Retention Using Electronic Payment Systems: An Empirical Study of Consumer’s Perspective in Vietnam

Le Thi Bich Diep

Department of Management and Business, Ho Chi Minh City University of Technology (HUTECH)

Corresponding author: ltb.diep@hutech.edu.vn

Abstract

In Vietnam, electronic payment (e-payment) is growing actively, but it only accounts for a tiny percentage compared to cash payment. The findings of this study are valuable to service providers as well as the Government. To encourage consumers to use e-payment, service providers and governments are required to understand their behavior. Thereby they can improve the quality of products and services. The paper aims to identify the factors influencing the retention using electronic payment systems (EPS) through individual users' personal experience in Vietnam. This paper proposes a combined method with qualitative and quantitative research. The qualitative method is conducted in a group discussion with 49 consumers in Vietnam. The questionnaire is sent to 349 consumers by using the convenience sampling method. The reliability and validity of the instruments are fit and show high values to be used in the actual study. Analysis of structural equation modeling is conducted to identify the impact of the relationship between concepts. The results of the study also indicate that perceived security and perceived trust are mediator role in the effect of technical protection, transaction procedure, security statement, past experience, and perceived benefit on retention using EPS. The results also show that a strong definite link between perceived security, perceived trust, technical protection, and retention using the EPS.

Keywords: Perceived Security, Perceived Trust, Retention, Electronic Payment Systems.

1. Introduction

In the past few years, the Vietnamese economy has grown dramatically, which is always one of the most growing economies in the world. According to the Government's reports, the Vietnamese GDP reached an unexpected result in 2019.

Besides the growing economy, consumer behavior has changed gradually recently. With the development of internet and digitalization, Consumers prefer using an electronic payment (e-payment) rather than cash in their purchases, because of its fast, and convenience. Following the Vietnamese government portal, financial transactions on the internet and mobile devices have increased significantly, which its growth is among the top of the world. However, total financial transactions are not a large amount comparing to other countries. In Vietnam, there are still 90% of transactions using cash, and there is only 10% using e-payment. Meanwhile, the State bank of Vietnam is deploying a schema to encourage consumers to use e-payment shortly. The growing and developing process of the financial market in Vietnam and around the world shows that the payment system is one of the essential constitutive factors. The e-payment system (EPS) influences the payment systems because it makes it
more vibrant and more enhanced in performance for financial operation. A major concern of EPS is the consumers' perception of retention using EPS. Therefore, identifying the factors which affect the consumer's retention on EPS is essential.

2. Literature Review

E-payment is known as the payment process without the paper instrument (Tella, 2012). It is a billing solution offering consumer’s options for payment without the use of cash or check. Consumers need to use accounts in e-payment. Besides, it requires supports from third parties, which are companies, banks, government, etc. One essential aspect of e-payment is established the necessary technical infrastructures, such as the EPS.

EPS is a way of making transactions good or services through an electronic medium. The monetary value is transferred electronically or digitally between two parties (Tella, 2012). EPS covers a variety of channels, including debit card, credit card, e-wallet, portal payment, etc. Barkhordari et al. (2016) state that EPS is classified into two types: Cash-based and account-based systems. Cash-based systems are electronic cash and prepaid card. Account-based systems include debit cards, credit cards, and electronic checks. It has several requirements: Security, acceptability, convenience, cost, anonymity, control, and traceability (Tan, 2004).

The success of an information system depends on the continuous usage of the users. In this study, I agree with TRA, TAM, and UTAUT theory to explain the adoption of EPS. Consumers select EPS or not that depends on their perception, because they don’t have much information (Pei at al., 2015). However, to explain the continuous use of EPS of users, the expectation – confirmation theory (ECT) is more suitable. According to this theory, the user forms expectations of products or services before purchasing decision making. After consuming those products or services, the user has a new perception based on consumption experiences. Therefore, beyond the first expectations about the value of the user, EPS acceptance and retention are also influenced by experience in the past. In previous studies, many factors affect on e-payment usage retention. Some of them have positive impact factors, and others bring negative ones. This study focuses on a positive determinant, which is essential for EPS usage retention.

Technical protection is a series of specific technical mechanisms that are utilized to ensure payment security during the transaction process (Kim et al., 2010). It includes privacy, integrity, and stability (Kim et al., 2010). Thus, the EPS provides technical protection, so the level of consumers’ perceived security and perceived trust in EPS can be enhanced (Kim et al., 2010). According to the previous studies, technical protection is shown to have a significant effect on perceived security (Oney et al., 2017; Barkhordari et al., 2016; Kim et al., 2010), and perceived trust (Oney et al., 2017; Kim et al., 2010).

Based on these findings, hypotheses are proposed:

H1: Technical protection has a positive impact on perceived security.
H2: Technical protection has a positive impact on perceived trust.

Transaction procedure is a performing process of consumers with vendors of EPS to completion of their transaction. There are three procedures: authentication of the participants, separate steps through the transaction, and explicit confirmation of the payment (Kim et al., 2010). The right transaction procedures assist individuals to eliminate their security concerns and promote consumers’ perceived trust. According to the previous studies, transaction procedure is shown to have a significant effect on perceived security (Barkhordari et al., 2016; Kim et al., 2010), and perceived trust (Kim et al., 2010). Hence, this study suggests:

H3: The transaction procedure has a positive impact on perceived security.
H4: The transaction procedure has a positive impact on perceived trust.

Security statement is the most definite statements of vendors about security on EPS. These statements are posted in public utterance for the consumer. Thus, the consumer is reassured to use EPS in their transaction (Kim et al., 2010). According to the previous studies, a security statement is shown to have a significant effect on perceived security (Oney et al., 2017; Kim et al., 2010), and perceived trust (Kim et al., 2010). Therefore, the following hypotheses are proposed:

H5: The security statement has a positive impact on perceived security.
H6: The security statement has a positive impact on perceived trust.
Past Experience is the knowledge and skill that the consumer has gained through using products or services for a previous time. Oney et al. (2017) mentioned consumers are more comfortable using new technology when they have prior experience. Thus, past experience builds trust and concerns of consumers about security (Oney et al., 2017). Knowing how the past experience of consumers is essential for developing EPS because previous users behave differently compared to newcomers. According to previous studies, the past experience had a significant effect on perceived security (Oney et al., 2017; Miyazaki et al., 2001), and perceived trust (Oney et al., 2017; Mohmed et al., 2013; Eastin, 2002). Based on these arguments and findings, the seventh and the eighth hypothesis of this study are:

H7: Past experience has a positive impact on perceived security.
H8: Past experience has a positive impact on perceived trust.

Perceived security is a consumer perception that the vendor would fulfill security requirements such as authentication, integrity, encryption, and non-repudiation (Salloum et al., 2019). According to Ozkan et al. (2010), perceived security defines as concerns of consumers about protecting the details of their transactions from internal and external criminal usage, which their money and personal information may get stolen. Thus, security in EPS is the way to enhance perceived trust and consumers’ intention to use EPS. According to the previous studies, the perceived security has a significant effect on perceived trust (Barkhordari et al., 2016; Kim et al., 2010) and retention to use EPS (Salloum et al., 2019; Halaweh, 2017; Oney et al., 2017; Barkhordari et al., 2016; Kim et al., 2010). Thus, the ninth and tenth hypothesis are:

H9: Perceived security has a positive impact on perceived trust.
H10: Perceived security has a positive impact on retention using EPS.

Perceived trust defines as the consumer's belief that e-payment transactions will be processed following their expectations (Oney et al., 2017). Perceived trust is the consumer's perception of certainty associated with the vendor perform behavior in their transaction. The perceived trust is the consumer's belief that the vendor will fulfill its obligations according to the expectations of them as goodwill (Nguyen et al., 2018). Consumers believe that e-payment transactions will be processed as their expectations (Dastan, 2016). Meanwhile, the consumers trust that their money and personal information will not misuse by vendors, banks, even if they use an imperfect system (Ozkan et al., 2010). They will not use EPS to complete their transactions without trust. Thus, perceived trust can be the ability to leverage their willingness to use EPS in their transactions. According to the previous studies, the perceived trust has a significant effect on the retention to use (Halaweh, 2017; Oney et al., 2017; Barkhordari et al., 2016; Pei et al., 2015; Kim et al., 2010). Therefore, the following hypothesis is inferred:

H11: The perceived trust has a positive impact on retention using EPS.

Perceived benefit is the degree to which the consumer perception that using the system will enhance their performance. It is the beneficial value of EPS to the consumers (Tella, 2012). The EPS allows consumers to make their payments by saving time, financial benefit from anywhere, and anytime. So, it is convenient to handle their transactions. The consumer usually compares the cost of traditional payment, and they want to low cost in their transactions (Pei et al., 2015). According to the previous studies, the perceived benefit has a significant effect on perceived trust (Choi et al., 2019), and retention to use EPS (Salloum et al., 2019; Choi et al., 2019; Pei et al., 2015). These arguments support our last hypothesis:

H12: The perceived benefit has a positive impact on perceived trust.
H13: The perceived benefit has a positive impact on retention using EPS.

3. Research methodology

To achieve the goal of this study, eight scales are constructed based on previous research (Oney et al. (2017), Safa et al. (2016), Kim et al. (2010)). In particular: technical protection, transaction procedure, security statement, past experience, perceived security, perceived trust, perceived benefit, and retention. All items are developed in English, but they are revised and modified in Vietnamese. Those depend on this research objective and characteristics of the subjects.
The retention using EPS has been studied in many experimental and different countries. However, the level of complexity in the perception of the consumer in those countries is more or less different from Vietnamese consumers. Therefore, this study model should be adapted and supplemented to suit Vietnamese consumers. One of the appropriate tools for this adjustment is the focus group discussions. This method is applied in exploring and adjust the framework of retention. Qualitative research is conducted through group discussions with 49 consumers. Finally, a questionnaire consisting of 39 questions is used. All items are measured on a Likert five-point scale, from “strongly disagree” to “strongly agree”.

Quantitative research is conducted using direct interviewing. Data is collected through the questionnaire. The sample is selected in a convenient, with the participation of 349 consumers in Vietnam. The sample comprises 197 males (56.4%) and 152 females (43.6%). Respondents use debit card (21.1%), credit card (17.2%), e-wallet (49.6%), portal (4.0%) and other (5.2%). Scales in the model are evaluated for reliability and exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). To test hypotheses in a theoretical framework, this study uses an analysis of structural equation modeling (SEM). The SPSS 20.0 and AMOS 20.0 software analyze the data.

4. Main findings

Cronbach’s Alpha coefficient is used to assess the inter-item consistency of measurement items. The results of the Reliability show eight concepts (technical protection, transaction procedure, security statement, past experience, perceived security, perceived trust, perceived benefit, and retention) had all credibility. All of them are greater than 0.7, and the composite reliability value range from 0.806 to 0.885 (Table 1). Thus, internal consistency reliability is considered acceptable, and the measurements are reliable.

Then, the exploratory factor analysis is used to assess valuable observations. The results of the EFA analysis show that 29 observations indicate sufficient convergent validity.
Furthermore, the test indexes of Kaiser – Meyer – Olkin (KMO) is 0.916, and the sig of Bartlett’s test is 0.000. These provide that the EFA of all observations is appropriate. Besides, the total variance explained is 72.727% that should thoroughly explain the difference in data roughly 72.727%.

**Table 1. Convergent validity and internal consistency reliability**

| Scales                  | Number of Observation | Composite Reliability | Average Variance Extracted | Cronbach's Alpha |
|-------------------------|-----------------------|-----------------------|----------------------------|------------------|
| Technical protection (TE)| 3                     | 0.883                 | 0.715                      | 0.881            |
| Transaction procedure (TP)| 4                    | 0.881                 | 0.650                      | 0.880            |
| Security statement (SS)  | 3                     | 0.868                 | 0.687                      | 0.865            |
| Past experience (PE)    | 3                     | 0.834                 | 0.626                      | 0.833            |
| Perceived security (PS) | 4                     | 0.887                 | 0.663                      | 0.885            |
| Perceived trust (TU)    | 4                     | 0.840                 | 0.568                      | 0.837            |
| Perceived benefit (PB)  | 4                     | 0.809                 | 0.515                      | 0.807            |
| Retention (RE)          | 4                     | 0.808                 | 0.513                      | 0.806            |

To verify the established hypotheses through the path coefficients acquired from the SEM, the suitability of the model regarding the relation of variables is first evaluated. The suitability of the model is $\rho = 0.000$, $\text{CMIN/df} = 1.933$, GFI = 0.886, TLI = 0.933, CFI = 0.942, and RMSEA = 0.052, generally meeting the evaluation criteria (Figure 2).

![Figure 2. SEM (standardization) results](image-url)

Table 2 shows a summary of results for hypothesizes in the research model. The significance of the estimates is identified. The results of SEM indicate that technical protection has a significant positive impact on perceived security ($\rho=0.000$) and perceived trust ($\rho=0.024$). Hence, both H1 and H2 are supported. The transaction procedure has a significant positive impact on perceived security ($\rho=0.004$) and perceived trust ($\rho=0.000$). The security statement also has a significant positive impact on perceived security ($\rho=0.045$) and perceived trust ($\rho=0.012$). Thus, H3, H4, H5, and H6 are supported. In contrast, past experience has a significant positive impact on perceived security ($\rho=0.000$) but not on perceived...
trust ($\rho=0.216$). Thus, H7 is supported, but H8 is not. Moreover, the results show that the perceived security, perceived benefit have a significant positive impact on perceived trust ($\rho=0.005$, $\rho=0.009$) and retention using EPS ($\rho=0.000$, $\rho=0.011$); the perceived trust has a significant positive impact on retention ($\rho=0.000$), indicating support for H9, H10, H11, H12, and H13. So, perceived security, trust, and benefit significantly impact consumers’ retention using EPS. Summarize, of the thirteen hypotheses, one is not supported.

Table 2. Result of structural model analysis

| Hypothesized path | Standardized Estimate | P-value | Decision |
|-------------------|-----------------------|---------|----------|
| H1: TE $\rightarrow$ PS | 0.325 | 0.000 | Supported |
| H2: TE $\rightarrow$ TU | 0.157 | 0.024 | Supported |
| H3: TP $\rightarrow$ PS | 0.192 | 0.004 | Supported |
| H4: TP $\rightarrow$ TU | 0.293 | 0.000 | Supported |
| H5: SS $\rightarrow$ PS | 0.125 | 0.045 | Supported |
| H6: SS $\rightarrow$ TU | 0.157 | 0.012 | Supported |
| H7: PE $\rightarrow$ PS | 0.267 | 0.000 | Supported |
| H8: PE $\rightarrow$ TU | 0.091 | 0.216 | Rejected |
| H9: PS $\rightarrow$ TU | 0.198 | 0.005 | Supported |
| H10: PS $\rightarrow$ RE | 0.393 | 0.000 | Supported |
| H11: TU $\rightarrow$ RE | 0.383 | 0.000 | Supported |
| H12: PB $\rightarrow$ TU | 0.141 | 0.009 | Supported |
| H13: PB $\rightarrow$ RE | 0.147 | 0.011 | Supported |

The result shows that perceived security and trust are essential because they take a full mediation role to connect technical protection, transaction procedure, security statement, experience with the retention of consumers using EPS. Besides, perceived trust is partial mediation in the relationship between perceived security, perceived benefit, and retention using EPS. Moreover, perceived security, perceived trust, and technical protection are the crucial factors that influence consumer decisions to continue using the EPS.

As can be observed for the model, there are three outcome constructs with the following R squares: Perceived security (0.536), perceived trust (0.618), and retention using the EPS (0.605). So, the model explains 53.6% of the variance in the perceived security, 61.8% of the variance in the perceived trust, and 60.5% of the variance in the retention using the EPS.

5. Discussion, Managerial implications and Conclusion

The penetration of the internet and the entrance of technology to Vietnamese lives make a significant change. Technology is applied in all areas of life. It makes the operation more efficient, including payment in transactions.

Technology adoption has become a key research field, which many researchers have had lots of interest over the years. The determinants affecting these technologies are varied from one context to the other. The EPS is one such technique that attracts the attention of many researchers. This study proposes and tests behavioral retention using the EPS model from technical protection, transaction procedure, security statement, past experience, and perceived benefit through perceived security, perceived trust. The results have the following academic significance and provide valuable implications for managers.

From the theoretical perspective, this study aims to analyze consumer behavior in retention using the EPS. The results show that technical protection, transaction procedure, security statement, and past experience are also to be determinants of continuous intention to use the EPS, although the effect is indirect. In other words, when the consumer feels a series of technical mechanisms of the EPS, which
can protect their transaction payment. So, they are more willing to the retention of using EPS. Streamlined transaction procedure, security statement, and good experience in EPS can increase consumers' continuous intention of using EPS. Besides, perceived security, perceived benefit has a direct effect on the retention using the EPS. It also has an indirect through perceived trust. This study confirms that perceived security and perceived trust play a mediator role in the technical impact protection, transaction procedure, security statement, past experience, and perceived benefit on retention using EPS (Choi et al., 2019, Oney et al., 2017; Barkhordari et al., 2016; Kim et al., 2010).

This study also provides several valuable implications for managers in developing EPS. If the vendors of EPS want to engage consumers in increasing retention to use, the managers need to understand the impact of the influencing factors. The managers should seek ways to convince consumers to believe in security and trust EPS. The relationship between technology protection, transaction procedure, security statement, past experience, and perceived security, perceived trust is confirmed. Besides, perceived security and trust also have relating. Thence, the vendors of EPS need to do well about technology protection, transaction procedure, security statement, past experiences because the consumer will be felt safe and trust in the service of the vendor. Therefore, they will continue to use the service.

Also, the managers should focus on building maximum technical protection systems for consumers. It ensures privacy, integrity, and stability. Moreover, the managers should establish a simple, clear, and safe transaction procedure. They need to make the clearest statement about security on EPS and announce it publicly. Finally, they should give a good experience for consumers, who used the EPS, in both products and services. The experiences need to be monitored and used as information to improve products and services.

The result also reveals that the perceived benefit affects directly retention using EPS and indirect through perceived trust. So, the managers need to concern about this factor. With EPS, consumers can do their transactions with the minimum of time, fees, and other vulnerabilities, such as robbery, or the possibility of disease transmission. The advantages of the EPS are less costly, easy registration, learnability, convenience, fast processing, less error, and mistakes. So, the managers should communicate extensively to the consumers about this advantage and make consumers feel clearly benefits when they are using.

The study is subject to certain limitations. The theoretical framework of this study is tested in many provinces of Vietnam. The framework should be tested in other markets because there may be differences. On the other hand, the convenience sampling method is selected. Consequently, it is not feasible to generalize the results obtained from this research.

This study examines only some of the major factors. Other factors are also likely to increase retention, such as performance expectations, attitude (Salloum et al., 2019; Daşan and Gürler, 2016; Tella et al., 2012). Future research could examine the impact of these factors.

Reference

[1] Barkhordari, M., Nourollah, Z., Mashayekhi, H., Mashayekhi, Y., & Ahangar, M. S. (2016). Factors influencing adoption of e-payment systems: an empirical study on Iranian customers. Information systems and e-business management, 15(1), 89-116.
[2] Choi, K., Wang, Y., & Sparks, B. (2019). Travel app users’ continued use intentions: it’s a matter of value and trust. Journal of Travel & Tourism Marketing, 36(1), 131-143.
[3] Daşan, İ., & Gürler, C. (2016). Factors affecting the adoption of mobile payment systems: An empirical analysis. EMAJ: Emerging Markets Journal, 6(1), 17-24.
[4] Eastin, M. S. (2002). Diffusion of e-commerce: an analysis of the adoption of four e-commerce activities. Telematics and informatics, 19(3), 251-267.
[5] Halaweh, M. (2017). Intention to Adopt the Cash on Delivery (COD) Payment Model for E-commerce Transactions: An Empirical Study. In IFIP International Conference on Computer Information Systems and Industrial Management. Springer, Cham, 628-637.

[6] Kim, C., Tao, W., Shin, N., & Kim, K. S. (2010). An empirical study of customers’ perceptions of security and trust in e-payment systems. Electronic commerce research and applications, 9(1), 84-95.

[7] Miyazaki, A. D., & Fernandez, A. (2001). Consumer perceptions of privacy and security risks for online shopping. Journal of Consumer affairs, 35(1), 27-44.

[8] Mohamed, A. S. I., Azizan, N. B., & Jali, M. Z. (2013). The impact of trust and past experience on intention to purchase in e-commerce. International Journal of Engineering Research and Development, 7(10), 28-35.

[9] Nguyen, T. D., & Huynh, P. A. (2018). The roles of perceived risk and trust on e-payment adoption. In International Econometric Conference of Vietnam. Springer, Cham, 926-940.

[10] Oney, E., Guven, G. O., & Rizvi, W. H. (2017). The determinants of electronic payment systems usage from consumers’ perspective. Economic research-Ekonomska istraživanja, 30(1), 394-415.

[11] Özkan, S., Bindusara, G., & Hackney, R. (2010). Facilitating the adoption of e-payment systems: theoretical constructs and empirical analysis. Journal of enterprise information management, 23(3), 305-325.

[12] Pei, Y., Wang, S., Fan, J., & Zhang, M. (2015). An empirical study on the impact of perceived benefit, risk and trust on e-payment adoption: comparing quick pay and union pay in China. In 2015 7th international conference on intelligent human-machine systems and cybernetics (Vol. 2), 198-202.

[13] Salloum, S. A., Al-Emran, M., Khalaf, R., Habes, M., & Shaalan, K. (2019). An Innovative Study of E-Payment Systems Adoption in Higher Education: Theoretical Constructs and Empirical Analysis. International Journal of Interactive Mobile Technologies, 13(6).

[14] Tan, M. (2004). E-payment: The digital exchange. NUS press.

[15] Tella, A. (2012). Determinants of E-Payment Systems Success: A User’s Satisfaction Perspective. International Journal of E-Adoption (IJEA), 4(3), 15-38.

[16] Safa, N. S., & Von Solms, R. (2016). Customers repurchase intention formation in e-commerce. South African Journal of Information Management, 18(1), 1-9.