

# **Application of ISS Model for individual customer satisfaction: A study of Internet Banking and Mobile Banking services in Ho Chi Minh City, Vietnam**

Nguyen Thi Binh Minh<sup>1\*</sup>, Khuc Dinh Nam<sup>1</sup>

<sup>1</sup>Nong Lam University, Ho Chi Minh City, Vietnam

\*Corresponding author: binhminh\_sunshine@hcmuaf.edu.vn

---

## **ARTICLE INFO**

**DOI:**10.46223/HCMCOUJS.  
econ.en.13.2.2110.2023

Received: December 01<sup>st</sup>, 2021

Revised: December 18<sup>th</sup>, 2021

Accepted: January 27<sup>th</sup>, 2022

JEL classification code:  
M10; M15

*Keywords:*  
customer satisfaction; Internet  
Banking; ISS model; Mobile  
Banking

## **ABSTRACT**

This paper aims to compare determinants affecting individual customer satisfaction between Internet Banking and Mobile Banking services in Ho Chi Minh City. We developed the research model based on the Information System Success Model (ISS) of DeLone and McLean (2003). The official sample size is 415 for Mobile Banking and 409 for Internet Banking. We applied the Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modeling (SEM) to discover that factors impacting customer satisfaction are organized from high to low following trust, service quality, system quality for Internet Banking, and system quality, information quality, trust, service quality for Mobile Banking. Finally, we also gave some recommendations for commercial banks to increase customer satisfaction with Internet Banking and Mobile Banking services.

---

## **1. Introduction**

In industry 4.0, the Internet is becoming more and more popular and developing strongly all over the world. At the beginning of 2021, the number of people using the Internet was more than 4.66 billion people worldwide (We Are Social and Hootsuite, 2021). In particular, in Vietnam, the number of mobile subscribers is 154.4 million, accounting for 157.9% of the Vietnamese population and the number of Internet users is 68.72 million. The rate of Vietnamese people owning any type of mobile device is 97%, smartphone is 96.9%, tablet device is 31.9%, and laptop/desktop is 66.1%. With such a high rate of use of devices, the three activities people spend the most time in a day are: using the Internet, watching television, and using social networks. These show that the penetration of the Internet into the daily lives of Vietnamese people is currently extremely large.

In the context of the current outbreak and spread of the Covid-19 pandemic, the World Health Organization warns that the risk of infection from cash is very large and advises people to turn to digital payment. According to financial experts, because of the current complicated epidemic, it is time for Vietnamese to increase the use of digital payment instead of the habit of using cash. In Vietnam, the most popular kinds of digital payment are Mobile Banking and Internet Banking services. Internet Banking is an electronic banking service through a global computer network and customers have to connect to the bank's website to make their

transactions (Do, 2016). Mobile Banking is also an electronic banking service in that customers use their mobile phones to make their transactions with the bank such as online payments, without going to the bank, and customers can use it 24/7 and everywhere (Vu & Vu, 2016). The Payment Department of the State Bank of Vietnam shows that as of the end of April 2021, the number of organizations providing payments via the Internet and mobile phones is 79 and 44 respectively; transactions via Internet channels rose by 31.2% in value and 65.9% in quantity respectively over the same duration in 2020; transactions via mobile phones grew by 123.1% in value and 86.3% in quantity respectively over the same duration in 2020 (Bang Tam, 2021). Therefore, with the development trend of Internet Banking and Mobile Banking services, commercial banks are currently aware of customer satisfaction with these services.

Currently, there are many studies on Internet Banking and Mobile Banking, divided into 03 main groups: (i) factors affecting the orientation of using Online Banking services; (ii) customer satisfaction with service quality; (iii) the reasons for developing these services (Do, 2016). The research about customer satisfaction is all based on some familiar theoretical models of service quality such as E-SERVQUAL, E- SQ (E- Quality of Service), and SERVQUAL. (Damabi, Firoozbakht, & Ahmadyan, 2018; Hsu & Nguyen, 2016; Musiime & Ramadhan, 2011; Nimako, Gyamfi, & Wandaogou, 2013; Seyal & Rahim, 2011; Tran & Nguyen, 2011).

However, Internet Banking and Mobile Banking are both services based on the foundation of the information technology system, so to successfully develop these services as well as maximize customer satisfaction, according to the ISS Model (DeLone & McLean, 2003) there are still other factors are system quality and information quality. Besides, the satisfaction of customers is also influenced by trust (Damabi et al., 2018; Lee & Chung, 2009; Nguyen, Khuc, & Phan, 2021b). The impact of these three new factors has rarely been analyzed by researchers in Vietnam. There is only one theoretical research proposal model about customer satisfaction for Internet Banking services (Nguyen, Khuc, & Phan, 2021a) and one empirical research for the same topic (Nguyen et al., 2021b). Moreover, there is not any research comparing Internet Banking and Mobile Banking services about factors impacting satisfaction for commercial banks in Vietnam. Therefore, our paper is an effort to fill the gap and is very necessary and meaningful because commercial banks always want to increase customer satisfaction with these services, and they are still confused about whether they should focus on developing which service to suit the ability of their technology.

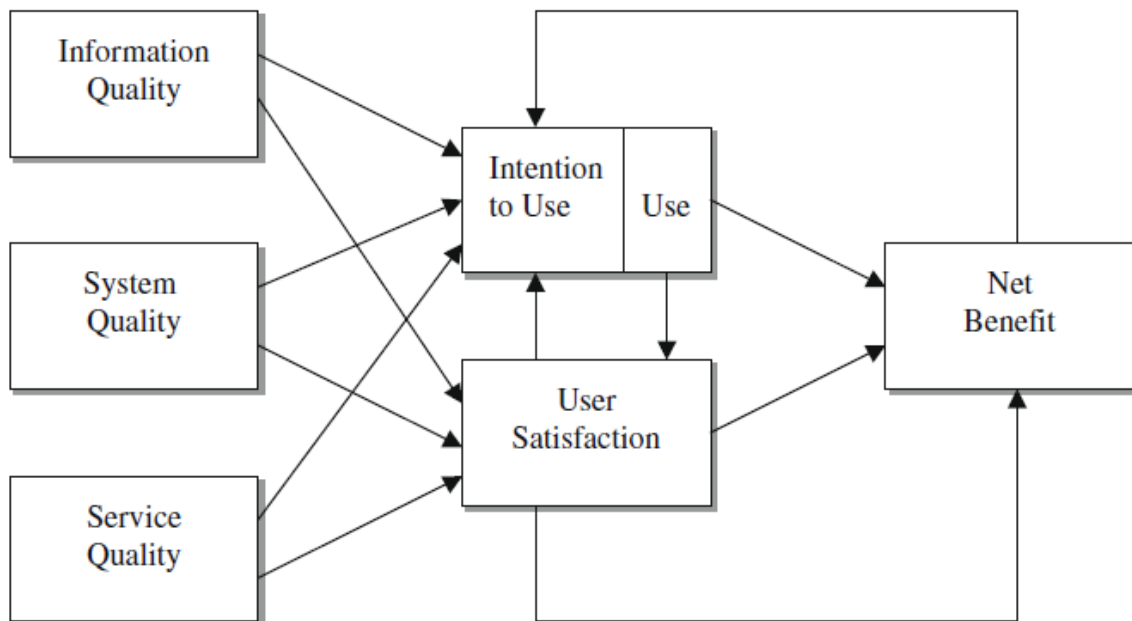
Our paper aims to systematically and specifically explore the factors affecting the satisfaction of individual customers with Internet Banking and Mobile Banking services in Ho Chi Minh City and then compare the impact of these factors on these services. The results of the study not only help state management agencies in the banking sector to propose policies and solutions to promote the development of Internet Banking as well as Mobile Banking services, towards the transformation from traditional banking to digital banking but also help commercial banks come up with solutions to increase customer satisfaction to develop these services being suitable with the existing technological capabilities of each commercial bank.

## **2. Literature review**

### ***2.1. The Information System Success (ISS) model of DeLone and McLean (2003)***

In 1992, DeLone and McLean proposed the ISS model for six factors of information success, including use, information quality, user satisfaction, system quality, organizational

impact, and individual impact. After that, they updated their ISS model in 2003 by adding service quality factor and net benefit which is replaced for individual and organizational impact (Figure 1). This new ISS model measures multidimensional and multivariate: service quality, information system, and system quality affecting customer satisfaction and intent to use/use, and intent to use/use correlates with satisfaction. Information quality concerns the output characteristics of an information system such as completeness, accuracy, relevance, timeliness, and currency. System quality concerns the reliability, convenience, easy-to-use, functional information system performance, and other metrics of the system. Service quality refers to the customer training, system maintenance, and troubleshooting that the information system provider will perform during its service provision. Service quality has relationships with customer satisfaction and their intent to use the service. As a result, customer satisfaction and the intent to use/use impact the net benefit. The net benefit is the most important success measure because of the balance capture of positive and negative impacts on customers and the organization. If the services based on an information system are to be continued, the net benefit from the owner's perspective, and then this leads to the use and customer satisfaction.



**Figure 1.** The ISS model (DeLone & McLean, 2003)

The ISS model has been applied and modified by researchers in many fields, particularly in e-banking.

Lee and Chung (2009) modified the ISS to study the satisfaction of 276 customers using Mobile Banking services in Korea. They added 02 new factors to this model: customer trust and interface design quality. The research results proved that customer satisfaction was positively influenced by information quality, customer trust, and system quality. Moreover, system quality, information quality, and interface design quality had a positive correlation with the trust of customers.

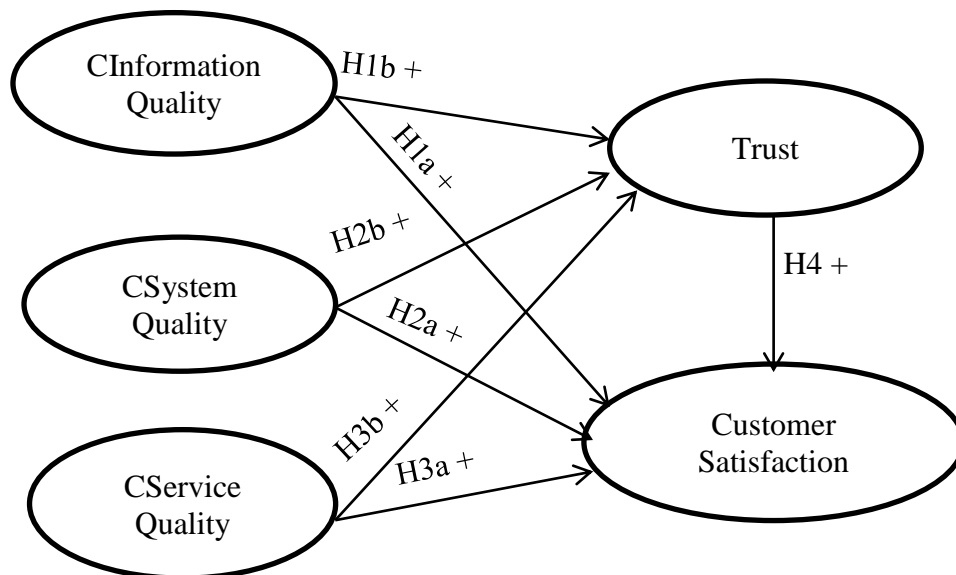
Koo, Wati, and Chung (2013) extended the ISS model to e-banking by adding customer trust as a success variable in Indonesia. Research results showed that for Internet Banking service, customer trust positively affected customer satisfaction; system quality and information quality had positive correlations with perceived usefulness and customer satisfaction. For Mobile

Banking services, customer trust is positively influenced by perceived usefulness and customer satisfaction; customer satisfaction was positively impacted by perceived usefulness and system quality; perceived usefulness and system quality had a positive correlation.

Damabi et al. (2018) also applied the ISS model (DeLone & McLean, 2003) and the model of Lee and Chung (2009) to study customer satisfaction and customer trust through an empirical survey of 155 customers using the Mobile Banking service of City Bank in Iran. They indicated that customer trust and interface design quality positively affected customer satisfaction. Moreover, the trust of customers had a relationship with interface design quality, system quality, and information quality.

**2.2. The research model and hypotheses**

The ISS model (DeLone & McLean, 2003) focused on information systems’ impact at 02 levels: organization and individual. We built our model on the individual level including information quality, system quality, service quality, and their subsequent impact on customer satisfaction and the trust of customers (Figure 2).



**Figure 2.** The proposed research model

- Information quality: DeLone and Mclean (2003) and Koo et al. (2013) showed that information quality is an important factor that positively impacts the satisfaction of customers when using Internet Banking. Lee and Chung (2009) demonstrated that information quality has a positive relationship with customer satisfaction and trust of customers in Mobile Banking services. Koo et al. (2013) found that the relationship between information quality and customer satisfaction was positive. Moreover, Damabi et al. (2018) also proved that the impact of information quality on the trust of customers in the Mobile Banking service in Iran was significant and positive. Therefore, we hypothesize:

*H1a: Information quality has a positive relationship with customer satisfaction*

*H1b: Information quality has a positive relationship with trust*

- System quality: Delone and Mclean (1992, 2003); Liu and Arnett (2000); Lee and Chung (2009) indicated that system quality is a key factor that strongly influences the satisfaction of customers and trust. According to the authors, system quality is measured by ease

of use (Doll & Torkzadeh, 1988; Gable, Sedera, & Chan, 2008; Iivari, 2005; Sedera, Gable, & Chan, 2004), transaction speed, and transaction speed. (Aladwani & Palvia, 2002; Iivari, 2005; Liao & Cheung, 2002), security (Hsu, 2008; Madu & Madu, 2002), and interface design (Liu, He, Gao, & Xie, 2008; Zviran, Glezer, & Avni, 2006). Damabi et al. (2018) also illustrated that the relationship between system quality on trust in Mobile Banking was significant and positive. Moreover, Koo et al. (2013) also found that system quality positively impacted the satisfaction of customers with Mobile Banking and Internet Banking. Thus, we hypothesize:

*H2a: System quality has a positive relationship with customer satisfaction*

*H2b: System quality has a positive relationship with trust*

- Service quality: DeLone and McLean (2003) showed that in the ISS model, service quality concerns the quality of customer support services and is a key factor that positively affects customer satisfaction. Widiatmika and Subawa (2017) proved that service quality positively affects the trust and satisfaction of customers in the Mobile Banking service. Ma (2012) indicated that the correlation between service quality and customer satisfaction in Internet Banking was positive. Hence, we hypothesize:

*H3a: Service quality has a positive relationship with customer satisfaction*

*H3b: Service quality has a positive relationship with trust*

- Trust: Morgan and Hunt (1994) indicated that trust arises when customers trust the integrity and reliability of suppliers. In business, trust is seen as a catalyst in many transactions between buyers and sellers to enhance the satisfaction of customers (Yousafzai, Pallister, & Foxall, 2003). Therefore, the concept of trust in this paper is the trust of customers in the organization that provides Internet Banking and Mobile Banking services, as well as the trust of customers in the mechanism of organizing transactions. Moreover, customer trust concerns reputation, technology orientation, and perceived risk (Mukherjee & Nath, 2003). Lee and Chung (2009) confirmed that customer trust positively impacts customer satisfaction, the more customers trust online banking services (Mobile Banking services), the more satisfied they are. Similarly, Damabi et al. (2018) also found that customer trust significantly and positively impacted customer satisfaction with the Mobile Banking service. Thus, we hypothesize:

*H4: Trust has a positive correlation with the satisfaction of customers*

### **3. Research methodology**

Our research goes through two phases: The first phase is qualitative research aimed at building and strengthening a theoretical research model through direct discussions with some experts in the banking sector as well as the same field research previously published. The second phase is quantitative research to identify and measure factors affecting the satisfaction of individual customers with Internet Banking (IB) and Mobile Banking (MB) services. All scales in this study are multivariate scales. We use a 5-point Likert: 1 being completely disagreed, up to 5 completely agreed. The scale in the study is presented in detail in Table 1 below.

**Table 1**

Summary of research scale

<b>Variables</b>	<b>Items</b>	<b>Measurement</b>
Information Quality (INQ)	INQ1	IB/MB provides me with all the useful information
	INQ2	IB/MB provides all the complete information that I need
	INQ3	IB/MB provides me with information concerning transactions
	INQ4	IB/MB provides all the current information
	INQ5	IB/MB quickly provides me with the information
	INQ6	IB/MB provides all the information being well format and clear
	INQ7	IB/BM provides me with all the exact information
System Quality (SYQ)	SYQ1	The website/app of IB/MB is easy to use
	SYQ2	The procedure of registration of IB/MB is simple
	SYQ3	IB/MB has a reliable security system
	SYQ4	The speed of transaction processing is quick
	SYQ5	The speed to connect to the Website/App is quickly
	SYQ6	The interface of IB/MB is designed to ease to use
	SYQ7	The interface of IB/MB is designed well
Service Quality (SEQ)	SEQ1	IB/MB has staff who is available to assist the customer
	SEQ2	IB/MB's staff is dedicated to assisting and helping the customer
	SEQ3	IB/MB provides services for safety
	SEQ4	Customers' questions or complaints are always resolved satisfactorily
	SEQ5	IB/MB's service fees are always stable and competitive
Trust (TRUST)	TRUST1	I feel that IB/MB always cares about the benefit of the customer
	TRUST2	I feel that IB/MB provides me with good service
	TRUST3	I feel confident in providing personal information during the transaction process on IB/MB
	TRUST4	Overall, I trust IB/MB
Customer satisfaction (SAT)	SAT1	I'm satisfied with the IB/MB's transaction processing
	SAT2	I'm satisfied with the IB/MB's services
	SAT3	I think I made the right decision to use IB/MB
	SAT4	IB/MB provides all services that I expected
	SAT5	Overall, I satisfy IB/MB

Source: The researcher's data analysis

Research data is surveyed through detailed questionnaires in a convenient method, with the survey subjects being customers who have used Internet Banking and/or Mobile Banking and are currently living and working in Ho Chi Minh City. There were 02 questionnaires for respondents using Internet Banking and one using Mobile Banking. Moreover, the respondents would answer both of them if they used 02 services.

The size of the sample applied in the study is based on the requirements of the Exploratory Factor Analysis (EFA) and the Structural Equation Model (SEM). Hair, Black, Babin, Anderson, and Tatham (1998) indicated that the sample size applied for EFA analysis must be at least 5 times the number of observed variables. With our model having 28 observed variables, the minimum sample size is 140 samples. On the other hand, the sample size needs to be considered to the number of parameters to be estimated, and if ML (Maximum Likelihood) estimation method is used, the minimum sample size should be between 100 and 150 so that indicators such as TLI, CFI are relatively stable and consistent based on the ML estimation method at sample size 250 or larger (Hair, Anderson, Babin, & Black, 2010). Therefore, the sample size applied to this study is 430 to prevent invalid sample collection. After removing invalid cases in the sample, the valid ones were 420 (satisfying the required sample size condition). Our official sample size was 415 for Mobile Banking and 409 for Internet Banking. All data were coded and analyzed data using SPSS 25.0 and AMOS 20.0 software.

## 4. Results and discussion

### 4.1. Descriptive statistics

**Table 2**

Sample description

Item	Frequency	Percentage
<i>Number of users</i>		
Internet Banking and Mobile Banking	404	96.19
Internet Banking only	5	1.19
Mobile Banking only	11	2.62
<i>Gender</i>		
Female	215	51.19
Male	205	48.81
<i>Usage time (per week)</i>		
Under 2	162	38.57
2 - 3	154	36.67
Over 3	104	24.76
<i>Education level</i>		
High School	2	0.48
Intermediate	13	3.10
College	27	6.42
University	328	78.10

Item	Frequency	Percentage
Over university	50	11.90
<i>Time for using (year)</i>		
Under 1	29	6.90
1 - 3	64	15.24
4 - 6	256	60.95
Over 6	71	16.91
<i>Commercial Banks</i>		
BIDV	97	23.10
Vietcombank	147	35.00
Vietinbank	63	15.00
Agribank	43	10.24
Sacombank	29	6.90
Others	41	9.76

Source: The researcher’s data analysis

Table 2 shows the official sample description (420 responses). The number of respondents using both Internet Banking and Mobile Banking services was 404 (96.19%). There were 05 and 11 respondents only using Internet Banking and Mobile Banking services respectively. 215 respondents were female (51.19%) and 205 were male (48.81%). The majority of participants used Internet Banking and/or Mobile Banking services under 02 times per week (38.57%) and from 02 to 03 times per week (36.67%). Moreover, most of them have experience in using Internet Banking and/or Mobile Banking service from 04 to 06 years (60.95%). The majority of the respondents graduated from university (78.10%) and the minority of the respondents did from high school (0.48%). The majority of participants used the Internet Banking and Mobile Banking services of Vietcombank, BIDV, Vietinbank, Agribank, and Sacombank with 35%, 23.1%, 15%, 10.24%, and 6.9%, respectively. Other banks accounted for 9.76%.

**4.2. Cronbach’s Alpha test for reliability of the scale and Exploratory Factors Analysis (EFA)**

**Table 3**

The result of the scale reliability test

Items	Number of initial variables		Number of variables after analysis		Cronbach’s Alpha	
	IB	MB	IB	MB	IB	MB
INQ	7	7	5	6	0.894	0.887
SYQ	7	7	5	6	0.893	0.855
SEQ	5	5	5	5	0.943	0.837
TRUST	4	4	4	4	0.851	0.865
SAT	5	5	5	5	0.899	0.875

Source: The researcher’s data analysis

Table 3 showed that all scales of IB and MB met reliability requirements with the minimum value of Cronbach's Alpha being 0.851 and 0.837, respectively. The observed variables being eliminated were INQ4, INQ2, SYQ5, SYQ6 for IB, and INQ5, SYQ6 for MB.

**Table 4**

The results of Exploratory Factors Analysis (EFA)

		<b>IB</b>	<b>MB</b>
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.905	0.931
Bartlett's Test of Sphericity	Approx. Chi-Square	6973.556	5458.095
	Df	276	300
	Sig.	0.000	0.000
Extraction Sums of Squared Loadings	Cumulative %	66.353	57.643

Source: The researcher's data analysis

Regarding IB, all 24 items loaded on five factors with Eigenvalues greater than 1, the cumulative percent of 66.353% and KMO values = 0.905 > 0.5. Bartlett's test is significant at  $p = 0.000 < 0.05$  for the variables measuring five factors. The observed variables of factors were strongly correlated.

Similarly, in the second EFA of MB, all 25 items loaded on five factors with Eigenvalues greater than 1, the cumulative percent of 57.643% and KMO values = 0.931 > 0.5. Bartlett's test is significant at  $p = 0.000 < 0.05$  for the variables measuring five factors (SYQ2 was eliminated). The observed variables of factors were strongly correlated.

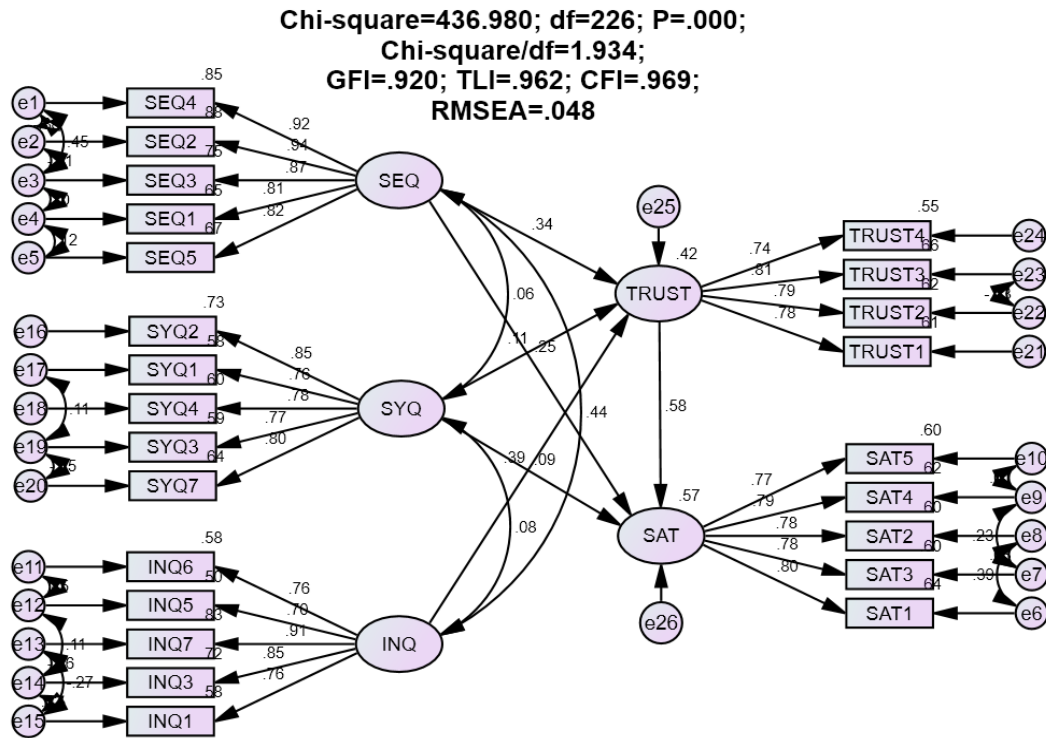
#### **4.3. Confirmatory Factor Analysis (CFA)**

The result of CFA for IB showed that model fit was acceptable with the data collected (Chi-square = 436.348;  $df = 225$ ;  $p = 0.000 < 0.05$ ; chi-square/ $df = 1.939 < 2$ ; GFI = 0.920 > 0.9; TLI = 0.962 > 0.9; CFI = 0.969 > 0.9; RMSEA = 0.048 < 0.08). Similarly, the model fit of MB was too (Chi-square = 382.155;  $df = 265$ ;  $p = 0.000 < 0.05$ ; chi-square/ $df = 1.442 < 2$ ; GFI = 0.928 > 0.9; TLI = 0.975 > 0.9; CFI = 0.978 > 0.9; RMSEA = 0.033 < 0.08). All the Standardized Regression Weights of IB and MB were over 0.5 ( $p$  - value = 0.000), so all observed variables were convergent validity.

All Composite Reliability (CR) scores were well (over 0.862 for IB and 0.840 for MB) and the Average Variance Extracted (AVE) values were over 69.9% for IB and 51.4% for MB. Thus all the scales were high reliability. Moreover, the correlations of the constructs with the square root of the AVE were diagonal. All the variables achieved a significant level ( $p < 0.01$ ). Thus, the test of discriminant validity for all observed variables was acceptable.

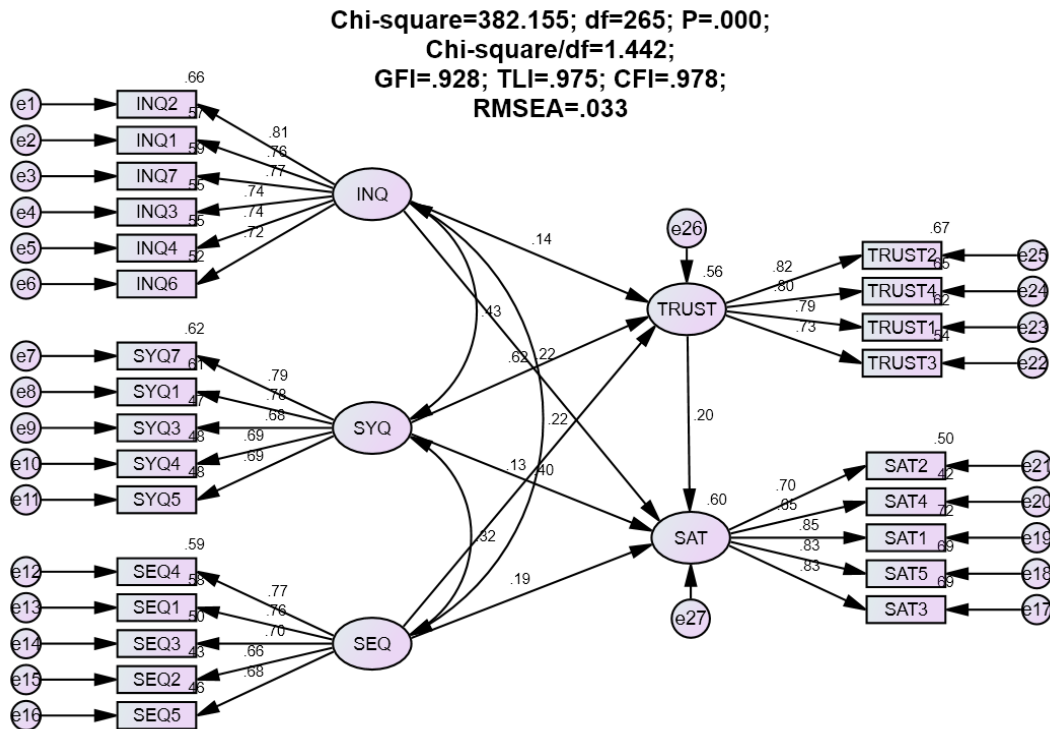
#### **4.4. The Structural Equation Model (SEM)**

In the first test for IB's SEM, the relationship between information quality (INQ) with satisfaction (SAT) having  $p > 0.05$  was eliminated from the model because it was not statistically significant. The results of the second test showed that the SEM was a good fit for IB with Chi-square = 436.980;  $df = 226$ ;  $p = 0.000 < 0.01$ ; Chi-square/ $df = 1.934 < 2$ ; GFI = 0.920 > 0.9; TLI = 0.962 > 0.9, CFI = 0.969 > 0.9 and RMSEA = 0.048 < 0.08 (Figure 3). Therefore, we can conclude that the IB's research model was completely consistent with the collected data and statistical significance at a 99% confidence level ( $p < 0.01$ ).



**Figure 3.** The IB's results of the structural equation model analysis

Figure 4 showed the SEM was a good fit for MB with Chi-square = 382.155; df = 265; p = 0.000 < 0.01; Chi-square/df = 1.442 < 2; GFI = 0.928 > 0.9; TLI = 0.975 > 0.9, CFI = 0.978 > 0.9 and RMSEA = 0.033 < 0.08. Therefore, we can conclude that the MB's research model was completely consistent with the collected data and statistical significance at a 99% confidence level (p < 0.01).



**Figure 4.** The MB's results of the structural equation model analysis

#### 4.5. Hypothesis test of model

Based on the results of the SEM analysis, the result of hypothesis testing was shown in Table 5.

**Table 5**

Results of the hypothesis test

Hypotheses		IB			MB		
		P	Standardized Regression Weights	Result	P	Standardized Regression Weights	Result
H1a+	INQ --> SAT	0.397	0.042	Rejected	0.000	0.219	Accepted
H1b+	INQ --> TRUST	0.000	0.393	Accepted	0.005	0.139	Accepted
H2a+	SYQ --> SAT	0.033	0.089	Accepted	0.000	0.401	Accepted
H2b+	SYQ --> TRUST	0.013	0.112	Accepted	0.000	0.621	Accepted
H3a+	SEQ --> SAT	0.000	0.246	Accepted	0.000	0.187	Accepted
H3b+	SEQ --> TRUST	0.000	0.343	Accepted	0.005	0.134	Accepted
H4+	TRUST --> SAT	0.000	0.579	Accepted	0.004	0.196	Accepted

Source: The researcher's data analysis

In the context of Internet Banking service, customer trust positively and strongly affect customer satisfaction, so hypothesis H4 is accepted. This means that trust is a key factor affecting customer satisfaction. Moreover, service quality and system quality impacted positively customer satisfaction, as a result of accepting hypotheses H3a and H2a. These indicated that increasing trust, service quality, and system quality led to enhance customer satisfaction. However, there was no correlation between information quality and customer satisfaction implying that hypothesis H1a was rejected. As expected, information quality, service quality, and system quality had a significant positive impact on trust leading to accept hypotheses H1b, H3b, and H2b.

In the case of the Mobile Banking service, all hypotheses (H1a, H1b, H2a, H2b, H3a, H3b, H4) are accepted. These results also suggest that if commerce bankings increase system quality, information quality, and service quality, the customer would increase their satisfaction and trust in Mobile Banking service. Moreover, more trust in the Mobile Baking service leads to more satisfaction with this service.

#### 4.6. Discussions

Our proposed research model was built from the ISS model (DeLone & McLean, 2003). Through empirical research at HCM city, we tested our model for Internet Banking and Mobile Banking services. The empirical results affirmed that our model was suitable to apply for Internet Banking and Mobile Banking services. There was only one hypothesis for Internet Banking service being rejected.

Regarding to Internet Banking, the most important factor affecting customer satisfaction was customers' trust. It meant that the more trust customers have may lead to more satisfaction. Moreover, customers also focused on system quality and service quality but they did not focus on information quality. However, information quality was the most significant variable

impacting customers' trust, so it was an indirect factor impacting customer satisfaction. Thus, to enhance customer satisfaction, commercial banks need to focus on 03 dimensions (system quality, service quality, and information quality) of the ISS model (DeLone & McLean, 2003) for developing successfully this service in the future.

Regarding to Mobile Banking, customers were most aware of system quality rather than information quality, trust, and service quality. Mobile Banking was a service being designed as a way to connect wireless devices and smartphones, hence customers may focus on connecting to their account, transaction process, and security. This was the reason why system quality was the most significant factor affecting customer satisfaction for Mobile Banking. Interestingly, system quality was an indirect factor affecting customer satisfaction as it was the most important factor affecting customers' trust and trust had a positive significant correlation with customer satisfaction. Moreover, service quality and information quality positively impacted customer trust. Therefore, commercial banks need to focus on information quality, system quality, and service quality, especially system quality to develop Mobile Banking because the more satisfied customer may lead to more using this service.

## **5. Conclusions and recommendations**

The paper extended the ISS Model (DeLone & McLean, 2003) to apply to Internet Banking and Mobile Banking services. We analyzed the Structural Equation Model (SEM) through AMOS 20.0 software. The result of the research model is completely consistent with the collected data for both services and is statistically significant at a 99% confidence level ( $p < 0.01$ ). By comparing Internet Banking and Mobile Banking services, our research indicated that the customers tended to have different focuses on the determinants affecting their satisfaction. The most important factor impacting customer satisfaction was trust for Internet Banking while one was system quality for Mobile Banking. Information quality didn't impact customer satisfaction for Internet Banking but it was the second important factor affecting satisfaction for Mobile Banking. The service quality least affected customer satisfaction for Mobile Banking, whereas it secondly affected customer satisfaction for Internet Banking. Moreover, system quality, information quality, and service quality had significant positive correlations with trust for all 02 services, and these factors are organized from high to low following: information quality, service quality, system quality for Internet Banking, and system quality, information quality, service quality for Mobile Banking.

Based on the above results, we propose some recommendations for commercial banks providing Internet Banking and Mobile Banking services to improve individual customer satisfaction, and also how to develop each service:

Firstly, to improve the quality system, commercial banks need to focus on improving the quality and security of customers' financial transactions and overcome weaknesses in their systems to avoid hackers' attacks. Besides, they need to improve the configuration of the server of their system to increase the transaction access speed of the service and improve the quality of the website for Internet Banking or application for Mobile Banking toward ease of use for customers.

Secondly, to enhance service quality, commercial banks need to set standards for customer support services, especially focusing on answering questions and complaints, which must be resolved quickly and satisfactorily worth. Moreover, they need to remain or decrease

the fees of Mobile Banking and Internet Banking services to enhance customers' demand using these services.

Thirdly, to increase the information quality, commercial banks need to have a professional team to control and manage the information displayed on their website for Internet Banking and application for Mobile Banking. This information must be useful, exact, clear, and up-to-date, as well as be displayed well format.

Finally, trust was the most essential in Internet Banking, whereas system quality was the most important factor affecting customer satisfaction in Mobile Banking. This means that, if commercial banks want to develop Internet Banking services, they need to increase customers' trust, as a result, they need to also enhance service quality, information quality, and system quality. By contrast, if commercial banks want to develop Mobile Banking services, they need to be aware of the system quality. Therefore, the commercial banks' managers should focus on these correlations when they have to give a decision on how to invest or choose to develop Internet Banking or Mobile Banking services.

## ACKNOWLEDGMENTS

Our paper was conducted with the financial support received from the research project (CS-CB21-KT-11) of Nong Lam University.

---

## References

- Aladwani, A. M., & Palvia, P. C. (2002). Developing and validating an instrument for measuring user-perceived web quality. *Information & Management*, 39(6), 467-476.
- Bang Tam (2021). *Ngày không tiền mặt 2021 hướng đến người thu nhập thấp [Cashless Day 2021 is aimed at low-income people]*. Retrieved October 10, 2021, from Báo điện tử của Chính phủ Việt Nam website: <http://baochinhphu.vn/Tai-chinh/Ngay-Khong-tien-mat-2021-huong-den-nguoi-thu-nhap-thap/434707.vgp>
- Damabi, M., Firoozbakht, M., & Ahmadyan, A. (2018). A model for customers satisfaction and trust for mobile banking using Delone and Mclean model of information systems success. *Journal of Soft Computing and Decision Support Systems*, 5(3), 21-28.
- Delone, W. H., & Mclean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60-95.
- Delone, W. H., & Mclean, E. R. (2003). The Delone and Mclean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9-30.
- Do, A. T. N. T (2016). *Các nhân tố ảnh hưởng đến việc sử dụng Internet Banking của khách hàng ở các ngân hàng thương mại Việt Nam [Factor influences on the use of Internet Banking by customers at Vietnamese commercial banks]* (Doctoral dissertation). National Economics University, Hanoi, Vietnam.
- Doll, W. J., & Torkzadeh, G. (1988). The measurement of end-user computing satisfaction. *MIS Quarterly*, 12(2), 258-274.
- Gable, G. G., Sedera, D., & Chan, T. (2008). Re-conceptualizing information system success: The IS-impact measurement model. *Journal of the Association for Information Systems*, 9(7), 377-408.

- Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate data analysis* (7th ed.). New York, NY: Prentice-Hall.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). *Multivariate data analysis*. New York, NY: Prentice-Hall.
- Hsu, S. H. (2008). Developing an index for online customer satisfaction: Adoption of American customer satisfaction index. *Expert Systems with Application*, 34(4), 3033-3042.
- Hsu, Y. I., & Nguyen, T. M. (2016). Service quality, customer satisfaction, and customer loyalty of Internet banking in Vietnam. *International Review of Management and Business Research*, 5(4), 1485-1496.
- Iivari, J. (2005). An empirical test of the DeLone-McLean model of information system success. *The Data Base for Advances in Information Systems*, 26(2), 8-27.
- Koo, C., Wati, Y., & Chung, N. (2013). A study of mobile and Internet banking service: Applying for IS success model. *Asia Pacific Journal of Information Systems*, 23(1), 65-86.
- Lee, K. C., & Chung, N. (2009). Understanding factors affecting trust in and satisfaction with mobile banking in Korea: A modified DeLone and McLean's model perspective. *Interacting with Computers*, 21(5/6), 385-392.
- Liao, Z., & Cheung, M. T. (2002). Internet-based e-banking and consumer attitudes: An empirical study. *Information & Management*, 39(4), 283-295.
- Liu, C., & Arnett, K. P. (2000). Exploring the factors associated with Web site success in the context of electronic commerce. *Information & Management*, 38(1), 23-33.
- Liu, X., He, M., Gao, F., & Xie, P. (2008). An empirical study of online shopping customer satisfaction in China: A holistic perspective. *International Journal of Retail & Distribution Management*, 36(11), 919-940.
- Ma, Z. (2012). Factors affect the customer satisfaction of Internet banking: An empirical study in China. *Journal of Convergence Information Technology*, 7(3), 101-109.
- Madu, C. N., & Madu, A. A. (2002). Dimensionsofe-quality. *International Journal of Quality & Reliability Management*, 19(3), 246-258.
- Morgan, R. M., & Hunt, S. D. (1994). The commitment trust theory of relationship marketing. *Journal of Marketing*, 58(July), 20-38.
- Mukherjee, A., & Nath, P. (2003). A model of trust in online relationship banking. *International Journal of Bank Marketing*, 21(1), 5-15.
- Musiime, A., & Ramadhan, M. (2011). Internet banking, consumer adoption, and customer satisfaction. *African Journal of Marketing Management*, 3(10), 261-269.
- Nguyen, M. T. B., Khuc, N. D., & Phan, H. T. L. (2021a). Mô hình nghiên cứu các nhân tố ảnh hưởng đến sự hài lòng của khách hàng cá nhân về dịch vụ Internet Banking [The model studies determinants affecting individual customers satisfaction about Internet Banking service]. *Tạp chí Kinh tế-Kỹ thuật Đại học Kinh tế Kỹ thuật Bình Dương*, 32(1), 39-46.
- Nguyen, M. T. B., Khuc, N. D., & Phan, H. T. L. (2021b). Các nhân tố ảnh hưởng đến sự hài lòng của khách hàng cá nhân về dịch vụ Internet Banking của các ngân hàng thương mại

tại Thành phố Hồ Chí Minh [Determinants affecting individual customers satisfaction about Internet Banking service of commercial banks in Ho Chi Minh City]. *Tạp chí Khoa học Đại học Mở Thành Phố Hồ Chí Minh-Kinh tế và Quản trị kinh doanh*, 16(3), 121-134.

- Nimako, S. G., Gyamfi, N. K., & Wandaogou, A. M. M. (2013). Customer satisfaction with internet banking service quality in the Ghanaian banking industry. *International Journal of Scientific & Technology Research*, 2(7), 165-175.
- Sedera, D., Gable, G., & Chan, T. (2004). A factor and structural equation analysis of the enterprise systems success measurement model. In *Proceedings of the 10th Americas conference on information systems* (pp. 676-682). Washington, D.C.: Association for Information Systems.
- Seyal, A. H., & Rahim, M. M. (2011). Customer satisfaction with internet banking in Brunei Darussalam: Evaluating the role of demographic factors. *e-Service Journal: A Journal of Electronic Services in the Public and Private Sectors*, 7(3), 47-68.
- Tran, M. T., & Nguyen, K. M. (2011). Các nhân tố ảnh hưởng đến sự hài lòng về chất lượng dịch vụ Internet-banking của khách hàng cá nhân [Factors affecting the individual customer's satisfaction at Internet Banking services quality]. *Kinh tế và quản trị kinh doanh*, 6(3), 52-65.
- Vu, T. H., & Vu, L. D. (2016). Hướng phát triển dịch vụ “Mobile Banking” cho các ngân hàng Việt Nam [Development direction of “Mobile Banking” service for Vietnamese banks]. *Tạp chí Ngân hàng*, 11(6), 36-41.
- We Are Social and Hootsuite. (2021). *The global state of digital 2021 report*. Retrieved October 10, 2021, from <https://wearesocial.com/digital-2021>
- Widiatmika, I. G. N. A., & Subawa, N. S. (2017). Effect of service quality and recovery service quality mobile banking service to e-trust, e-satisfaction and e-loyalty mobile banking users of local bank customer in Bali. *Imperial Journal of Interdisciplinary Research (IJIR)*, 3(3), 1252-1260.
- Yousafzai, S. Y., Pallister, J. G., & Foxall, G. R. (2003). A proposed model of e-trust for electronic banking. *Technovation*, 23(11), 847-860.
- Zviran, M., Glezer, C., & Avni, I. (2006). User satisfaction from commercial web sites: The effect of design and use. *Information & Management*, 43(2), 157-178.

