The Implication Factors of Thai's User Adoption toward Banking Technology in the Next Normal

Busaya Vongchavalitkuna[1], Ampol Navavongsathianb[2], Tanakorn Limsarun[3], Nantaporn Damrongpongd[4] and Chalermporn Yenyueke[5]

Southeast Bangkok College, Bangkok, Thailand[1,2]

Siam University, Bangkok, Thailand[3,4]

Rangsit University, Pathumthani, Thailand[5]

E-mail: busaya2001@gmail.com[1],dr.tanakorn@siam.edu[3], chalermporn.y@rsu.ac.th[5]

Received: 2022-10-28; **Revised:** 2022-12-30; **Accepted:** 2022-12-31

Abstract

In the world of technology disruption and covid-19 pandemic situation, people are encouraged and forced to use the technology in their daily activities to keep a social distancing. Banking technology has also played a significant role to support these activities. The main purpose of this research was to study the implication factors of Thai's user adoption toward banking technology in the next normal. The stratified random sampling technique was used to collect four hundred samples from mobile banking users in Thailand. The relationship of observed variables was analysed by structural equation modeling (SEM). The results obtained from the analysis can be seen that perceived ease of use, perceived usefulness and security were influenced to mobile banking adoption and customer satisfaction. The statistical data has displayed the harmony result as follow: $\chi 2$ = 1.987, df. = 223, $\chi 2$ / df. = 1.987, p-value = .050, CMIN = 404.076, CMIN / DF = 1.812, GFI = .977, TLI = .985, AGFI =.988, CFI = .966, RMSEA = .004, at significant level .05. Therefore, banking technology service provider would apply this research for the benefit of understand and increase number of mobile banking users, also prepared for the next normal stage.

Keywords: Banking technology, Next normal, User adoption and Customer Satisfaction

Introduction

World Health Organization (WHO) has reported global Covid-19 situation in October 2022 that there have been 621.79 million confirmed cases, including 6.54 million deaths and 12.78 billion vaccine doses have administered (WHO, 2022). By non-pharmaceutical, social distancing seem the be another effective way to protect against the spread of pandemics,

while mobile and wireless technologies can facilitate the social distancing practice (Murad, Yussof & Badeel, 2022). With emerging technology, mobile banking technology has also played a vital role to provide a variety of services towards monetary transaction during this time (Xie, Ye, Huang & Ye, 2021). The recent report from Bank of Thailand (2021) has reported that there were 35.86 million of Internet banking account with 45.65 million monthly transactions and there were 74.98 million of mobile banking account with 1.22 billion monthly transactions. However, the majority of mobile banking transaction were on money transfer but rarely used for the investment and funding (Phimolsathien, 2021). While the emerging of financial technologies have introduced the market to provide innovative financial solutions which challenging the established banks for their survival (Smith & Geradin, 2022). The technology was not an only thing to maintain the number of customers, but almost always depended on customer perceived value that positively related to customer satisfaction and loyalty in mobile banking system (Barbu et al, 2021). Therefore, the aim of this study was to identify implication factors of Thai's user adoption toward banking technology in the next normal. Thus, the finding of these research paper would be benefit to the banking services provider in term of number of user and efficiency management. Moreover, these would be a guideline for any applicable industries who looking forward to implementing the financial technology.

Research Objectives

To study the implication factors of Thai's user adoption toward banking technology in the next normal.

Literature Review

Banking technology

The use of banking technology has a tendency increase and grow exponentially, especially in the past few years which grown more than 72% in mobile and internet banking transaction (Bank of Thailand, 2021). COVID-19 pandemics was also one of the key driving factors to have more adoption of banking technology. Thus, banking technology would be the norm of monetary transaction in the next normal context, even still limited in digital divided group (Tonghui, Kongpalee & Chimnoi, 2020).

Customer's perceived ease of use and usefulness toward customer satisfaction

The banking service provider have implemented banking technologies for the expect of reducing costs and expenses, also looking forward to increasing their customer satisfaction (Kelly & Palaniappan, 2019). However, customer satisfaction is impacted from customer's

perceived ease of use and usefulness level that indicate success of technology adoption (Olivia & Marchyta, 2022). Therefore, this study has postulated the following hypotheses:

H_1. Perceived ease of use (PEOU) has an associate impact to the customer satisfaction.

H_2. Perceived Usefulness (PU) has an associate impact to the customer satisfaction.

Customer's perceived security and Customer Satisfaction

The security was considered as a major concern to process the financial transactions via electronic channels, (Singh & Srivastava, 2018). These was related to users perceived security of function and control on their personal information in a particular online system (Tahar, Riyadh, Sofyani & Purnomo, 2020). Thus, customer attitudes and perceived security have significant effect towards their satisfaction (Sampaio, Ladeira & Santini, 2017). In case of customer perceived substantial risk, they were likely to avoid the system (Raza, Umer & Shah, 2017). On the other hand, the customers satisfaction increased when they perceived the banking technology services has a high security (Masrek, Halim, Khan & Ramli, 2018). This study investigated the customer satisfaction that influenced by customer's perceived security by the following hypothesis:

H_3. Customer's perceived security has a positively related to customer satisfaction.

Customer Satisfaction and Mobile Banking Adoption

Consumer **satisfaction** is a key success of the adoption **banking** technology (Geebren, Jabbar & Luo, 2021). Not merely introducing innovative products and services (Ameme & Wireko, 2016), but also user friendly (Lee, Harindranath, Oh & Kim, 2015). Therefore, the researchers have investigated the hypothesis:

H_4: Customer satisfaction has a direct effect to the banking technology adoption

Conceptual Framework

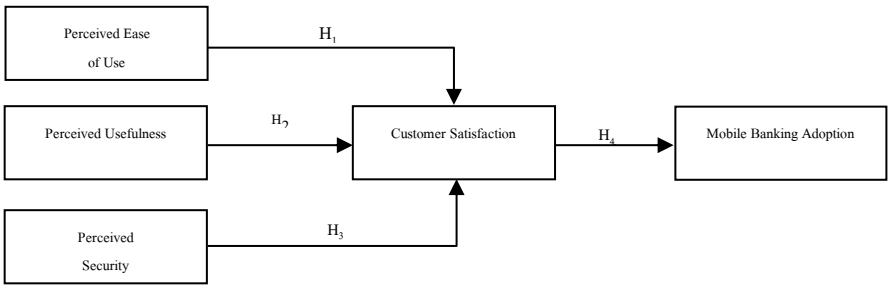

Figure1: Conceptual Framework (applied from Olivia & Marchyta, 2022; Tahar, Riyadh, Sofyani & Purnomo, 2020; Singh & Srivastava, 2018; Sampaio, Ladeira & Santini, 2017)

Methods

To collect the primary data, researcher used online questionnaire as a research tool which have been pre-tested with thirty Thai mobile banking users to analyze and evaluate the reliability, Cronbach's alpha coefficient has shown a prominent level of reliability and consistency at the values of 0.886 (Cronbach, 1963). While the bank of Thailand (2022) has reported the number of the mobile banking user equal to 91.62 million as of June 2022. However, the structural equation modeling (SEM) analysis has not indicated a certain sample size but could not be less than two hundred samples (Kline, 2010). While Bentler and Chou (1987) stated that to consider the observable variables should be in a minimum proportion of one to five toward the number of samples. Since, there were total twenty-three observable variables in this study. The researchers decided to collect the data from four hundred samples from mobile banking users around Bangkok and its vicinities, Changmai, Nakhonratchasima during January- March 2021 by stratified random sampling technique. The online questionnaires were sent to collect the data from four hundred Thai mobile banking users via a research network group in Bangkok, Northern region, Northeastern region, and Southern region of Thailand.

Data Analysis

The preliminary data analysis was analyzed by descriptive statistics to describe the population's characteristics and variables, while structural equation modeling has adopted to investigate the theoretical framework. While the implication variables of Thai's user adoption toward banking technology which were customer's perceived usefulness, customer's perceived security, customer's perceived ease of use and customer satisfaction were analyzed by principal axis factoring exploratory factor analysis, common factor analysis and principal axis factoring.

Results

The demographic analysis has shown that most respondents were female worker in the private companies with 22-35 years old of age, and the average monetary transaction was between 10-15 times per month. And the majority of the samples are the Siam Commercial Bank and Kasikorn Bank customer. The Kaiser Meyer Olkin (KMO) and Bartlett's test of sphericity values were 0.899 and Sig = .000, which indicated the relationship among all of the observe variables.

Common Factor Analysis (CFA) toward mobile banking adoption

There were 5 factors and 23 measurements to verify the mobile banking adoption, where the common factor analysis has shown the value that $\chi 2$ ($\chi 2$ = 443.131, df= 223, p-value = 0.50, $\chi 2$ /df = 1.987). Thus, the model was fit exceeded the common acceptance level. The structural validity of the empirical model showed the values of $\chi 2$ / df. = 1.987, and CMIN / DF = 1.987 was less than 2.0. Thus, there was an interrelated between the structural equation modeling and empirical data (Schumacker & Lomax, 2010). Moreover, the data has shown the value of GFI = .977, TLI = .985, AGFI =.988 and CFI = .966 which represents a good consistency. The RMSEA = .004 and p-value = 0.000. While the index values that verify the consistency between the conceptual model and empirical data have shown the conformity at a proficient level (Kelloway, 2015).

The evaluation of conceptual model

The conceptual model proposes was examined, while the relationship among the observed variable have shown in following figure

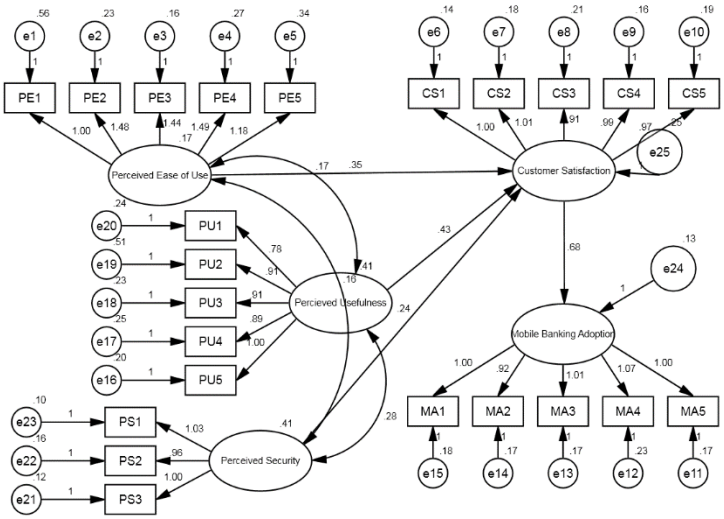

Figure 2. The structural equation modeling $\chi 2$ = 443.131, df. = 223, $\chi 2$ / df. = 1.987, p-value = .050, CMIN / DF = 1.987, GFI = .977, TLI = .985, AGFI =.988, CFI = .966, RMSEA = .004, at . 05 significant level

The confirmatory element analysis of the measurement model was shown that

1) Perceived Ease of Use was measured by five observable variables. The highest observed variable weight values were 1.49, followed by 1.48 and 1.00, respectively.

2) Perceived Usefulness was measured by five observable variables. The highest observed variable weight values were 1.00, followed by .90 and. 89, respectively.

3) Perceived Security was measured by three observable variables. The highest observed variable weight values were 1.03 followed by 1.00 and 0.96, respectively

4) Customer Satisfaction was measured by five observable variables. The highest observed variable weight values were 1.01, followed by 1.00 and 0.99, respectively.

5) Mobile Banking Adoption was measured by five observable variables. The highest observed variable weight values were 1.07, followed by 1.01 and 1.00, respectively.

Table 2 The path coefficient on influence factors toward the mobile banking adoption

Effect variable	**Estimate (β)**	**S.E.**	**Z-test**	**p**	
Perceived Ease of Use → Customer Satisfaction	.354	.115	5.380	.002	$H_{1:\ Support}$
Perceived Usefulness → Customer Satisfaction	.434	.081	10.402	.000	$H_{2:\ Support}$
Perceived Security → Customer Satisfaction	.235	.072	10.914	.001	$H_{3:\ Support}$
Customer Satisfaction → Mobile Banking Adoption	.675	.042	6.859	.000	$H_{4:\ Support}$

The path coefficient analysis results were shown that

1) The path coefficients were between .235 to .434 where perceived usefulness (PU) had the highest path coefficient which PU had a direct effect to customer satisfaction (CS) (β = 0.434, Z = 10.402, p = 0.000); thus, H_2 was support, while PS has a positive influence on customer satisfaction (CS) (β = 0.235, Z = 10.914, p = 0.001). Thus, H_3 was support.

2) Customer satisfaction factor was shown path coefficient with the mobile banking adoption at .675 (Z = 6.859, p = 0.000); thus, H_4 was support.

3) In addition, customer's perceived ease of use has a positive relationship with customer satisfaction (β = 0.354, Z = 5.380, p = 0.002); thus, H_1 was support.

4) The prediction coefficients were in between .235 and .434. where customer's perceived usefulness had the highest prediction coefficient, on the other hand the perceived security had smallest prediction coefficient. Therefore, each probable factor might be able to predict 66% of causal relationship among the factors that influence to customer satisfaction.

5) The harmoniousness with the empirical data has shown the ratio between chi-square and degrees of freedom at 1.987 (less than 2). Comparative Fit Index (CFI) equal to.966 (more than 0.95). Tucker-Lewis Index (TLI) equal to .985 (more than 0.95). Root means square error of approximation (RMSEA) equal to 0.04 (less than 0.05)

Thus, the conceptual model was consistent with the empirical data, where the direct influence, indirect influence and combined factors mobile banking adoption analysis found that

1) Perceived ease of use was direct effect to customer satisfaction but indirect effect on the customer adoption, with indirect influences on 1 path which were influenced the customer satisfaction (influence size = 0.11) and total influence (influence size = 0.11)

2) Perceived usefulness was direct influence on the customer satisfaction (influence size = 0.32)

3) Perceived security was directly influenced on customer satisfaction mobile (influence size = 0.44)

4) Customer Satisfaction was directly influenced on the mobile banking adoption (influence size = 0.30)

Discussion

The causal influence relationship of perceived ease of use on customer satisfaction with statistical significance at the level of 0.002 conformed with the study of George and Kumar (2013). Moreover, consumers are looking forward to having a fast detail on their monetary transaction where the password should be short such as six-digit personal identification numbers and easy to switch between various banking accounts and investment. In addition, customers needed a basic knowledge and abilities due to the special characteristics of mobile banking (Rehman & Shaikh, 2020). When analyzing the causal influence relationship of perceived usefulness, the result was found that there was a causal influence on the customer satisfaction with statistical significance at the level of 0.000 corresponded to the study of Dewi, Riani, Harsono & Setiawan (2020) which confirmed usefulness affected to customer satisfaction. Moreover, when analyzing the causal influence relationship of perceived security, the data was found out that there was a causal influence on the customer satisfaction with statistical significance at the level of 0.001. These was accordance with Peikari (2010) that customers have a positive perceived security where the service provider offered a security guarantee. Wilson, Alvita and Wibisono (2021) who shown the finding that highly secure service process, notification system and customer privacy were crucial factors to the trust and customer acceptance behavior (Venkatesh & Davies, 2000).

The research resulted showed that the proposed model was able to reach an adoption mobile banking level of predictive power for all factors, as all criteria related to the measurement models. i.e., construct reliability and validity, were met. Further, R_2 showed the combine effect of the exogenous latent constructs, explaining about 76 % of the variance in

the endogenous latent construct, suggesting that perceived usefulness, perceived ease of use, perceived usefulness, perceived security, and customer satisfaction predict the consumers adoption of mobile banking. According to the path coefficient analysis, customer satisfaction was proved as a key factor in predicting an individual's adopt mobile banking.

Conclusion and Recommendation

This research found that the factors indirectly affecting the mobile banking adoption customers in Thailand were customer's perceived usefulness, customer's perceived ease of use, and customer's perceived security. In addition, customer satisfaction was directly affected to the mobile banking adoption in Thailand. The study results have led to the recommendations as follows

1) The usefulness perception, customer should easily access mobile banking. While safety to use would create customer satisfaction that increase a chance of success marketing due to the awareness of customer.

2) The commercial banks must enable easily accessible, conveniently, fast, and efficient respond to customer when using services by a modern technology system. The service process should be highly secured and not complicated. In addition, notification system for service results, reliability, consistency to the speed, security, and convenience through the financial transactions on mobile banking. Also focus on the security log in procedures that serve the elderly person in aging society.

3) In the midst of a pandemic crisis, consumers are aware of COVID-19 that influence an increasing of online transaction, coupled with the emergence of applications that withdraw the money out unknowingly. Therefore, bank and related parties should improve the system that have preventive and surveillance measures to build consumer confidence.

4) Finally, the result of this study has shown that the customer satisfaction was the directly affected to the mobile banking adoption customers. Therefore, the bank's head office and related parties should often focus on creating mobile banking customer satisfaction, by applying this knowledge as a guideline for developing competitive strategies, also increasing the level of PU, PEOU and PS.

References

Ameme, B., & Wireko J. (2016). Impact of technological innovations on customers in the banking industry in developing countries. *The Business & Management Review, 7*(3), 388-397.

Bank of Thailand, (2021). *PS_PT_009_S2 Service payment transactions via Mobile Banking and Internet Banking*. Retrieved from https://www.bot.or.th/App/BTWS_STAT/statistics/BOTWEBSTAT.aspx?reportID=949&language=en

Bank of Thailand, (2022). *PS_PT_009_S2 Use of Mobile Banking and Internet Banking 1/.* Retrieved from www.bot.or.th/App/BTWS_STAT/statistics/BOTWEBSTAT.aspx? reportID =949&language=ENG

Barbu, C. M., Florea, D. L., Dabija, D.-C., & Răzvan Barbu, M. C. (2021). Customer Experience in Fintech. *Journal of Theoretical & Applied Electronic Commerce Research*, *16*(5), 1415–1433.

Bentler, P. M., & Chou, C. P. (1987). Practical issues in structural modeling. Social. *Methods Res, 16*, 78–117.

Cronbach, L. J. (1963). *Educational Psychology*. (2nded). New York: Harcourt, Brace and Company

Dewi, S., Riani, A., Harsono, M., & Setiawan, A. I. (2020). Building Customer Satisfaction through Perceived Usefulness. *Quality-Access to Success*, *21*(178), 128-132.

Geebren, A., Jabbar, A., & Luo, M. (2021). Examining the role of consumer satisfaction within mobile eco-systems: Evidence from mobile banking services. *Computers in Human Behavior*, *114*, N.PAG.

Kelloway, E. K. (2015*). Using Mplus for Structural Equation Modeling; A Researcher's Guide.* CA: Sage Publications.

Kelly, A. E., & Palaniappan, S. (2019). Survey on customer satisfaction, adoption, perception, behavior, and security on mobile banking. *Journal of Information Technology and Software Engineering*, *9*(259), 1-15.

Kline, R. B. (2010). *Principles and Practice of Structural Equation Modeling*, 3rd ed. New York: Guilford.

Lee, H., Harindranath, G., Oh, S., & Kim, D. J. (2015). Provision of mobile banking services from an actor–network perspective: Implications for convergence and standardization. *Technological Forecasting and Social Change*, *90*, 551-561.

Masrek, M. N., Halim, M. S. A., Khan, A., & Ramli, I. (2018). The impact of perceived credibility and perceived quality on trust and satisfaction in mobile banking context. *Asian Economic and Financial Review*, *8*(7), 1013-1025.

Murad, S. S., Yussof, S., & Badeel, R. (2022). Wireless Technologies for Social Distancing in the Time of COVID-19: Literature Review, Open Issues, and Limitations. *Sensors (14248220)*, *22*(6), 2313.

Olivia, M., & Marchyta, N. K. (2022). The Influence of Perceived Ease of Use and Perceived Usefulness on E-Wallet Continuance Intention: Intervening Role of Customer Satisfaction. *Jurnal Teknik Industri*, *24*(1), 13–22.

Peikari, H. R. (2010). The influence of security statement, technical protection, and privacy on satisfaction and loyalty; a structural equation modeling. In *International Conference on Global Security, Safety, and Sustainability* (pp. 223-231). Springer, Berlin, Heidelberg.

Phimolsathien, T. (2021). Determinants of the use of financial technology (Fintech) in Generation Y. *Utopia y Praxis Latinoamericana*, *26(2)*, 27–35.

Raza, S. A., Umer, A., & Shah, N. (2017). New determinants of ease of use and perceived usefulness for mobile banking adoption. *International Journal of Electronic Customer Relationship Management*, *11*(1), 44-65.

Rehman, Z. U., & Shaikh, F. A. (2020). Critical factors influencing the behavioral intention of consumers towards mobile banking in Malaysia. *Engineering, Technology & Applied Science Research*, *10*(1), 5265-5269.

Sampaio, C. H., Ladeira, W. J., & Santini, F. D. O. (2017). Apps for mobile banking and customer satisfaction: a cross-cultural study. *International Journal of Bank Marketing*, *35*(7), 1133-1153.

Schumacker, R. E., & Lomax, R. G., (2010). *A beginner's guide to structural equation modeling.* (3rd ed.). New Jersey: Lawrence Erlbaum Associates.

Singh, S., & Srivastava, R. K. (2018). Predicting the intention to use mobile banking in India. *International Journal of Bank Marketing, 36*(2), 357-378.

Smith, T., & Geradin, D. (2022). Maintaining a level playing field when Big Tech disrupts the financial services sector. *European Competition Journal*, *18*(1), 129–167.

Tahar, A., Riyadh, H., Sofyani, H., & Purnomo, W. (2020). Perceived ease of use, perceived usefulness, perceived security, and intention to use e-filing: The role of technology readiness. *The Journal of Asian Finance, Economics, and Business*, *7*(9), 537-547.

Tonghui, T., Kongpalee, T., & Chimnoi, A. (2020). Towards a cashless economy:Consumer behavior and opportunities of Thai businesses during COVID-19. Retrieved date 1 October 2021, from https://www.bot.or.th/Thai/ResearchAndPublications/articles/Pages/Article_21Jul2020.aspx

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management science*, *46*(2), 186-204.

Wilson, N., Alvita, M., & Wibisono, J. (2021). The Effect of Perceived Ease of Use and Perceived Security Toward Satisfaction and Repurchase Intention. *Jurnal Muara Ilmu Ekonomi dan Bisnis*, *5*(1), 145-159.

WHO (2022). *WHO Coronavirus (COVID-19) Dashboard*. Retrieve 10 October 2021 from https://covid19.who.int/

Xie, J., Ye, L., Huang, W., & Ye, M. (2021). Understanding FinTech Platform Adoption: Impacts of Perceived Value and Perceived Risk. *Journal of Theoretical and Applied Electronic Commerce Research*, *16*(5), 1893-1911.