai and Yani-de-Soriano, 2012).

Figure-2.1 Technology Acceptance Model (Davis, 1989)

2.2 Innovation Diffusion Theory (IDT)

Innovations Diffusion Theory (IDT) was considered as theories that have attempted to explore factors that affect an individual to new technology and innovation intention to use (Rogers, 2003). IDT is a theory that explain what, why and how technologies spread through cultures. As a consequence, diffusion processes result shows the acceptance or penetration of a new idea, behavior, or physical innovation. Regarding with the IDT, new technology and innovation intention to use depends on five characteristics of the innovation, namely relative advantage, compatibility, complexity, observability, and trialability. For the exception, complexity has a negative relationship with the new technology and innovation intention to use, which assume that most of people are not preferred on complex or hard to understand technology. For other factors positively affect with new technology and innovation intention to use. (Lin, 2011; Puschel, Mazzon & Hernandez, 2010).

Regarding to Ibrahim, 2015 “The intention to use mobile banking” the theoretical framework was designed with an integration of Technology Acceptance Model (TAM), and Innovation Diffusion Theory (IDT) according to Figure-2.

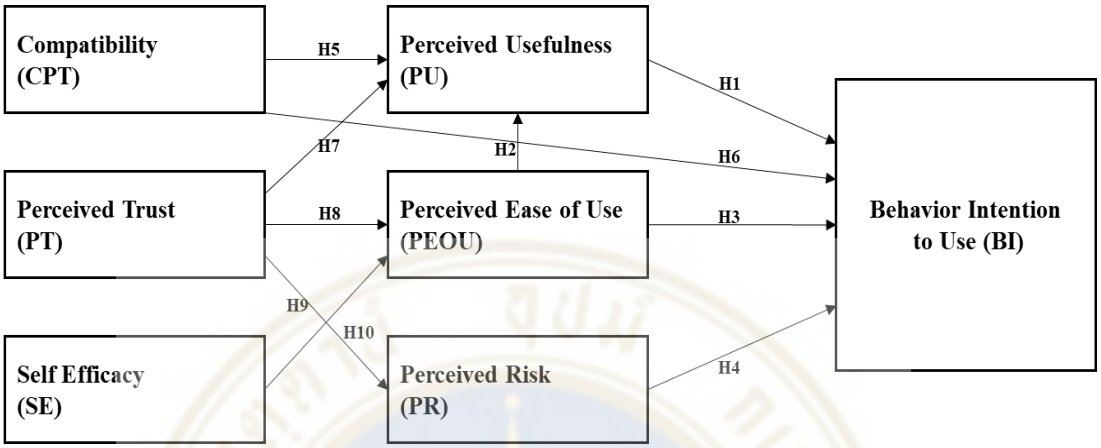


Figure-2.2 Integrated model of TAM & DIT proposed by (Ibrahim, 2015)

Hypothesis test result found that, “Compatibility is powerful driver to the intention to use mobile banking and perceived risk is severe hindrance. Bank customers are sensitive to risk”

Hypothesis	Path	Coefficient	|T-Value|	Support
H_1	Perceived usefulness ---> Intention to use	0,044	$0,875^{ns}$	No
H_2	PEOU ---> Perceived usefulness	0,455	$4,405^{a}$	Yes
H_3	PEOU ---> Intention to use	-0,007	$0,146^{ns}$	No
H_4	Perceived risk ---> Intention to use	-0,140	$3,008^{b}$	Yes
H_5	Compatibility ---> Perceived usefulness	0,114	$1,830^{d}$	Yes
H_6	Compatibility ---> Intention to use	0,741	$17,171^{a}$	Yes
H_7	Perceived trust ---> Perceived usefulness	0,213	$2,344^{c}$	Yes
H_8	Perceived trust ---> PEOU	0,520	$6,480^{a}$	Yes
H_9	Perceived trust ---> Perceived risk	-0,234	$2,997^{b}$	Yes
H_{10}	Self-efficacy ---> PEOU	0,155	$1,608^{ns}$	No

$^{a}P < 0.000$, $^{b}P < 0.005$, $^{c}P < 0.050$, $^{d}P < 0.100$, ns = not significant

Source: The intention to use mobile banking: Further evidence from Saudi Arabia (Ibrahim, 2015)

2.3 Research Model and Hypotheses

The theoretical framework of this study has been conducted on basis of variable on the previous research which had considering to integrate between TAM and IDT for explaining customer's intention to use mobile banking and test a differentiation according to each period 1. Before the pandemic of COVID-19, 2. During the pandemic of COVID-19, and 3. After the pandemic of COVID-19. Moreover, the framework work tries to understand customer attitude toward intention through demographic (Age, Gender, Income and Asset under management).

2.4 Perceived Usefulness

Perceived usefulness is defined customer believes and perceives that mobile banking is more benefit and convenience, when compared to other banking channels, like branch and ATM. These benefits include allowing customer to complete banking activities suddenly when necessary, anytime, and anywhere in other word save time. And also, customer perceives on value for example, save fee charge. When customers perceive that the mobile banking services will be more useful, there is creating a potential which customer are willing to use it. In other words, the main reason customers use mobile banking systems is that they find them useful and is "capable of being used advantageously" (Davis, 1989: 320).

2.5 Perceived Ease of Use

Perceived ease of use is defined customer believes and perceives that mobile banking is easy to understand and use (Lin, 2011) for example, easy to use, easy for self-learning, easy for understand UX/UI design, easy to complete task and not put much effort. The previous research found that perceived ease of use (PEOU) influences attitude towards mobile banking and this influences a behavioral of intentions of using mobile banking towards mobile banking besides continuing to use the mobile banking (Puschel et al., 2010). Lin (2011) shown that PEOU influence with intention of using mobile banking.

2.6 Perceived Risk

Perceived risk is defined the uncertainty a consumer has when using mobile banking. It mentioned about possibility that the user might incur losses in the form of financial losses or personal account information by using mobile banking services. The research also found that perceived risk is important barriers to affecting intention of using mobile banking or the same context of intention to use (Laukanen and Cruz, 2008).

For some research, it can divide perceived risk to five aspects: performance risk, financial risk, time risk and security risk and social risk, which provided more in-depth understanding of characteristics of risks towards mobile banking (Lee,2009). For example, "Customer feel the insecurity of their bank account when system is suddenly disconnected or breakdown.", it's related to performance risk (Kuismaa, T., Laukkanena, T., & Hiltunenb, M., 2007). "Customers are fear that they may make mistakes in their banking processes and lose money from transaction mistaken.", it's related to financial risk (Laukkanen, T., & Lauronen, J., 2005). "Customer are fear that the PIN codes may be taken used by others by hacking and other means". It's related to security risk and privacy risk (Kuismaa, T., Laukkanena, T., & Hiltunenb, M., 2007).

2.7 Perceived Trust

Perceived trust is defined the level of creditability that customer have with products and services without taking a benefit. Perceived trust in Mobile banking is defined as the confidence the user has in the mobile device being used to conduct the online transaction. (Lori N. K. Leonard, 2010). In previous research found that trust has a positive effect on both perceived ease of use and perceived usefulness (Kerem and Nilsson, 2005). Moreover, perceived trust and perceived risk are related together. It shown a reflection on how the level of risk increases or decreases when a person trusts banking products or services to do a transaction. Perceived trust also shown that is an important determinant for overcomes personal fears associated with risk and uncertainty too. (Phonthanukitithaworn Chanchai & Sellito Carmine & Fong Michelle., 2015)

2.8 Compatibility

Compatibility is defined the level that products and service is matched and consistent with users existing values, beliefs, habits and present and previous experiences (Chen, Gillenson & Sherrell, 2004). While mobile banking services become compatible with the user's needs, preferences, lifestyle, even compatible to other relevant technology. For example, A compatible between mobile banking and e-Wallet or other application (such as LINE or WeChat or Gmail) as noticing on “share to” feature. Customer is possible to share an confirm transaction to another person. Customer would consider these services match to make their life easier to do financial activities and transaction that fulfil customer wants and needs. Puschel et al. (2010) found that compatibility highly affects attitude towards of intention of using mobile banking.

2.9 Self-Efficacy

“Self-efficacy is defined as the level of confidence that a user possesses in using mobile banking technology and it considers the element of technology ease of use and having relative confidence in using the service” (Al-Jabri, Ibrahim., 2015). According to pervious research found, that self-efficacy effects on perceived behavioral control which influenced intention of using mobile banking application (Puschel et al., 2010)

2.10 Behavioral Intention to Use

Behavioral Intention to Use is defined the willingness or preference of a customer to use a certain product or service. Customer behavior that evaluative affects with performing on behavior. It is supported for a positive effect of attitude toward using mobile banking application. According to TAM, it shown that attitude influences behavioral intention and that behavioral intention influences actual behavior. Behavioral Intention to Use is a dependent factor that are a measure of the respondent’s attitude towards using a product or availing a service. In the same ways, it has another aspect that the consumer will use a product after evaluation.

Moreover, Behavioral Intention to Use are frequently measured as an input for decisions about new and existing products and services. Intention to use is correlated and predict future usage, (Morwitz, 2012)

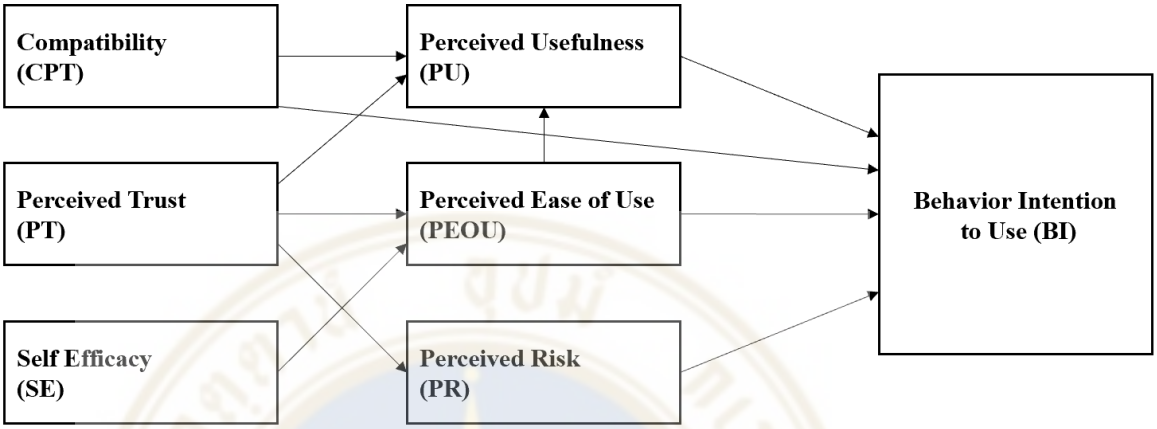


Figure-2.3 The research purposed model

CHAPTER III
RESEARCH METHODOLOGY

In order to comprehend customer attitudes and behavioral intention towards using on mobile banking usage according to each period 1. Before the pandemic of COVID-19, 2. During the pandemic of COVID-19, and 3. After the pandemic of COVID-19. The research design is on primary research which collecting data by using quantitative method to finding an effectiveness of correlation on significant numbers. The measurement scale ranged from 1 = strongly disagree to 5 = strongly agree. The survey questionnaire is used for this study from the reason that the number significant represent on whole population in Thailand, who are recently user or NON user mobile banking.

3.1 Sampling Plan

The quantitative research, it performs by using a self-administered questionnaire. The sample size for the questionnaire consider at least 200 respondents. The target population of the study is banking customers of all bank in Thailand who have are Mobile banking users and Non-Mobile banking users. Our study is intended for both male and female respondents.

With the questionnaire, it was developed from the reference on figure-3 which is the research purposed model. The pilot interview and questionnaire will be conducted for population who are bank customer with user or NON user mobile banking.

The questionnaire is divided into 3 parts by follow these;

Part 1. Screening section of the Banking customer experience and usage to understand customer on main operating bank, frequency and activity of customer who visiting branch and using mobile banking, and customer product and service holding.

Part 2. Customer factors and behavior that impact intention to use mobile banking by divided periods 1. Before the pandemic of COVID-19, 2. During the pandemic of COVID-19, and 3. After the pandemic of COVID-19

Part 3 Customer demographics

(Appendix A: The Self-administered Quantitative Questionnaire)

3.2 Data Collection

Quantitative data collection, the self-administered questionnaire has been used for the quantitative part. The questionnaire is distributed through online questionnaire according to period of July 2020. However, before colleting the data, the questionnaire is also pretested with the small number of the target respondents to ensure that some error is mitigated.

3.3 Data Analysis

The quantitative analysis has been performed through SPSS (Statistical Package for Social Sciences). The statistical is used to analyze the data in our study as follows;

1. Descriptive statistic by presenting the results of demographic data
2. Reliability analysis by using Cronbach's Alpha
3. Relationship analysis by using correlation and regression

CHAPTER IV
DATA ANALYSIS AND FINDING

4.1 Descriptive Statistic

According to the questionnaire, there are 247 usable respondents. The profile of the respondents is summarized in Table 4.1 The demographic characteristics indicated gender in order that 127 respondents (51.4%) are female, 115 respondents (46.6%) are male, and 5 respondents (2%) are others. In this study, it is divided in 11 different age group which are 1. Less than 15, 2. 15-19 years, 3. 20-24 years, 4. 25-29 years, 5. 30-34 years, 6. 35-39 years, 7. 40-44 years, 8. 45-49 years, 9. 51-54 years, 10. 55-59 years and 11. More than 59 years. With regard to the questionnaire, the majority among age group is 35-39 years old with 52 respondents (21.1%) followed by 30-34 years old with 43 respondents (17.4%).

Regarding the distribution of respondents by the marital status, most of the respondents are single (63.2%) or 156 respondents. Married are (33.2%) or 82 respondents. Others are (3.6%) or 9 respondents.

For the salary income per month, it is classified with 9 different levels which are 1. Less than 10,000 Baht, 2. 10,000 - 15,000 Baht, 3. 15,001 - 25,000 Baht, 4. 25,001 - 35,000 Baht, 5. 35,001 - 50,000 Baht, 6. 50,001 - 85,000 Baht, 7. 85,001 - 100,000 Baht, 8. 100,000 - 300,000 Baht, 9. More than 300,001 Baht. From the survey, the majority among income is between 100,000 - 300,000 Baht per month (55 respondents, 22.3%) followed by 50,001 - 85,000 Baht per month (52 respondents, 21.1%) (Approximately 32 Baht = 1 USD)

For the asset under management or AUM, it is classified with 8 different levels which are 1. Less than 50,000 Baht, 2. 50,000 - 100,000 Baht, 3. 100,001 - 500,000 Baht, 4. 500,001 - 1,000,000 Baht, 5. 1,000,001 - 2,000,000 Baht, 6. 2,000,0001 - 10,000,000 Baht, 7. 10,000,0001 - 50,000,000 Baht and 8. More than 50,000,000 Baht.

From the survey, the majority among AUM is between 100,000 - 500,000 Baht (57 respondents, 23.1%) followed by 2,000,0001 - 10,000,000 Baht (50 respondents, 20.2%) (Approximately 32 Baht = 1 USD)

For the educational level, it is classified with 4 different levels, Below College, Bachelor's degree Master's degree, and PhD. or higher. The majority of respondents are Master's degree with 123 respondents (49.8%) followed by the Bachelor's degree with 108 respondents (43.7%).

About the current occupation, it is classified with 5 different types which are 1. Government officer or State-Owned Enterprise, 2. Private Company, 3. Business Owner, 4. Retired and 5. Student

Most of the respondents are the Private Company consisting of 101 respondents (40.9%) followed by a Government officer or State-Owned Enterprise consisting of 70 respondents (28.3%) and Business Owner consisting of 57 respondents (23.1%)

Most of the respondents are located in Bangkok at 212 respondents (85.8%)

Table 4.1 The Demographic Characteristics

Demographic		N	%
Gender	Male	115	46.6%
	Female	127	51.4%
	Others	5	2.0%
	15-19 years	3	1.2%
	20-24 years	2	0.8%
	25-29 years	34	13.8%
	30-34 years	43	17.4%
	35-39 years	52	22.1%
	40-44 years	21	8.5%
	45-49 years	36	14.6%
	50-54 years	21	8.5%
	55-59 years	20	8.1%
	More than 59 years	15	6.1%

Table 4.1 The Demographic Characteristics (cont.)

Status	Single	156	63.2%
	Married	82	33.2%
	Others	9	3.6%
Salary per Month	Less than 10,000 Baht	4	1.6%
(32 Baht = 1 USD)	10,000 - 15,000 Baht	7	2.7%
	15,001 - 25,000 Baht	20	7.8%
	25,001 - 35,000 Baht	27	10.5%
	35,001 - 50,000 Baht	47	19.0%
	50,001 - 85,000 Baht	52	21.1%
	85,001 - 100,000 Baht	18	7.3%
	100,000 - 300,000 Baht	55	22.3%
	More than 300,001 Baht	17	6.9%
Asset Under Management			
(AUM)	Less than 50,000 Baht	37	15%
With main operating bank	50,000 - 100,000 Baht	24	9.7%
(32 Baht = 1 USD)	100,001 - 500,000 Baht	57	23.1%
	500,001 - 1,000,000 Baht	32	13.0%
	1,000,001 - 2,000,000 Baht	34	13.8%
	2,000,0001 - 10,000,000 Baht	50	20.2%
	10,000,0001 - 50,000,000 Baht	10	4.0%
	More than 50,000,000 Baht	3	1.2%
Education	Below College	11	4.5%
	Bachelor's degree	108	43.7%
	Master's degree	123	49.8%
	PhD., and higher	5	2%
Occupation	Government officer or State-Owned Enterprise	70	28.3%
	Private company	101	40.9%
	Business owner	57	23.1%
	Retired	13	5.3%
	Student	6	2.4%
Location	Bangkok	212	85.8%
	Up country	35	14.2%

4.2 Banking Experience and Usage

For this research result, it shows banking experience and usage of respondent which is summarized in Table 4.2 The majority of respondents are used three banks as a main operating bank which are Krungthai Bank (29.55%), Siam Commercial Bank (28.74%) and Kasikornthai Bank (26.32%). With these three banks, there are three out of five main player bank and gain high market share in the market.

About main reasons why they are used bank as a main operating bank, it shows that customer get a salary from the bank (62.35%). They deposit money in bank account at (25.10%), Branch convenience and location (4.05%), Digital Service Convenience & Capability (3.24%), and Product & Service related or answer your needed (2.02%)

Mostly of the respondents who are using with main operating bank, they have a fundamental products and services in term of payment which are Deposit (25.40%), Credit Card (16.17%), Mobile Banking & e-Wallet Application (15.01%) and Debit Card (11.55%).

Table 4.2 Main Operating Bank and Products Holding

1	What is your main operating bank? Or Do you prefer the most?		
	Krungthai Bank (Krungthai)	73	29.55%
	Siam Commercial Bank (SCB)	71	28.74%
	Kasikornthai Bank (KBank)	65	26.32%
	Bangkok Bank (BBL)	15	6.07%
	Thai Military Bank (TMB)	13	5.26%
	Bank of Ayudhya (Krungsri)	4	1.62%
	Thanachart Bank (Tbank)	3	1.21%
	Citibank (Citi)	2	0.80%
	Government Savings Bank (GSB)	1	0.40%
2	Why do you use the bank as a main operating bank? Or Why do you prefer it the most?		
	Salary Account	154	62.35%
	Deposit Account	62	25.10%
	Branch Convenience & Location	10	4.05%
	Digital Service Convenience & Capability	8	3.24%
	Product & Service related or answer your needed	5	2.02%
	Advisory & Staff	2	0.81%

Table 4.2 Main Operating Bank and Products Holding (cont.)

	Assets Under Management (AUM)	2	0.81%
	Profitability & Return	2	0.81%
	Others	2	0.81%
3	What products and services do you have/holding with the bank?		
	Deposit	220	25.40%
	Credit Card	140	16.17%
	Mobile Banking & e-Wallet Application	130	15.01%
	Debit Card	100	11.55%
	Fund	76	8.78%
	Life Insurance	69	7.97%
	Mortgage or housing loan	42	4.85%
	Personal loan	25	2.89%
	Stock Market	23	2.66%
	Non-Life Insurance (Car, Fire, etc.)	18	2.08%
	Bond	13	1.50%
	Business Loan	8	0.92%
	Others	2	0.23%
	Total *(Able to select more than 1 choice)*	866	100.00%
4	What products and services you plan to buy/have within 1-3 months?		
	Deposit	92	22.49%
	Fund	91	22.25%
	Stock Market	46	11.25%
	Life Insurance	35	8.56%
	Mobile Banking & e-Wallet Application	31	7.58%
	Credit Card	30	7.33%
	Bond	18	4.40%
	No Plan	17	4.16%
	Personal loan	16	3.91%
	Mortgage or housing loan	14	3.42%
	Debit Card	7	1.71%
	Non-Life Insurance (Car, Fire, etc.)	6	1.47%

Table 4.2 Main Operating Bank and Products Holding (cont.)

	Business Loan	5	1.22%
	Others	1	0.24%
	Total *(Able to select more than 1 choice)*	409	100.00%

In term of channel usage and frequency, the result shows in the table 4.3 that customer behavior has behavior on banking channel usage within a month in order to these, Visited Branch 1-2 times per month (59.51%), Used ATM/ CDM 1-2 times per month (37.25%), and mostly Use Mobile Banking more than 5 times per month (84.21%).

Table 4.3 Banking Channel Usage and Frequency

5	How often do you visit to branch within a month?		
	1-2 time/month	147	59.51%
	Never	84	34.01%
	>5 time/month	9	3.64%
	3-5 time/month	7	2.83%
6	How often do you use ATM/CDM within a month?		
	1-2 time/month	92	37.25%
	3-5 time/month	70	28.34%
	>5 time/month	57	23.08%
	Never	28	11.34%
7	How often do you use Mobile Banking Application within a month?		
	>5 time/month	208	84.21%
	3-5 time/month	23	9.31%
	1-2 time/month	13	5.26%
	Never	3	1.21%

In term of mobile banking usage, the result shows in table 4.4. It shows that respondents use mobile banking application 1-2 banks (49.39%), 3-4 banks (39.27%) and more than 5 banks (11.34%). Mostly, the respondents are using mobile application for Transferring (25.34%), Bill Payment (22.29%), Check Balance and Inquiry (22.08%) and QR Code Payment (17.46%). They consider to buy products and service on mobile banking (70.85%).

For the customer satisfaction on mobile banking, it shows that most of the respondent satisfy with mobile banking Very Likely (21.89%) and Likely (61.54%).

Most of the respondents, they know clearly how to use and function on the mobile banking (90.28%). Surprisingly, they need financial advisor system to help or guide on mobile banking (59.51%). On the other hand, they don't need financial advisor system (40.49%). It can assume that some of customer they may preferred personal financial advisor/planner for consulting or willing to consult at the branch.

Table 4.4 Mobile Banking Application Usage

8	How many banks that you use mobile banking application?		
	1-2 Banks	122	49.39%
	3-4 Banks	97	39.27%
	More than 5 Banks	28	11.34%
9	What Mobile Banking do you use the most often?		
	Krungthai Bank (Krungthai)	71	28.74%
	Kasikornthai Bank (KBank)	69	27.94%
	Siam Commercial Bank (SCB)	68	27.53%
	Bangkok Bank (BBL)	15	6.07%
	Thai Military Bank (TMB)	14	5.67%
	Bank of Ayudhya (Krungsri)	4	1.62%
	Thanachart Bank (Tbank)	4	1.62%
	United Overseas Bank (UOB)	1	0.40%
	Government Savings Bank (GSB)	1	0.40%
10	What's kind of transaction or activity that you use on the mobile banking application?		
	Transferring	241	25.34%

Table 4.4 Mobile Banking Application Usage (cont.)

	Bill Payment	218	22.92%
	Check Balance/Inquiry	210	22.08%
	QR Code Payment (Pay/Receive)	166	17.46%
	Fund (Buying/Selling)	63	6.62%
	Currency Exchange	30	3.15%
	Insurance	13	1.37%
	Loan (Requesting)	7	0.74%
	Others	3	0.32%
	Total (*Able to select more than 1 choice)*	951	100.00%
11	Will you buy/register financial product and service on Mobile Banking?		
	YES	175	70.85%
	NO	72	29.15%
12	Do you like the main mobile banking application that you used?		
	Likely (4)	152	61.54%
	Very Likely (5)	54	21.86%
	Not Sure (3)	39	15.79%
	Unlikely (2)	2	0.81%
	Very Unlikely (1)	0	0.00%
13	Do you know clearly on Mobile banking functions or how to use?		
	Yes	223	90.28%
	No	24	9.72%
14	Do you need financial advisor system to help/guide you on mobile banking application?		
	Yes	147	59.51%
	No	100	40.49%

In term of mobile banking behavior on intention according to the pandemic of COVID-19 in table 4.5, it shows the customer preference on each period which is 1. Before, 2. During, and 3. After of COVID-19. For before COVID-19, respondents consider to buy or register banking product through mobile banking (70.45%), branch (24.29%), and (ATM5.26%).

On during COVID-19 and branches were close, most of respondents prefer to use mobile banking instead branch and ATM (94.33%). They use mobile banking for transferring (28.35%), bill payment (25.03%) and check balance/inquiry (23.25%) and QR code payment (16.01%). The product that answer their need the most are mobile banking (38.87%), deposit (33.66%) and credit card (13.77%). Moreover, the banking service transaction the answer their need the most are transfer (33.06%), bill payment (25.70%), withdraw (15.22%) and deposit (11.29%). After the COVID-19, the respondent still considers to prefer using mobile banking (91.09%)

Table 4.5 Mobile Banking Behavior on Intention according to the Pandemic of COVID-19

15	Before COVID19, when you consider to buy/register a product and service, where will you do?		
	Mobile Banking Application	174	70.45%
	Branch	60	24.29%
	ATM	13	5.26%
16	During the COVID19 and branches were close, how do you do with financial activities?		
	Prefer mobile banking instead Branch/ATM	233	94.33%
	No/Freeze action on financial activities	10	4.05%
	Prefer ATM instead Branch	4	1.62%
17	During the COVID19, what feature and function on Mobile Banking do you use the most?		
	Transferring	239	28.35%
	Bill Payment	211	25.03%
	Check Balance/Inquiry	196	23.25%
	QR Code Payment (Pay/Receive)	135	16.01%
	Fund (Buying/Selling)	39	4.63%
	Insurance	12	1.42%
	Currency Exchange	7	0.83%

Table 4.5 Mobile Banking Behavior on Intention according to the Pandemic of COVID-19 (cont.)

	Loan (Requesting)	4	0.47%
	Total *(Able to select more than 1 choice)*	843	100.00%
18	During COVID19, what is the product that answer to you needed the most?		
	Mobile Banking & e-Wallet Application	96	38.87%
	Deposit	83	33.60%
	Credit Card	34	13.77%
	Fund	11	4.45%
	Life Insurance	10	4.05%
	Debit Card	6	2.43%
	Stock Market	5	2.02%
	Bond	1	0.40%
	Business Loan	1	0.40%
19	During COVID19, what is service transaction possible answer you needed the most?		
	Transfer	202	33.06%
	Bill Payment	157	25.70%
	Withdraw	93	15.22%
	Deposit	69	11.29%
	Account (Open/Close/Update Passbook)	27	4.42%
	Fund (Buy)	21	3.44%
	Loan (Open/Paid/Close)	18	2.95%
	Insurance (Register)	11	1.80%
	Cheque	6	0.98%
	Credit & Debit Card (Register)	5	0.82%
	Foreign Exchange	2	0.33%
	Total *(Able to select more than 1 choice)*	611	100.00%
20	After the COVID19, which channel do you prefer to buying/doing financial activities?		
	Mobile Banking Application	225	91.09%
	Branch	16	6.48%
	ATM	6	2.43%

4.3 Reliability Analysis

To test if each question in each factor is reliable, Cronbach's Alpha has been observed. The result shows that Perceived Usefulness, Perceived Ease of Use, Perceived Risk, Perceived Trust, Compatibility, Behavior Intention are defined as a good scale with the Cronbach's Alpha > 0.8 and Self-Efficacy is defended as an adequate scale with Cronbach's Alpha = 0.705.

Table 4.6 Reliability on Factors

	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Perceived Usefulness	.805	.831	5
Perceived Ease of Use	.909	.923	5
Perceived Risk	.892	.896	5
Perceived Trust	.874	.875	5
Compatibility	.839	.844	5
Self-Efficacy	.705	.734	5
Behavior Intention	.830	.868	10

4.4 Relationship Analysis

This part is used to test whether the factors have a significant linear relationship with the dependent variable. For the research purposed model framework on figure-2.3, it shown dependent variable according to these, Perceived Usefulness, Perceived Ease of Use, Perceived Risk, Behavior Intention which can summarized dependent variable equations in table 4.7

Table 4.7 Dependent Variable Equation (Multiple Linear Regression)

1	PU	= CPT + PT + PEOU
2	PEOU	= PT + SE
3	PR	= PT
4	BI	= PU + CPT + PEOU + PR

4.4.1 Perceived Usefulness (PU)

According to the result on equation (PU = CPT + PT + PEOU), r-square indicates that 29.4% of the variance in perceived usefulness (PU) can be predicted from the factors compatibility (CPT), perceived trust (PT), and perceived ease of use (PEOU). Furthermore, we can say that those factors, compatibility (CPT), perceived trust (PT), and perceived ease of use (PEOU) can be used to reliably predict perceived usefulness at $F = 33.790$, $p < 0.05$.

The comparison of the magnitude of the relationship between factors and the dependent variable has been performed which compatibility (CPT) has unstandardized coefficient $B = 0.203$, and perceived ease of use (PEOU) has unstandardized coefficient $B = 0.203$. There respectively are significant impact for perceived usefulness (PU). On the other hand, perceived trust (PT) is NOT significant which standardized coefficient -0.039, and $Sig = 0.594$, $p > 0.05$. And also, it has unstandardized coefficient $B = -0.022$.

(Appendix B: Perceived Usefulness Model summary, ANOVA, and Coefficients)

4.4.2 Perceived Ease of Use (PEOU)

According to the result on equation (PEOU = PT + SE), r-square indicates that 36.3% of the variance in perceived ease of use (PEOU) can be predicted from the factors self-efficacy (SE), and perceived trust (PT). Furthermore, we can say that those factors, self-efficacy (SE), and perceived trust (PT) can be used to reliably predict perceived usefulness at $F = 71.001$, $p < 0.05$.

The comparison of the magnitude of the relationship between factors and the dependent variable has been performed which self-efficacy (SE) has unstandardized coefficient B = 0.400, and perceived trust (PT) has unstandardized coefficient B = 0.251 There respectively are significant impact for perceived ease of use (PEOU).

(Appendix C: Perceived Ease of Use Model summary, ANOVA, and Coefficients)

4.4.3 Perceived Risk (PR)

According to the result on equation (PR = PT), r-square indicates that 2% of the variance in perceived risk (PR) can be predicted from the factors perceived trust (PT). Furthermore, we can say that perceived trust (PT) can be used to reliably predict factors perceived trust (PT) at $F = 5.941$, $p < 0.05$.

The comparison of the magnitude of the relationship between factors and the dependent variable has been performed which perceived trust (PT) is significant impact which shows on standardized coefficient -0.154, and Sig = 0.016, $p < 0.05$. And also, it has unstandardized coefficient B = 0.161.

(Appendix D: Perceived Risk Model summary, ANOVA, and Coefficients)

4.4.4 Behavior Intention to Use (BI)

According to the result on equation (BI = PU + CPT + PEOU + PR), r-square indicates that 33.60% of the variance in behavior intention to use (BI) can be predicted from the factors perceived usefulness (PU), perceived ease of use (PEOU), perceived risk (PR), and compatibility (CPT). Furthermore, we can say that those factors, perceived

usefulness (PU), perceived ease of use (PEOU), perceived risk (PR), and compatibility (CPT) can be used to reliably predict perceived usefulness at $F = 33.054$, $p < 0.05$.

The comparison of the magnitude of the relationship between factors and the dependent variable has been performed which perceived usefulness (PU) has unstandardized coefficient B = 0.276, perceived risk (PR) has unstandardized coefficient B = 0.093, and compatibility (CPT) has unstandardized coefficient B = 0.308. There respectively are significant impact for perceived usefulness (PU). On the other hand, perceived ease of use (PEOU), is NOT significant which standardized coefficient -0.013, and Sig = 0.853, $p > 0.05$. And also, it has unstandardized coefficient B = -0.010

(Appendix E: Behavior Intention to Use Model summary, ANOVA, and Coefficients)

4.5 Discussion

With the result, it shows that compatibility (CPT) is the highest correlate with behavior intention to use (BI) which unstandardized coefficient is 0.308 follow by perceived usefulness (PU), which unstandardized coefficient is 0.276 and perceived risk (PR) which unstandardized coefficient is 0.093.

Compatibility has the strongest positive effect on the intention to use which is similar to the previous research. This implies that mobile banking services match with customers lifestyles and need, which possible to coverage all financial activities even data information that useful for making decision. Moreover, mobile banking has to support and compatible with other technologies such as LINE, Gmail or another related. Therefore, mobile banking users are intended to use mobile banking, when they perceive that using mobile banking is completely compatible to lifestyle, no matter in any period 1. Before, 2. During, or 3. After COVID19. Customer intend to increase using, if bank can design it to compatible to customer. In the previous research, it also found that compatibility had the strongest positive effect on the intention to use. Customer intend

to adopt mobile banking when it fit to the way they normally do the financial activity and lifestyle. (Ibrahim, 2015)

Perceived usefulness (PU) also has positive effect on the intention to use similar to the previous research. This implies that mobile banking services help user to save time and convenience instead visit at branch or doing an activity via ATM machine, helps customer to increase performance on doing financial transaction and efficiency, and helps to get you easier to carry out your task. Save money of fee charging has high considering for customer perspective. In the previous research, it found that perceived usefulness had no significant effect on behavior intention to use mobile banking application according to the customer perceive on alternative channels like branch and ATM machine have similar functions and difficult for evaluation (Ibrahim, 2015).

Perceived risk (PR) also has positive effect on the intention to use similar to the previous research. This implies that most of customer they know about the risk on mobile banking such as risk on system failure which make transaction NOT complete or can NOT access to the application or losing money, risk on data privacy which is possible for someone take your data for their benefit or know your security PIN code or about Hacker/Fisher, risk on losing mobile phone or forget password or PIN code. What if, bank possible to solve and make mobile banking more stabilize and reducing in failure, it can create customer intension which lead to customer satisfaction to make it more sustained in mobile banking usage.

Perceived ease of use (PEOU) found that has NO relationship with behavior intention to use (BI) in the context of Thai people behavior, but it has a relationship with perceived usefulness (PU) which is similar to the previous research. Similar with perceived usefulness, the perceived ease of use is hard to evaluate for mobile banking behavior intention to use according the customer perceive that alternative channels like branch and ATM machine are easy to as well.

Therefore, it can assume that Thai people is familiar with using mobile banking for many years. They already perceive that mobile banking is easy to use, easy for self-learning, easy to understand UX/UI design, easy to accomplish financial activity and NOT require much on metal effort. According to, Thai's bank has an experience to

develop mobile banking for many years and improve the mobile banking performance and capability to satisfy customer in high level. With this assumption, it may a reason that perceived ease of use eliminates direct relationship to behavior intention in Thai context of mobile banking behavior intention.

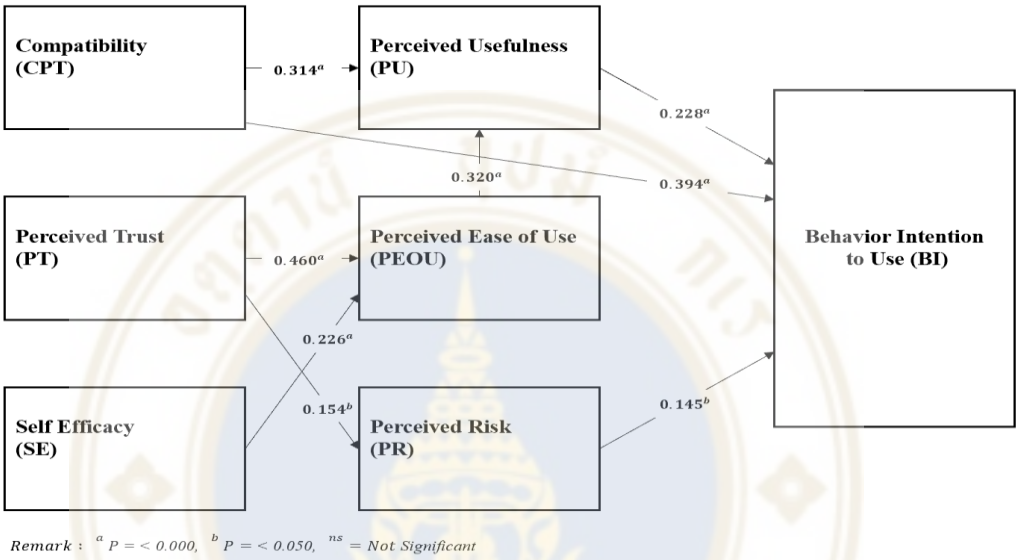


Figure-4.1 Thai customer behavior on intention of using mobile banking conceptual model

CHAPTER V
CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This research paper aims to provide understanding on Thai customer behavior and experience on using banking channels especially mobile banking according to each period 1. Before the pandemic of COVID-19, 2. During the pandemic of COVID-19, and 3. After the pandemic of COVID-19, and also to understanding the factors that effect on the behavior intention to use mobile banking in Thailand.

According to the research result, it shows that Thai customer highly adopt mobile banking. The majority of respondent is in middle age in between 25 to 39 years with qualify in education level and accumulate 80% for salary in between 25,000-300,000 Baht per month who are located in Bangkok more than 80%. Mostly, they are using Krungthai Bank, Kasikornthai Bank and Siam Commercial Bank as a main operation bank. Respondent use mobile banking application to do a financial activity such as transferring, bill payment, checking balance/inquiry and QR Code payment which has accumulated percent more than 80%. Moreover, more than 80% of respondents are satisfy on using mobile banking. They are usually used mobile banking and accepted to be a part in customer daily life.

Before COVID-19, when they consider to buy/register a product and service. They are preferred to use mobile banking around 70% and branch 24%. During the COVID-19, they are preferred to use mobile banking instead branch and ATM at 94%. It shows that Thai mobile banking customer dramatically increase 24% on mobile banking preference. After the COVID-19, the result shows that customer remain using in mobile banking in a same level around 90% and little convert back to branch 2% to 3%.

With the other research objective, it is to understand behavior intention to use mobile banking in Thailand. Compatibility has the strongest positive effect on the intention to use which is similar to the previous research. This implies that mobile banking services

match with customers lifestyles and need, which possible to coverage all financial activities even data information that useful for making decision. Moreover, mobile banking has to support and compatible with other technologies such as LINE, Gmail or another related.

Perceived usefulness (PU) also has positive effect on the intention to use similar to the previous research. This implies that mobile banking services help user to save time and convenience instead visit at branch or doing an activity via ATM machine, helps customer to increase performance on doing financial transaction and efficiency, and helps to get you easier to carry out your task. Save money of fee charging has high considering for customer perspective.

Perceived risk (PR) also has positive effect on the intention to use similar to the previous research. This implies that most of customer they know about the risk on mobile banking such as risk on system failure which make transaction NOT complete or can NOT access to the application or losing money, risk on data privacy which is possible for someone take your data for their benefit or know your security PIN code or about Hacker/Fisher, risk on losing mobile phone or forget password or PIN code. What if, bank possible to solve and make mobile banking more stabilize and reducing in failure, it can create customer intension which lead to customer satisfaction to make it more sustained in mobile banking usage.

5.2 Recommendation

For this research, it will benefit to financial initiation and banking sector or related. In order to, plan for mobile banking upgrading and improvement on feature and function that meet with the customer needed satisfaction in order to consistence with customer centric idea. And also, plan for business or migration strategies from branch to mobile banking application, which intend to developed and upgrade performance and capability on mobile banking equality to traditional channel like branch. It's consequence to reduce in cost of cash management and fixed cost at branch and forecasting or developing a branch closure and consolidation plan or turning asset to be more valuable in near future.

With the recommendation to satisfy customer behavior intention and satisfaction, banking institution should frequently improve mobile banking which integrate feature and function that match to customer lifestyle link between financial and non-financial services as an omni-channel concept to create a ONE STOP SERVICE application platform. It is possible to create satisfy in high level of compatibility and perceived usefulness factors

Moreover, mobile banking risk elimination is another issue that banks have to concerned. The mobile banking operating system plays an important role. Some of customers perceive on risk that may happened and effect to their money and financial activity. It makes they fear to use mobile application. What if, banks possibly eliminate risk of using mobile banking such as system failure which consequently losing money during transaction or else. It would create a more behavior intention to use mobile baking as well.

5.3 Limitation

Regarding the sample size and characteristic of demographic respondent, it can be a limitation which is the majority of respondent clustering in Bangkok city and well-education with high income.

For more accuracy on behavior and reflecting on Thai population in the future research, it should set up a sample size quota by using an overall population scale and find a significant number of respondents such as young generation 15-19 years or 20-24 years with minimum 25 amount of respondent, which is coverage on big city overall in Thailand to test behavior and perception in each area.

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Appendix A for the Self-administered Quantitative Questionnaire

Part 1. Screening section of the Banking customer experience and usage

Part 1: Screening Section: Banking customer experience and usage

1. What is your main operating bank ? Or Do you perfer the most? (Please choose only 1 choice)

- ☐ Krungthai Bank (Krungthai)
- ☐ Kasikornthai Bank (KBank)
- ☐ Siam Commercial Bank (SCB)
- ☐ Bank of Ayudhya (Krungsri)
- ☐ Bangkok Bank (BBL)
- ☐ TMB Bank (TMB)
- ☐ Thanachart Bank (Tbank)
- ☐ Government Savings Bank (GSB)
- ☐ United Overseas Bank (UOB)
- ☐ Citibank (Citi)
- ☐ CIMB Thai (CIMB)
- ☐ Kiatnakin Bank (KK)
- ☐ CIMB Thai (CIMB)
- ☐ Tisco Bank (TISCO)
- ☐ Land & House Bank (HL)
- ☐ Industrial and Commercial Bank of China (ICBC)
- ☐ Bank for Agriculture and Agricultural Cooperatives (BAAC)
- ☐ Islamic Bank of Thailand
- ☐ Others (Please specify)

2. Why do you use the bank as a main operating bank ? Or Why do you perfer it the most? (Able to select more than 1 choice)

- ☐ Salary Account
- ☐ Deposit Account
- ☐ Assets Under Management (AUM)
- ☐ Profitability & Return
- ☐ Product & Service related or answer your needed
- ☐ Branch Convenience & Location
- ☐ Digital Service Convenience & Capability
- ☐ Advisory & Staff
- ☐ Others (Please specify)

3. What products and services do use have/holding with the bank? (Able to select more than 1)

- ☐ Deposit
- ☐ Fund
- ☐ Stock Market
- ☐ Life Insurance
- ☐ Non-Life Insurance (Car, Fire, etc.)
- ☐ Personal loan
- ☐ Mortgage or housing loan
- ☐ Business Loan
- ☐ Credit Card
- ☐ Debit Card
- ☐ Mobile Banking & e-Wallet
- ☐ Service application (Please specify)
- ☐ Other Please specify)

4. What products and services you plan to buy/have within 1-3 months (Able to select more than 1)

- ☐ Deposit
- ☐ Fund
- ☐ Stock Market
- ☐ Life Insurance
- ☐ Non-Life Insurance (Car, Fire, etc.)
- ☐ Personal loan
- ☐ Mortgage or housing loan
- ☐ Business Loan
- ☐ Credit Card
- ☐ Debit Card
- ☐ Mobile Banking & e-Wallet Application
- ☐ Service Application (Please specify)
- ☐ Other Please specify)

5. How often do you visit to branch within a month?
   - ☐ Never
   - ☐ 1-2 time/month
   - ☐ 3-5 time/month
   - ☐ >5 time/month

6. How often do you use ATM/CDM within a month?
   - ☐ Never
   - ☐ 1-2 time/month
   - ☐ 3-5 time/month
   - ☐ >5 time/month

7. How often do you use Mobile Banking Application within a month?
   - ☐ Never
   - ☐ 1-2 time/month
   - ☐ 3-5 time/month
   - ☐ >5 time/month

8. How many bank that you use Mobile Banking Application ?
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 5
   - ☐ 6
   - ☐ More than 6

9. What Mobile Banking do you use the most often? (Please choose only 1 choice)
   - ☐ Krungthai Bank (Krungthai)
   - ☐ Kasikornthai Bank (KBank)
   - ☐ Siam Commercial Bank (SCB)
   - ☐ Bank of Ayudhya (Krungsri)
   - ☐ Bangkok Bank (BBL)
   - ☐ TMB Bank (TMB)
   - ☐ Thanachart Bank (Tbank)
   - ☐ Government Savings Bank (GSB)
   - ☐ United Overseas Bank (UOB)
   - ☐ Citibank (Citi)
   - ☐ CIMB Thai (CIMB)
   - ☐ Kiatnakin Bank (KK)
   - ☐ CIMB Thai (CIMB)
   - ☐ Tisco Bank (TISCO)
   - ☐ Land & House Bank (HL)
   - ☐ Industrial and Commercial Bank of China (ICBC)
   - ☐ Bank for Agriculture and Agricultural Cooperatives (BAAC)
   - ☐ Islamic Bank of Thailand
   - ☐ Others (Please specify)

10. What's kind of transaction or activity that you use on the mobile banking application (Able to select more than 1)
   - ☐ Check Balance/Inquiry
   - ☐ Transfering
   - ☐ Bill Payment
   - ☐ QR Code Payment (Pay/Receive)
   - ☐ Fund (Buying/Selling)
   - ☐ Loan (Requesting)
   - ☐ Insurance
   - ☐ Currency Exchange
   - ☐ Others (Please specify)

11. Will you buy/register financial product and service on Mobile Banking?
   - ☐ Yes
   - ☐ No

12. Do you like the mobile banking application that you used?
   - ☐ Very likely (5)
   - ☐ likely (4)
   - ☐ Not sure (3)
   - ☐ Unlikely (2) (Please specify reason why)
   - ☐ Very unlikely (1) (Please specify reason why)

13. Do you know clearly on Mobile banking functions or how to use?
   - ☐ Yes
   - ☐ No

14. Do you need financial advisor or chatbot to help you on mobile banking application?
- ☐ Yes
- ☐ No

15. Before COVID19, when you consider to buy or register a product and service, where will you do?
- ☐ Branch
- ☐ ATM
- ☐ Mobile Banking Application

16. During the COVID19 and branches were close, How do you do with financial activities?
- ☐ No/Freeze action on financial activities
- ☐ Prefer ATM instead Branch
- ☐ Prefer mobile banking instead Branch/ATM

17. During the COVID19, what feature and function on Mobile Banking do you use the most?
- ☐ Check Balance/Inquiry
- ☐ Transfering
- ☐ Bill Payment
- ☐ QR Code Payment (Pay/Receive)
- ☐ Fund (Buying/Selling)
- ☐ Loan (Requesting)
- ☐ Insurance
- ☐ Currency Exchange
- ☐ Others (Please specify)

18. After the COVID19, which channel do you prefer to buying/doing financial activities ?
- ☐ Branch
- ☐ ATM
- ☐ Mobile Banking Application

18 According to COVID19, What is the product that answer to your needed the most ?
- ☐ Deposit
- ☐ Fund
- ☐ Stock Market
- ☐ Life Insurance
- ☐ Non-Life Insurance (Car, Fire, etc.)
- ☐ Personal loan
- ☐ Mortgage or housing loan
- ☐ Business Loan
- ☐ Credit Card
- ☐ Debit Card
- ☐ Mobile Banking & e-Wallet Application
- ☐ Service Application (Please specify)
- ☐ Other (Please specify)

19 According to COVID19, What is service transaction possible answer your needed the most?
- ☐ Deposit
- ☐ Withdraw
- ☐ Transfer
- ☐ Bill Payment
- ☐ Cheque
- ☐ Foreign Exchange
- ☐ Account (Open/Close/Update Passbook)
- ☐ Loan (Open/Paid/Close)
- ☐ Insurance (Register)
- ☐ Fund (Buy)
- ☐ Credit & Debit Card (Register)
- ☐ Other (Please specify)

Thank you for section 1

Part 2. Customer factors, attitude, and behavior that impact intention to use mobile banking by divided periods 1. Before the pandemic of COVID-19, 2. During the pandemic of COVID-19, and 3. After the pandemic of COVID-19

Perceived Usefulness	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1. Mobile banking helps you to **save time** instead visit at branch/ATM.					
2. Mobile banking helps you to **convience** instead visit at branch/ATM.					
3. Mobile banking helps you to **save money** on fee charging.					
4. Mobile banking helps you to **increase performance** on doing financial transaction and efficiency.					
5. Mobile banking helps to get you more **easy to carry out your task**.					

Perceived Ease of Use	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1. Mobile banking is **easy to use**.					
2. Mobile banking is **easy for self-learning**.					
3. Mobile banking is **easy to understand with design (UX/UI).**					
4. Mobile banking is **easy to accomplish my financial activities.**					
5. Mobile banking is **NOT require a lot of mental effort.**					

Perceived Risk	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1. I know **risk on system,** such as system failure which make transaction NOT complete or can NOT access to the application.					
2. I know **risk on data privacy,** such as someone take your data for their benefit or know your security PIN code or about Hacker/Fisher.					
3. I know **risk on losing mobile phone** or forget pasword or PIN code.					
4 I'm worried that other **people may be able to access my account.**					
5. I'm worried that **I will lose my money when transferring** via Mobile banking.					
6. I would **NOT feel safe providing personal privacy information** over the Mobile banking.					

Perceived Trust	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1. I trust to **using mobile banking equally branch or ATM.**					
2. I trust that **mobile banking will NOT failure/error occurred while you necessary to used.**					
3. I trust on **my bank/ techology & innovation** especially mobile banking.					
4. I trust on **mobile banking to keep its promise.**					
5. I trust that **mobile banking will keep customers' interest in mind.**					

Compatability	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1. Mobile banking is **match to my lifestyle**.					
2. Mobile banking is **meet my needs**.					
3. Mobile banking **can served all of financial activities**.					
4. Mobile Banking provide **financial data** & **information that benefit to you or decision.**					
5. Mobile banking is **compatible with other technologies I use,** such as LINE, Gmail, or related					

Self-Efficacy	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1. I could use, if Mobile banking has instruction feature for assistance.					
2. I could use, if someone show me how to do it					
3. I do **NOT feel difficulties to use** M-banking					
4. I do **NOT need some people's help to use** M-banking					
5. I have a **confidence to use** Mobile banking					

Attitude towards Using	1 Strongly disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly agree
1. I'm **interesting to use** Mobile Banking ?					
2. I think my recent mobile banking is **usefull** ?					
3. I think my recent mobile banking is **easy to use** ?					
4. I think my recent mobile banking has **low risk** ?					
5. I think my recent mobile banking I **can trust** ?					
6. I think my recent mobile banking is **fit to your lifestyle** ?					
7. **Before** the COVID19, it's **just a good idea for using** Mobile Banking.					
8. **During** the COVID19, it's an **excellent idea for using** Mobile Banking.					
9. **After** the COVID19, I **may consider to use.**					

Intention to Use	Strongly disagree	2 Disagree	3 Neutral	4 Agree	Strongly agree
1. What if, **Bank make a simply understand** how to use mobile banking. I will used it more often.					
2. What if, **Bank can show benefit/convenince**. I will used it more often					
3. What if, **Bank can resolve uncertainty/failure on system**. I will used it more often					
4. What if, **Bank can create confident on mobile banking or other technology**. I will used it more often					
5. What if, **Bank can develop mobile banking match to my lifestyle.** I will used it more often					
6. I oftenly use mobile banking before COVID19.					
7. I will **used mobile banking more often only COVID19 period**.					
8. I will **used mobile banking more often when COVID19 gone.**					
9. **Product name influences** to making decision to intention to use					
10. **Design/Color (UX/UI) influences** to making decision to intention to use					

Part 3 Customer Demographics

Part 3: Demographics

1. What is your gender?
   - ☐ Male
   - ☐ Female
   - ☐ Other

2. What is your age range?
   - ☐ Less than 15 years old
   - ☐ 15-19 years old
   - ☐ 20-24 years old
   - ☐ 25-29 years old
   - ☐ 30-34 years old
   - ☐ 35-39 years old
   - ☐ 45-54 years old
   - ☐ 55-59 years old
   - ☐ 60 and above

3. What is your marital status?
   - ☐ Single
   - ☐ Married
   - ☐ Others (divorced. Widowed, separated, etc.)

4. What is your personal income per month?
   - ☐ Less than 10,000 Baht
   - ☐ 10,000 - 15,000 Baht
   - ☐ 15,001 - 25,000 Baht
   - ☐ 25,001 - 35,000 Baht
   - ☐ 35,001 - 50,000 Baht
   - ☐ 50,001 - 85,000 Baht
   - ☐ 85,001 - 100,000 Baht
   - ☐ 100,000 - 300,000 Baht
   - ☐ More than 300,001 Baht

5. What is your AUM (Bond/Fund/Insurance/Stock) do you have on main operating bank?
   - ☐ Less than 50,000 Baht
   - ☐ 50,000 - 100,000 Baht
   - ☐ 100,001 - 500,000 Baht
   - ☐ 500,001 - 1,000,000 Baht
   - ☐ 1,000,001 - 2,000,000 Baht
   - ☐ 2,000,0001 - 5,000,000 Baht
   - ☐ 2,000,0001 - 10,000,000 Baht
   - ☐ 10,000,0001 - 50,000,000 Baht
   - ☐ 50,000,0001 - 100,000,000 Baht
   - ☐ More than 100,000,000 Baht

6. What is your highest level of education?
   - ☐ Below High School
   - ☐ High School
   - ☐ College
   - ☐ Bachelors degree
   - ☐ Masters degree or higher
   - ☐ PhD.
   - ☐ Other (please specify)

7. What is your present occupation?
   - ☐ Government officer or State-Owned Enterprise (Officer)
   - ☐ Government officer or State-Owned Enterprise (Management)
   - ☐ Private company (Officer)
   - ☐ Private company (Management)
   - ☐ Business owner (Please specify)
   - ☐ Doctor
   - ☐ Retired
   - ☐ Student
   - ☐ Other (please specify)

8. Where is your current living?
   - ☐ Bangkok
   - ☐ Up country (Please specify)

9. What is your hobbie?
   (Please list top 3 favorite hobbies)

Thank you for section 3

Appendix B: Perceived Usefulness Model summary, ANOVA, and Coefficients

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.543[a]	.294	.286	.35405

a. Predictors: (Constant), avr_c, avr_peou, avr_pt

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.707	3	4.236	33.790	.000[a]
	Residual	30.461	243	.125		
	Total	43.168	246			

a. Predictors: (Constant), avr_c, avr_peou, avr_pt

b. Dependent Variable: avr_pu

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.103	.170		18.273	.000
	avr_peou	.203	.045	.320	4.490	.000
	avr_pt	-.022	.041	-.039	-.534	.594
	avr_c	.203	.049	.314	4.154	.000

a. Dependent Variable: avr_pu

Appendix C: Perceived Ease of Use Model summary, ANOVA, and Coefficients

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.607[a]	.368	.363	.52570

a. Predictors: (Constant), avr_se, avr_pt

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	39.244	2	19.622	71.001	.000[a]
	Residual	67.432	244	.276		
	Total	106.676	246			

a. Predictors: (Constant), avr_se, avr_pt

b. Dependent Variable: avr_peou

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.721	.252		6.842	.000
	avr_pt	.400	.051	.460	7.818	.000
	avr_se	.251	.065	.226	3.846	.000

a. Dependent Variable: avr_peou

Appendix D: Perceived Risk Model summary, ANOVA, and Coefficients

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.154[a]	.024	.020	.78537

a. Predictors: (Constant), avr_pt

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.665	1	3.665	5.941	.016[a]
	Residual	151.116	245	.617		
	Total	154.781	246			

a. Predictors: (Constant), avr_pt

b. Dependent Variable: avr_pr

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.660	.270		13.571	.000
	avr_pt	.161	.066	.154	2.437	.016

a. Dependent Variable: avr_pr

Appendix E: Behavior Intention to Use Model summary, ANOVA, and Coefficients

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.588[a]	.346	.336	.41374

a. Predictors: (Constant), avr_c, avr_pr, avr_pu, avr_peou

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.948	4	5.487	32.054	.000[a]
	Residual	41.425	242	.171		
	Total	63.373	246			

a. Predictors: (Constant), avr_c, avr_pr, avr_pu, avr_peou

b. Dependent Variable: avr_bi

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.476	.319		4.633	.000
	avr_pu	.276	.075	.228	3.676	.000
	avr_peou	-.010	.053	-.013	-.185	.853
	avr_pr	.093	.035	.145	2.689	.008
	avr_c	.308	.055	.394	5.657	.000

a. Dependent Variable: avr_bi