Factors influencing customers' adoption of digital banking in Thailand

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ABSTRACT

Nowadays, Digital Economy is under the implementation worldwide of which the key driver is the internet. Then, the internet becomes another part of our life. The internet users are continuously growth every year. This technology helps people to connect every daily activity anywhere and anytime including banking service. This is a quantitative research to discover the factors which are influencing the adoption of digital banking or Internet Banking in the other word. The study used the survey method to gather information from respondents in the form of questionnaire. All the questions shown in the questionnaire are based on the objective of this study. The sample size is 400 respondents. The Five-Point Likert Scale is used as the indicator for measuring the level of satisfaction. Additionally, this research used Statistical Package for the Social Sciences (SPSS) version 17.0 as the statistical instrument in order to analyze the collected data. Descriptive statistic, Pearson's correlation coefficient and multiple regression analysis are used in the data analysis. The result from hypothesis testing has revealed that performance expectancy, effort expectancy, social influence and facilitating condition have positive affect with the intention to use Digital banking through the internet across three branches of commercial bank in Bangkok, Thailand.

Keywords: *ICT and Digital Innovation, Internet Banking, Digital Banking*

1. INTRODUCTION

At present, Thailand is in the implementation of SMART Thailand 2020 which is the ICT Policy Framework targeted for the year 2020. In developing ICT for strengthening the production sector within the scope of the ICT2020 policy, special attention should be paid to the production sectors in which Thailand has an advantage, namely service sectors with "smart service" trend [1]. As known, the internet becomes more imperative for smart service and communication. Most of all services combine the traditional service into internet. One part of the service which is growing rapidly is banking service. The National Electronics and Computer Technology Center (NECTEC) found that the numbers of Thailand internet users are also dramatically increasing from 2,300,000 in 2000 to 26,140,473 in 2013 [2]. Therefore, many enterprises use the internet and cyber space to reach their customers in everywhere at any time. To protect current position in the market and against other players who may provide more convenience and lower priced services, all banking use the internet channel. Internet banking is providing users 24/7 service with various facilities to access their account and gather information about the transactions and other service without any formal documentation [3]. Internet banking is another channel that allows customers to engage in financial activities through virtual spaces and environments [4]. However, it may be called Digital Banking likewise.

In Thailand, the first bank that has its own website was Siam Commercial Bank PCL (SCB). They distributed general information to their customers through internet in 1995. The initiative of internet banking service to provide customers with banking transactions was in 1999 which had been approved by Bank of Thailand (BOT). Moreover, financial transactions over the internet banking are increasing every year. The numbers of user that have been applied for the service are growth from 4,822,947 accounts in 2010 to 8,033,061 accounts in 2013 [5, 6]. Some people are still not interested in using the internet banking although it provides flexibility in performing financial transaction, fast and easy. There are some reasons that make people afraid to use the internet banking such as security, privacy, lacking of knowledge of system and

risk. Tan and Teo [7] suggested that risk is a very significant factor in order to gain the confidence to utilize the internet banking. Thus, this study's intention is to explore the effect of four independent factors which are 1) performance expectancy, 2) effort expectancy, 3) social influence and 4) facilitating condition to the customers' adoption to use digital banking system in Thailand.

2. MATERIALS AND METHODS

2.1 Concept of Internet Banking

Sathye [8] stated that internet banking provided customers to use the internet in order to access their bank and account for any banking transactions. Riquelme and Rios [9] suggested that customers using internet banking are through computers connected to internet. Moreover, internet banking was a bank web page so that banks could serve information about products and services to their customers as well [8]. There are five basic services support over online banking view account balances and transaction histories; paying bills; transferring money between accounts; requesting credit card advances; and ordering checks for more faster services [10]. Internet banking presented various benefits to banks in terms of reducing cost, meeting new customers, enhancing image and increasing customer satisfaction [11]. On the other hand, customer also gain more values from banks such as saved cost for accessing and using banks services, enlarged comfort and time-saving transactions by available 24 hours per day without visit physically banks [12].

2.2 Theory and Concept of Unified Theory of Acceptance and Use of Technology (UTAUT)

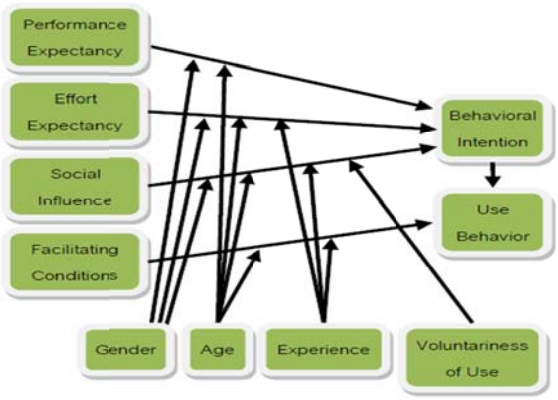

Fig. 1 *Unified Theory of Acceptance and Use of Technology Model (UTAUT).*

Source: Viswanath Venkatesh, Michael G. Morris, Gordon B. Davis Fred D. Davis, 2003

UTAUT has been use in this study because it integrated with eight models, including the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planed behavior (TPB), a model combining the technology acceptance model and the theory of planned behavior (CTAM-TPB), the model of PC utilization (MPCU), the innovation diffusion theory (IDT), and the social cognitive theory (SCT). Venkatesh et al. [13] developed UTAUT in order to predict user adoption technology by studying from four organizations in United State. Moreover, performance expectancy, effort expectancy, social influence and facilitating condition are main independent variable and also the most of significant elements in UTAUT model. Moreover, ref. [14, 15] confirmed the relationship of parameters in UTAUT in certain environments.

2.3 Factor Affecting Intention to Use the Internet banking System

2.3.1 Performance Expectancy

The performance expectancy is first independent variable in the model which is defined the degree of an individual believes that using the system will help him or her reach benefits in job performance. Venkatesh et al. [13] also found that performance expectancy was gathered from perceived usefulness (TAM, and combined TAM-TPB), extrinsic motivation (MM), job-fit (MPCU), relative advantage (DOI), and outcome expectancy (SCT). Furthermore, ref. [16] studied that performance expectance can reflect an individual's perception of performance improvement by using the internet banking such as convenient payment, service effectiveness and time saving. Moreover, internet banking can access more people and people also can avoid from waiting in front of bank counter when compare with traditional banking.

2.3.2 Effort Expectancy

The second independent variable is effort expectancy. It is defined as the degree of ease of associated with the use of internet banking. Venkatesh et al. [13] used effort expectancy to represent perceived ease of use (TAM/ TAM2), complexity (MPCU) and ease of use (IDT). Chen and Barnes [17] also studied that effort expectancy was another important aspects of the online interface for customer acceptance. According to Calisir and Gumussoy [18] discovered, effort expectance was a considerable key to raise the internet banking acceptance. In additional, if the internet bank

has fast download time and low downtimes, it will also influence users for using internet banking [18, 19, 20].

2.3.2 Social Influence

Another important independent variable in UTAUT is social influence. It is driven from subjective norm in TRA, TAM2, TPB/DTPB, and C-TAM-TPB, social factors in MPCU, and image in IDT [13]. Prior research suggested that social influence was a noteworthy factor in order to determine the acceptance and use of technology [13], [21], [22], [23]. Moreover, ref. [13] also defined social influence as the degree to which an individual perceives that important others believe he or she should use technology. The opinion of family, friends and colleagues were a social pressure for using internet banking.

2.3.4 Facilitating Condition

The last independent variable in this study is facilitating condition. It is the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system. The constructs in the other models that pertain to facilitating condition are: perceived behavioral control (TPB/DTPB and combined TAM-TPB), facilitating condition (MPCU), and compatibility (DOI) [13]. As the studies from Karjaluoto et al. [19], [24], internet banking has granted banks in order to enter more people via internet. However, the performance of all hardware and software are the significant key to drive the immediately respond of customers' requests [19], [24]

2.3.5 Intention to us the Internet Banking System

Spears and Singh [25] implied that according to his or her feelings, knowledge, or evaluations of previous experiences, behavioral intention was defined as an individual's trend to behave. The increasing of experience makes customers have more chance to support their habit because they have more time in order to confront the role and perform the associated behavior [26]. The UTAUT model proved that the behavioral intention was a significant influence on technology usage [13], [27]. Moreover, Ali & Khalil [28]; Homburg & Giering [29] found that behavioral intention to use the internet banking was post-acceptance behavior which involves repeat purchasing of products or services in the coming future.

In this study, a set of questionnaires was developed to gather data from the groups of respondents. The researchers separated the research instruments which is a closed end questionnaire into 3 parts. In part 1, there are four main independent variables which are performance expectancy, effort expectancy, social influence and facilitating condition that is the factors affecting the customers' intention to use internet banking system. Intention behavior is the dependent variable. This part has a total of 19 questions. The researcher used the 5-point Likert scales to measure respondent's information. Part 2 is the demographic factors provide data of internet banking user who had experience using the internet banking system, gender, age, marital status, education and income.

Descriptive analysis had been use to describe the brief information from the data collected (such as frequency, percentage), which is normally used for analyzing demographic factors. For inferential analysis, the researcher used Pearson's correlation coefficients in order to identify the direction between two variables. Moreover, multiple regression analysis was used to predict or explain a dependent variable based on two or more independent variables.

2.4 Research hypotheses

According to the conceptual framework, this study has in total 4 hypotheses as the follows:-

H1: Performance expectancy affects intention behavior to use internet banking

H2: Effort expectancy affects intention behavior to use internet banking

H3: Social influence affects intention behavior to use internet banking

H4: Facilitating condition affects intention behavior to use internet banking

3. RESULTS AND DISCUSSION

In this study, 30 sets of questionnaire are used to test the reliability of all questions by Cronbach's Coefficient Alpha scale.

Table 1 *Summary of Reliability Analysis*

Variables	**Cronbach's Alpha**
Performance Expectancy	0.893
Effort Expectancy	0.858
Social Influence	0.881
Facilitating Condition	0.855
Intention to use internet banking system	0.850

The reliability test outcome of the research instrument shown in table 1 shows that all questions

were consistent and reliable to be applied as the research instrument in this study with Alpha test greater than 0.60.

Table 2 shows the Pearson Correlation Coefficients between performance expectancy, effort expectancy, social influence, facilitating condition and intention behavior to use internet banking have the relationship move in the same direction which is positive direction.

Table 2 *Summary of Correlation Analysis*

	Performance Expectancy	Effort Expectancy	Social Influence	Facilitating Condition	Intention Behavior
Performance Expectancy	1.000	0.488	0.406	0.575	0.633
Effort Expectancy	0.488	1.000	0.620	0.623	0.593
Social Influence	0.406	0.620	1.000	0.576	0.460
Facilitating Condition	0.575	0.623	0.576	1.000	0.660
Intention Behavior	0.633	0.593	0.546	0.660	1.000

Based on the result of table 3, the researcher found that the Adjusted R Square was 0.569, representing that 56.9 percent of variance can be explained by fours independent variables for intention behavior to use internet banking.

Table 3 *Result of model summary for the factor Affecting the society's intention in the internet banking use*

Model Summary

Model	Adjusted R Square
1	0.569

The researcher found that Sig. value of performance expectancy, effort expectancy, social influence and facilitating condition are 0.000, 0.001, 0.001 and 0.000 which are less than significant level at 0.05. Therefore, H1, H2, H3 and H4 are supported. It means that all independent variables affecting on customers' intention to use internet banking. Therefore, the regression equation is

IB = - 0.514 + 0.417 PE + 0.207 EE + 0.191 SI + 0.349 FC

Where:

IB is intention behavior for using internet banking
PE is performance expectancy
EE is effort expectancy
SI is social influence
FC is facilitating condition

The regression results reveal that coefficient for performance expectancy is 0.417. So for every unit increase in performance expectancy, a 0.417 unit increase in intention behavior is predicted. 0.207 is the coefficient represented by effort expectancy. It means that every unit increase in effort expectancy, the research expects a 0.207 unit increase in the intention behavior. The coefficient for social influence is 0.191. Thus, for every unit increase in social influence, a 0.191 unit increase in intention behavior is predicted. For facilitating condition, the coefficient is 0.349. It means that for every unit increase in facilitating condition, researcher expects a 0.349 increase in the intention behavior. Furthermore, the performance expectancy with largest beta coefficient is the most significant independent variable follow by facilitating condition, effort expectancy and social influence respectively.

An examination of VIF for performance expectancy, effort expectancy, social influence and facilitating condition are 1.560, 2.022, 1.797 and 2.100 and tolerances are 0.641, 0.495, 0.557 and 0.476. Therefore, multicollinearity is not found in the analysis. The result has shown in table 4.

Table 4 *Result of multiple regression analysis*

Coefficients[a]

Model		Unstandardized Coefficients		Collinearity Statistics	
		B	Sig.	Tolerance	VIF
1	(Constant)	-.514	.012		
	Performance Expectancy	.417	.000	.641	1.560
	Effort Expectancy	.207	.001	.495	2.022
	Social Influence	.191	.001	.557	1.797
	Facilitating Condition	.349	.000	.476	2.100

[a]*: Dependent Variable = Intention Behavior*

4. RECOMMENDATIONS

Regarding to the result from study, researchers found that performance expectancy is the most important factor that affect the customers' intention to adopt digital banking system followed by facilitating condition. It is confirmed by the results in [30], [31]. Also, the suggestion of respondents who had experience

to use internet banking system mention that they use internet banking system because it is convenient, saving their time and saving their expresses. The respondents also give the recommendation about the performance of the system. They recommend that if banks integrate many services through internet banking, banks should provide summary all financial transaction into chat pattern. With internet banking system, banks can gain a competitive advantage. Therefore, banks should protect and increase their customers who use internet banking system by providing them more convenient on previous financial statement and providing them to print all those statement as well. Moreover, as the demographic summary in this research found that only 1.5% with high school or below and the income level between 15,000 baht or less (9.5%) were the lowest group who use the internet banking system. In order to increase the number of customer, bank should provide clearly conditions to users for using internet banking system with easily understanding.

This research studied about the factors affecting the customers' intention and adoption on the internet banking use of commercial banks in Bangkok, Thailand. The result and findings of this research would be useful for studies in future. This research can be adapted by other researchers to create their conceptual framework for future study about the intention to use internet banking. However, the result of this research has the limitations in geographic areas because the researcher collected the data in Bangkok, Thailand. For the future study, other researchers should acquire the data from different locations both in Bangkok and from other provinces in order to get into the depth of the study because different places will have different life styles and thinking. As the value of adjusted R square (0.569), this show that around 43.1 % are further variables more than the variables provided in this research which may affect the intention to use the internet banking. Moreover, the sample size of this research can be expanded to cover more than 400 sets of questionnaires and more than 19 questions for getting deeper and more exact data. In-depth understanding of factors affecting the customers' intention to adopt the internet banking is very important and can benefit to assist the banks to understand consumer intention and consumer expectation.

5. CONCLUSIONS

This study reveals several affecting factors that influence the adoption of Digital Banking by users in Thailand. Digital Banking could be named as Banking through the Internet or Internet Banking. In order to increase intention behavior for adopting such digital banking service, performance expectancy (0.417) is most encouraged. Secondly, facilitating condition (0.349) is also recommended. Later, effort expectancy (0.207) and social influence (0.191) are also considered. In the hypothesis testing, hypotheses one, two, three and four were analyzed by using Pearson Correlation to explore the direction of the variables. Moreover, the multiple regression analysis was used to examine the factor affecting the customers' intention on the digital banking adoption. All data were collected from digital banking users who had experience using the digital banking system of commercial banks in Bangkok, Thailand. Base on the result from hypothesis one, two, three and four in this study, independent variables which are performance expectancy, effort expectancy, social influence and facilitating condition were found to have positive affect with intention to adopt digital banking which was represent by adjusted R square equal to 0.574 and 0.01 for significant level value which could be considered major impacts to the adoption. The rest of 0.426 would be for future study.

REFERENCES

[1] Ministry of Information and Communication Technology, Thailand Information and Communication Technology Policy Framework (2011-2020), Thailand, 2011, pp. 41-51.
[2] Network Electronics and Computer Technology Center, Internet Information Research Network Technology Lab [Online], Available: http://internet.nectec.or.th/webstats/ home.iir?Sec=home [2014, September 24].
[3] Thulani D. et al., "Adoption and Use of Internet Banking in Zimbabwe: An Exploratory Study", Journal of Internet Banking and Commerce, April 2009, Vol. 14, no.1.
[4] Malik, A., "Modeling the antecedents of internet banking service adoption Structural Equation Modeling approach". Journal of Internet Banking and Commerce, JIBC2011, 2011, Vol,16, no.1.
[5] Bank of Thailand, Bank of Thailand [Online], Available: http://www.bot.or.th/ ENGLISH/STATISTICS/Pages/index1.aspx [2014, September 30].
[6] hansaitong V., Siam Intelligence Unit [Online], Available: http://www.siamintelligence.com/pridiyathorn-with-digital-economy/ [2014, December 2].
[7] Tan, M., and Teo, T.S.H.," Factors influencing the adoption of Internet banking", Journal of the Association for information Systems, 2000, Vol. 1 No. 5, pp. 1-42.
[8] Sathye, Milind, "Adoption of Internet banking by Australian consumers: an empirical investigation", The International Journal of Bank Marketing, 1999, Vol. 17, Issue. 7, pp. 324-334.
[9] Riquelme, H. and R. E. Rios, "The moderating effect of gender in the adoption of mobile banking", International Journal of Bank Marketing, 2010, Vol. 28, No. 5: pp. 328-341.
[10] Jayawardhena, C., and Foley, P., "Changes in the banking sector: the case of internet banking in the UK". Internet Research: Electronic Networking Applications and Policy, 2000, Vol. 10 No. 1, pp. 19-30.
[11] Chou, D., & Chou, A.Y., "A Guide to the Internet Revolution in Banking", Information Systems Management, 2000, 17(2), 51-57.
[12] Tuchila, R. (2000). "Services bancare prin Internet, E-Finance Romania". Journal of e-business and Information Technology, 2000, p. 231-130.
[13] Viswanath Venkatesh, Michael G. Morris, Gordon B. Davis, Fred

D. Davis, "User Acceptance of Information Technology: Toward a Unified View", MIS Quarterly, 2003, Vol. 27, No. 3, pp. 425-478.
[14] Troy Devon Thomas, Lenandlar Singh and Kemuel Gaffar, "The utility of the UTAUT model in explaining mobile learning adoption in higher education in Guyana", International Journal of Education and Development using Information and Communication Technology (IJEDICT), 2013, Vol. 9, Issue. 3, pp. 71-85.
[15] Yeoh Sok Foon, Benjamin Chan Yin Fah, "Internet Banking Adoption in Kuala Lumpur: An Application of UTAUT Model", International Journal of Business and Management, 2011, Vol. 6, No. 4, pp. 161-167.
[16] Shumaila Y. Yousafzai, "A literature review of theoretical models of Internet banking adoption at the individual level", Journal of Financial Services Marketing, 2012, Vol. 17, No. 3, pp. 215-226.
[17] Chen, Yu-Hui and Barnes, S., "Initial trust and online buyer behavior", Industrial Management & Data Systems, 2007, Vol.107(1), 21-36.
[18] Calisir, F. and C.A. Gumussoy, "Internet Banking Versus Other Banking Channels: Young Consumers' View". International Journal of Information Management, 2008, Vol. 28, No: 3, pp. 215-221.
[19] Arumugam Raman & Yahya Don, "Preservice Teachers' Acceptance of Learning Management Software: An Application of the UTAUT2 Model", International Education Studies, 2013, Vol. 6, No. 7, pp.157-164.
[20] Arne Floh and Horst Treiblmaier, "WHAT KEEPS THE E-BANKING CUSTOMER LOYAL? A MULTIGROUP ANALYSIS OF THE MODERATING ROLE OF CONSUMER CHARACTERISTICS ON E-LOYALTY IN THE FINANCIAL SERVICE INDUSTRY", Journal of Electronic Commerce Research, 2006, VOL 7, NO.2, 2006, pp.97-110.
[21] Ajzen, I., "The theory of planned behavior", Organizational Behavior and Human Decision Processes, 1991, 50(2), pp. 179-211.
[22] Moore, G. C. and I. Benbasat, "Development of an instrument to measure the perceptions of adopting an information technology innovation" Information Systems Research, 1991, Vol 2 No 3, pp 173-191.
[23] Taylor, S., and Todd, P. A., "Assessing IT Usage: The Role of Prior Experience", MIS Quarterly, 1995a, (19:2), pp. 561-570.
[24] Karjaluoto, H., Mattila, M., and Pento, T., "Factors underlying attitude formation towards online banking in Finland", International Journal of Bank Marketing, (2002, Vol. 20 No. 6, pp. 261-72.
[25] Spears, N. & Singh, S. N., "Measuring attitude toward the brand and purchase intentions", Journal of Current Issues and Research in Advertising, 2004, 26(2), 53-66.
[26] Kim, S. S., and Malhotra, N. K., "A Longitudinal Model of Continued IS Use: An Integrative View of Four Mechanisms Underlying Post-Adoption Phenomena", Management Science (51:5), 2005, pp. 741-755.
[27] Venkatesh, V. & Zhang, X., "The Unified Theory of Acceptance and Use of Technology: U.S. vs. China", Journal of Global Information Technology Management, 2010, 13 (1), pp. 5-27.
[28] Ali, A. S., & Khalil, M. N., "Influencing factors on behavioural intention to adopt internet banking service". World Applied Sciences Journal, 2013, 22(11), 1652–1656.
[29] Homburg, C., & Giering, A., "Personal characteristics as moderators of the relationship between customer satisfaction and loyalty", Psychology and Marketing, 2001, 18(1), 43–66.
[30] Yee Yen Yuen, *User Acceptance of Internet Banking Services: A Comparative Study*, Doctor of Philosophy, Faculty of Business and Law, Multimedia University, 2010.
[31] Network Electronics and Computer Technology Center, Internet Information Research Network Technology Lab [Online], Available: http://internet.nectec.or.th/webstats/home.iir?Sec=home [2014, September 24].

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