Czech University of Life Sciences

Faculty of Economics and Management

Department of Informatics and Technology

Bachelor thesis

Analysis of the e-banking service in Vietnam

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Department of Information Technologies

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Truong Doan Khue

Economics and Management

Thesis title
Analysis of e-banking services in Vietnam

Objectives of thesis

The main aim of this paper is to evaluate performance of e-banking service from the customer perspective in Vietnam.
The partial goals are such as:
- to make an overview of current situation e-banking services in Vietnam,
- to make a qualitative and quantitative assessment of e-banking services performance,
- to evaluate findings and make conclusion.

Methodology

Theoretical part of thesis will be based on secondary data analysis and literature reviews. The research will draw on qualitative and quantitative approach and the questionnaire survey will be done. Results from theoretical and practical research will be summarized and final conclusions will be formulated.

Schedule for processing

1) Preparation and study of specialized information resources, refinement of partial goals and selection of work process: 04-06/2013
2) Processing of literature overview according to information resources: 07-10/2013
3) Development of the own solution, discussion and evaluation of results: 11/2013 -01/2014
4) Creation of the final document of the thesis: 02-03/2014
5) Submission of thesis and abstract: 03/2014

The proposed extent of the thesis

30-40 pages

Keywords

E-banking, online banking, Vietnam, customer trust, satisfaction, security, future orientation.

Recommended information sources

Pearson, Bob Zehr, Dan Addicks, Mark. Pre-Commerce: How Companies and Customers Are Transforming Business Together. Jossey-Bass. 2011. pISBN: 9780470928448

Mahajan, C.P. Commerce and Business Management in Modern World. Global Media. 2008. 4th ed. pISBN: 9788183761437.

Mahmood Shah, Steve Clarke. E-Banking Management: Issues, Solutions, and Strategies. Information Science Reference, 2009. ISBN: 9781605662527.

Bank in Vietnam Blog: E-banking services in Vietnam. [last check 10/10/2013] http:// bankingvietnam.blogspot.cz/2007/11/e-banking-services-in-vietnam.html

The Bachelor Thesis Supervisor

Ulman Miloš, Ing., Ph.D.

Last date for the submission

March 2014

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Declaration

I hereby declare that I have worked on my Bachelor thesis titled " Analysis of the e-banking service in Vietnam " solely and completely on my own and that I have marked all quotations in the text. The literature and other material I have used are mentioned in the Preferences section of the thesis.

In Prague on 17th March 2014 _____

Truong Doan Khue

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I would like to take this opportunity to thank all those who have helped and supported me in writing this thesis.

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Analýza e-bankingu ve Vietnamu

Analysis of the e-banking service in Vietnam

Souhrn:

Svět se mění velkou rychlostí a technologie je považována za nedílnou součást veškerého dění kolem nás. Jakožto aplikace internetové technologie, e-banking zlepšuje tok peněz a transakce zboží a služeb ve všech zemích. Tato internetová služba je známá svými výraznými výhodami, jako například výrazné šetření času a peněz jedinců stejně jako podniků. Je zde však zřejmé, že se uživatelé této služby cítí také ohroženi různými nejistotami. Převážně v rozvíjejících se zemích, jako Vietnam, se e-banking dostává do podvědomí zákazníků. Právě proto se získávání důvěry zákazníků dostává mezi nejdůležitější aspekty zlepšujících se životních standardů 90ti milionové populace Vietnamu. Tato práce nazvaná „ Analýza e-bankingu ve Vietnamu "se zabývá analýzou e-bankingových služeb z pohledu zákazníků. Dále se také zabývá tím, jak zlepšit kvalitu e-bankingu ve Vietnamu.

Klíčová slova:

E-banking, online bankovnictví, Vietnam, důvěra zákazníků, využitelnost, bezpečnost, budoucí záměr.

Summary

The world is now changing at a rapid rate and technology is considered to be a key driven in every aspects around us. As an application of internet technology, e-banking enhances the cashflow and transaction of goods and services in every country. This online services stands for its enormous benefits as significant time and cost savings for individuals as well as entreprises. However, those who are using e-banking services also feel vulnerable toward risks and uncertainties. Especially in the developing countries, like Vietnam, e-banking services has just made its first stage into the perception of consumers. Therefore gaining the trust of e-banking customers has become more and more essential as huge potential demand from the increasing living standards of 90 million population in the country. This bacherlor thesis named Analysis of the E-Banking Services in Vietnam aims to analyze the performance of E-banking activities under the customers perspectives, and to develop the most suitable method of improving the quality of e-banking services in Vietnam.

Keywords: e-banking, online banking, Viet Nam, customer trust, usability, security, future orientation.

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Table and Figures

1 Introduction:

Online banking or e-banking is one of the most important inventions that changed the banking business over decades. The revolution of online banking has promoted variety of strategic behaviors from banks toward their customers. As the world moves faster everyday, time management has become more and more essential within banking providing services. With the adaption of Information and Communication Technology (ICT), banks have delivered excellent online services to the customers. E-banking has not only declined time and cost consumption, but also significantly increased the business efficiency by combining with other services outside of banking sector such as shopping, insurance, housing, etc… A customers can now sit comfortably at one place and control majority of his business or daily activities with the support of modern ICT including E-banking.

E-banking has created new environment for banks in expanding their business. Banks now can approach toward new markets and customers. Especially in the developing country such as Vietnam, the common living standard and demands for goods and services are drastically increasing over years. Even thought e-banking system has been developed for more than 8 years from 2005. This online service is still facing obstacles in searching for its position in Vietnamese customers trust. Despite the outstanding benefits, there are still existing reasons within customers' perception such as traditional saving and shopping, uncertainty of transaction and delivery, underdeveloped infrastructures in online banking supports. As the demand for living is changing day by day, it is essential to understand the behavior of these customers to develop the suitable strategic management for e-banking activities in Vietnam. Because e-banking service has a long history in the world but it is only in its first stage of development in Vietnam.

2 Thesis objectives and methodology

2.1. Thesis objectives

This bachelor thesis aimed to evaluate the performance of E-banking activities in Vietnam under the customers perspectives by analyzing the impacts of selected E-banking factors influencing their decision making process. These factors are categorized into four different groups as security, usability, future orientation and trust of customers. There are two selected target market that are expected to reflect the whole situation of E-banking in Vietnam, The customers in big cities (Hanoi and Ho Chi Minh City – Hanoi & HCMC) and the customers in other collected cities as the second target group.

In order to perform the analysis, this bachelor thesis also aims to verify two hypotheses:

- The customers E-banking expectation and satisfaction in big cities is relatively higher than other locations in Vietnam
- The E-banking factors of security, usability and future orientation have different impacts upon trust of customers toward E-banking services in two selected groups.

2.2.   Methodology

This research was based on qualitative and quantitative approach. The qualitative research was performed by collecting data from customers' behavior questionnaires. The collected data then was transferred into quantitative number in type of scale data (1-5) to conduct the analysis. The questionnaires consisted of four identical questions (location, age group, career and gender) and sixteen behavior question related to E-banking services interaction. These sixteen behaviors questions then regroup into four main perceived factors influencing the customers' decision making in E-banking (Security, Usability, Future orientation and Customers trust). The questionnaires were conducted by online survey and sent to the E-banking users in Vietnam in different cities.

In order to verify the first hypothesis, *"The customers E-banking expectation and satisfaction in big cities is relatively higher than other locations in Vietnam"* the research compared of generated mean value from sixteen questions collected from questionnaires. The graph and mean value was created by the Microsoft Excel program.

For the second hypothesis, *"The E-banking factors of security, usability and future orientation have different impacts upon trust of customers toward E-banking services in two selected groups"* the research created the linear regression model of the perceived factors. This model reflected the interrelationship and statistical correlation between independent variables and dependent variable

The linear regression model in target location was formulated in

$$Y = a + b*X1 + c*X2 + d*X3$$

Where	Y	=	dependent variable – customers trust
	X1	=	independent variable – security factors
	X2	=	independent variable – Usability factors
	X3	=	independent variable – Future orientation factors
a, b, c, d		=	parameters of generated model

[1]The regression model then was verified by mathematic and statistic method to identify which independent factor had either positive or negative to dependent variable. The statistical verification was conducted by comparing the generated p-value of each parameter with the significant level of 0.05 (5%). If the p-value is less than significant level, the related factors have statistical impact in the model. In the opposite, if the p-value is greater than significant level, the related factors are not statistically significant in the model. The other additional statistic instrument was also analyzed to enhance the effectiveness of the model such as coefficient of determination R^2 and correlation matrix of independent variables[2].

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[1] Sonia, Taylor. Business Statistics. 3rd ed. 2007; Plgrave Macmilan publisher. 2007; ISBN: 978-0-230-50646-6

[2] H.R. Seddighi, K.A. Lawler, A.V. Katos. Econometrics: A practical approach; Routledge publisher. 2000; ISBN 0-425-15644-0

3 Literature review

3.1.   Definition and history of E-Banking

Electronic Banking services (or E-Banking) is understood as the performance of banking activities without direct interactions and transactions between customers and brick-and-mortal banking institutes (commercial banks). In the wider definition, E-Banking is the combination of traditional banking activity with the extensive use of information technology. E-Banking service is one type of E-commerce specified for banking system. In more details, E-banking is the informatics application what allows the customers to access and interact with commercial banks with the support of necessary modern devices and technologies (Personal computer, internet, mobile phone, Automatic Teller Machince-ATM).

History of E-banking:

[3]In the early 1990s, many US leading commercial banks introduced the new technology home banking which allows the customers to conduct their essential banking business activities via personal computers (PCs) at home or office without visiting the physical institutions. The commercial banks set up their own intranet and offer the suitable devices for the customers to connect to the banking system. However the biggest obstacle in this service is operating cost. In order to implement this project, they had to share their profit with the technology companies and intermediaries such as Visa and ATM provider credit card. Including the marketing cost, the total cost of home banking was too high that the commercial bank forced to target the high income class and unable to expand their electronic business at that moment.

In the mid-1990s, the commercial use of internet for business and entrepreneurs was accepted. E-banking was divided into two sectors of business home banking and internet banking. The home banking system had comparative advantage of greater security,

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[3] R. Guttmann. Cybercash : The Coming Era of Electronic Money; Palgrave Macmilan publisher 2003; ISBN: 0-333-98730-6

while online banking had greater concern of operating cost. Internet had provided the ready infrastructure of computerization in banking system with lower total cost and marketing delivery. Due to huge investment of their system intranet, the previous banks were unable to adopt the new application of internet. But despite of better performance, internet banking sector also faced its obstacle. At that time, even in US, the internet adoption was relative low. [4]In 2002 there was only 13% of US household used internet. The web page services took about seven years to be able meet the friendly usage for customers. Including the low security, internet banking grew slowly in the market share. At that time, a new bank companies were introduced which is called internet base banks. Without physical body, these commercial banks operated the transactions by electronic money. When using these services, the customers could only make transactions online and unable to withdraw the cash for traditional purchasing. With the purpose of cheaper banking services delivery, these internet based banks did not have their own ATM that later has become their major disadvantage with the mortal and brick commercial banks. The customers had to pay higher withdraw fees to receive physical cash. This inconvenience was enough to dissuade many households to use the internet base services banking at that time.

3.2. Types of e-banking

3.2.1. ATM- Automatic Teller Machine:

This is the oldest and most popular service of E-banking. The first ATM was invented by Shepherd Barron. The system then was widely applied in 1980s. Until now, ATM is the most perfect electronic banking system and money distribution in the banking activities. The ATM is the system of computers, information and cash storages connected to the commercial bank intranet. The customers can access to their bank account and make transactions with the credit or debit card. The modern ATM nowadays also has developed with more value added function such as cash deposit, foreign currency exchange and direct bill payment working in 24/7.

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[4] R. Guttmann. Cybercash : The Coming Era of Electronic Money; Palgrave Macmilan publisher 2003; ISBN: 0-333-98730-6

By using ATM, the commercial banks have significantly increased the operating efficiency like labour cost, business expansion, competitiveness and customers' relationship management. However this service also has many disadvantages such as high set up and maintenance cost, low information and marketing delivery to customers.

3.2.2. EFTPOS – Electronic Funds Transfer at Point of Sale

EFTPOS is the money transfer services usually allocated within shops and supermarkets. The amount of money used for the purchasing is transfer by electronic money from commercial banks to the certain shops by credit card reading devices. These devices allow the customers information reaching the information center[5]. The flow of information is coded to ensure the security. The information center then selects the specific commercial bank service to secure the customers related bank information:

- Card number
- Expired date
- Amount of cash delivery
- Identified registered number of shop
- Identified registered number of device
- Ect…

With the agreement of customers, the commercial bank authorizes number of acceptance to information center and the required amount of cash is transferred to the shop account to complete the transaction. The customers and shops then receive the issues of confirmation with related informations of buyers and buyers in the transactions. This service is fast, flexible, secured and decreases the cost and time consumed of transaction.

3.2.3. Telephone banking

Telephone banking services are the fastest and most effective in banking customers' relationship management. The customers can contact directly to the commercial bank to access and control their bank account and receive information about other banking services. With the long distance customers, this service greatly reduces their

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[5] Roger Clarke, Introduction to electronic payment mechanism:
http://www.rogerclarke.com/EC/EPMIntro.html

time and cost traveling. The introduction of telephone banking has closed the gap between banks and customers by providing the certain services as quick as possible. The most advantage of telephone banking is the automatic answer working in 24/7. Within the working hour of commercial bank, the customers can receive more information and services such as:

- Interest rate
- Exchange rate
- ATM location
- Account creating
- Account detail information
- Additional banking activity and marketing of new services

   The cost of telephone services is classified as lowest operating cost. The transaction cost is charged based on duration of the communication for the customers.

3.2.4.   Personal computers banking – PCs banking

As introduced above in the history of E-Banking, computerization in banking services was introduced as home banking and internet banking.

3.2.4.1 Home banking

Home banking is the most advantage of distribution channel in E-banking services in 1990s. Home banking allows the customers to access and make transaction at their home and office without any direct interaction with brick and mortal bank branches[6]. Application and development of home banking created a giant step in E-banking in satisfying customers transaction time and cost demand. Its most advantage features are fast, secured and flexible. With home banking, the customers can receive certain services such as:

- Money transfer:

The customers can make transactions or money transfer to the third party at their home within a few minutes. The information and setting of transactions is recorded and save for the next transaction with a few changes to maximize the services effectiveness.

- Account access:

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[6] David Soskin. Net Profit: How to succeed in digital business; John Wiley & Son L.td 2010; ISBN: 978-0-470-66081-2

The customers can access to their own account anytime at home to manage their finance. The information of account is monitored and controlled directly by the owners. Also the customers can also receive more information of additional bank activities as soon as possible. This procedure increases the customers trust and loyalty with the commercial bank.

- Create the letter of credit:

This function of service helps businesses and enterprises to improve their activities performances. The business owners can issues the invoice and record of cash flow with a certain setting and send to the business stake holders. The information of these documents then is secured with specific code and delivery to the partners by bank services.

Home banking service is normally higher cost due to its set up and maintenance. The customers PCs need to be connected with the institution intranet or specific network with additional devices. The bank then provides customers the management software with secured account and password[7].

3.2.4.2 Internet banking[8]

Internet banking can also be called as global banking as its most advantage application of internet. The network system is similar to home banking but instead of using the bank intranet, this system uses internet as medium of information transportation. Therefore the set up and connection cost is greatly reduced with the easy and comfortable internet accession nowadays. There are two type of internet banking services in the market, software base and web base. These two types of internet banking services provide the same functions of E-banking services as home banking such as money transferring, account accession and creating the letter of credits. The customers can enjoy these benefits with external additional internet application such as communication and global information richness. However the customers have to face the threats of insecurity, information loss, and illegal violation of bank account and prevent them by using the additional supporting software like antivirus and spyware

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[7] Durant state bank. PC banking: quick start guide
http://www.durandstatebank.com/wp-content/uploads/2013/05/online-banking-quickstart.pdf
[8] Investorworld: definition of e-banking: http://www.investorwords.com/3420/online_banking.html

3.2.5.   Mobile banking:

This term of service made its first appearance in 1999 when the commercial banks use mobile phone to conduct E-banking services through SMS to consumers. At that time, mobile banking was mainly used to delivery message between banks and customers for examples: authorized transferring code and marketing. Mobile banking was developed deeper as the new era of smart phone started in 2006. Smart phone and portable devices such as table step by step has replaced PCs and notebook. Smart phone has most of PCs functions such as internet connection (wifi), web access and application management. Nowadays mobile banking is defined as "using mobile phone to access to bank account, credit card account, or other financial account. Mobile banking can be done either by accessing the bank's web page through the web browser on the phone mobile, via text messaging or by using an application downloaded to the mobile phone"[9]. The mobile banking services are heavily depended on the adoption of smartphone, which segment of market has higher number of smartphone users resulting in higher mobile banking receive. As the combination of telephone banking and PCs banking, mobile banking services have all the strong points and advantage feature of E-banking services:

Fast, secured (still ambiguous) and flexible.

With mobile banking, varieties of E-banking services were provided to customers to satisfy the demands of both customers and commercial banks such as:

- Bank account accessing and management
- Money transferring
- Online transaction and payment
- Marketing of new banking services and activities
- ATM location
- Interest rate and exchange rate information
- Customers relationship management via application, SMS, email
- Ect

The security issues in mobile banking are still the biggest problems in this service. Two major issues discourage the customers' adoption of mobile phone and mobile payment

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[9] Board of Governors of the Federal Reserve System, Consumers and Mobile Financial Services, March 2012, quarterly financial report

technology are concerns about security and possibility of hackers remotely accessing customers' phones.

3.3.   Factors influencing customers' decision making in E-banking

In order to sustain the business, the banks always have to maintain their positions in customers' perception. Customers' choices and preferences are always changing by their decision making and comparison with other services. The business goals are to surpass the customers' expectation and help them to reach maximum satisfaction. Therefore, the services providers break down their customers' perception into essential factors and develop the certain strategy to improve the weakness and enhance the advantage.

There are many factors influencing customers' perspective when using E-banking services. However the main factors can be categorized into four main groups Security, Usability, Future orientation and Customer trust.

3.3.1.   Security:

Saving and expenditure is a sensitive matter for each person. Customers deposit their income and earning into the bank account for saving and expenditure management. Security of bank account and personal information plays an essential part in E-banking services to ensure the customers trust[10]. The analysis of security factors is the combination of these elements below:

- Privacy: how the customers feel about their personal information of their bank account when using E-banking.
- Comprehensibility: how the customers perceive and understand the stated information from E-banking services.
- Supportiveness: how the customers evaluate supporting information and help from E-banking service
- Loss: how the customers consider risk when using E-banking services

3.3.2.   Usability

Usability in E-banking is defined as easiness to use the E-banking services or the usefulness level of E-banking services. If the bank provides the web page and application,

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[10] Abhishek Singh. Risk in the e-banking. http://www.scribd.com/doc/22356535/Risk-in-E-Banking-PDF

usability determines how many percentages of total services are understandable and perceivable by the common customers. [11]Certainly the perception level of each customer is different. The younger group age customers are more likely adaptive and flexible to E-banking because of their frequency of internet and new application usage. Higher education level has more technological and electronic acceptance rate. If the banks want to expand their business and attract more customers, it is necessary to improve the performance of web page and application to create the friendly and useful online environment to surpass the customers' expectation and meet their satisfaction. The components of usability then are defined as:

- Procedure: how customers think about creating the bank account
- Comfortability: how customers feel when using E-banking services
- Purpose: the main reason when customers made when using banking services.
- Usefulness: how customers feel about E-banking services satisfied their expectation.

3.3.3. Future orientation

Future orientation is considered as long term decision making in customers perspective. Even the customers choices usually change, long term usage create behaviors and belief in customers' perception[12]. With ensured security and high level of satisfaction, customers will interact deeper with E-banking services and become irreplaceable stake holders to banks and business. These customers will draw more potential partners to banks and generate stable cash flow to the bank. Long term relationship management maintains the sustainability and expansion of business. Future orientation consists of the components below:

- Effeciency: how the customers perceived the effectiveness of E-banking service
- Future usage: customers future plan of E-banking services usage
- Adaptiveness: the customers understand the E-banking service in general.

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[11] Nielsen Norman group, usability 101, introduction to usability: http://www.nngroup.com/articles/usability-101-introduction-to-usability/

[12] E. Howlett, J. Kees, E. Kemp. The role of self regulation, future orientation and financial knowledge in long-term financial decisions. 2008 http://onlinelibrary.wiley.com/doi/10.1111/j.1745-6606.2008.00106.x/pdf

- Expanding: the customers opinion about introducing the E-banking service to their relative and family

3.3.4. Customers trust

Together the previous factors security, usability and future orientation create the trust in E-banking service in customers' perception[13]. Trust is defined as the belief of customers in the selected brand and its utilities for them in order to achieve the certain goal. Like future orientation, a trustful customer brings more benefit to banks and helps them spreading more precise information of E-banking service than any marketing activities. The components of customers trust are:

- Trust in brand: the perception of trust level in customers banking brand selection.
- Trust in security: the belief and expectation of customers in banking security
- Uniqueness: the different feeling of customers perception
- Future prediction: the future vision of customers with development of local E-banking service.

3.4.   E-banking system in Vietnam

Vietnam is the agricultural core economic country lying in the South East Asia. Therefore the banking system in the country was relatively slower than other countries in the area. The main reasons are the ICT education level was still underdeveloped and low level of incomes. The cash payments dominated 90% of total domestic transactions in the country in the late 1990s. The banking development in Vietnam could be divided into three separated periods[14].

The first period was 1993-2005 as the first card payment was introduced in the country. Both debit cards and credit cards were introduced into the market. Common consumers tended to use credit cards for personal financial management and small and medium business tended to use debit cards for loan borrowing and business management. In the late 1990s, the debit cards dominated the card payment systems and accounted more

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[13] S. Srinivasan. Role of trust in e-business success, article review 2004, College of Business and Public Administration, USA.
[14] Le Anh Dung, Lim Choom Seng, The development of E-payment and challenges in Central Banks in the SEANCES countries; chapter 11: The development of E-payment and challenges in Vietnam. South East Central Bank publisher 2008. ISBN: 983-9478-64-8

than 95% of total cards. There were 4,280 ATMs but only 8.3 million cards (roughly 10% of population) in 2005. The highest cards/ATM was recorded in big cities such as Hanoi and Ho Chi Minh City as around 4500 cards/ATM.

The second period started from 2005 to 2010 as E-commerce was first introduced in Vietnam. Online business has created the environment for non cash payment and E-banking to develop. Most of the online transactions were implemented by banks and business to business. In 2007, the debit cards still dominated the 90% total number of cards[15]. While the personal transactions and living expenditures were sorely based on cash transaction as 97% of cash payment and 3% of non-cash payment [2009].

The last period started from 2010 until now. The Vietnamese banking system started the new program of "banking modernization at the threshold of economic recovery" at the Banking Vietnam conference [2010]. One of the main tasks is to improving non-cash transaction in the "Banking technology with improving Non-cash payment for the economy" and "Securing Banking information system and services" [16]. The project specified objectives to be archived by the end of 2015 by increasing the number of people having bank accounts to 35-40% of population. The goal is to increasing the economic effectiveness of non-cash payment with lower inflation rate and gaining more customers trust in online banking service[17]

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[15] Asia Focus: country analysis unit. Banking reform in Vietnam
http://www.frbsf.org/banking-supervision/publications/asia-focus/2011/june/banking-reform-vietnam/june-banking-reform-in-vietnam.pdf
[16] Press release 26/05/2010. Banking modernization on the threshold of economic.
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[17] Micheal von Brasch, Vietnam business forum.
http://www.xing.com/net/vn/vietnam-business-news-trends-tin-tuc-kinh-doanh-o-viet-nam-34367/vietnam-has-only-about-14-percent-of-non-cash-payment-40145327

4 Own research

4.1. Data gathering and processing

The researched data was collected through online survey questionnaires. The questionnaires consisted of 4 general questions and 16 behavior question related to factors influencing customers' decision making in E-banking.

- 4 general questions:

  Location: (Hanoi, Ho Chi Minh City, other cities)

  Age group   (<18, 18-25, 25-33, 33-40, >40)

  Career (employed, self-employed, student, other)

  Gender(male, female)

- 16 behaviors questions:

  Security   (privacy, comprehensibility, supportiveness, loss)

  Usability   (procedure, comfortability, purpose, usefulness)

  Future orientation   (efficiency, future usage, adaptiveness, expanding)

  Customer trust   (trust in brand, trust in security, uniqueness, future prediction)

The behavior question was formulated into scale from 1 as disagreement to 5 as agreement. Each question was asked to E-banking service users about their agreement level with each behavior factor component like privacy, comprehensibility, supportiveness, loss, procedure, comfortability, purpose, usefulness, efficiency, future usage, adaptiveness, expanding, trust in brand, trust in security, uniqueness and future prediction. These components then were recalculated into percentage of agreement level to reflect the table of data collection result with mean values. The mean value of behavior components was used to compare the difference of E-banking performance in Hanoi and HCMC with others location in Vietnam.

[18]The behavior factor group as security, usability, future orientation and customer trust was calculated as total sum of their components and recorded in the scale from 4 to 20.

Security =   privacy + comprehensibility + supportiveness + loss

Usability =   procedure + comfortability + purpose + usefulness

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[18] Sonia, Taylor. Business Statistics. 3rd ed. 2007; Plgrave Macmilan publisher. 2007; ISBN: 978-0-230-50646-6

Future orientation =   efficiency + future usage + adaptiveness + expanding

Customer trust =   trust in brand + trust in security + uniqueness + future prediction

[19]The linear regression model was generated to create the relationship between customers trust as dependent variable with security, usability and future orientation as independent variables.

$$Y = a + b*X1 + c*X2 + d*X3$$

Where   Y   =   customer trust

        X1   =   usability

        X2   =   security

        X3   =   future orientation

    a, b, c, d   =   parameters of generated model

After two months of sending survey to E-banking customers in Vietnam, 330 respondents were gathered (178 in Hanoi &HCMC and 152 in other cities). The data set was filtered to exclude the incorrect and missing data. After filtering, 13 samples were excluded and the researched data set consisted of 172 in Hanoi&HCMC and 145 in other cities.

[19] H.R. Seddighi, K.A. Lawler, A.V. Katos. Econometrics: A practical approach; Routledge publisher. 2000; ISBN 0-425-15644-0

Table 1 - Hanoi and HCMC

Factors group	components	1	2	3	4	5	total
Usability	procedure	9.30%	19.77%	26.74%	16.28%	27.91%	100 %
	comfortability	5.81%	6.98%	30.23%	29.07%	27.91%	100 %
	purpose	6.98%	11.63%	34.88%	20.93%	25.58%	100 %
	usefulness	9.30%	10.47%	20.93%	19.77%	39.53%	100 %
Security	privacy	18.60%	17.44%	29.07%	17.44%	17.44%	100 %
	comprehensibility	3.49%	10.47%	27.91%	30.23%	27.91%	100 %
	supportiveness	23.26%	20.93%	31.40%	8.14%	16.28%	100 %
	loss	9.30%	6.98%	31.40%	22.09%	30.23%	100 %
future orientation	efficiency	5.81%	9.30%	20.93%	23.26%	40.70%	100 %
	future usage	3.49%	6.98%	23.26%	31.40%	34.88%	100 %
	adaptiveness	9.30%	17.44%	31.40%	22.09%	19.77%	100 %
	expanding	4.65%	10.47%	36.05%	25.58%	23.26%	100 %
customer trust	trust in brand	4.65%	3.49%	30.23%	26.74%	34.88%	100 %
	trust in security	5.81%	4.65%	39.53%	19.77%	30.23%	100 %
	uniqueness	3.49%	5.81%	37.21%	32.56%	20.93%	100 %
	future prediction	6.98%	8.14%	27.91%	32.56%	24.42%	100 %

Source: own computation

Table 2 - other cities

Factor group	Components	1	2	3	4	5	total
Usability	procedure	3.45%	3.45%	41.38%	20.69%	31.03%	100 %
	comfortability	3.45%	3.45%	34.48%	13.79%	44.83%	100 %
	purpose	3.45%	6.90%	41.38%	20.69%	27.59%	100 %
	usefulness	17.24%	6.90%	27.59%	10.34%	37.93%	100 %
Security	privacy	17.24%	10.34%	44.83%	10.34%	17.24%	100 %
	comprehensibility	3.45%	0.00%	44.83%	13.79%	37.93%	100 %
	supportiveness	37.93%	13.79%	31.03%	3.45%	13.79%	100 %
	loss	6.90%	6.90%	41.38%	13.79%	31.03%	100 %
future orientation	efficiency	0.00%	3.45%	27.59%	10.34%	58.62%	100 %
	future usage	3.45%	0.00%	41.38%	17.24%	37.93%	100 %
	adaptiveness	3.45%	10.34%	41.38%	20.69%	24.14%	100 %
	expanding	3.45%	6.90%	44.83%	17.24%	27.59%	100 %
customer trust	trust in brand	0.00%	3.45%	24.14%	20.69%	51.72%	100 %
	trust in security	0.00%	3.45%	24.14%	27.59%	44.83%	100 %
	uniqueness	0.00%	3.45%	27.59%	27.59%	41.38%	100 %
	future prediction	0.00%	0.00%	31.03%	31.03%	37.93%	100 %

Source: own computation

4.2. Mean comparison of customers behavior questions in E-banking

The mean value of each behavior component is calculated as the average value of total sum of recorded respondents allocated in big cities (Hanoi and Ho Chi Minh City) and other cities. The purpose of this chapter is to compare the customers behaviors and perceptions toward E-banking service between two biggest cities and other cities. From that, this comparison can be developed to evaluate the performance of E-banking in these two selected segment.
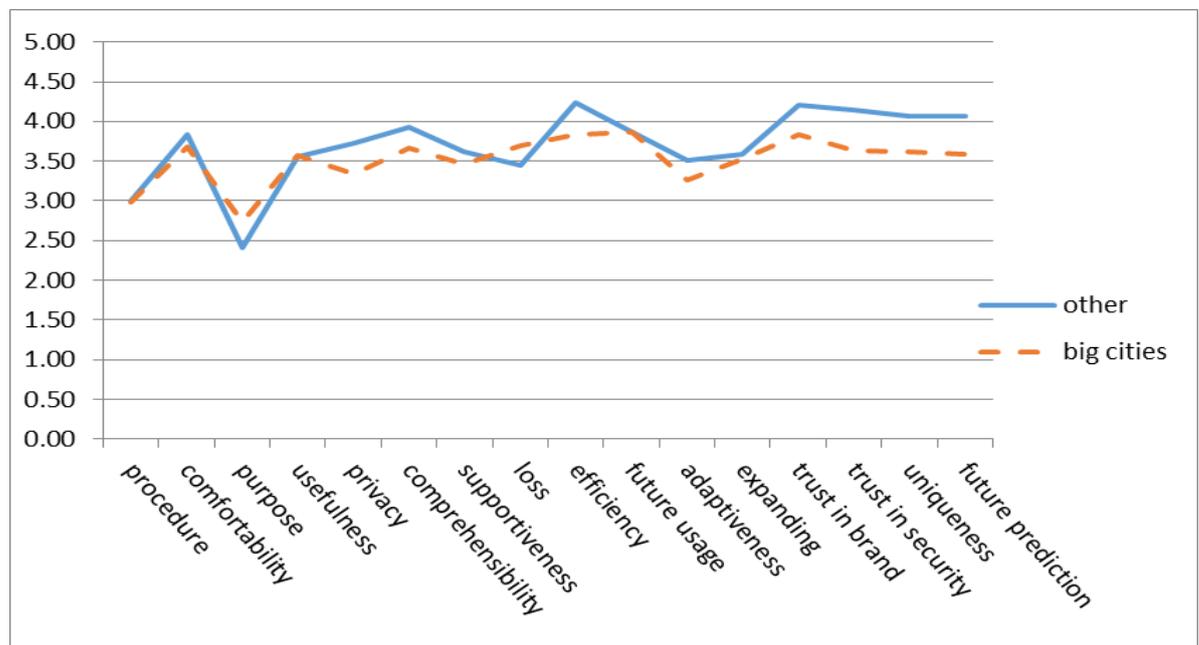
Figure 1 - Mean comparison of behavior factors in two selected area

Source: own computation

4.2.1 Usability

Table 3 - Calculated mean values of usability group factors

Components	Questionnaires	Other cities	Big cities
Procedure	Do you think the creating the E-banking service is very complicating and time consumed?	3.00	2.98
comfortability	Do you think E-banking service is very easy to use and accessible?	3.83	3.69
purpose	Do you think the E-banking service also generated	2.41	2.73

	higher interest?		
privacy	When using E-banking, you can also manage your income and spending better?	3.55	3.57

Source: own computation

The usability mean value comparison here is reflected by the part of procedure, comfortability, purpose and usefulness mean value. The line of mean value between two graphs in this part fluctuated simultaneously. The highest component of mean value was recorded in comfortability and lowest value at the purpose. The customers in these two segment agreed more at the features of E-banking, quickly to adapt and easy to understand and disagreed at the generating higher profit. The main purpose they used E-banking service was because of its usefulness such as fast and flexibility. Creating and understanding the E-banking services was considered normal factor influencing their approach to E-banking adoption.

4.2.2 Security

Table 4 - Calculated mean values of security group factors

Components	Questionnaires	Other cities	Big cities
Privacy	The E-banking service ensured your privacy?	3.72	3.34
comprehensibility	The transferring procedure is understandable?	3.93	3.66
Supportiveness	The online support services and hotline telephone supports are also helpful?	3.62	3.47
Risk of loss	Do you feel comfortable when transferring the relatively large amount of money (e.g. >1,000,000 VND) ?	3.45	3.70

Source: own computation

In the security factors, the respondents in other cities had relatively higher mean value than in big cities. In the big cities, E-banking and E-commerce images have been damaged by

illegal and fraud activities in real estate and financial leasing. The infrastructure level for E-banking still have not met the customers' satisfaction in Hanoi&HCMC and created relatively less positive impact on mean value in consumers' perception. The customers perception in E-banking security was more positive when the security in privacy, transferring and support ensuring from the banking services. The highest recorded component mean value belonged to comprehensibility, the customers considered this factor component had higher reliability compared to the other. However, the users in other cities less agreed with the risk when transferring large amount of money. This can be explained by more amount of online transferring was done in Hanoi&HCMC compared to the other locations.

4.2.3 Future orientation

Table 5 - Calculated mean values of future orientation group factors

Components	Questionnaires	Other cities	Big cities
Efficiency	Using E-banking can significantly reduce cost and time consuming?	4.24	3.84
Future usage	Do you wish to keep using E-banking service in your business and daily spending?	3.86	3.87
Expanding	Will you recommend your families and friends using the same E-banking service like yours?	3.52	3.26
Adaptiveness	E-banking service is very useful in Vietnam?	3.59	3.52

Source: own computation

The perception of future E-banking usage in other cities had higher mean value than in Hanoi&HCMC. The customers outside of big cities had more positive future vision of E-banking development. The highest mean value recorded in both locations segment was adaptiveness (3.86 and 3.87). The satisfaction from perceiving E-banking services generated trust and belief in customers. This trust created more frequent their interactions with E-banking services and persuaded them to invite their relatives to involve into the E-banking business. With the high number of increasing internet user, the customers also

believed the online business would flourish in the near futures. The differences between visions of customers in big cities and other location can be explained by the different in demand and supply in these two locations. With the higher infrastructure and transportation development level, the traditional transaction in cash and face to face shopping in big cities still dominated the business environment, which resulted in lower demand for online business in their daily expenditure. On opposite, the internet users outside of Hanoi&HCMC had more demand for online good and services[20]. This demand influenced higher mean value and positive vision in online services customers outside of big cities.

4.2.4   Customers trust
Table 6 - Calculated mean values of customers trust group factors

Components	Questionnaires	Other cities	Big cities
Trust in security	Do you trust in the E-banking security service?	4.21	3.84
Trust in brand	Do you trust in the brand of the E-banking provider?	4.14	3.64
Uniqueness	Do you feel unique when using selected E-banking service?	4.07	3.62
Future prediction	Do you think the E-banking system in Vietnam will be improved further and faster?	4.07	3.59

Source: own computation

In the graph, the line of mean values in trust distinguished with each other between big cities and other location. Less positive values in security services generated less trust in customers' perspective. The E-banking customers are also internet users who perceived more information than non-internet users. The news and information was spread quickly in online environment that also damaged the image of banks brand in general. Lower mean

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[20] Do Anh Minh. Tech in Asia: Hanoi vs Saigon: Weighing Up Vietnam's Two Biggest Startup Cities http://www.techinasia.com/hanoi-saigon-weighing-vietnams-biggest-startup-cities/

value in trust may not be worse E-banking performance from banks in Hanoi&HCMC. But the customers here encountered more negative events from banks or the temporary online services in Vietnam did not match their expectation. Together these reasons created less positive in online banking development in big cities.

4.3. Linear regression model of factors

The linear regression model was generated to create the relationship between customers trust as dependent variable with security, usability and future orientation as independent variables. The model was created by using Microsoft Excel with verification of p-value and coefficient of determination R^2 to identify the fitness of theoretical dependent variable with actual dependent variable.

4.3.1. Generated linear regression model in Hanoi&HCMC

Table 7 - output summary of linear regression in Hanoi&HCMC

Regression Statistics	
Multiple R	0.770692
R Square	0.593967
Adjusted R Square	0.586716
Standard Error	2.210113
Observations	172

ANOVA

	df	SS	MS	F
Regression	3	1200.434	400.1447	81.91967
Residual	168	820.6125	4.884598	
Total	171	2021.047		

	Coefficients	Standard Error	t Stat	P-value
Intercept	1.958029	0.872144	2.245075	0.026068
security	0.257255	0.052828	4.869702	2.56E-06
usability	0.196398	0.065029	3.020181	0.002921
future Or.	0.451275	0.061043	7.392728	6.48E-12

From the ANOVA table, the generated linear regression model of factors relationship is rewritten as:

$$Y = 1.96 + 0.26*x1 + 0.20*x2 + 0.45*x3$$

Where   Y = customer trust

x1 = security

x2 = usability

x3 = future orientation

4.3.2.   Verification of model in Hanoi&HCMC:

According to the correlation matrix of independent variables, the absolute value of the relationship among independent variables did not exceed 0.85. The input variable did not omit multicolinearity or the input variable was not highly correlated within the model. The coefficient of determination R^2 is equal 0.59. The model can only explain 59% of dependent variable customers' trust or the generated customers trust from model fit with 59% of actual customers trust from collected data.

Table 8 - correlation matrix of Hanoi&HCMC regression model

	security	usage	future Or.	Customer trust
security	1			
usability	0.349961	1		
future Or.	0.54367	0.49543	1	
Customer trust	0.602639	0.505207	0.711103	1

The parameter of security is equal 0.26, security factors has positive impact on customers trust. Higher security value resulted in higher trust in customers' perception. As security measured increased by 1 unit, factor of trust increased by 0.26 unit in customers' perspective. The generated p-value of security is $2.56*10^{-06}$ less than significant level of 0.05, which means security has statistically significant impact on customers trust.

The parameter of usability is equal 0.20, usability factors has positive impact on customers trust. Higher usability value resulted in higher trust in customers' perception. For every usability factor measured increased by 1 unit, factor of trust increased by 0.20 unit in customers' perspective. The generated p-value of usability is 0.002921 less than significant level of 0.05, the usability factor also has statistically significant impact on generated trust in customers' perception.

The parameter of future orientation is equal 0.45, future orientation factors also has positive impact on customers trust. Higher future orientation value resulted in higher trust in customers' perception. As future orientation measured increased by 1 unit, factor of trust

increased by 0.26 unit in customers' perspective. The generated p-value of future orientation is $6.48*10^{-12}$ less than significant level of 0.05, future orientation is statistically significant to dependent variable of customers trust.

4.3.3. Generated linear regression model in other cities in Vietnam

Table 9- output summary of linear regression in other cities in Vietnam

Regression Statistics	
Multiple R	0.727452
R Square	0.529186
Adjusted R Square	0.519168
Standard Error	2.220183
Observations	145

ANOVA

	df	SS	MS	F
Regression	3	781.1876	260.3959	52.82705
Residual	141	695.0192	4.929215	
Total	144	1476.207		

	Coefficients	Standard Error	t Stat	P-value
Intercept	5.881802	0.97328	6.04328	1.28E-08
security	0.093425	0.071114	1.313736	0.191068
usability	-0.15773	0.074723	-2.1109	0.036546
future Or.	0.739352	0.074373	9.941091	5.65E-18

From the ANOVA table, the generated linear regression model of factors relationship in other cities in Vietnam is rewritten as:

$$Y = 5.88 + 0.09*x1 - 0.16*x2 + 0.74*x3$$

Where   Y = customer trust

x1 = security

x2 = usability

x3 = future orientation

4.3.4. Verification of model in other cities in Vietnam

From the created matrix of correlation, the independent variables of model in other cities in Vietnam did not omit the multicolinearity as the absolute value of the correlation numbers did not exceed the value of 0.85. The model coefficient of determination is equal 0.53 where the generated model can only explain 53% of actual data of dependent variable customers' trust.

Table 10 - correlation matrix of Hanoi&HCMC regression model

	security	usage	future Or.	Customer trust
security	1			
usability	0.591943	1		
future Or.	0.586743	0.536602	1	
Customer trust	0.443873	0.300327	0.716568	1

From the regression model in the other cities in Vietnam, the parameter of security is equal 0.09. The security has positive effect on customers trust. However its p-value is 0.191 greater than significant level of 0.05. The factor of security did not statistically influence the customers trust.

The parameter of usability is equal -0.16, the factor usability has negative effect on customers trust. Its p-value is equal 0.036 less than significant level of 0.05. Usability has statistically negative impact on customers trust in the regression model of behavior factors in other cities in Vietnam

The parameter of future orientation is 0.74, this factor has positive effect on customers trust. The related p-value is equal $5.65*10^{-18}$ less than significant level of 0.05. The impact of future orientation is statistically significant to customers trust.

5. Discussion and results

5.1. Hypothesis approval
Hypothesis 1:

The customers' E-banking expectation and satisfaction in big cities is relatively higher than other locations in Vietnam.

From the comparison of mean values, the evaluation of E-banking performance of customers in big cities was relatively lower than other locations. The result reflected higher demand of customers in Security and Usability, while E-banking in Hanoi&HCMC could not meet the users' expectation. That resulted in lower record of mean values in customer perspective. -> Hypothesis 1 is rejected

> *Hypothesis 2:*
>
> *The E-banking factors of security, usability and future orientation have different impacts upon trust of customers toward E-banking services in two selected groups.*

The generated model created the linear relationship in each selected locations. In Hanoi&HCMC, security, usability and future orientation had positive impact upon customers trust and were statistically significant in the model. In the other cities in Vietnam, usability had negative impact, future orientation had positive impact and security is not statistically significant in the model.   => Hypothesis 2 is accepted

5.2.   Discussion:

The similarity of two graphs from the mean comparison of behavioral factors from subchapter 4.2 can be explained by the age group of respondents
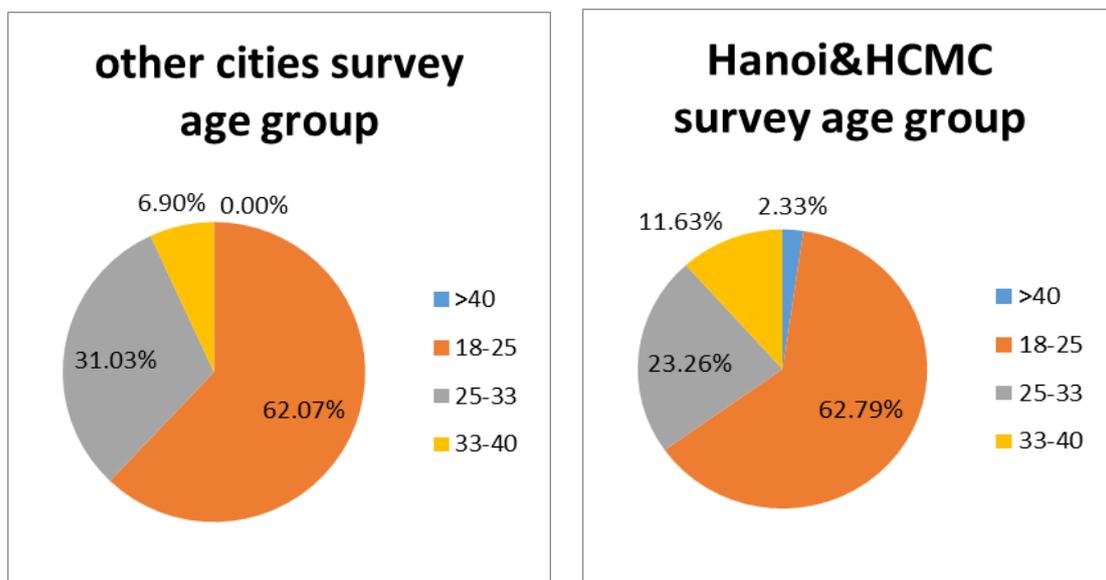

Figure 2 - age group of respondents from collected data

 In the survey data, the age group of 18-25 as students was the majority of respondents. The second group is 25-33. These two age groups are considered to be relatively young

and flexible with new technologies and online services. Therefore their perspectives and behaviors toward e-banking services in Vietnam as general have many similarities, which caused the close gap between two lines of mean comparison that leading to the rejection of the first hypothesis.

However in the next part of research the linear regression models are created successfully. E-banking performance in Vietnam is reflected differently in each market location. In the big cities like Hanoi&HCMC, the behaviors factors group of security, usability and future orientation had positive impacts upon customers' trusts. In the other locations, the each of behavior factors group reflects different impacts upon the customers' trust of e-banking services. Together, these two models reflects the acceptance of the second hypothesis in the sub chapter 4.2.2.

6. Conclusion

This bachelor research has successfully evaluated the performance of e-banking activities in Vietnam under the customers perspectives by analyzing the impacts of selected e-banking factors influencing their decision making process. The paper may encountered some limitations due to age group of respondents doing the questionnaires survey. The inter-relationship between selected behavior factors were created by the linear regression models of two different market segments in big cities and other cities in Vietnam. The impact upon customers trust has been reflected differently in each model. These models then can be used for the bank to adjust their customer approach strategy in each specific location. There are several recommendations for the Vietnamese commercial banks in their management for improvement of e-banking services. First the banks should optimize the potential of internet and information and communication technology application. This process requires huge investment into upgrading infrastructure and network system as well as higher level skills of banking employees in working with modern environment in electronic document and online services. Second the banks should ensure the security and stability of non-cash transaction for customers. In the two generated models, security had relatively low impact upon the customers' trusts as the customers usually feel vulnerable during online transaction. The last recommendation concerns about the collaboration of bank with other e-commerce activities[21]. The banking system in Vietnam should promote e-commerce by supply services related to real estate, insurance and financial leasing in order to encourage the demand of e-banking customers.[22] Customers' behaviors changes over time as their living standard are increasing day by day in Vietnam. If the online banking can surpass the consumer expectation, the E-banking services will surely flourish to satisfy the enormous demand of 90 million population in the incoming years.

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8. Appendix
Questionnaires:

1. What is your current address?

Mark only one

- o Hanoi
- o Ho Chi Minh City
- o Other

2. What is your age?

Mark only one

- o < 18
- o 18 - 25
- o 26 - 33
- o 33 - 40
- o >40

3. What is your gender?

Mark only one

- o male
- o female

4. What is your career?

Mark only one

- o Student
- o Employed
- o Self-employed
- o Other

Usability

Customers' opinion when they are using the E-banking service in Vietnam

5. Do you think the creating the E-banking service is very complicating and time consumed?

<div align="center">1   2   3   4   5</div>

Disagree   agree

6. Do you think E-banking service is very easy to use and accessible?

<div align="center">1   2   3   4   5</div>

Disagree   agree

7. Do you think the E-banking service also generated higher interest?

<div align="center">1   2   3   4   5</div>

Disagree   agree

8. When using E-banking, you can also manage your income and spending better?

<div align="center">1   2   3   4   5</div>

Disagree   agree

<div align="center">**Security**</div>

<div align="center">Customers' perspective toward their E-banking service</div>

9. The E-banking service ensure your privacy?

<div align="center">1   2   3   4   5</div>

Disagree   agree

10. The transferring procedure is understandable?

<div align="center">1   2   3   4   5</div>

Disagree   agree

11. The online support services and hotline telephone supports are also helpful?

<div align="center">1   2   3   4   5</div>

Disagree   agree

12. Do you feel comfortable when transferring the relatively large amount of money (e.g. > 1,000,000 VND)?

<div align="center">1   2   3   4   5</div>

Disagree   agree

<div align="center">**Future expectation (Future orientation)**</div>

What customers expect the outcome of the E-banking service toward them self and their relative?

13. Using E-banking can significantly reduce cost and time consuming?

             1   2   3   4   5

      Disagree   agree

14. Do you wish to keep using E-banking service in your business and daily spending?

             1   2   3   4   5

      Disagree   agree

15. Will you recommend your families and friends using the same E-banking service like yours?

             1   2   3   4   5

      Disagree   agree

16. E-banking service is very useful in Vietnam?

             1   2   3   4   5

    Disagree   agree

Customer trust

The reliability values of E-banking service toward consumers' experience

17. Do you trust in the E-banking security service?

             1   2   3   4   5

      Disagree   agree

18. Do you trust in the brand of the E-banking provider?

             1   2   3   4   5

      Disagree   agree

19. Do you feel unique when using selected E-banking service?

                                 1   2   3   4   5

                            Disagree   agree

20. Do you think the E-banking system in Vietnam will be improved further and faster?

                                 1   2   3   4   5

                            Disagree   agree

21. What is your favorite banking service in Vietnam?
- o Agribank
- o BIDV
- o Vietinbank
- o MMB
- o Techcombank
- o Other