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Research Article

Factors Affecting the Intention to Use Blockchain in International Payment Activities: An Empirical Study at Vietnamese Commercial Banks

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ABSTRACT

The application of Blockchain technology (BLC) in the banking and finance sector has been implemented in many countries worldwide, but in Vietnam, only a few banks have used it. This study evaluates the factors affecting the intention to use BLC in international payment activities (ITP) at Vietnamese commercial banks, thereby proposing solutions to deploy Blockchain technology applications in Vietnamese commercial banks. The authors conducted a survey and analyzed data collected from 215 survey samples of managers and employees working at commercial banks who regularly use international payment services for customers. The study uses the TAM and UTAUT models to test the factors determining the intention to use international payment services of commercial banks applying BLC such as Customer service quality, Performance Expectancy, Government regulations, Facilitating conditions, and Behavioral intention. The research results show that (i) All of the above factors positively affect the intention to use international payment services at Vietnamese banks implementing BLC. (2) Help managers at commercial banks fully understand the factors affecting the intention to use new digital technology BLC (BTC) to improve the efficiency of international payment, so that, banks can find an alternative method to implement international payment by smart contracts using BLC instead of using many types of proof documents as before.

Keywords: Blockchain technology, commercial bank, international payment, Vietnam

INTRODUCTION

The fourth industrial revolution has witnessed the emergence of a wave of technological innovation spreading across various industries (Tung, N. T. T). A series of new technologies such as cloud computing (Duong, B. D., 2017), 3D printing, internet of Things (IoT) (Huong, T. P. T., &Trang, T. L. T., 2021) along with artificial intelligence (AI) and Blockchain (BLC) are applications within the scope of the fourth industrial revolution.

Blockchain technology (BLC) was invented by Satoshi Nakamoto in 2008 and was applied to a core part of Bitcoin. Blockchain is widely adopted in many fields, such as voting, electronic digit recording, and health care (Mackey, T., et al 2020)...Currently, BLC is a widely used application in the financial field, most notably used for trading digital assets and crypto currencies (HashemiJoo et al ., 2020). Some prominent crypto (crypto currency) and BLC projects in Vietnam are Axie Infinity, Coin98, Kyber Network, and Kardia Chain... Blockchain technology is a core, fundamental technology with high application prospects in the banking industry (Guo, Y., & Liang, C, 2016) for clearing and settlement, financial services (Nikiforova, V et al., 2019) or international payment activities.

International trade (exchange) is one of the driving forces for the progress of society (Derindag et al., 2020), so it is necessary to explore the possibilities of making global payments cheaper, more efficient, and more secure (Mark Buitenhek, 2016). Blockchain can improve financial processes, making international payments faster, more reliable, and more accessible to everyone in commercial banks (Slatvinska, V et al.,., 2020). Santander InnoVentures, a Spanish bank, has applied BLC to its payment operations, which can cut banks' infrastructure costs by up to $15 billion to $20 billion per year (Mark Buitenhek, 2016). In 2019, We Trade's technology was allowed by 16 banks in 15 countries to build the world's first BLC-powered trade finance platform (Duy, T. P. K, 2021). (Sinha, D., & Roy Chowdhury S., (2021) studied the implementation of BLC into Distributed Ledger Technology and smart contracts to facilitate application to international payment activities of commercial banks.

The applications of BLC tools in commercial banks have conducted in different countries. In Japan, three BIG banks, NAMELY Mizuho Bank, Sumitomo Mitsui Bank, and MUFG Bank apply BLC to their banking business. The European financial system applies BLC technology to international payment activities and applies BLC to their banking business. The European financial system applies BLC technology to international payment activities and its first BLC-based trade finance agreement was a successful transaction in 4 hours instead of 10 working days as before (Peter, H., & Moser, A., 2017). Meanwhile, Ant Financial Services Group in China launched a cross-border remittance business based on BLC in June 2018 (Deng, Q., 2020). This BLC technology enables cross-border remittances to e-wallets between the Philippines, Hong Kong, and China within three seconds. This result shows that international payments using BLC are faster and more convenient.

Grupo Santander - a Spanish banking group has pioneered the application of BLC and has built a One Pay FX payment system on the BLC platform. The main goal of this system is to optimize payments between Europe and South America using a distributed ledger (Ha, N. T. H., 2020). India has completed a project that allows members to share payment activities using BLC to combat terrorist financing and anti-money laundering (Garg, P et al., 2021). BLC technology is adopted by some State-owned banks of India for foreign trade purposes, such as ICICI Bank, Yes Bank, Kotak Mahindra Bank, and Axis Bank (Jena, R. K., 2022).

BLC technology plays an important in practice in the US (expected revenue of 4.2 billion USD in 2022) and in Western Europe (with 2.9 billion USD), and have also pointed out many factors affecting the intention to use BLC (Garg, P et al., 2021), (Jena, R. K., 2022), (Venkatesh, V, 2022), (Ha Nguyet Dam et al., 2020) in international payment activities at commercial banks around the world.

In 2016, Bank of America, HSBC, and the ICT Development Authority of Singapore developed a trade finance application and provided valid evidence when applying BLC to provide transparency to authorized participants while encrypting confidential data (McDaniel, C. A., & Norberg, H. C., 2019)

In Vietnam, most Vietnamese commercial banks are members of SWIFT (Hoàng, Á. L., 2013) and mainly use this technology in international payments. Along with the development of information technology and the 4.0 industrial revolution, the Joint Stock Commercial Bank for Investment and Development of Vietnam (BIDV) is the first bank to successfully issue a letter of credit (LC) paid using BLC. After the success of BIDV, some banks, such as Vietcombank applied BLC to improve user experience for the VCB Rewards program on the digital bank VCB Digibank. In July 2018, TPBank, VietinBank, VIB, and NAPAS successfully tested interbank money transfer transactions using Blockchain. In 2019, HSBC also applied BLC in international payments using letter of credit (L/C) transactions.

Thus, there are currently five banks that have successfully applied international payment by BLC in Vietnam. In addition, the Vietnamese Government has issued documents referring to BLC in payment activities at banks, such as Decision 2117/QD-TTg dated December 16, 2020, Decision 942/QD-TTg dated June 15, 2021, Decision No. 810/QD-NHNN dated May 11, 2021.

The research results of Feng, X., and colleagues show that BLC technology can help banks form a faster, more flexible, and safer international payment system (Feng, X et al., 2022). Blockchain, which is a new technology, will help trace the origin (Deng, Q., 2020, March), and perfect the financial process, making it faster, more reliable, and more accessible to users than traditional payment activities using many documents. The process of transforming the payment model aims to reshape trust and intention to use BLC to improve cross-border payment capacity at Vietnamese commercial banks.

Payment revolution, the orientation of information technology development in the economy until 2025 is a key premise to assess the prospects and vision of commercial banks in Vietnam. The use of BLC technology for international payment is a necessary condition to help Vietnamese commercial banks integrate with the world financial market. Researching the factors affecting the intention to apply BLC in international payment activities plays an important role in this integration process of Vietnamese commercial banks.

HYPOTHESIS AND RESEARCH MODEL

Research Hypothesis

With the rapid development of technology, the adoption of BLC in the banking sector requires user acceptance (Taherdoost, H, 2018). There are many models used to assess the level of customer acceptance of technology, such as the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1977), the Technology Acceptance Model (TAM) (Davis, F. D., 1989), Theory of Planned Behavior (TPB) (Ajzen, I., 1985). In this study, the authors used the Technology Acceptance Model and the Technology Acceptance and Use Model as the basis for studying behavioral intentions and intentions to use BLC in international payment activities at Vietnamese commercial banks.

Technology Acceptance Model (TAM) is one of the most widely used theories in the studies of technology user behavior. This model helps explain the factors that motivate users to accept and use new technology, including artificial intelligence (AI) technology (Duong Thi Minh Phuong, 2023)

Unified Theory of Acceptance and Use of Technology – (UTAUT) is a model combining eight models of users' acceptance of emerging technology such as the theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivation Model (MM), Theory of Planned

Behavior (TPB), A model combining TAM and TPB (C-TAM-TPB), Model of PC Utilization (MPCU), (Innovation Diffusion Theory (IDT), Social Cognitive Theory (SCT). The UTAUT model assesses users' acceptance and use of technology to predict their attitudes. Based on the research results, the author proposes necessary solutions to improve the intention to use BLC in international payment activities of Vietnamese commercial banks. Previous studies have shown that the UTAUT theory can explain 70% of customer usage behavior cases, better than any previous theory (which can only explain about 30-45%) (Venkatesh, V et al., 2022), (Bui, N. T., 2016).

Quality customer services (QCS): Service quality is a condition for the success of business operations at commercial banks. Customer satisfaction depends on transparency (QCS1) (Quan, N. H, 2020), trust (QCS2), data accuracy (QCS3), risk reduction (QCS4) (Ha Nguyet Dam et al., 2020), automation of actions and transactions between parties (QCS5) and brand awareness and value received, (Garg, P. et al., 2021).

Hypothesis 1 (H1): Quality customer service positively affects behavioral intention to use BLC technology
Hypothesis 2 (H2): Quality customer service positively affects behavioral intention to use BLC technology

Performance Expectancy - PE: Reducing transaction costs and operational efficiency are important reasons commercial banks adopt BLC technology instead of traditional payment activities (Garg, P. et al., 2021). The authors argue that “the extent to which an individual believes that using the system will help them achieve benefits in work performance” (Venkatesh et al., 2003; Bui Ngoc Toan, 2016). Customers’ expectations when applying BLC to international payments are to reduce transaction costs (PE1), eliminate intermediaries (PE2), reduce administrative costs (PE3), and reduce operating costs (PE4) (Jena, R. K., 2022). Lowering costs and minimizing transaction intermediaries makes more customers intend to use BLC in payment activities (HamedHeidar et al., 2018).

Hypothesis 3 (H3): Performance Expectancy positively influences behavioral intention to use BLC technology
Hypothesis 4 (H4): Performance Expectancy positively influences behavioral intention to use BLC technology

Government Regulation –GR: According to Decision No. 2117/QD-TTg dated December 16th, 2020 of the Prime Minister, the Ministry of Science and Technology has also approved the "National Key Science and Technology Program for the period up to 2025", in which Blockchain technology is considered one of the key technologies. Blockchain technology will streamline business processes (GR1), the government will issue laws to ensure immutable business rules (GR2), Blockchain technology will prevent fraud and financial fraud (GR3), the government needs to issue laws to ensure customer data protection (GR4), improve regulatory compliance between banks and customers (GR5). The government's regulation on the adoption of BLC will create a legal corridor for commercial banks to implement (GR6). (Garg, P. et al., 2021), (Jena, R. K., 2022)

Hypothesis 5 (H5): Government regulations positively affect behavioral intention to adopt BLC technology
Hypothesis 6 (H5): Government regulations positively affect behavioral intention to adopt BLC technology

Facilitating Conditions (FC) builds a technical infrastructure system that meets the application

of BLC technology in international payment activities at banks. Influenced by the level of full technical, organizational, infrastructure, and human support of users to use the technology (FC1) (Jena, R. K., 2022). The function of BLC affects technology users (FC2) (HamedHeidar et al., 2018) to ensure convenience in the process of use in payment activities. Building a reasonable process for customers to have initial confidence in using technology (FC3) (Hmoud, B. I., &Várallyai, L, 2020) (Venkatesh, V, 2022), (Bui Ngoc Toan, 2016).

Hypothesis 7 (H7): Facilitating Conditions positively affect the behavioral intention to adopt BLC technology
Hypothesis 8 (H8): Facilitating Conditions positively affect the intention to use BLC technology

Behavioral intention: The level of intention of a person to perform a specific behavior, in this case, using BLC in international payment activities at commercial banks. Whether customers continue to use BLC in international payment activities (BI1) is essential to the success of the BLC application process. Customers often pay attention to new BLC applications (BI2). The level of intention to use also affects the update of the latest BLC applications at the bank (BI3) and the intention to spend time accessing BLC in the future (BI4) (Davis, F. D., 1989).

Hypothesis 9 (H9). BI significantly affects the intention to use BLC.

Intention to Use (IU): IU is an indication of an individual's readiness to perform a certain behavior (Fishbein, M., and Ajzen, I., 1975). Intention to use is an antecedent of usage behavior (Kim, S. S et al., 2005). If customers highly value the factors proposed in the model, they prefer international payment using BLC technology. Intention to use measures the likelihood that commercial banks will use BLC in international payment activities (IU1) (Quan, N. H, 2020), banks will use BLC for international payment activities for all future international payment activities (IU2), and customers' absolute trust in BLC in international payment activities (UI3).

Research Model
Based on the analysis of previous research documents, the authors propose a research model of factors affecting the intention to use BLC in international payments as follows:

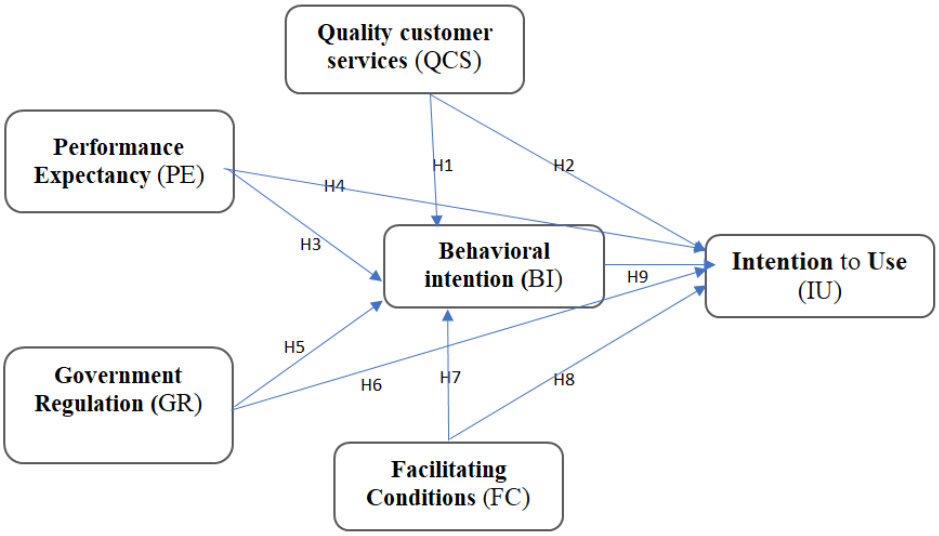

Figure 1: The author's proposed research model

DATA ANALYSIS

Research Method

The author uses both of qualitative and quantitative research methods to conduct the research. Qualitative methods are used to identify factors, scales and recommendations through expert interviews after synthesis. Quantitative methods are used to process data collected from surveys.

In addition to the descriptive statistics section, the questionnaire includes 25 observed variables, with 5 factors affecting the dependent variable (UI) as shown in Table 1. The questionnaire uses a 5-level Liket scale with levels ranging from 1 (Strongly disagree) to 5 (Strongly agree).

Table 1. Survey question design

Factors	Symbol	Observation variable	References
Quality customer service (QCS)	QCS1	Blockchain technology will improve transparency	Garg, P. et al., 2021; Jena, R. K., 2022; Ha Nguyet Dam et al., 2020;
	QCS2	Blockchain technology will increase trust	
	QCS3	Blockchain technology will increase data accuracy	
	QCS4	Blockchain technology will reduce risk	
	QCS5	Blockchain technology will automate actions and transactions between parties	
Performance Expectancy (PE)	PE1	Blockchain technology will reduce transaction costs	Jena, R. K., 2022; Garg, P. et al., 2021; Ha Nguyet Dam et al., 2020; Davis, F. D., 1989; Hamed Heidar et al., 2018; Bui Ngoc Toan, 2016; Venkatesh, V, 2022;
	PE2	Blockchain technology will eliminate intermediaries	
	PE3	Blockchain technology will reduce administrative costs	
	PE4	Blockchain technology will reduce operating costs	
Government Regulation (GR)	GR1	Blockchain technology will optimize business processes	Garg, P. et al., 2021; Jena, R. K., 2022; Venkatesh, V, 2022;
	GR2	Blockchain technology ensures efficient implementation of business rules	
	GR3	Blockchain technology will prevent fraud and financial fraud	
	GR4	Blockchain technology will ensure data security	
	GR5	Blockchain Technology will improve regulatory compliance	
	GR6	The state issues laws to ensure smooth operation of BLC.	
Facilitating Conditions (FC)	FC1	Customers' behavioral intention to use BLC technology is influenced by the level of adequate technical, organizational, infrastructure and human support of commercial banks.	Jena, R. K., 2022; Ha Nguyet Dam et al., 2020; Venkatesh, V, 2022; Hamed Heidar et al., 2018; Bui Ngoc Toan, 2016;
	FC2	The functions of technology affect the users.	
	FC3	Trust in technology of commercial banks.	
Behavioral intention	BI1	Commercial banks will open Blockchain training classes for	Jena, R. K., 2022; Garg, P. et al., 2021;

(BI)		employees in the future	Nguyet Dam et al., 2020; Davis, F. D., 1989; Hamed Heidar et al., 2018;
	BI2	Commercial banks will pay attention on emerging BLC applications.	
	BI3	Commercial banks will update the latest BLC applications.	
	BI4	Commercial banks will devote resources to meet BLC expansion needs in the future.	
Use intention (UI)	IU1	Measuring the capability that commercial banks will use BLC in payment operations	Jena, R. K., 2022; Ha Nguyet Dam et al., 2020; Davis, F. D., 1989; Hamed Heidar et al., 2018; Bui Ngoc Toan, 2016; Venkatesh, V, 2022;
	IU2	The Bank uses BLC for international payment operations in the future	
	IU3	Banks' faith in BLC in international payment activities	

Research Sample

To collect research data, the author sent survey forms to 225 managers and employees at commercial banks who regularly use international payment services of commercial banks in Vietnam. Data collection period is from January 2024 to May 2024. The results obtained 215 valid forms. The author used SMARTPLS 4.1.0.0 software to process data.

RESEARCH RESULTS

Descriptive Statistics

Table 2: Characteristics of the research sample

Characteristics	**Quantity (n)**	**Proportion (%)**
I. Position	**215**	**100.00%**
Director, Deputy Director	30	13.95%
Chief Accountant, Sales Manager	56	26.04%
Staff	129	60.01%
II. Education	**215**	**100.00%**
College	59	27.44%
Bachelor	95	44.19%
Master	58	26.98%
Doctor	3	1.40%
III. Gender	**215**	**100.00%**
Male	112	52.09%
Female	103	47.91%
IV. Age group	**215**	**100.00%**
22 - 30	45	20.93%
31 - 40	88	40.93%
41 - 50	62	28.84%
51 - 60	18	8.37%
>60	2	0.93%

Source: Author's statistical results

The survey was conducted at 39 branches of commercial banks in major provinces and cities in Vietnam. The number of people surveyed who were bank employees accounted for 60.01% of the total sample. The management team (Director, Deputy Director, Chief Accountant, Head of Departments) of commercial banks surveyed accounted for 40%, of which senior managers accounted for 13.95%, and the rest were middle-level managers.

In terms of educational level, university graduates accounted for the highest proportion (44.19%), people with doctoral degrees accounted for only 1.4%, and they are consultants in the financial field for banks. In addition, people with master's degrees also accounted for another high proportion of 26.98%. The educational level of employees working at banks is quite high, so the ability to absorb and use new technologies.

In terms of the gender of the surveyed people, the proportion of men and women is also quite balanced.

The age of employees working at the bank is quite young. They are a flexible team, easily adaptable to new requirements of the labor market. The age group from 30 to 40 accounts for the highest proportion of 40.93%. At this age, employees have both work experience and good health to meet the job requirements at the commercial bank.

Testing the Scale in the Research Model

Assessing the Reliability of the Scale

The author uses SMARTPLS 4.1.0.0 software to assess the reliability of the scale. The evaluation results show that the Cronbach's Alpha of each factor ranges from 0.780 to 0.812, meeting the reliability requirements of the scale. The Cronbach's Alpha indexes of each observed variable are all greater than 0.7 (Hair et al., 2018) (Hair et al., 2020), in which some observed variables "QCS_5"; "GR_1"; "GR_2"; "GR_3"; "GR_4" "FC_1"; "FC_2"; "IU_1"; "IU_3" have loading factors less than 0.700, so they are eliminated from the model. The average variance extracted (AVE) value ranges from 0.595 to 0.840, so the scales of each variable in the model all achieve convergent value. The analysis results are shown in Table 3.

Table 3. Reliability and convergence analysis of factors

Factors	Observation variable	Factor loading	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Quality customer service (QCS)	QCS1	0.761	0.802	0.820	0.867	0.620
	QCS2	0.795				
	QCS3	0.807				
	QCS4	0.787				
Performance Expectancy (PE)	PE1	0.828	0.818	0.822	0.879	0.646
	PE2	0.799				
	PE3	0.784				
	PE4	0.803				
Government Regulation (GR)	GR5	0.897	0.800	0.928	0.905	0.827
	GR6	0.935				
Facilitating Conditions (FC)	FC3	1.000				
Behavioral intention (BI)	BI1	0.840	0.780	0.830	0.854	0.595
	BI2	0.767				
	BI3	0.766				
	BI4	0.705				
Use intention (UI)	IU2	1.000				

Source: Author processed from SMART 4.1.0.0 software

Item Collinearity

After eliminating some inappropriate observed variables, the results showed that the remaining observed variables of the model did not have multicollinearity because all of VIF < 5. The results are presented in Table 4.

Table 4. Summary of VIF magnification factors

Observation variable	VIF	Observation variable	VIF
BI1	1.510	PE3	1.728
BI2	1.630	PE4	1.792
BI3	1.792	QCS1	2.503
BI4	1.458	QCS2	2.536
FC3	1.000	QCS3	1.701
IU2	1.000	QCS4	1.482
PE1	1.886	GR5	1.875
PE2	1.843	GR6	1.875

Source: Author processed from SMART 4.1.0.0 software

Testing the Discriminability of Variables

The results of the discrimination test of the variables in the scale are shown in Tables 5 and 6 below.

Table 5. Correlations between variables

	BI	FC	IU	PE	QCS	RCo
BI	0.771					
FC	0.086	1.000				
IU	0.700	0.091	1.000			
PE	0.491	0.234	0.368	0.804		
QCS	0.430	0.163	0.550	0.538	0.788	
GR	0.646	0.038	0.659	0.299	0.293	0.916

Table 6. Heterotrait-Monotrait Ratio (HTMT)

	BI	FC	IU	PE	QCS	RCo
BI						
FC	0.106					
IU	0.749	0.091				
PE	0.594	0.259	0.404			
QCS	0.511	0.187	0.590	0.628		
GR	0.728	0.038	0.728	0.350	0.317	

Source: Author processed from SMART 4.1.0.0 software

The results of the two Fornell - Larcker and Heterotrait - Monotrait Ratio (HTMT) in Table 5 and Table 6 show that the discriminant values between the variables in the research model are appropriate, ensuring the testing steps for the structural model.

R^2và Adjusted R^2

Table 7. R^2và Adjusted R^2

	R-square	R-square adjusted
BI	0.527	0.518
IU	0.643	0.634

$R^2_{(IU)}$ = 0.643> 0.5 proves that the official research model is meaningful, the factors in the model can explain over 64.3% to evaluate the intention to use BLC in international payment activities at commercial banks.

Hypothesis Testing

In the first test, we see that the significance level (P value) of the hypotheses FC -> BI = 0.729, FC -> IU = 0.761 is greater than 0.05, which proves that hypotheses H7 and H8 are not statistically significant and should be eliminated from the model.

Test Results of the Official Model

Table 8. Results of coefficient testing

Hypotheses	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
BI -> IU	0.383	0.379	0.074	5.182	0.000
PE -> BI	0.260	0.263	0.065	3.995	0.000
PE -> IU	-0.106	-0.106	0.053	1.994	0.046
QCS -> BI	0.136	0.136	0.068	1.984	0.047
QCS -> IU	0.342	0.343	0.065	5.265	0.000
GR -> BI	0.528	0.528	0.045	11.615	0.000
GR -> IU	0.343	0.346	0.062	5.555	0.000

***Source*:** Author processed from SMART 4.1.0.0 software

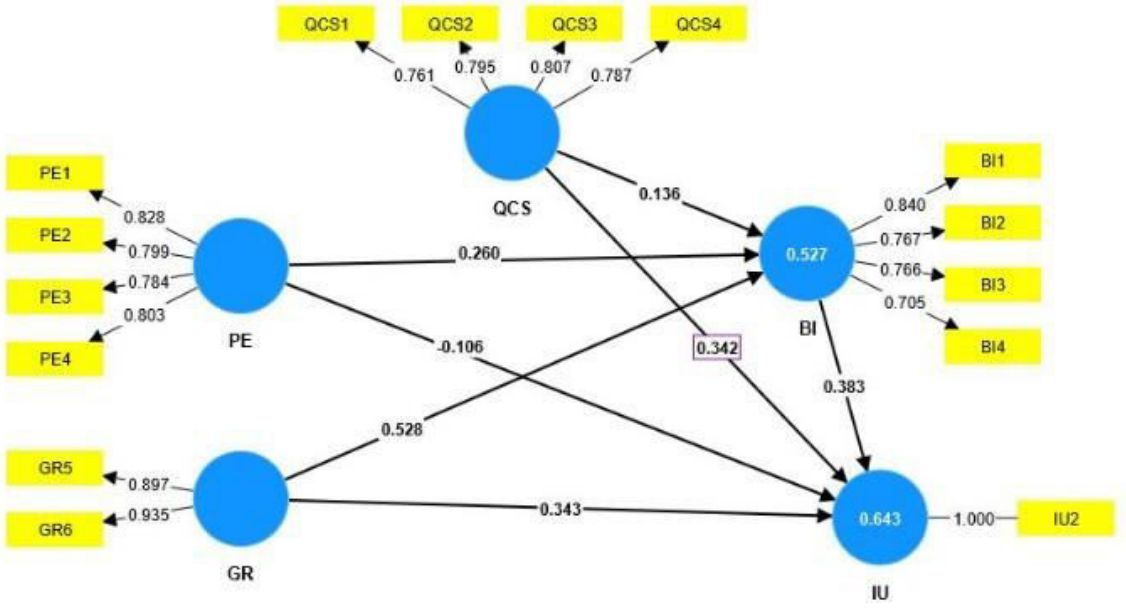

Figure 2: Official PLS – SEM results

The research results show that the factor that has the strongest impact on the intention to apply BLC technology to international payment activities at commercial banks is "Government regulations", followed by the impact of the factor "Quality customer service". The proposed model explains a reliable proportion of the impact of behavioral intention on the intention to use BLC technology and is consistent with previous research models of many authors such as:

Government Regulation (GR) is the strongest influencing factor of the model with a positive sign and is completely suitable (hypothesis H5: GR -> BI = 0.528), H6: GR -> IU = 0.343 is completely accepted). Government regulation is a prerequisite for building a legal corridor, and at the same time creates conditions for commercial banks to apply BLC to the international payment system. This helps banks to conduct financial transactions or make investment decisions easily and conveniently. The author's results are consistent with previous studies (Garg, P. et al., 2021), (Jena, R. K., 2022), (Venkatesh, V, 2022).

Quality customer service is the second strongest factor with a positive sign and is completely consistent with hypothesis H1 (QCS -> BI = 0.136) and hypothesis H2 (QCS -> IU = 0.342). Good service quality will satisfy customers better and at the same time reduce transaction time for employees, increase transparency, create trust in new services of commercial banks, and minimize transaction risks between parties when using international payment services at commercial banks. This result is consistent with the results of previous studies. (Garg, P. et al., 2021), (Jena, R. K., 2022), (Ha Nguyet Dam et al., 2020).

Performance Expectancy Factor: Hypothesis H3 (PE -> BI = 0.260) shows that PE has a positive impact on BI, while H4 (PE -> IU = -0.106) means that PE has a negative impact on IU. This result is different from the research results of (Venkatesh, V et al., 2003) and (Venkatesh 2022) but this result is consistent with the research results of (Davis, F. D., 1989), (Bui Ngoc Toan,2016) and (Ha Nguyet Dam et al., 2020).

Facilitating Conditions factor was eliminated from the model because P value > 0.05, so hypotheses H7 and H8 are not statistically significant.

Finally, the behavioral intention factor positively affects the intention to use commercial bank services (BI -> IU = 0.0383), hypothesis 9 is accepted. This research result is consistent with previous studies (Jena, R. K., 2022), (Ha Nguyet Dam et al., 2020), (Davis, F. D., 1989), Venkatesh, V, 2022), (HamedHeidar et al., 2018), (Bui Ngoc Toan, 2016).

The study has achieved the goal of determining the level of impact of behavioral attitudes on the intention to use international payment services at commercial banks. Deploying international payment services using BLC at commercial banks in Vietnam is an inevitable trend, consistent with this trend in the world. The article uses the acceptance and use of technology (UTAUT) model which is completely appropriate.

The research results show that the application of BLC technology in international payment activities at commercial banks is necessary. Commercial banks in Vietnam need to consider and improve the factors affecting the intention to use BLC technology in their international payment activities, in order to improve the efficiency of bank operations.

RECOMMENDATIONS AND RESEARCH DIRECTIONS

This study aims to use a tool to measure the benefits of implementing blockchain technology in the commercial banking sector in Vietnam. From the research results, commercial banks can refer to the level of positive and negative impacts of factors affecting the intention to use international payment services applying BLC in Vietnam. From there, the study has some proposals to regulate

these factors in a way that is beneficial for the application of BLC technology in the field of international payment of banks. From the survey results, the authors found a consensus: The intention to use BLC in international payment activities of banks is assessed depending on the legal framework of the government, the quality of services of banks, expected performance is assessed depending on transaction costs, reliability, security, and risk limitation at banks. Therefore, for an emerging technology like BLC to be widely used in international payments at Vietnamese commercial banks, the study proposes some solutions to promote the application of BLC in the banking sector as follows:

Regarding quality customer service: is the key to success for any business. Commercial banks need to build a variety of services to attract customers and enhance the reputation of bank services. Small-scale banks that have not yet tested the application of BLC in payment activities need to design models and processes to help international payment services at the bank become known. Focus on safety, accuracy, and ease of use for customers through improving the quality of information. Vietnamese commercial banks promote the development of digital banking applications in the digital age.

Performance Expectancy: BLC technology reduces time and financial costs for banks and service users. However, according to a survey, some small-scale banks do not prefer to use BLC because high server maintenance costs also create obstacles to applying BLC. Therefore, it is necessary to build a synchronous infrastructure system between banks so that the process of applying BLC technology is more effective.

Regarding Government Regulations: The strong development of the digital era is both a driving force and a challenge for applying BLC. Government regulations are the factor that most affects the intention to use BLC technology. Therefore, in addition to previously issued documents, the State needs to have complete legal documents for banks to apply. The State Bank needs to cooperate with specialized organizations on BLC to create management software for the entire banking system instead of each bank applying its own model as it is now.

Regarding Facilitating Conditions (FC): According to experts, natural conditions in Vietnam are not favorable for the application of BLC technology in international payment activities. Many opinions say that BLC technology is still new, Vietnam's infrastructure is still weak, and the trust of technology users is not high. To increase the conditions for application, banks need to build a specific application roadmap, send employees to attend BLC courses, and schools need to have a specific curriculum on BLC for students majoring in finance and banking.

Blockchain technology is still in its early stages and is being tested for various industries in Vietnam. The main contribution of this study is to provide a foundation for future research in the field of BLC in small-scale banks. This study attempts to enrich the literature and contribute to future research related to BLC. Blockchain technology brings many benefits from smart contracts, renewal, and process optimization in the field of international payments in commercial banks, and can also be a reference for other fields.

Limitations of the study: The author's article focuses on studying 5 factors affecting the intention to use BLC at commercial banks, there is no research on the intention to use BLC for customers who regularly use international payment services at banks such as import-export enterprises or individual travelers. Therefore, this limitation will be implemented in the next study.

Further research direction: Expand the research to individual and corporate customers who have real needs for international payment activities at commercial banks. In addition, the author can consider including some other key factors leading to the success of service usage intention such as Ease of use, usefulness, and social impact when using BLC in international payment activities at banks.

CONCLUSION

The study contributes to both the theoretical and practical aspects of applying BLC in the banking

sector. Theoretically, the study provides a validated tool to support managers in assessing the benefits of blockchain implementation in the banking sector, providing several factors that positively impact the intention to use BLC in international payment activities at commercial banks. In practice, it promotes the implementation of technology in payment activities at small-scale banks in Vietnam. The research results partly assess the impact of factors on the intention to use BLC in international payment activities at banks. In the future, to apply BLC, it is necessary to have a good legal framework and service policies for the banking ecosystem, which will help optimize the process of deploying BLC in banks.

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