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An Investigation of Behavioral Intention Towards QR Code Payment in Bangkok, Thailand

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Abstract

The purpose of this research is to investigate the factors affecting Thai commercial bank users' behavioral intention towards QR code payment system via mobile banking applications. The researchers conducted the study based on quantitative research approach. Non-probability sampling method such as the quota and convenience sampling was applied as sampling technique. A self-administered questionnaire was distributed. The data was collected from 1,800 respondents living in Bangkok, who have had an experience with QR code payment system with the top-three mobile banking applications in Thailand. This study concentrates on confirmatory factor analysis and structural equation modeling as a statistical tool to examine the data, model accuracy, and influence of critical variables. In addition, the researchers applied the first-order and second-order techniques to examine the relationship between constructs. Adoption readiness and perceived risk were second-order constructs. The results reveled that compatibility has an impact on attitude towards QR code payment. Moreover, adoption readiness, compatibility, attitude, and personal innovativeness are statistically significant that impact behavioral intention towards QR code payment. The strongest antecedents of behavioral intention were compatibility, attitude, adoption readiness, and personal innovativeness, respectively. Surprisingly, perceived risk and perceived trust do not statistically have a significant impact on behavioral intention towards QR code payment.

Keywords: Behavioral Intention, QR Code Payment, Adoption Readiness, Perceived Risk, Personal Innovativeness

JEL Classification Code: M31, M10, O32

1. Introduction

In this era, the innovative development in mobile technology has led to an invention of QR code payment system through mobile phone, which attracts customers to purchase and pay for products or services via mobile banking applications. The banking service providers always offer innovative features that give customers convenience, flexibility, creative design, and effective process of payment, which affect customer's preference towards innovative QR code payment system. QR code payment system significantly increases financial transactions. Understanding the customer's behavioral intention to adopt the QR code payment system is a critical issue in every industry. Behavioral intention is an important predictor of profitability for all organizations. Supported by Bajs (2015), he stated that positive behavioral intentions are determinants of profitability and long-term relationship with customer. In addition, behavioral intention is an ultimate goal for every organization as it is a key component to sustainability for all industries (Chen & Chen, 2007).

Adoption of digital payment system has rapidly grown in many countries. More recently, new electronic payment platforms such as e-wallet, and other mobile payment applications have become popular. Cashless society may emerge in some countries long ago. However, some countries, including Thailand, are in a process of moving into a digital payment society. The innovative QR code payment system has been introduced to Thailand in the fourth quarter of 2017. Since each bank has launched the QR code payment system to the public, all banking service providers have been competing with each other to be a leader in the area of QR code payment system by increasing the number of transactions and merchants that accept QR code payment mode both in Thailand and in foreign countries. Therefore, banking service providers need to understand

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customers' expectations and perceptions towards QR code payment system, in order to achieve positive behavioral intention which will reflect the number of QR code payment transactions and lead to bank's profitability and sustainability.

2. Literature Review and Research Framework

2.1. Literature Review

2.1.1. Behavioral Intention

Behavioral intention is considered the best predictor of actual behavior of using any new technology (Liébana-Cabanillas et al., 2015). Moreover, behavioral intention or intention is a central concept and widely applied as the main construct in various theories; TAM by Davis (1989), and UTAUT by Venkatesh et al. (2003). Zarmpou et al. (2012) stated that in mobile payment context, behavioral intention refers to the probability of the users' willingness to make mobile payment. Supported by Saha and Theingi (2009), they conceptualized behavioral intention of mobile payment as the probability of the user to perform a certain behavioral act. Hence, in this research, the researchers focused on the probability of the user's willingness to continue using QR code payment system.

2.1.2. Compatibility

Compatibility has been acknowledged to be a critical component in different innovative technology contexts (Crespo & del Bosque, 2010). Compatibility refers to the degree to which mobile payment system is consistent with existing user's value, behavioral patterns, and experiences (Schierz et al., 2010; Phonthanukithaworn et al., 2016). Su et al. (2018) stated that a high level of compatibility means that the innovation can meet user's need, belief, and lifestyle. Compatibility ensures that the innovative mobile payment system is not distant from existing user's value system. Chen (2013) reported that the more positive beliefs about compatibility users have, the more positive attitude towards mobile banking services perceived. Moreover, various empirical research found that compatibility was statistically significant to predict attitude towards using mobile payment service (Aslam et al., 2017; Schierz et al., 2010). Phonthanukithaworn et al. (2016) found that compatibility is the most significant factor affecting behavioral intention of Thai consumers in mobile payment context. Furthermore, various researchers supported that the perception of compatibility plays a critical role for non-users, potential users, frequent users, and infrequent user in mobile payment and mobile banking context (Chen, 2013; Schierz et al., 2010; Yang et al., 2015). Based on the above discussion, the following hypotheses were developed.

H1: *There is a causal relationship between compatibility and attitude*.

H2: *There is a causal relationship between compatibility and behavioral intention*.

2.1.3. Attitude

Chiu et al. (2017) stated that attitude is a beneficial factor in which particular behavior is either positive or negative. Similarly, Lee (2009) mentioned that a favorable or unfavorable attitude directly influences behavior and belief regarding the likely outcome. Liébana-Cabanillas et al. (2015) stated that attitudes are developed over time as people acquire payment system experiences. In the same point of view, Chung and Holdsworth (2012) mentioned that favorable attitude is the individual interest in an innovation and actively seeks information about it. Chen (2013) found that user's behavioral intention of those who use mobile banking is based on the user's attitude towards mobile banking services. It has been confirmed by previous researchers that individual's attitude is a critical influential predictor of behavioral intention towards product and/or service (Liao et al., 2011). Users who have positive attitude towards mobile payment services will carry a positive effect on behavioral intention in terms of adoption (Mallat, 2004). Hence, the following hypothesis was proposed.

H3: *There is a causal relationship between attitude and behavioral intention of QR code payment user*.

2.1.4. Perceived Trust

Perceived trust is one of the most widely approached constructs when assessing mobile payment adoption (Dalhberg et al., 2015). Ooi and Tan (2016) conceptualized perceived trust as a psychological expectation that parties will be sincere in keeping promises and will not behave opportunistically in expectation of a promised service derived from mobile payment transaction. Similarly, Zhou (2013) stated that trust refers to the user's belief that the parties will fulfil their promises and it plays an important role in mobile financial transaction. Moreover, in competitive mobile payment industry, there is an emphasis on trust in an attempt to build solid and long-term relationship with users (Sekhon et al., 2014). Previous empirical research confirmed that perceived trust plays an important role to influence the use of mobile payment (Chung & Holdsworth, 2012; Ngan & Khoi, 2020; Phung et al., 2020). Madan and Yadav (2016) stated that the higher perceived trust leads to the higher behavioral intention. Therefore, the following hypothesis was developed.

H4: *There is a causal relationship between perceived trust and behavioral intention*.

2.1.5. Adoption Readiness

Weidman et al. (2015) defined adoption readiness as a state of mind for the needs for innovation. Furthermore, Thakur and Srivastava (2014) stated that an intention to use or continue using any innovative products or services requires user to have a certain level of adoption readiness. In this research, the nature of adoption readiness is a second-order construct, in which the first-order construct consists of perceived usefulness, perceived ease of use, facilitating conditions, and social influence. In this research, perceived usefulness is defined as the degree of a person who believes that QR code payment system would enhance user's ability and/or performance (Morosan, 2014); for example, its usefulness in daily life and an increase in daily productivity. Perceived ease of use is defined as the degree of a person who believes that using QR code payment system would be free of efforts (Taylor & Todd, 1995). It is easy to make a payment, to learn, and understand how to use it. Facilitating conditions are conceptualized as an individual perception of the availability of technological, individual, and external resources to use QR code payment; for example, knowledge, mobile phone, and external help and support (Venkatesh et al. 2003). Social influence refers to the users' decision towards using QR code payment system that is affected by the opinion of their families, relatives, friends, and mass media (Riquelme & Rios, 2010).

Thakur and Srivastava (2014) confirmed that adoption readiness (perceived usefulness, perceived ease of use, facilitating conditions, and social influence) is the most important antecedent of behavioral intention of mobile payment. Supported by Weidman et al. (2015), his study on behavioral intention of technological innovation indicated that adoption readiness construct influences user's behavioral intention of technological innovation. Various researchers found that perceived usefulness, perceived ease of use, facilitating conditions, and social influence have a significant effect on behavioral intention in mobile payment and mobile banking context (Kalinic & Marinkovic, 2016; Koening-Lewis et al., 2010; Liébana-Cabanillas et al., 2015; Navavongsathian et al., 2020; Phan et al., 2020). Hence, the following hypothesis was proposed.

H5: *There is a causal relationship between adoption readiness and behavioral intention*.

2.1.6. Perceived Risk

Many innovative products or services are considered inherently risky. Dalhberg et al. (2015) mentioned that perceived risk is one of the most widely approached constructs when assessing mobile payment adoption. Koening-Lewis et al. (2010) conceptualized perceived risk as the probability that something will happen while using new innovative technologies and the consequences of the outcome are usually undesirable. In this research, perceived risk was a second-order construct. The first-order constructs were perceived financial risk, perceived performance risk, perceived privacy risk, perceived psychological risk, and perceived time risk. Perceived financial risk is defined as user's perception towards the possible monetary loss caused by the use of mobile payment system (Featherman & Pavlou, 2003). Perceived performance risk refers to the users' perception towards the probability of QR code payment system that does not perform as expected, such as not performing as it was designed or advertised, and a breakdown of the system (Lee, 2009). Perceived privacy risk is defined as the user's perception towards personal information that may be exposed without user's acknowledgement or permission, such as being exposed to a direct market, third party companies, and criminal uses. Perceived psychological risk is the negative effect on the user's peace of mind, such as an uncomfortable feelings, nervousness, and confusion (Martins et al., 2014). Finally, perceived time risk is defined as a loss of time by using QR code to make a payment, learning how to use the system, and the delays of making a payment (Lee, 2009).

Previous empirical research had proven that perceived risk negatively influences behavioral intention to use mobile banking (Liao et al., 2011). Moreover, numbers of researchers support that five sub-constructs presented in this research were negatively significant on behavioral intention to adopt mobile banking and mobile payment context (Chen, 2013; Martins et al., 2014; Nguyen & Nguyen, 2017; Yang et al., 2015). Therefore, the following hypothesis was developed.

H6: *There is a causal relationship between perceived risk and behavioral intention*.

2.1.7. Personal Innovativeness

The concept of innovation was introduced by Rogers (1995), who defined personal innovativeness as how fast an innovative technology is adopted by an individual in comparison to other members in the society. Aroean and Michaelidou (2014) stated that the concept of personal innovativeness is critical for marketing practitioners. Personal innovativeness is defined as the user's willingness to try out new technology or new things (Yi et al., 2006). Moreover, Kim et al. (2010) stated that personal innovativeness refers to an individual's interest to try out any new technology and it has a positive significance on mobile payment service. Various empirical research supported the relationship between personal innovativeness and behavioral intention in mobile payment and mobile banking context (Chakraborty & Mitra, 2018; Humbani & Wiese, 2017; Tan et al., 2014). Hence, the following hypothesis was proposed.

H7: *There is a causal relationship between personal innovativeness and behavioral intention of QR code payment users*.

2.2. Research Framework

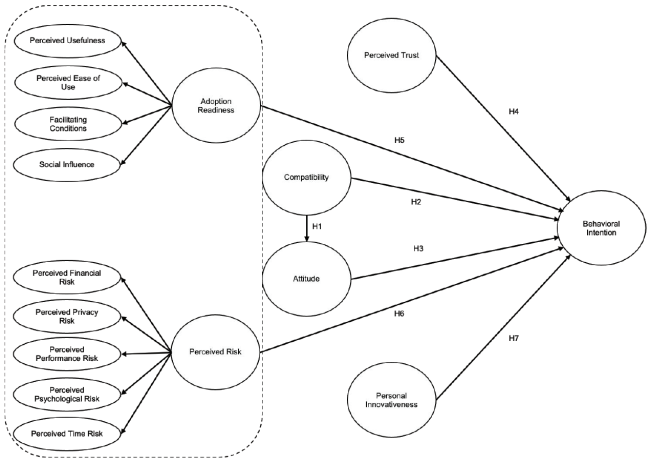

Figure 1: Conceptual Framework

3. Methodology

Quantitative method was used in this research by applying quota and convenience sampling. The questionnaire was developed based on previous theories and empirical research. Sequentially, a pilot test was conducted to test the reliability of research measurement scale by applying Cronbach's alpha. For the pilot test, the questionnaire was distributed to 50 respondents who have the same characteristic within the target population. Also, the adjustments were made according to the feedback from the respondents in the pilot test. Hence, the questionnaire consisted of three parts. The first part includes screening questions which are used to filter the respondents. Secondly, a 5-point Likert scale was applied to measure 14 first-order constructs, ranging from strongly disagree (1) to strongly disagree (5). Thirdly, the questions were based on demographic profile of respondent's gender, age, education, monthly income and so forth. Then, the questionnaire was distributed to 1,800 target respondents by offline platform to those who have had experiences with QR code mobile payment via mobile banking application. Afterward, the researchers analyzed the collected data by SPSS and AMOS. Confirmatory factor analysis and structural modeling were applied to test the proposed model.

3.1. Population and Sample Size

The population in this research consisted of Thais who have an experience with QR code payment system via top-three mobile banking applications in Bangkok, and aged 18 years old or above. The ranking of top-three banking was classified by number of mobile banking users. Kline (2016) stated that the minimum sample size required for SEM is 375. Similarly, Hair et al. (2006) stated that the minimum sample size for a complex model should be 500 cases. Hence, the researcher distributed 600 questionnaires per bank. In conclusion, a total of 1,800 sets were distributed.

3.2. Sampling Technique

Non-probability sampling technique was applied in the research - quota and convenience sampling. The questionnaire was distributed offline at three main flagship stores of mobile service operators in Thailand. Those stores are also located in the top-ranking malls in Bangkok. The quota sampling was applied to divide each location and bank equally (Gray, 2017). Afterward, convenience sampling was applied to access data from respondents who are convenient to participate. The survey was conducted between June to October 2020.

3.3. Pilot Test

The pilot test was held after the research instrument was completely developed from previous theories and empirical research. Then, it was ready for a final-check before distributing it to the whole target population. Cronbach's alpha coefficients analysis was applied to test the reliability of each construct in the model. Hair et al. (2007) mentioned that the sample size for a pilot test should be approximately 30 participants. Therefore, the researcher distributed questionnaires to 50 respondents who have experiences with QR code payment via mobile banking application. Afterward, Cronbach's alpha coefficients analysis was applied to examine the reliability. According to Hair et al. (2013), the construct above or equal to 0.60 is adequate for a reliability test. Therefore, the result of the reliability test in the study was between 0.607 and 0.897. In conclusion, all the constructs in this study have alpha coefficient above 0.60, which means that all constructs were reliable and adequate to be used as the research instrument for this study.

4. Results and Discussion

4.1. Demographic Factors

The majority of the respondents was female, representing 54.3% of the target population, whereas male respondents were accounted for 45.7%. The majority age range fell between 26-33 years old, representing 35.8%, followed by 34-41 years old (33.8%), 18-25 years old (17.3%), 42-49 years old (8.3%), 50-57 years old (3.4%), and 58 years old and above (1.3%). In terms of education, most respondents graduated with a Bachelor degree, representing 49.4%, followed by Master's degree, high school graduated and

below, and higher than master degree, representing 37.9%, 9.4%, and 3.5%, respectively. For an income range, the majority earned an average monthly income between 15,001-25,000 THB (23.3%), followed by 30,001 – 45,000 THB (16.5%), 25,000-30,000 THB (16.4%), 45,001-55,000 THB (15.6%), more than or equal to 65,001 THB (10.5%), less than or equal to 15,000 THB (9.3%), and 55,001-65,000 (8.4%). In terms of occupation, the majority respondents were private company employees, representing 79.7%, followed by students (15.8%). Lastly, the average frequency of QR code payment use per week is as followed; most respondents used the QR code payment 2-3 times a week, representing 50.6%, followed by 4 times or more a week (35.5%), and none or at least once a week (13.9%).

4.2. Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) or measurement model is a procedure to identify the variation and covariation among a set of indicators. In other words, CFA makes judgment whether a model is acceptable or not. Hence, factor loading, composite reliability (CR), average variance extracted (AVE) were carried out to validate all first-order constructs. Firstly, the value of factor loading greater or equal to 0.3 is acceptable. Based on the analysis, the factor loading of 68 indicators ranged between 0.653 – 0.878 and were found significant ($t > 1.96$). This suggested that all indicators were adequate for further analysis. Composite reliability and average variance extracted were applied to assess the convergent validity. Convergent validity is the technique to measure the level of correlation of multiple indicators in a single construct that are in the same phenomenon (Hamid et al., 2017). The value of composite reliability varies between 0 and 1. The higher values indicate the higher levels of reliability. However, the values of composite reliability with at least or equal to 0.60 is an acceptable value (Hair et al., 2006). Based on the analysis, the lowest CR was 0.82, and this suggested that all constructs were acceptable for further analysis. Lastly, Average Variance Extracted, the value range of AVE falls between 0 to 1. The value of AVE should exceed 0.50 to adequate the convergent validity (Bagozzi & Yi, 1988; Hair et al., 2006). Based on the analysis, the value of AVE ranged between 0.535-0.712, which means that all constructs were adequate for further analysis. The results of factor loading, CR, and AVE were summarized in Table 1.

Furthermore, Voorhees et al. (2016) mentioned that discriminant validity is important in research because in marketing context each construct is intangible by definition, so the researchers require evidence to show that all constructs in the research are distinct and not just empirical reflections of each other. Hence, the researcher applied Fornell and Larcker criterion to assess the discriminant validity in this study. Discriminant validity is measured by comparing the squared correlation between a pair of constructs with the average variance extracted (AVE) for each two constructs. If the square correlation is smaller than AVEs, then the discriminant validity is established (Fornell & Larcker, 1981). The result of discriminant validity for this research was established as shown in Table 2.

Moreover, adoption readiness and perceived risk were conceptualized as a second-order latent construct. The CFA of first-order and second-order was performed (Thakur and Srivastava, 2014). Table 4 shows the results of CFA of the final measurement model (CMIN/DF = 2.862, GFI = .903, AFGI = .891, NFI = .945, CFI = .964, TLI = .960, RMSEA = .032, and RMR = .035) which reflects an adequate model that fits with the data. Moreover, each first-order construct factor loading strongly and significantly correlate the second-order constructs as shown in Table 3.

4.3. Structural Equation Model (SEM)

Structural equation modeling (SEM) was also known as covariance structure analysis and correlation structure analysis (Cheung, 2015). Similarly, Ainur et al. (2017) stated that SEM is a statistical technique that combines elements in tradition multivariate models (factor analysis and regression analysis). After the researcher processed in SEM and adjusted the model, the result showed that overall model fit index (CMIN/DF = 2.827, GFI = .913, AGFI = .897. NFI = .975, CFI = .984, TLI = .982, RMSEA = .032, RMR = 0.34) as shown in Table 4.

4.3. Research Hypothesis Testing

In an effort to determine the antecedent of behavioral intention towards QR code payment by individual difference on perceived trust, adoption readiness, compatibility, attitude, perceived risk, and personal innovativeness, the researchers conducted SEM analysis. The summary of the result is shown in Table 5. The detailed result of the hypotheses testing was explained below.

H_1: The standard path coefficient between compatibility and attitude was 0.836 with t-value of 35.535***. There is a casual relationship between compatibility and attitude towards QR code payment system. Thus, H_1 was supported. The users perceived that QR code payment fits well with their lifestyle, matches with the way they buy products and service, and matches with the way they manage their finances as a QR code payment allows users to track their history record. Therefore, users who perceived high level of compatibility will leverage their attitude towards QR code payment system. The results of this study were also supported by Aslam et al. (2017)

Table 1: Confirmatory Factor Analysis (CFA), Composite Reliability (CR), and Average Variance Extracted (AVE) Results for First-order Constructs

Constructs	Source of Items	Items	Standardized Loading	CR	AVE
Perceived Usefulness (PERU)	Liébana-Cabanillas et al. (2015); Thakur and Srivastava (2014)	6	0.728-0.797	0.89	0.584
Perceived Ease of Use (PERE)	Liébana-Cabanillas et al. (2015); Thakur and Srivastava (2014)	4	0.709-0.772	0.83	0.550
Facilitating Conditions (FCTC)	Thakur and Srivastava (2014)	4	0.653-0.779	0.82	0.535
Social Influence (SCIF)	Kalinic and Marinkovic (2016); Thakur and Srivastava (2014)	5	0.688-0.797	0.87	0.565
Perceived Financial Risk (FINR)	Chen (2013); Nguyen and Nguyen (2017); Yang et al. (2015)	5	0.814-0.878	0.93	0.712
Perceived Privacy Risk (PRIR)	Khalilzadeh et al. (2017); Thakur and Srivastava (2014)	4	0.836-0.858	0.91	0.721
Perceived Performance Risk (PRMR)	Chen (2013); Yang et al. (2015)	5	0.798-0.826	0.91	0.661
Perceived Psychological Risk (PSCR)	Chen (2013); Yang et al. (2015)	5	0.784-0.823	0.90	0.651
Perceived Time Risk (PTIR)	Chen (2013); Yang et al. (2015)	5	0.798-0.827	0.91	0.666
Perceived Trust (PTRU)	Mehrad and Mohammadi (2016); Phonthanukitithaworn et al. (2014)	5	0.696-0.840	0.89	0.611
Compatibility (COMP)	Schierz et al. 2010; Liébana-Cabanillas et al. (2015); Phonthanukitithaworn et al. (2014)	5	0.724-0.759	0.86	0.553
Attitude (ATTI)	Chen (2013); Mehrad and Mohammadi (2016); Khalilzadeh et al. (2017)	5	0.764-0.806	0.88	0.602
Personal Innovativeness (PINN)	Kalinic and Marinkovic (2015); Thakur and Srivastava (2014); Khalilzadeh et al. (2017)	5	0.756-0.816	0.89	0.609
Behavioral Intention (BEHA)	Kalinic and Marinkovic (2016); Liébana-Cabanillas et al. (2015); Mehrad and Mohammadi (2016); Thakur and Srivastava (2014)	5	0.738-0.799	0.87	0.583

Note: Composite Reliability (CR); and Average Variance Extracted (AVE).

Table 2: Discriminant Validity

	PERU	PERE	FCTC	SCIF	FINR	PRIR	PFMR	PSCR	PTIR	PTRU	COMP	ATTI	PINN	BEHA
PERU	.764													
PERE	.415	.741												
FCTC	.396	.413	.731											
SCIF	.427	.424	.439	.752										
FINR	-.356	-.363	-.379	-.552	.843									
PRIR	-.365	-.361	-.373	-.540	.705	.849								
PFMR	-.385	-.394	-.388	-.488	.586	.576	.813							
PSCR	-.372	-.384	-.394	-.510	.616	.590	.585	.807						
PTIR	-.347	-.361	-.350	-.432	.438	.509	.420	.444	.816					
PTRU	.383	.378	.377	.506	-.529	-.523	-.472	-.475	-.399	.782				
COMP	.368	.358	.349	.417	-.378	-.383	-.366	-.364	-.319	.432	.743			
ATTI	.403	.388	.381	.411	-.367	-.373	-.379	-.373	-.347	.439	.417	.776		
PINN	.384	.371	.379	.445	-.419	-.409	-.406	.360	-.360	.471	.407	.441	.780	
BEHA	.390	.375	.372	.426	-.366	.377	-.368	-.366	-.333	.435	.412	.451	.430	.763

Note: The square root of AVE (Average Variance Extracted) is shown on diagonal and correlation coefficients is shown in off diagonal for first-order constructs.

Table 3: Second-order Model

Second-order Factor	First-order Factor	Loadings	Variance Explained (%)
Adoption Readiness	Perceived Usefulness	.944***	89
	Perceived Ease of Use	.901***	81
	Facilitating Conditions	.903***	82
	Social Influence	.825***	68
Perceived Risk	Perceived Financial Risk	.943***	89
	Perceived Privacy Risk	.964***	93
	Perceived Performance Risk	.980***	96
	Perceived Psychological Risk	.992***	99
	Perceived Time Risk	.958***	92

Note: ***Significant at p<0.001.

Table 4: Goodness of Fit

Goodness-of-Fit Indices	Criterion	Measurement Model	Structural Model
CMIN/DF	≤ 3.0 (Schreiber et al., 2006)	2.862	2.827
GFI	≥ .90 (Bagozzi & Yi, 1988)	.903	.913
AGFI	≥ .85 (Schermelleh-engal et al., 2003)	.891	.897
NFI	≥ .90 (Arbuckle, 1995)	.945	.975
CFI	≥ .90 (Hopwood & Donnellan, 2010)	.964	.984
TLI	≥ .90 (Hopwood & Donnellan, 2010)	.960	.982
RMSEA	≤ .08 (MacCallum et al.,1996)	.032	.032
RMR	≤ .05 (Hair et al., 2006)	.035	.034

Note: The ratio of the chi-square value to degree of freedom (CMIN/DF); Goodness-of-Fit Index (GFI); Adjust Goodness-of-Fit Index (AGFI); Normed Fit Index (NFI); Comparative Fit Index (CFI); Turker Lewis Index (TLI); Root Mean Square Error of Approximation (RMSEA); Root Mean Square Residual (RMR).

H_2: The standard path coefficient between compatibility and behavioral intention was 0.665 with t-value of 7.667***. There is a casual relationship between compatibility and behavioral intention to use or continue using QR code payment system. Thus, H_2 was supported. This means that users who perceived compatibility tend to have positive attitude towards QR code payment system. The relationship between these two constructs was aligned with the previous empirical research in mobile payment context (Chakraborty & Mitra, 2018; Humbani & Wiese, 2017).

H_3: The standard path coefficient between attitude and behavioral intention was 0.353 with t-value of 3.971***. There is a casual relationship between attitude and behavioral intention towards using or continuing to use QR code payment system. Thus, H_3 was supported. This concludes that users who perceived QR code payment system as convenient, beneficial, interesting, and a good idea to use, will be enhanced in terms of behavioral intention towards QR code payment system. The result of this study was supported by various empirical research (Chen, 2013; Phonthanukithaworn et al., 2016).

H_4: The standard path coefficient between perceived trust and behavioral intention was 0.040 with t-value of 1.899 and p-value of 0.058. There is no causal relationship between perceived trust and behavioral intention. Thus, H_4 was not supported. The findings of this study found that trust does not statistically and significantly impact behavioral intention of QR code payment. Similarly, previous empirical research found that perceived trust was not associated with behavioral intention (Seetharaman et al., 2017)

H_5: The standard path coefficient between adoption readiness and behavioral intention was 0.151 with t-value of 6.508***. There is a casual relationship between adoption readiness and behavioral intention. Thus, H_5 was supported. In this study, adoption readiness consists of four sub-constructs including perceived usefulness, perceived ease of use, social influence, and facilitating conditions. This means that users who perceived high level of perceived usefulness, perceived ease of use, social influence, and facilitating conditions tend to enhance behavioral intention. The result of this relationship was also supported by various empirical research in mobile payment and mobile banking context (Makanyeza, 2017; Tan et al., 2014; Thakur & Srivastava, 2014).

Table 5: Hypothesized Relationship

Hypothesized path		Standardized Coefficients	T-value	P-value	Result
H1	COMP → ATTI	.836	35.535	***	Supported
H2	COMP → BEHA	.665	7.667	***	Supported
H3	ATTI → BEHA	.353	3.971	***	Supported
H4	PTRU → BEHA	.040	1.899	.058	Not Supported
H5	ADOP → BEHA	.151	6.508	***	Supported
H6	RISK → BEHA	.023	1.657	.098	Not Supported
H7	PINN → BEHA	.157	6.219	***	Supported

Note. ***p<0.001; **p<0.01; *p<0.05.

H_6: The standard path coefficient between perceived risk and behavioral intention was 0.023 with t-value of 1.657 and p-value of 0.098. There is no causal relationship between perceived risk and behavioral intention towards using or continuing to use QR code payment. Thus, H_6 was not supported. In this study, perceived risk consists of five sub-constructs, which are perceived financial risk, perceived performance risk, perceived time risk, perceived psychological risk, and perceived privacy risk. However, the result of this study explored that perceived risk is not statistically significant with behavioral intention towards QR code payment. The concept was supported by various empirical studies which found that perceived risk had no significant relationship with behavioral intention in mobile payment context (Chakraborty & Mitra, 2018; Munoz-Leiva et al., 2017; Unnikrishman & Jagannathan, 2016)

H_7: The standard path coefficient between personal innovativeness and behavioral intention was 0.157 with t-value of 6.219***. There is a casual relationship between personal innovativeness and behavioral intention. Thus, H_7 was supported. This can be assumed that users who are likely to experience new technology and always try out new technology before friends and family leveraged their behavioral intention towards QR code payment. The relationship between these two constructs was aligned with the previous empirical research in mobile payment context (Humbani & Wiese, 2017; Seetharaman et al., 2017)

4.4. Direct, Indirect and Total Effects of Relationship

The estimation of standardized regression weight value also reports the direct, indirect, and total effect between independent constructs and one dependent construct in the model. The direct effect refers to the relationship between two constructs without mediating construct. In contrast, indirect effect refers to the relationship between two constructs with at least one mediating construct (Hair et al., 2013). However, in this study only one construct is an indirect effect. The direct, indirect, and total effect of each constructs are explained below.

4.4.1. Attitude

The significant direct effect of compatibility on attitude towards QR code payment was 0.836. There was no evidence of indirect effect. Therefore, the total effects were equal to 0.836. In conclusion of total effect, compatibility is an important factor that significantly has an effect on attitude towards QR code payment system.

4.4.2. Behavioral Intention

There are five factors that directly affect behavioral intention. The first significant direct effect is an attitude with 0.353, followed by personal innovativeness with the significant direct effect which equals to 0.157. Sequentially, a significant direct effect of adoption readiness, perceived trust, and perceived risk are equal to 0.151, 0.040, and 0.23, respectively. Meanwhile, there was one factor that had indirect effect - the significant indirect effect of compatibility which was accounted for 0.171. In summary, in terms of a total effect on behavioral intention, compatibility has the most statistically significant effect on behavioral intention (0.836), followed by personal innovativeness (0.157), and adoption readiness (0.151).

5. Conclusion, Recommendation, and Limitation

5.1. Conclusion

In this study, the researchers aim to study the factors that affect behavioral intention towards QR code payment system via top-three mobile banking applications in Bangkok, Thailand. A total of 1,800 questionnaires were distributed to Thais who are older than 18 years old and have experiences with QR code payment system. The proposed research model was developed from various theories and empirical research. The factors included in the proposed model were perceived trust, compatibility, attitude, and personal innovativeness. Moreover, the researchers also conducted second-order constructs, which are adoption readiness and perceived risk.

For adoption readiness, the factors are perceived ease of use, perceived usefulness, facilitating conditions, and social influence. For perceived risk, the factors are perceived financial risk, perceived performance risk, perceived time risk, perceived psychological risk, and perceived privacy risk. The outcome of this research was examined by confirmatory factor analysis (CFA) to ensure reliability and validity. In addition, structural equation model (SEM) was applied to test all the hypotheses and to conclude the outcome of this study.

In summary, the strongest factors affecting behavioral intention towards QR code payment were compatibility, attitude, adoption readiness, and personal innovativeness. The results of this research were consistent with empirical research in mobile payment context (Chakraborty & Mitra, 2018; Humbani & Wiese, 2017; Makanyeza, 2017; Phonthanukithaworn et al., 2016). In addition, compatibility has an impact on behavioral intention. Surprisingly, perceived trust and perceived risk do not have impact on behavioral intention. The result was also supported by critical research in mobile payment context (Chakraborty & Mitra ,2018; Seetharaman et al., 2017)

The findings of this research revealed that compatibility was the strongest factor that has an impact on behavioral intention. The users perceived that QR code payment matches with their lifestyles, the way they purchase the product or service, and their ability to manage their finance that would enhance behavioral intention. Apart from compatibility, attitude is one of the critical factors that has both direct and indirect effect on behavioral intention. Moreover, attitude also significantly impacts compatibility. The users who perceive using QR code payment as a good idea, convenient, beneficial, and interesting would enhance behavioral intention. Furthermore, adoption readiness cannot be left behind. Users perceived positive experience towards using QR code payment as easy to use and useful. Also, users who have efficient facilities to use QR code payment (e.g., mobile phone and tablet) and influenced by friends/family members slightly enhanced behavioral intention. Lastly, personal innovativeness also impacts behavioral intention. As mobile payment is an innovative technology, therefore, the majority of individuals still have little expertise on mobile payment (Humbani & Wiese, 2017; Kim et al., 2010).

5.2. Recommendations

The results of this research explored various factors that are considered as the antecedent of behavioral intention towards QR code payment. Those critical factors were compatibility, attitude, adoption readiness, and personal innovativeness. Therefore, the recommendations from the result of this study would begin with enhancing compatibility. Users have to perceive higher level of compatibility. These can promote how using QR code payment would fit with their lifestyle, the way they buy products and services, and the way they manage their finances. Bank can enhance these by creating advertising to promote QR code payment that matches with users' lifestyle than other kinds of payment system. Moreover, attitude is one critical factor. Bank can enhance attitude by promoting that using QR code payment system is a good idea, convenient, beneficial, and interesting. The bank can lunch promotion such as credit rewards, cash coupon, and games, to enhance the perception of using QR code as beneficial and interesting. In addition, bank might promote the use of QR code payment as more convenient than using other kinds of payment system such as cash, credit card, and debit card. Finally, bank also continues to improve or maintain the perception on how using QR code payment is useful and easy to use via mobile application.

5.3. Limitation and Further Study

The first limitation of this research was the sample of this study which focused only on QR code payment of top-three commercial banks in Thailand based on the number of mobile banking users. Thus, the result of the study may not be applicable to other mobile banking services such as a request for loan, a credit card application, purchasing mutual fund, and other services available on mobile banking applications. On the other hand, other commercial banks or non-banking parties who would like to understand consumers' behavioral intention toward QR code payment may seek an advantage from the result of this study due to a similar payment process that has been fixed by Thai Government. In addition, Singh (2015) stated that different nationalities might perceive the perception of behavioral intention differently. However, this study did not consider respondents' nationality and that may give a significant different result. Similarly, Makanyeza (2017) stated that demographic factors such as age, gender, education and income are important in marketing context. Therefore, in further research, demographic factors should be studied. Finally, this study focused on limited factors that have an effect on behavioral intention of QR code payment. Thus, other critical constructs that may impact QR code payment on users' behavioral intention might be interesting, such as satisfaction, self-efficacy, habit, hedonic motivation, and cost (Makanyeza, 2017; Ozturk, 2015; Zhou, 2013).

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