THE DETERMINANTS OF CUSTOMERS' INTENTION TO USE QR CODE MOBILE PAYMENT SERVICES

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Abstract: *Based on the unified theory of acceptance and use of technology (UTAUT) model, this study extends the prior literature on consumer adoption of mobile payment by investigating the key factors affecting customers' intention to use Quick Response (QR) code mobile payment services. Covariance-based structural equation modelling (CB-SEM) is used to analyze survey data from 248 respondents in Hanoi, Vietnam. The results show that customers' effort expectancy is the most influential factor, followed by compatibility, performance expectancy, and personal innovativeness. This paper enriches research on mobile payment services, offers insights into user behavior, and provides important implications for suppliers of QR code mobile payment services.*

• Keywords: *QR code, mobile payment, intention to use, UTAUT.*

Tóm tắt: *Dựa trên mô hình chấp nhận và sử dụng công nghệ (UTAUT), nghiên cứu này tiếp nối các nghiên cứu trước đây về việc chấp nhận thanh toán trên thiết bị di động của người tiêu dùng qua việc phân tích các nhân tố chính ảnh hưởng đến ý định sử dụng dịch vụ thanh toán trên thiết bị di động qua mã QR của khách hàng. Mô hình phương trình cấu trúc dựa trên hiệp phương sai (CB-SEM) được sử dụng để phân tích dữ liệu khảo sát từ 248 người dùng trên địa bàn Hà Nội. Kết quả cho thấy nỗ lực kỳ vọng của khách hàng là yếu tố ảnh hưởng lớn nhất, tiếp theo là sự tương thích, hiệu quả kỳ vọng và sự tự đổi mới. Nghiên cứu này làm phong phú thêm các nghiên cứu về các dịch vụ thanh toán trên thiết bị di động, cung cấp thông tin chi tiết về hành vi của người dùng và đưa ra các khuyến nghị hữu ích cho các nhà cung cấp dịch vụ thanh toán trên thiết bị di động qua mã QR.*

• Từ khóa: *mã QR, thanh toán di động, ý định sử dụng, UTAUT.*

1. Introduction

With the emergence of Industry 4.0, financial sector has been restructured by integrated new technologies. Fintech companies have also become competitors to banks in providing more affordable payment services. In recent years, consumers have more payment methods to select rather than just making cash or credit card transactions. QR code mobile payment, which is a payment service based on mobile payment, receives a lot of attention because of its convenience, ease of use and fast transaction speed. However, in one survey on internet users, just 5% of respondents use QR code mobile payment frequently to pay for their daily transactions.[1]

In this era, Vietnamese banks and fintech companies have also found different ways to adopt new technologies to improve cashless payment services. However, the number of cashless transactions of Vietnamese consumers is much lower than other neighbor countries. Specifically, 4.9% of transactions in Vietnam is cashless, meanwhile in China, Thailand and Malaysia, this number is 26.1%, 59.7% and 89%, respectively.[2]

[1] *https://www.statista.com/statistics/248306/distribution-of-global-mobile-payment-volume-forecast/. Accessed 16/12/2021.*

[2] *http://tapchitaichinh.vn/nghien-cuu-trao-doi/phat-trien-thanh-toan-di-dong-tai-viet-nam-hien-trang-va-thach-thuc-300485.html. Accessed 25/11/2021.*

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Therefore, we attempt to examine the factors determining the intention to use QR code mobile payment to find solutions to develop this service as well as the cashless payment system in Vietnam and worldwide.

Based on the unified theory of acceptance and use of technology (UTAUT) model, we develop a model with seven constructs. Explanatory variables include performance expectancy (PE), effort expectancy (EE), social influence (SI), personal innovativeness (PI), compatibility (CO) and perceived cost (PC). We carry out both online and paper surveys to collect data and target respondents in Hanoi, Vietnam. The structure equation modelling (SEM approach is used to analyze survey responses. The results show that customers' intention to use QR code mobile payment is affected by four factors, i.e. performance expectancy, effort expectancy, personal innovativeness, and compatibility. Social influence and perceived cost are found to have an insignificant influence on customers' intention to use.

2. Literature review

QR code was developed by Denso Wave in 2000. This is a storage system using a dot matrix or two-dimensional bar code, which can store thousands of digits compared to about 20 digits that traditional bar code can store. QR code can be printed or displayed on screen and be interpreted by a special reader. In Vietnam, VNPAY (Vietnam Payment Solution Joint Stock Company) provides the first payment gateway integrating QR code mobile payment solution on mobile banking. In this study, we follow prior studies and define QR code mobile payment as *a mobile service allows customer to pay for goods and services by using smartphone to create or scan a payment QR code.*

Intention to use is defined as "the individual's interest in using the system for future work" (Wu et al., 2008, 124). Iyer and Srivastava (2018, 76) refer intention to use as "a citizen's intention to adopt and make use of a certain tool in the future". In this study, following other researchers, we define customers' intention to use as *the plans of customers in making use of a service.*

Previous studies tend to use various models to find out which factors affecting the intention to use a new product or service such as Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM), Integration of Innovation Diffusion Theory (IDT), and Unified Theory of Acceptance and Use of Technology (UTAUT). Among these, TAM and UTAUT model are the most favorable in examining behavioral intention of mobile payment. However, UTAUT model, which is a unified model based on eight models, is more up-to-date and overcomes the shortcomings of the TAM model. IDT is a theory that has been usually used to explain new technology adoption.

Several studies have found evidence of factors affecting behavioral intention of using mobile payment. Liébana-Cabanillas et al. (2015) find that attitude, subjective norms, and personal innovativeness have positive effects on consumers' intention to use. Jung et al. (2020) show that performance expectancy, knowledge, trust, compatibility, and social influence have significant influence on the intention to use of an individual in the United States. Humbani and Wiese (2018) and Humbani and Wiese (2019) conclude that consumers' perceptions of convenience and compatibility are the drivers of intention to use in South Africa, meanwhile consumers' perceptions of insecurity is the barrier of using mobile payment.

A few studies have been carried out in Vietnam regarding mobile payment as well as electronic payment and mobile banking. Nguyen et al. (2015) conclude that compatibility, perceived usefulness, and consumer trust affect the intention to use mobile payment of Vietnamese customers. Phan et al. (2020) report that performance expectation, effort expectation, social influence, security and privacy and reputation of suppliers influence the intention to use mobile payment service in Hanoi, Vietnam. More recently, Dao and Nguyen (2021) show that perceived value, social norms, and social self-image significantly influence users' intention to use mobile payment services.

3. Hypothesis development

Based on the UTAUT model, this study develops a model with seven constructs as demonstrated in Figure 1. Intention to use (IU) QR code mobile payment is the dependent variable. Explanatory variables include performance expectancy (PE), effort expectancy (EE), social influence (SI),

personal innovativeness (PI), compatibility (CO) and perceived cost (PC). Specifically, PE, EE and SI are adapted from the UTAUT model. Because QR code mobile payment is a new technology service, we include PI and CO from the IDT model. Also, as we aim to explore the barriers of customers' intention to use, PC, which is adapted from studies of Humbani and Wiese (2018), is integrated to the model.

Figure 1. Proposed Model for Intention to use
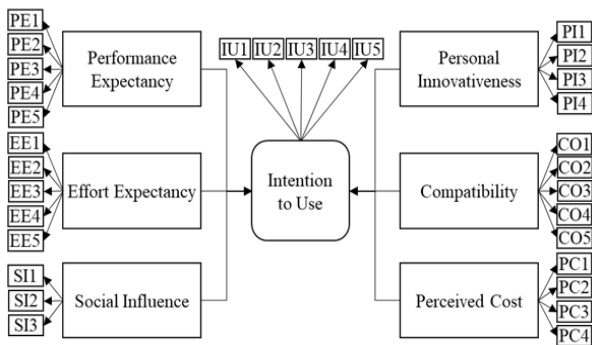
PE is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, 447). PE is a construct in the UTAUT model and is a unified construct based on five other constructs and relating theories as follows: perceived usefulness (TAM), extrinsic motivation (MM), job fit (MPCU), relative advantage (IDT), and outcome expectations (SCT). In this study, PE can be understood as the benefits offered by using QR code mobile payment such as enhancing the customers' job or daily work, according to an individual's perception.

H1. Performance expectancy (PE) will positively affect customers' intention to use (IU) QR code mobile payment.

Like PE, EE is a construct in the UTAUT model. Three constructs that capture the concept of EE are perceived ease of use (TAM), complexity (MPCU) and ease of use (IDT) (Venkatesh et al., 2003). Therefore, EE is defined as "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, 450). If an individual finds it hard to learn and use a new technology, his or her intention to use would decrease. On the other hand, if it does not take much effort to use a new system, customers would have more motivation to adopt.

H2. Effort expectancy (EE) will positively affect customers' intention to use (IU) QR code mobile payment.

SI is unified based on three constructs and corresponding theories which are subjective norm (TRA/TAM2/TPB/C-TAM-TPB), social factors (MCPU), and image (IDT). Therefore, SI is defined as "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003, 451). In this study, SI is defined as the degree that customers think their important others believe they should use QR code mobile payment. Specifically, important others refer to their family, friends, colleagues etc. who have close relationship to the customers.

H3. Social influence (SI) will positively affect customers' intention to use (IU) QR code mobile payment.

Rogers (1983) defines innovativeness as the extent to which a person adapts to a new idea or technology earlier in comparison with other people of the same system. In addition, individual innovativeness is affected by an individual's personality and the characteristics of the social system in which that individual is a member as well. In this study, PI is evaluated by the degree to which an individual is willing to try out a new technology and is affected by that individual's personality. An individual is compared with those who have similar situations and living conditions such as colleagues or friends.

H4. Personal innovativeness (SI) will positively affect customers' intention to use (IU) QR code mobile payment.

In the context of new technology adoption, CO is one construct in the IDT model. Rogers (1983) defines CO as the degree to which a new idea or technology is perceived as being relevant to the existing values, past experiences, and needs of potential users. Therefore, a new technology "can be compatible or incompatible (1) with sociocultural values and beliefs, (2) with previously introduced ideas, or (3) with client needs for innovations" (Rogers, 1983, 223). CO is also one of the constructs that pertains to unification of facilitating conditions in the UTAUT model.

H5. Compatibility (CO) will positively affect customers' intention to use (IU) QR code mobile payment.

PC is defined as the extent to which an individual believes that using a service will cost his or her extra money (Luarn & Lin, 2005). Regarding mobile payment, the usage costs may include communication and transaction fees. In this study, PC is considered as the financial barriers that customers may deal with to use QR code mobile payment.

H6. Perceived cost (PC) will positively affect customers' intention to use (IU) QR code mobile payment.

4. Research methodology

4.1. Variable measurement

This study uses a standardized, self-administered questionnaire to collect data for assessing the research model. All the measurement items are used with a 7-point Likert scale with scores anchored between 1 (totally disagree) and 7 (totally agree). The questionnaire also comprises several questions about respondents' demographic characteristics and behaviors (e.g., gender, age, education level, monthly income, job, occupation status, operating system of mobile devices, experience with QR code mobile payment…).

To ensure that the questionnaire is readable and reliable, the first version of the questionnaire was sent to a group of interviewees who are requested to validate the content of the questions. Accordingly, some minor changes were made to some questions to form the final version of survey questionnaire.

4.2. Data collection

We employ a convenience sampling method to target voluntary respondents in Hanoi and apply both paper-print and web-based survey approaches. After excluding invalid survey responses with invalid or missing information, there are 248 usable survey responses collected in the final research sample.

Bentler and Chou (1987) suggest that the ratio of sample size to the number of measurement items should be over 5:1, while Hair et al. (2009) propose that 150 is the minimum sample size for a model with 7 constructs or fewer, in which each construct contains at least 3 measurement items. Therefore, given 248 usable responses to assess a research model with 7 constructs and 31 measurement items, the rule proposed by Hair et al. (2009) is satisfied. We also fulfill the minimum

sample size suggested by Bentler and Chou (1987) because the ratio between the number of sample and measurement items is 8:1.

The sample characteristics are summarized in Table 1. The frequency in each characteristic is 248, except for occupation because some respondents have more than one job at the same time. Although we have approached almost all groups of customers in Hanoi, most respondents are quite young at the age of 18-21 years and still working as students with relatively low incomes. Besides, although 43.95% respondents prefer to use mobile payment, almost all respondents state that they only use QR code mobile payment for below 20% of transactions. The education level of respondents in this study is quite high, with 100% respondents have studied at a university or college. In addition, 100% respondents use smartphones, with 59.68% using iOS devices and 40.32% using Android devices.

Table 1. Sample characteristics

Demographic characteristics	Group	Frequency	Percentage
Gender	Male	58	23.39%
	Female	190	76.61%
	Total	**248/248**	**100.00%**
Age	18 - 21	215	86.69%
	22 - 30	19	7.66%
	Above 30	14	5.65%
	Total	**248/248**	**100.00%**
Education level	Bachelor's degree	236	95.16%
	Master's degree	9	3.63%
	PhD's degree	3	1.21%
	Total	**248/248**	**100.00%**
Monthly income	Below VND5,000,000	187	75.40%
	VND5,000,000 - VND10,000,000	32	12.90%
	VND10,000,000 - VND20,000,000	14	5.65%
	VND20,000,000 - VND35,000,000	6	2.42%
	VND35,000,000 - VND50,000,000	3	1.21%
	Above VND50,000,000	6	2.42%
	Total	**248/248**	**100.00%**
Occupation	Student	204	82.26%
	Freelancer	18	7.26%
	Office worker	46	18.55%
	Professional worker	10	4.03%
	Other	2	0.81%
	Total	**280/248**	**112.90%**

Demographic characteristics	Group	Frequency	Percentage
Type of preferable payment method	Mobile payment	109	43.95%
	Traditional payment (cash)	62	25.00%
	Card payment	46	18.55%
	Online payment	31	12.50%
	Total	**248/248**	**100.00%**
Operating system of mobile devices	iOS	148	59.68%
	Android	100	40.32%
	Total	**248/248**	**100.00%**
Length of QR code mobile payment usage	Never used	43	17.34%
	Less than 1 month	18	7.26%
	1-3 months	39	15.73%
	4-6 months	27	10.89%
	7 months - 1 year	31	12.50%
	1 year – 2 years	51	20.56%
	More than 2 years	39	15.73%
	Total	**248/248**	**100.00%**
The percentage of payments using QR code mobile payment	0%	43	17.34%
	01 - 10%	101	40.73%
	11 - 20%	43	17.34%
	21 - 30%	31	12.50%
	31 - 40%	27	10.89%
	>40%	3	1.21%
	Total	**248/248**	**100.00%**

4.3. Data analysis

The statistical data is analyzed using SPSS 23 and Amos 20 software. Structure equation modelling (SEM), a second-generation statistical analysis technique, is used to analyze survey responses. This method is appropriate to this study because each construct in the proposed model is measured by multiple indicators. Data is analyzed through reliability analysis (i.e., Cronbach's Alpha indicator), exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and covariance-based structural equation modeling (CB-SEM).

5. Results

5.1. Reliability analysis and exploratory factor analysis

To measure the reliability of the scales, Cronbach's Alpha indicator is used. The Cronbach's Alpha value is higher than 0.8 and below 0.95 in all scales. The corrected item-total correlation is also higher than 0.3 for all items. In addition, deleting any item would not increase the Cronbach's Alpha. Therefore, the variables have adequate reliability levels.

Next, we carry out an exploratory factor analysis (EFA) using Principal Axis Factoring with Promax rotation as the extraction method. The results show the factor analysis process with KMO of about .900 (> 0.5) and Bartlett's test with statistical significance level of .000. Moreover, total variance explained is 70.502% (> 50%), which proves the appropriateness of factor analysis.

The EFA pulls out seven major factors from 31 variables. In addition, all factors extracted is consistent with the proposed hypotheses, including intention to use (IU), performance expectancy (PE), effort expectancy (EE), social influence (SI), personal innovativeness (PI), compatibility (CO) and perceived cost (PC). Besides, all factor loadings exceed 0.5, which is the minimum threshold required (Hair et al., 2009).

5.2. Confirmatory factor analysis

Confirmatory factor analysis is used to test the measurement model fit and convergent and discriminant validity. First, we use some different fit indices to measure the model fit, namely Root Mean Square Error Approximation (RMSEA), Chi-square/df, Comparative Fit Index (CFI), Tucker & Lewis Index (TLI), and Goodness of Fit Index (GFI). The value of df is equal to 403. Chi-square is 948.282 with p value equals 0.000. Chi-square/df is 2.353, lower than the maximum threshold of 0.3 (Hair et al., 2009). In addition, the value of the CFI (0.914) and TLI (0.901) indices exceed the threshold of 0.9, and the RMSEA value (0.074) is lower than the maximum recommended level of 0.8 (Hair et al., 2009). The GFI value (0.811) is also acceptable given that it is above the level of 0.8 as suggested by Doll et al. (1994).

Next, the values of average variance extracted (AVE), composite reliability (CR), maximum shared squared variance (MSV) are calculated to assess convergent and discriminant validity, as well as composite reliability. All values of AVE are higher than the threshold of 0.5 and all CR values exceed the minimum recommended level of 0.7 (Hair et al., 2009). Besides, all factor loadings are higher than 0.6 and significant at 5% level, which meets the requirement recommended by Hair et al. (2009). Moreover, all AVE values are higher than the corresponding MSV as required by Fornell and Larcker (1981). The squared roots of AVE are all greater than the inter-construct correlations

as suggested by Hair et al. (2009). Thus, the measurements are reliable, and convergent validity and discriminant validity criteria are satisfied.

5.3. Structure equation modeling results

Structure equation modeling using the maximum likelihood method is applied to test the hypotheses. The total effects are tested and the statistical significance of four out of the six estimated coefficients are confirmed. In other words, hypotheses H1, H2, H4, and H5 are supported. EE is the most influential factor on intention to use with a standardized estimate of 0.342, followed by CO, PE, and PI. The independent variables explain 66,3% of the variance of the intention to use QR code mobile payment.

Table 2. Hypothesized relationship

Hypothesis				Standardized estimate	S.E.	C.R.	P	Result
H1.	IU	<---	PE	0.241	0.098	3.002	0.003	Support
H2.	IU	<---	EE	0.342	0.077	4.601	***	Support
H3.	IU	<---	SI	-0.093	0.061	-1.455	0.146	Not support
H4.	IU	<---	PI	0.129	0.055	2.188	0.029	Support
H5.	IU	<---	CO	0.331	0.066	4.426	***	Support
H6.	IU	<---	PC	0.036	0.034	0.774	0.439	Not support

*Note: *** p < 0.01*

6. Discussion and conclusion

The objective of this study is to analyze the factors affecting customers' intention to use QR code mobile payment. The predictive power of the resulting model is 66.3%. The results show that customers' intention to use is influenced by four factors, i.e. performance expectancy, effort expectancy, personal innovativeness, and compatibility.

The most influential factor on the intention to use is effort expectancy. This result is consistent with Phan and Dang (2019) and Phan et al. (2020) who argue that effort expectancy is the strongest factor affecting behavioral intention of customers who have not used mobile payment. Overall, this result shows that the easier to use a new payment method like QR code mobile payment, the more willing are customers to adopt. This is because payment is a daily work, an individual would

like to interact with an application with a clear display. Moreover, payment is related to financial matters. Therefore, users might want to deal with a clear and understandable interaction to decrease the risk of false manipulation.

The significant effect of compatibility on the intention to use is also discovered. An application which is compatible with lifestyle, habits, and needs of the customers will be accepted easier. This finding is supported by many previous studies (Humbani & Wiese, 2018; Jung et al., 2020; Nguyen et al., 2015). The influence of compatibility on the intention to use can be explained by the frequency of an individual's payment transactions. As everyone needs to proceed many payment transactions daily, people would prefer an application which is suitable for their daily habits.

Moreover, performance expectancy is found to have a significant effect on the intention to use QR code mobile payment. Several studies report the same results, such as Al-Saedi et al. (2020) and Jung et al. (2020). To increase customers' intention to use, a service must have outstanding features, which are different from other relative services. In addition, QR code mobile payment is a new payment method, then it might be compared with other popular payment methods in the market. Therefore, the higher the performance expectancy, the higher customers' intention to use.

Personal innovativeness does not strongly affect the intention to use as does effort expectancy, compatibility, and performance expectancy. However, it still has a remarkable influence on customers' intention to use QR code mobile payment. Liébana-Cabanillas et al. (2020) and Liébana-Cabanillas et al. (2015) also point out the significant effect on the intention to use of personal innovativeness. Because QR code mobile payment is an innovation, people who have high personal innovativeness would be the first customers to try this service.

On the other hand, social influence and perceived cost are found to have an insignificant influence on the intention to use. Regarding social influence, this can be explained by the low popularity of QR code mobile payment.

Therefore, customers would not be affected by others' opinions when deciding to choose QR code mobile payment or not. In addition, QR code mobile payment is a service developed based on some previous mobile payment services like mobile banking and mobile wallets. As a result, if customers have used these mobile payment services before, there is almost no cost for them to use QR code mobile payment.

This study provides significant practical implications for the providers of QR code mobile payment to develop this service. First, the providers should focus on investment and research, such as developing an easy-to-interact interface and simplifying the operation for users. Second, it is essential for them to thoroughly understand the needs and lifestyle of customers by proceeding market investigation. Furthermore, it is also important to develop a service that is suitable for a multimedia platform and for many different operations of smartphones. Third, it is imperative that suppliers research and optimize the speed and flexibility of the products. In addition, service providers should also regularly update the software to ensure the efficiency of the service operation. Finally, providers should do promotions aimed at these customers in the early stages. Their attention should be adequately paid to collecting feedback from this customer group to improve their service, thereby gradually expanding to individuals who are reluctant to try new information technologies.

Despite this research contributions to the literature on the intention to use QR code mobile payment, some limitations should be acknowledged. Firstly, the surveyed respondents are based in Hanoi, hence the research results may not be generalized for other regions or countries. Secondly, this study uses convenience sampling method with 248 respondents and most of them are students. Accordingly, the representativeness of this study's results might be affected. Finally, although great efforts have been made in reviewing the extant literature in order to select most appropriate variables to use in the research model, this study still may not control for some other influential factors. Such limitations provide potential avenues for other studies in the future.

References:

Al-Saedi, K., Al-Emran, M., Ramayah, T., & Abusham, E. (2020). Developing a general extended UTAUT model for M-payment adoption. Technology in Society, 62, 1-10.

Bentler, P. M., & Chou, C. P. (1987). Practical Issues in Structural Modeling. Sociological Methods & Research, 16(1), 78-117.

Doll, W. J., Xia, W., & Torkzadeh, G. (1994). A Confirmatory Factor Analysis of the End-User Computing Satisfaction Instrument. MIS Quarterly, 18(4), 453-461.

Dao, T. M. H and Nguyen, V. H (2021). Nghiên cứu các nhân tố tác động tới ý định sử dụng dịch vụ thanh toán di động dựa trên phân tích lợi ích – chi phí và ảnh hưởng xã hội.Tạp chí Quản lý và Kinh tế quốc tế, 141, 62-79.

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. Journal of Marketing Research, 18(1), 39-50.

Hair Jr, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). Multivariate Data Analysis (7th ed.). London: Pearson.

Humbani, M., & Wiese, M. (2018). A Cashless Society for All: Determining Consumers' Readiness to Adopt Mobile Payment Services. Journal of African Business, 19(3), 409-429.

Iyer, J., & Srivastava, R. K. (2018). Exploring the Factors associated with Employees' Intention to Use e-Government services in India. Journal of Applied Business and Economics, 20(5), 73-83.

Jung, J. H., Kwon, E., & Kim, D. H. (2020). Mobile payment service usage: U.S. consumers' motivations and intentions. Computers in Human Behavior Reports, 1, 1-7.

Liébana-Cabanillas, F., Molinillo, S., & Japutra, A. (2020). Exploring the Determinants of Intention to Use P2P Mobile Payment in Spain. Information Systems Management, 1-16.

Liébana-Cabanillas, F., Ramos de Luna, I., & Montoro-Ríos, F. J. (2015). User behaviour in QR mobile payment system: the QR Payment Acceptance Model. Technology Analysis & Strategic Management, 27(9), 1031-1049.

Luarn, P., & Lin, H. H. (2005). Toward an understanding of the behavioral intention to use mobile banking. Computers in Human Behavior, 21(6), 873-891.

Nguyen, P. Y., Lee, S. T., Kang, W. M., Kim, J. S., & Gim, G. Y. (2015). An Empirical Study on Factors Affecting Customer Intention to Use Mobile Payment System in Vietnam. Journal of Information Technology Services, 14(4), 171-184.

Phan, H. N., Tran, M. D., Hoang, V. H., & Dang, T. D. (2020). Determinants influencing customers' decision to use mobile payment services: The case of Vietnam. Management Science Letters, 10, 2635–2646.

Rogers, E. M. (1983). Diffusion of Innovations (3rd ed.). New York: The Free Press.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View. MIS Quarterly, 27(3), 425-478.

Wu, J. H., Shen, W. S., Lin, L. M., Greenes, R. A., & Bates, D. W. (2008). Testing the technology acceptance model for evaluating healthcare professionals' intention to use an adverse event reporting system. International Journal for Quality in Health Care, 20(2), 123-129.