

INFLUENCE OF DIGITAL TECHNOLOGY USE TO CUSTOMERS' ELECTRONIC PAYMENT INTENTION IN VIETNAM

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Abstract

The objective of this research study is to investigate the influence of using digital technology to electronic payment intentions of customers in Northern Vietnam. A quantitative research with 360 respondents who have used or had intention of using electronic payment in Northern Vietnam was conducted. Results revealed that 7 factors including Perceived usefulness, Perceived ease of use, Risk perception, Trust, Digital technology activities, Subjective norms and Perceived behavioral control have influence to customers' electronic payment intention. Among them, three factors of Perceived usefulness, Perceived ease of use and Perceived behavioral control have a significant impact customers' electronic payment intention.

Keyword: *digital technology, electronic payment, electronic payment intention*

1. Introduction

Due to the popularity of Internet and strongly development of e-commerce, electronic-payment (e- payment) has increasingly become a global trend. E- payment is gradually asserting its position with preeminent benefits such as speed, convenience and accuracy in transactions, and easy control of spending. This payment form also brings benefits in the socio-economic field such as promoting sustainable economic development, creating transparency in expenditures and transactions, and creating a transparent cash flow. Governments of many countries have introduced policies to encourage the development of e- payment, especially in the context of Covid-19 pandemic, which further motivates people to change their money usage habits. Switching to electronic transactions help people ensure safety and limit the spread of disease in the community.

According to the statistics of Datareportal Vietnam, there were 68.17 million Internet users in January 2020, up by 6.2 million users (10%) over the previous year. As well,

approximately 145.8 million mobile devices connected to the Internet in 2020, an increase of 2.7 million devices (1.9%) comparing to the 2019's figures. The mass adoption of digital technology is one of the main reasons for the tremendous growth in online payment in Vietnam. In addition, there are great benefits in using online payment such as having a wide selection of platforms offering unique features and customized services to meet users' increasing needs and demands. Rural areas are the next destinations for Fintech companies in the future as the Government's policies continue to encourage online payment .

Although the data in the Landscape 2020 e-payment market report shows a boom in Vietnam, cash is still the most popular payment method, accounting for up to 80% of the transaction rate; 20% of the transaction rate comes from the electronic payment market throughout Vietnam. In addition, according to statistics from the State Bank of Vietnam, in 2020, approximately 31% of people own bank cards. The main reason is that Vietnamese people's habit of using cash has been ingrained for a long time. Electronic payment methods are still very new and have not been widely disseminated due to users' anxiety of insecurity and risk. In the context that the application of digital technologies in payment is becoming increasingly popular, it is important to research customer behavior to make customers feel secure in paying using technology. Investigating the influence of digital technology to customers' e-payment intentions helps to enhance customers' e-payment intentions

2. Theory and hypothesis development

Due to the fact that the use of internet has been becoming popular, there have been a number of researches on factors affecting the customer's e-payment intention, for example, a study by Zlatko Bezhovski's group, Goce Delchev University, and Krste Misirkov (2016) on the future trend of mobile payments, focusing on one a wide range of issues with electronic payment methods including security, privacy and consumer acceptance of e-commerce for payment; or the study "Factors affecting the intention to use Mobile Banking" by the group of authors P. Luarn, H.-H. Lin (2005) emphasizes perceived usefulness and two factors of perceived behavioral control (perceived self-efficacy and perceived financial costs) on customers' intention to use mobile banking services. In Vietnam, there have been several studies on the topic such as "Factors affecting the intention to accept mobile banking products of individual customers - a case study for Vietcombank" by Nguyen Binh Minh, Trinh Xuan Truong; "Research model of factors affecting consumers' decision to use electronic payment methods" by Master Vu Van Diep. Since none of them consider digital technology use determinant factor to customer's electronic payment intention, study on the relationship between digital technology use and customer's electronic payment intention is needed.

Digital technology and electronic payment

Fitzgerald et al. (2014) defined digital technology as social media using forms such as mobile, computer, analytic, or embedded usage. These digital technologies include the

Internet of Things - IoT (Perkel, 2017) with next-generation telecommunications networks - 5G (Ting, Wong and Sim, 2019); Big Data (LeCun, Bengio, and Hinton, 2015); artificial intelligence - AI using deep learning (Ting, Wet and Nat, 2018); and block-chain technology (Heaven, 2019). Digital technology has transformed aspects of life from work, travel, shopping, entertainment, and communication. Realizing its popularity, Paul (2021) pointed out the important benefits of digital technology including social connection, multi-tasking ability, automation, information storage, etc.

Dennis (2004), described an electronic payment system as a type of financial commitment between a buyer and a supplier connected by the use of electronic infrastructure. In addition, Briggs and Brooks (2011) see online payments as a form of relationship between associations and people supported by banks and companies that convert between financial transaction empowerment. Electronic payment is a form of the electronic transaction including money transfer, money receipt, and withdrawal via the Internet. An electronic payment service exists under a web interface that allows customers to remotely access and manage their bank accounts and transactions (Weir et al. 2006, Lim 2008). Electronic payment systems can be classified into five categories (Lawrence et al. 2002, Guan and Hua 2003, Abrazhevich 2004, Dai and Grundy 2007, Schneider 2007), including electronic money, debit cards, credit cards, prepaid cards, and electronic checks. K. Peffers and W. Ma (2003; 2015) classify electronic payment systems including electronic checks, electronic money, credit cards, and electronic transfers. Currently, popular forms of electronic payment worldwide include credit card, debit card, e-wallet, mobile payment (mobile banking, QR code), electronic money, payment via the gateway.

Hypothesis development

Perceived usefulness

Perceived usefulness is defined as the degree to which a person believes that their job performance will be enhanced by using a particular system (Davis, 1989). Wen et al. (2011) introduced another concept of perceived usefulness as consumers' evaluation of the benefits of product information and perceived usefulness when shopping online. Perceived usefulness is an important determinant of intention to use (Al-Marroof and Al-Emran, 2018). In electronic payment, perceived usefulness variable is measured by transaction speed, user-friendliness, customer experience, accuracy, convenience... (Liao, ZQ and Cheung, 2002). Several studies have shown that perceived usefulness has a positive relationship with intention to use electronic payments (Al-Fahim et al., 2015; Ayo et al., 2010; Chin and Ahmad, 1970, 2015; Dutot., 2015; Lee, 2009; Meharia, 2012; Nasir et al., 2015; Pham and Ho, 2015; Santouridis and Kyritsi, 2014; Sinha and Mukherjee, 2016; Upadhyay and Jahanyan, 2016). Thus, the first hypothesis can be stated as follows:

H1: Customer's perceived usefulness positively influence on electronic payment intention.

Perceived ease of use

Perceived ease of use is defined as the degree to which a person believes it will be effortless to use a particular system (Davis et al., 1989). Ease of use is also studied in the documents on intention to use electronic payments (Cabanillas 2014, 2017; Gefen 2003; Phon Tanuki Thaworn, 2016; Yang, 2015). The less complex the perception of using electronic payments, the more positive customer attitudes towards e-banking services. Therefore, the second hypothesis is introduced as follows:

H2: Customers' perceived ease of use positively influence on electronic payment intention.

Risk perception

Risk perception is the ability to express the loss associated with achieving desired outcomes when using e-services (Yang et al, 2015). Previous studies have demonstrated that risk perception is one of the most important impediments to customers' acceptance of mobile banking (Akturan and Tezcan, 2012; Cruz et al., 2010; Hanafizadeh et al., 2014; Lee et al., 2007). Zhao et al. (2008) pointed out the risks that customers face when using online banking services including privacy, financial, security and performance. Featherman and Pavlou (2003) and Littler and Melanthiou (2006) hypothesized that risk perception encompasses five dimensions in the context of banking services: financial risk, performance, timing, mentality and security. According to the Federal Reserve Board (FRB, 2012), consumer adoption of mobile banking and mobile payment technology is hampered by concerns about information theft and security. The third hypothesis is established as follows:

H3: Consumers' risk perception positively influence on electronic payment intention.

Trust

Trust is the foundation of interpersonal communication and a catalyst in transactions between sellers and buyers to achieve customer satisfaction as expected (Yousafzai et al., 2003). Trust is considered an important factor in determining intention to adopt technology (Chong et al, 2012; Zhang et al., 2012; Chong, 2013). Many studies on the influence of trust on electronic services (Featherman and Pavlou, 2003; Gefen et al., 2003), electronic banking (Gao and Waechter, 2017, Nguyen and Nguyen, 2016; Pham, 2013) proved that trust is one of the factors that strongly influence the electronic payment intention. When making a comparison between traditional payment and electronic payment, it is found that the more people use the electronic payment channel, the higher the level of trust in electronic payment. Dahlberg et al. (2003), Shin (2009), Amoroso and Watanabe (2012), Xin et al. (2013) and Ho Pham (2014) argued that the trust factor can be used as a strong predictor of e-wallet adoption.

Research conducted Gefen et al (2003) found that perceived trust has a positive and significant relationship with perceived usefulness. Thus, the fourth hypothesis is as follows:

H4: Consumers' trust positively influence on electronic payment intention.

Digital technology activities

Previous studies have identified technologies related to society (Li et al., 2017; Oestreicher-Singer and Zalmanson, 2012), mobility (Hanelt et al., 2015a; Pousttchi et al., 2015), analytics (Duerr et al., 2017; Günther et al., 2017), cloud (Clohessy et al., 2017; Du et al., 2016), and Internet of things - IoT (Petrikina et al., 2017; Richter et al., 2017). Digital technology has been identified as a source of disruption (Karimi and Walter, 2015) to consumer behavior and expectations, the competitive landscape, and data availability. Changing consumer behavior and expectations of digital technology have profound effects on the behavior (Chanas, 2017; Hong and Lee, 2017) of common consumers (Yoo et al., 2010a) to approach information and communication capabilities (e.g. using social media on phones, laptops). Applying these technologies, customers become active participants in the relationships that take place between an organization and its stakeholders (Kane, 2014; Yeow et al., 2017). Thus, the fifth hypothesis is established as follows:

H5: Consumers' digital technology activities positively influence on electronic payment intention.

Subjective norms

Subjective norm or social influence is people's perception of social pressure to perform or not their behavior (Ajzen and Fishbein, 1975; Park et al., 2006). These social pressures come from family, friends, co-workers and surrounding media. Previous researches have shown a positive correlation between subjective norm and customers' intention to use electronic payments (Ravi, Carr & Sagar, 2007; Bhattacharjee, 2000; Nasir, Wu, Yago, & Li, 2015; Goh 2017). Research by Nysveen et al. (2005) demonstrated the above correlation that individuals can accept a certain system when under huge pressure from society and the influence of the elders or friends. In particular, they are directly influenced through word of mouth about electronic payments. Thus, the sixth hypothesis can be established as follows:

H6: Customers' subjective norms positively influence on electronic payment intention.

Perceived behavioral control

Perceived behavior control factor was proposed by Ajzen (1985) to improve the TRA model for more realism. Perceived behavioral control plays an essential role such as an individual's self-assessment of the difficulty or ease of performing a behavior. The more resources and opportunities they are getting, the fewer barriers they will face, so that it will

be more difficult to control their perceived behavior perception. According to Ajzen (1991), this element is developed from the self-belief of the person intending to perform the behavior, and the easy and favorable conditions for performing this one. Taylor and Todd (1995) argued that perceived behavioral control of customers is obtained when the person intending to perform the behavior has all the information necessary for personal decision and self-assertion. Through these studies, perceived behavioral control has been shown to have a positive effect on behavioral intention. Thus, the seventh hypothesis is stated as follows:

H7: Customers' perceived behavioral control positively influence on electronic payment intention.

Given the seven hypotheses, the research model can be illustrated as followings:

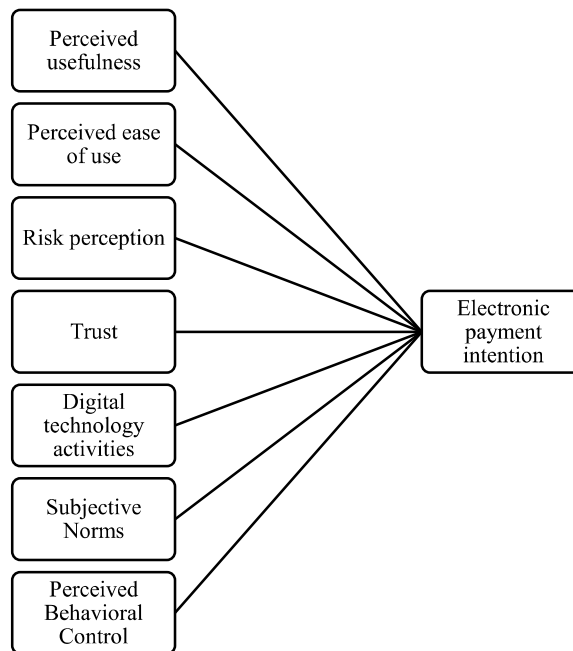


Figure 1: Proposed research model

3. Method

In this research, the authors used two main methods: qualitative research and quantitative research. Regarding the qualitative method, the research team has carried out in-depth interviews combined with referring to more documents related to the topic in order to figure out the elements in the proposed model. Regarding the quantitative method, using a questionnaire designed on a 5-likert scale to assess the degree of agreement of the respondents with the assertions given in the questionnaire. Then, the authors collect data through 360 final qualifying results and analyze it using tools such as descriptive statistics, exploratory factor analysis (EFA), scale testing (Cronbach's Alpha), correlation analysis and analysis regression - hypothesis testing.

Data analyzed using sample size N=360. According to statistics, men accounted for 34.72%, women accounted for 64.72%, and other 0.56%. The age of the respondents is highest at 18-25 years old (94.17%), with a large difference in the age ratio. People attending university education accounted for the highest rate of 88.61%. Respondents' income is mainly under 10 million dong.

4. Results

Cronbach's Alpha

In the first measurement, the reliability analysis for all indicators of the factors has Cronbach's Alpha coefficient of the total variable greater than 0.6, which means that all are accepted for reliability. However, when looking specifically at each indicator of the factors, the research team found that Cronbach's Alpha if item deleted of *Digital technology activities* 03 is 0.843 which is larger than the Cronbach's Alpha coefficient of the total is 0.765 and *Perceived usefulness* has Cronbach's Alpha if item deleted is 0.934 which is greater than Cronbach's Alpha coefficient of total variable is 0.921, so these two indicators are removed. The new results give a table of Cronbach's Alpha coefficients as below:

Table 1: Cronbach's Alpha

Factor name	Number of indicators	Cronbach's Alpha coefficients
Perceived Usefulness	5	.934
Perceived Ease of Use	5	.931
Risk Perception	5	.895
Trust	5	.889
Digital technology activities	3	.843
Subjective Norms	4	.852
Perceived Behavioral Control	3	.917
Electronic Payment Intention	3	.920

Source: results of the study

There are 33 indicators which are accepted to be used in exploratory factor analysis EFA and regression analysis.

Exploratory Factor Analysis (EFA)

The EFA results show that KMO = 0.949, Sig = 0.00 < 0.005, the final results of it are presented in the following table:

Table 2: EFA analysis

	1	2	3	4	5	6	7
LI01	.875						
LI02	.786						
LI03	.759						
LI04	.724						
LI05	.708						
DSD01		.786					
DSD02		.752					
DSD03		.686					
DSD04		.661					
DSD05		.623					
RR01			.741				
RR02			.733				
RR03			.712				
RR04			.699				
RR05			.643				
TT01				.693			
TT02				.685			
TT03				.657			
TT04				.644			
TT05				.629			
HØ01					.789		
HØ02					.724		
HØ04					.703		
CCQ01						.788	
CCQ02						.745	
CCQ03						.684	
CCQ04						.651	
KSHV01							.697
KSHV02							.652
KSHV03							.631

Source: results of the study

The results of the first EFA analysis show that the KMO values and the sig coefficients of the Bartlett test are satisfied. The Eigenvalue numeric value has up to the 7th

factor whose value is equal to 1,057 (greater than 1), and the cumulative percentage is as high as 69.032%. This proves that the indicators of seven factors *Perceived usefulness, Perceived ease of use, Risk perception, Trust, Digital technology activities, Subjective norm, Perceived behavioral control* have been satisfy the necessary conditions in exploratory factor analysis.

Correlation Analysis

Before the linear regression analysis, we analyze the correlation between the variables by building a correlation matrix. The results of the correlation matrix analysis between the independent and dependent variables are presented in table 3.

Table 3: Correlation matrix

		YĐ	LI	DSD	RR	TT	HĐ	CCQ	KSHV
YĐ	Pearson Correlation	1	.611**	.631**	.485**	.693**	.715**	.664**	.797**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	360	360	360	360	360	360	360	360
LI	Pearson Correlation		1	.723**	.428**	.517**	.629**	.420**	.385**
	Sig. (2-tailed)			.000	.000	.000	.000	.000	.000
	N		360	360	360	360	360	360	360
DSD	Pearson Correlation			1	.561**	.634**	.644**	.538**	.431**
	Sig. (2-tailed)				.000	.000	.000	.000	.000
	N			360	360	360	360	360	360
RR	Pearson Correlation				1	.723**	.404**	.502**	.398**
	Sig. (2-tailed)					.000	.000	.000	.000
	N				360	360	360	360	360
TT	Pearson Correlation					1	.625**	.677**	.441**
	Sig. (2-tailed)						.000	.000	.000
	N					360	360	360	360
HĐ	Pearson Correlation						1	.587**	.414**
	Sig. (2-tailed)							.000	.000
	N						360	360	360
CCQ	Pearson Correlation							1	.464**
	Sig. (2-tailed)								.000
	N							360	360
KSHV	Pearson Correlation								1
	Sig. (2-tailed)								
	N								360
**. Correlation is significant at the 0.01 level (2-tailed).									

Source: results of the study

Regarding to table 3, there is a correlation between the dependent variable and the independent variables at the 5% level of significance. And in fact, at the 5% level of significance, the hypothesis that the correlation coefficient which is zero is rejected. This means that there is a linear correlation between YĐ and the independent variables LI, DSD, RR, TT, HD, CCQ and KSHV.

Table 4: Linear Regression Analysis

Model summary

Model	R	R Square	Adjusted R Square	STD. Error of the Estimate	Durbin – Waston
	.634	0.502	.533	.78179925	1.939

Source: results of the study

Regarding to model summary table, we focus on commenting on two values that are the calibrated R-squared value and the Durbin-Waston value. The adjusted R-squared value reflects the influence of the independent variables on the dependent variable. In this case, with the adjusted R-squared value of 0.533 (within the threshold of 50%, this value is acceptable), it means that the 7 independent variables explain 53.3% of the change in independent variable *Electronic payment intention*. Durbin-Waston value is 1,939, close to 2, showing that there is no first order series correlation in the model.

In this study, the team only selected a limited number of samples to investigate, thereby reducing the properties of the overall. Therefore, the group conducted ANOVA test to check whether this linear regression model is generalizable and applicable. The result of Sig value of ANOVA test is 0.000 less than 0.05, so the linear regression model (1) is suitable for the overall.

Table 5: Linear regression analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	0.147	0.065		0.000	1.000		
LI	0.586	0.065	0.586	6.801	0.000	1.00	1.000
DSD	0.527	0.065	0.527	4.417	0.000	1.00	1.000

RR	0.511	0.065	0.511	5.311	0.000	1.00	1.000
TT	0.381	0.065	0.381	4.195	0.000	1.00	1.000
HĐ	0.347	0.065	0.347	4.871	0.000	1.00	1.000
CCQ	0.214	0.065	0.214	6.125	0.000	1.00	1.000
KSHV	0.198	0.065	0.198	4.987	0.000	1.00	1.000

Source: results of the study

In this regression table, the group focuses on analyzing three values that are Beta Standardized Coefficients, the Sig value and the VIF coefficient. We see that the Sig value of the 7 independent variables is 0.000 less than 0.05, so the independent variable is significant in this regression model.

$$YD = 0.147 + 0.586.LI + 0.527.DSD + 0.511.RR + 0.381.TT + 0.347.Contract + 0.214.CCQ + 0.198.KSHV$$

Considering Beta Standardized Coefficients, the results show that 7 independent variables have impact on the dependent variable *Electronic payment intention*, and the group also sees the *Perceived usefulness* factor which is the strongest impact with Beta coefficient of 0.586, followed by *Perceived ease of use* factor with Beta coefficient of 0.527 and *Risk perception* factor with Beta coefficient of 0.511, the weakest influencing factor is *Perceived behavioral control* with a Beta coefficient of 0.198; in which there is the element of risk perception that has a negative impact on the dependent variable because in the process of asking the questionnaire, the group asked the opposite questions. That is the reason why the beta coefficient is positive but the impact of this factor is negative, while the remaining factors have a positive impact on the dependent variable.

The VIF value is used to check the multi-collinearity phenomenon, with this research topic, if the VIF coefficient is less than 2, there is no multi-collinearity. The results show that the VIF values of all 7 factors are equal to 1 (less than 2) so there is no autocorrelation between these 7 factors.

5. Discussion and Conclusion

From the above results, it is found that the factor Perception usefulness has the most significant impact on the online payment intention of Vietnam customers. In order to promote the electronic payment behavior, the research team will focus on solutions to improve this factor. The contributions of organizations, businesses, and government are very important to meet the expectation of developing online payment in the future. Besides, it is

necessary to develop infrastructure and promote communication policies in order that consumers will be aware of the benefits of electronic payment compared to the current traditional one. Organizations and agencies need to provide conditions for customers to experience and discover the benefits of this kind of payment. Enterprises ought to promote communication and advertising to get this form closer and deeper to everyone. In addition, the Government also should come up with policies and measures to support the development of infrastructure for digital technology. Contemporarily, Vietnamese consumers need to learn further to use this kind of payment correctly and effectively. If the bilateral relationship between consumers and organizations is implemented, perceived ease of use of electronic payment behavior will be enhanced. Thus, these actions will create favorable opportunities for payment transactions. E-payment services will become stronger in the future.

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