Factors Influencing Customer Usage of QR Code Payment: A Case Study of ACLEDA Institute of Business Students

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ABSTRACT

The study attempts to determine influential factors of QR code payment adoption in financial industry in Cambodia. The study employs quantitative approach with the total sample size of 231, using a correlational design. The combined factors of the DeLone & McLean IS Success Model and TAM model are used to find the customers' intention to adopt QR code payment. The study has shown that perceived information quality, perceived usefulness, perceived ease of use, and attitude are statistically significant at .000, .003, .000, and .012, respectively, whereas perceived system quality is not statistically significant. For a summary of the model fitness, the study can predict 82% in variance of behavioral intention (BI) to use QR code payment influenced by the independent variables.

Keywords: QR code payment, information quality, system quality, perceived usefulness, perceived ease of use, attitude, and behavioral intention

1. Introduction

Background of the study

The industrial revolutions (IR) have affected people's lifestyles through technological advancements (Taj & Jhanjhi, 2022). Industry 5.0 envisions the mass production with zero waste, minimal cost, and maximal accuracy (Zeb et al., 2022). Notably, one of the themes for Industry 5.0 is human-robot co-working (Demir et al., 2019).

Ganesan and Gopalsamy (2022) have asserted that blockchain technology has affected the financial world, and digital marketing drastically. In this regard, the financial technology known as Fintech has emerged through the combination of technology and finance in order to support financial activities. According to Nijjer et al. (2022), "Fintech is enhancing the banking industry through several channels and financial inclusion may include the provision of financial services to underserved populations with limited access to traditional financing channels." Fintech is currently expanding and brining a new era and competing classic financial methods (Haris Haxhimehmeti & Adrian Besimi, 2020, Ahmi et al., 2020).

Problem statement

As part of Fintech, mobile payment system involves players, namely: customer, merchant, issuing bank, acquiring bank and micropayments systems such as software architectures, security, mobile payment methods, mobile acceptance of the system, QR code method to complete a payment, and component interaction (Haris Haxhimehmeti & Adrian Besimi, 2020). Fintec which performs cashless payment and convenient financial services is considered limited, whereas the blockchain technology, a breakthrough for digital financial transactions, helps save time and money, to ensure security for money transfer and to promote cashless payment (Mishra, 2022). Digital payments have changed people's financial behaviors in Asian countries and the expansion of the internet network and the intensification of gadget functions have fostered digital payment systems in mobile payments, internet banking, QR Codes, and electronic payments (Susanto et al., 2022). The issue arises as to what pushes ACLEDA Institute of Business students to adopt the financial transactions by using QR Code payment.

Research objectives

The study focuses on banking industries' financial services and transactions by using mobile payment systems:

- To examine factors influencing customer intentional usage of QR Code payment
- To find out the relationship of influential factors with QR Code payment

Research question

To reach the objective, the researchers employed research questions as follow:

- What are the factors influencing the use and acceptance of QR Code payment?
- How is the relationship of the influential factors with QR Code payment?

Significance of the study

The study provides insight into the trends influencing banking clients' adoption of Fintech for any routine mobile payment with smartphones and smart devices. Meanwhile, the study has validated the research model concerning finance and technology development in the Cambodian context in order to develop better understanding about the smart ecosystem for the new industrial revolution 5.0 vision.

2. Literature Review

Overview of payment systems and Quick Response (QR Code)

Payment systems

According to the National Bank of Cambodia (NBC) (2020), payment systems are important for the financial infrastructure of the country, contributing to the economic development of the nation with efficient payment, the exchange of money for goods, services, and financial assets. The safe and efficient feature enables authorities to manage systemic risk and monetary policy implementation. Banking industry of the private sector providing the digital and electronic payment services, digital network for access to finance, households, small and medium enterprises is considered crucial to fuel the economic growth for sustainability, convenience, affordability, fairness, and safety features with relevant stakeholders without discriminating the types of institutions (NBC, 2020).

The white paper entitled "The Next Generation Payment System" of the NBC wrote, "digital wallets allow a user to simply wave or tap their smart phone to complete a transaction (NBC, 2019). The commercial banks provide credit remittance via branch, ATM, Internet, PC, and mobile. The major commercial banks like ACLEDA are providing credit remittance services via ATM, internet or mobile banking, and the volume of USD payment transactions, which is larger than those of KHR payment transactions" (NBC, 2020).

The banks provide diversified products and services as cards service, digital service, funds transfer service, trade finance service, and other cash management facilities besides loans and deposits (ACLEDA Bank Plc., 2022). The digital services such as ACLEDA Mobile,

ACLEDA internet banking, ATM machines, and ACLEDA POS are well known among financial services clients (ACLEDA Bank Plc., 2022). ACLEDA Mobile is a FinTech application running on smart phone, which enables customers to perform their banking transactions anywhere and anytime has become so popular from day to day and with this application, payments can be made from all types of cards and QR from all banks (ACLEDA Bank Plc., 2021).

Figure 1: ACLEDA Mobile app (ACLEDA Bank Plc., 2021) and NBC's Bakong Apps

Quick Response (QR Code)

The banking sector in Cambodia promotes safe and efficient payment system for economic agents. The Safe and efficient payment systems are crucial for the financial system and economy as a whole (NBC, 2023). The monetary and payment system authority of the NBC has developed Bakong App to promote the use of local currency and electronic payment in Cambodia (NBC, 2020). The Bakong function is a convenient feature for real-time fund transfer, instant payment transaction, interconnectedness and interoperability openness to all payment service providers and the adoption of QR code payment. It is widely used by Cambodian younger population as a modern payment system via QR code (NBC, 2020). A Quick Response (QR Code) utilizes a smartphone camera for payment (Susanto et al., 2022), a payment for products, goods or services between two parties, consumers and merchants (Nseir Sana et al., 2013). The QR Code payment is a financial inclusion that ensures the ease of access, availability, and usage of formal financial system, the equality of opportunities to access financial services inclusively to all people of a nation (Loo, 2019). According to the NBC (2020, p. 20), "Financial Inclusion is a primary agenda of the NBC. One of the effective measures to promote financial inclusion is to ensure a cashless society where transactions could be performed digitally, and money transfer/mobile banking is accessible and affordable to every citizen."

Mobile media are channels for digital marketers and advertisers because of their potential to support one-to-one, one-to-many and mass communication at a reasonable price and effective

manner; mobile marketing ensures customer engagement with a brand, user-generated content, and mobile commerce (Watson et al., 2013). Firms are using QR code initiatives in their marketing strategies (Shin et al., 2012).

Figure 2: QR Code (AIB, 2023)

Toward a conceptual framework

Perceived information quality, system quality and interactivity

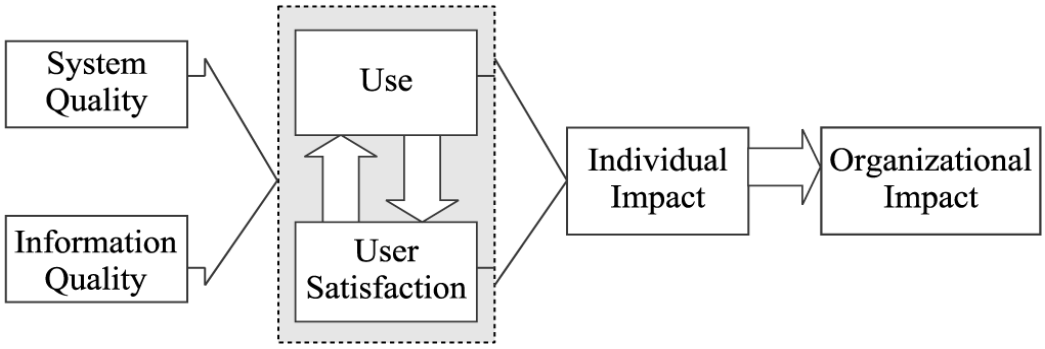
DeLone & McLean Success Model introduced the framework for measuring the performance of information systems (DeLone & McLean, 2004). Delone and McLean's (1992) model suggests that both system usage and user satisfaction be affected by these two factors: information quality, system quality (Bokhari, 2005). DeLone & McLean (1992) reviewed the multiple dimensional components of IS success and identified sixcomponents of IS success: system quality, information quality, use, user satisfaction, individual impact, and organizational impact (Petter et al., 2008), as shown in figure 3.

Information quality captures the user perceived value of the output produced by a system and measured by information accuracy, relevance, timeliness and completeness. The perceived information quality perceived as the "cognitive beliefs about the favorable or unfavorable characteristics of the accuracy, completeness, relevance and reliability of the information derived from QR codes" (Shin et al., 2012).

The system quality is about the measurement of the functionality of a system, the usability, availability, reliability and response time (Shin et al., 2012). The system quality of QR codes is perceived "as the degree to which individuals perceive that the connection between a mobile device and the QR code is satisfaction in terms of transfer speed and reliability" (Shin et al., 2012).

The QR code interactivity include responsiveness, user control and connectedness, perceived personalization, real time interactions, playfulness are the critical components (Shin et al., 2012). Perceived credibility is "the extent to which an individual believes that the use of service technology will have no security or privacy threats" (Kongarchapatara & Rodjanatara, 2018) and the highly interactive characteristics of QR code use, and user intention towards technology acceptance and adoption are key success in advertising.

H1: Perceived information quality positively influences on customer intention to use QR code payment.
H2: Perceived system quality positively influences on customer intention to use QR code payment.



Source: Adapted from Delone and McLean (1992)

Figure 3: The DeLone & McLean Success Model

The researchers in the area of IS Success developed and validated system quality, information quality, use, and user satisfaction; and modified the "Use" with "Usefulness of Davis" model (Petter et al., 2008). The perceived usefulness is about the "user believes the technology/ particular system will improve his/ her performance, and job-fit-how the capabilities of a system enhance an individual's job performance (Venkatesh et al., 2003). Petter et al. (2008) describe the components of the D&M model as the following: (1) User satisfaction is about "users' level of satisfaction with reports, websites, and support services; (2) the net benefit is about "the extent to which IS are contributing to the success of individuals, groups, organizations, industries, and nations"; (3) user information satisfaction (UIS) contain items related to system quality, information quality, and service quality, rather than only measuring overall user satisfaction with the system".

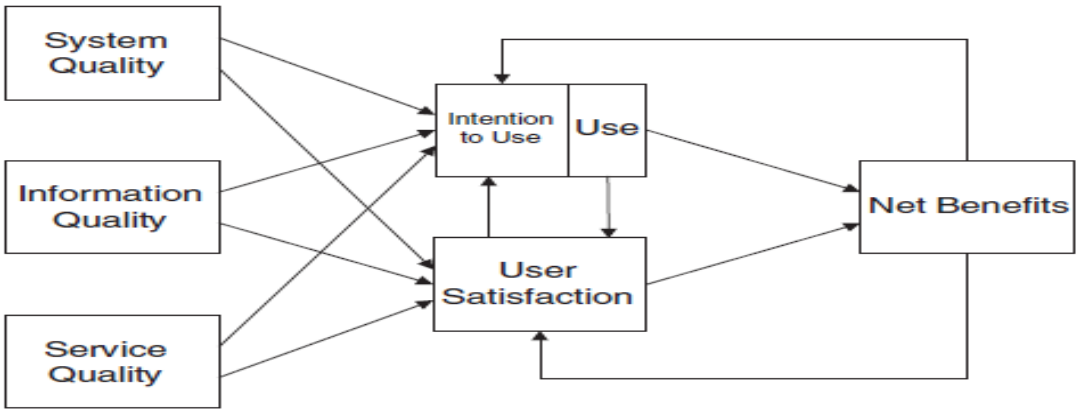


Figure 4: Updated Delone and Mclean is success model

Perceived usefulness, ease of use, attitude and behavioral intention

The constructs, namely perceived usefulness, ease of use, attitude and behavioral intention, proposed by (Venkatesh & Bala, 2008; Venkatesh et al., 2003), are called Technology Acceptance Model (TAM). The perceived usefulness and perceived ease of use could be affected by external variables (Liu et al., 2010). Any new technology needs to be perceived as being useful and easy to use in order for it to be accepted (Ozkaya et al., 2015). The perceived ease of use is "the belief that using the technology will be free of effort and using an innovation is perceived as being difficult to use" (Venkatesh et al., 2003). The theory of reasoned action (TRA model) stated that an attitude is about "an individual's positive or negative feelings (evaluative affect) about performing the target behavior" (Venkatesh et al., 2003). Attitude is "an individual's positive and negative feelings about the performing the target behaviors (Ventakesh et al., 2003). The previous papers mentioned attitude as "a critical influential predictor of behavioral intention towards banking products and services" (Suebtimrat & Vonguai, 2021). Behavioral Intention refers to the probability of the users' willingness to make mobile payment (Ventakesh et al., 2003; Suebtimrat & Vonguai, 2021).

Previous studies found that perceived usefulness has a positive and significant effect on the intention to adopt mobile banking (Em et al., 2021). Also, another study found perceived ease of use influence intention mobile banking adoption through the attitudes (Norng, 2022). Finally, several studies found attitudes influence mobile payment or mobile banking (Em et al., 2021; Norng, 2022; Yang et al., 2021)

H3: Perceived usefulness has a positive effect on customer intention to use QR code payment
H4: Perceived ease of use has a positive effect on customer intention to use QR code payment
H5: Attitude has positive effects on customer intention to use QR code payment

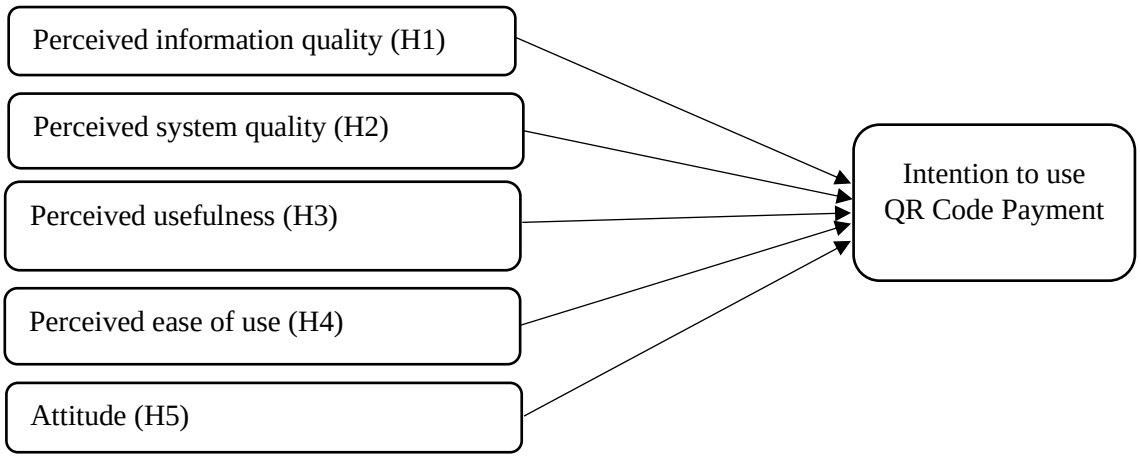


Figure 5: Proposed Research Model

This paper modified service quality of the updated D&M IS Model with Perceived interactivity and unhidden usefulness from information quality and ease of use from system quality of the D&M model.

3. Research Methods

Research design

The paper employed quantitative research approach, using a correlational study design to examine the relationship among the independent, moderating and dependent variables. The descriptive and inferential statistics were used to find out the relationships of the proposed constructs. The research instrument was adapted from validated similar literature contexts (Hanif et al., 2018).

Research area

The study was conducted in Phnom Penh, specifically at the ACLEDA Institute of Business (AIB), to find out the factors influencing the usage of QR code payment among AIB students.

Population and sample

The AIB students were selected as the accessible population in the study due to the common uses of the QR payments among the students. The population size of the QR code payment users is unknown and the sample size of the study from the whole population was calculated at the 95 per cent confidence, accounting for the error of margin at 5 per cent based on the sample size of 231. Green (1991) and Tabanick and Fidell (2013) show the required sample formula as follows, "$N \geq 50 + 8m$" and where "m" is the number of IVs; that is sufficient for testing the multiple correlation and "$N \geq 104 + m$ for testing individual predictors". In practicality, the required

sample size depends on a number of issues, including the desired power, alpha level, number of predictors, and expected effect sizes (Tabachnick & Fidell, 2013; Knofczynski & Mundfrom, 2008).

Research participants

The table 1 shows the demographic information of the 231 research participants, comprised of males 13.9% and females 86.1% with the age range from under 20 years to above 30 years. The participants use mobile apps for payments with the following mobile apps: ACLEDA, Bakong, ABA, Wing, and others along the QR code use frequency.

Table 1: Demographics

Respondents' demographic	Category (n=231)	Frequency	Percentage
Gender	Male	32	13.9
	Female	199	86.1
Age	Under 20 years old	108	46.8
	between 21 to25 years old	120	51.9
	between 26 to 30 years old	1	.4
	Others	2	.9
Mobile Apps	ACLEDA Mobile Apps	149	64.5
	BAKONG Apps	69	29.9
	ABA Mobile Apps	3	1.3
	Wing Bank App	1	.4
	Others	9	3.9
QR Code Use Frequency	Once a week	28	12.1
	Twice a week	21	9.1
	Twice a month	8	3.5
	Every day	75	32.5
	When necessary	99	42.9

Research tools and measurements of constructs

Survey questionnaire, using Google form, was developed based on the measured items adapted from literature studies. The items were carefully reworded to fit QR Code adoption context in Cambodia. The Google form link was sent to the respondents via G-mail and telegram for the data collection. The instrument was self-administered, using a seven-point Likert scale, ranging from strongly disagree to strongly agree.

Table 2: Summary of Measurement Construct

Variables	Items	Sources
Perceived information quality	PIQ1: I think that QR codes provide a variety of information and services PIQ2: I think that the services and information I can get from QR codes are valuable. PIQ3: QR codes provide the information and services that I need in a timely fashion.	Delone and Mclean (1992), Lee et al. (2002)
Perceived system quality	PSQ1: I think that QR codes provide very reliable service PSQ2: I think that the speed of QR codes is sufficient. PSQ3: I think that QR codes are secure to use. PSQ4: I find that QR code are safe and efficient.	Parasuraman et al. (1988), Shin(2009) (NBC, 2020)
Perceived usefulness	PU1: I evaluate QR codes as useful. PU2: I evaluate QR code service as practical. PU3: I evaluate QR codes as functional. PU4. The QR mobile payment system is a useful mode of payment PU5: QR mobile payment systems allow quick use and flexibility.	Davis (1989) Bhattacherjee (2001)
Perceived ease of use	PEU1: I find using QR codes easy. PEU2: It is easy to learn to use the QR mobile payment system. PEU3: It is easy to follow all the steps to use the QR mobile payment system. PEU4: It is easy to interact with the QR mobile payment system PEU5: Overall, QR codes are easy and convenient.	(Davis (1989) Bhattacherjee (2001), Davis(1989), Taylor and Todd (1995) Venkatesh and Davis (2000),
Attitude	The use of QR mobile payments is a good idea. The use of QR mobile payments is convenient. The use of QR mobile payments is beneficial. The use of QR mobile payments is interesting.	Yang and Yoo (2004), Schierz Schilke, and Wirtz (2010)
Behavioral Intention	BI1: I think I will use QR codes in the future. BI2: I recommend that others use QR codes. BI 3: I intend to continue using QR codes in the future. BI 4: I intend to use a QR mobile payment system when the opportunity arises. BI 5: I am open to using a QR mobile payment system in the near future	Davis (1989), Shin (2009)

The level of agreement analysis

The pilot test for reliability was used to test the measured items. Armstrong (1987) asserts that the higher the score, the more important the variable is. The Seven-Likert- scale point applied

to measure the factors, which influence the consumers' perception QR Code Payment in Phnom Penh.

Table 3: The Level of Agreement Analysis

No	Likert Scale	Acceptable scored rank	Source
1	Strongly Disagree	1 - 1.84	(Armstrong, 1987)
2	Disagree	1.84 - 2.70	
3	Somewhat disagree	2.7 - 3.56	
4	Neutral	3.56 - 4.42	
5	Somewhat Agree	4.42 - 5.28	
6	Agree	5.28 - 6.14	
7	Strongly Agree	6.14 - 7.00	

Table 4: Reliability Statistics

Variables	Items	Pilot Cronbach's Alpha (n=50)
Perceived information quality (PIQ)	3	0.882
Perceived system quality (PSQ)	4	0.849
Perceived usefulness (PU)	5	0.916
Perceived ease of use (PEU)	5	0.936
Attitude (ATT)	4	0.940
Behavioral Intention (BI)	5	0.957

The Cronbach's Alpha, the estimator of test reliability that suite for use in single applications of a test, typically in a cross-sectional design (Forero, 2014), ranged from the lowest 0.849 to the highest 0.957 for the test reliability.

Data collection

A cross-sectional descriptive study conducted in 2023 with the AIB students who are using Payment App, through the use of Google form as a means to collect data from the selected participants.

Data analysis

The survey questionnaire was downloaded from Google form and encoded in Spreadsheet. The data were then transformed into numerical data. The Statistical Package for the Social Sciences

(SPSS) version 23 of IBM was used to analyze data with descriptive statistics, using means, standard deviation of each factor, and referential statistic for correlation and regression. The set of relationships between one or more independent variables, either continuous or discrete, and one or more dependent variables, either continuous or discrete, can be either factors or measured variables (Tabachnick & Fidell, 2013). The regression analysis was employed to examine the relationship between a dependent variable and several independent variables and to determine how strong relationships between dependent variable and independent variables are.

Ethical consideration

Ethically, literature, authors, publishers, data sources, sampling and data analysis in academic research are seriously taken into account in this study to ensure the research integrity through the whole research process. There was a consent from the research committee before the study was conducted in order to ensure that the study was conducted in a professional and ethical manner. Meanwhile, the study was in line with the AIB vision, missions and values.

4. Results and Discussions

Correlation analysis

The results show the correlation among constructs, namely the lowest value .720 of the correlation between perceived system quality and perceived information quality and the highest value .915 of the correlation between the attitude and the perceived ease of use .915 as illustrated in table 5. Tabachnick and Fidell, (2017) have asserted that correlation is used when the intent is simply to investigate the relationship between the dependent variables and independent variables.

Table 5: Multiple Correlations Matrix

Items	PIQ	PSQ	PU	PEU	ATT	BI
Perceived information quality	1					
Perceived system quality	.720**	1				
Perceived usefulness	.804**	.786**	1			
Perceived ease of use	.773**	.831**	.869**	1		
Attitude	.769**	.751**	.832**	.915**	1	
Behavioral Intention	.797**	.775**	.845**	.877**	.851**	1
N	231	231	231	231	231	231

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

The table 6 shows that the model is significant for the study at .000, which indicates that at least one independent variable among the predictors (perceived information quality, perceived system quality, perceived usefulness, perceived ease of use, attitude) affects the dependent variable (behavioral intention) with F (5, 225) =204.61, p<.001 along with r=.905; R Square= .820, which indicates that the model can predict 82% in variance of behavioral intention (BI).

Table 6: Analysis of Variance

ANOVA[a]						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	225.814	5	45.163	204.618	.000[b]
	Residual	49.662	225	.221		
	Total	275.476	230			

Dependent Variable: Behavioral Intention

Predictors: (Constant), Perceived information quality, perceived system quality, perceived usefulness, Perceived ease of use, Attitude

Table 7: Coefficients analysis

Constructs	Unstandardized Coefficients		Standardized Coefficients	Sig.
	B	S. E	Beta	
(Constant)	.128	.181		.482
Perceived information quality	.194	.051	.192	.000
Perceived system quality	.070	.054	.069	.193
Perceived usefulness	.194	.066	.190	.003
Perceived ease of use	.355	.093	.336	.000
Attitude	.188	.074	.186	.012

Dependent Variable: Behavioral Intention

The table of coefficients indicates the perceived information quality of β= .192 with p-value .000, perceived system quality with β=.069 and the p-value .193; perceived usefulness with β= .190 and P-value .003; perceived ease of use with β= .336 and p-value .000**; and the attitude of β=.186 with p-value .012.

Hypothesis testing result

The behavioral intention (BI) was regressed by predicting variables: perceived information quality, perceived system quality, perceived usefulness, perceived ease of use, and attitude (Table 7).

The table 7 shows that perceived information quality, the perceived ease of use, perceived usefulness, and the attitude are statistically significant while the perceived system quality was not significant at p-value greater than 0.05.

Discussion

The result shows that there are some influential factors, namely perceived information quality, perceived usefulness, perceived ease of use; and attitude play important role to push customer acceptance of QR Code payment. This study corresponds to the previous literature by (Delone & Mclean, 2003, Petter et al., 2008, Shin et al., 2012) that perceived information quality has p-value .000; perceived ease of use has p-value .000**, all be positive result. Furtherly, perceived usefulness with p-value .003, and the attitude with p-value .012, this also indicates positive result,

5. Conclusion and Implication

Conclusion

The study of banking industries' financial services and transactions by using mobile payment systems has determined some influential factors on customer usage of QR Code payment. Firstly, the research concern "what are the factors influencing the use and acceptance of QR Code payment?" The influential factors are perceived information quality, perceived usefulness, and perceived ease of use. They play most crucial impact on QR Code payment of customers. The secondly, "how is the relationship of the influential factors with QR Code payment?" The perceived information quality correlates with behavioral intention .797, perceived usefulness with behavioral intention. 845, perceived ease of use with behavioral intention .877; and attitude with behavioral intention (QR Code payment acceptance). So, this correlation is significant at the 0.01 level (2-tailed test).

Limitation and recommendations for future research

The study employed a quantitative approach with the total sample size of 231 who use QR code payment. It applied the D&M IS Success model with the integrated TAM model with only the data from one higher education institution. The future work should deal with larger sample heterogeneity to gain more insight for the generalization of the findings. Researchers recommend p<.001 and R Square= .820, which indicates that the model can predict 82% in variance of behavioral intention (BI) of the QR Code payment users in the Phnom Penh capital.

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