



ADDIS ABABA UNIVERSITY
COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES
SCHOOL OF INFORMATION SCIENCE

Study of CBE's Mobile Banking Usage

By
Kidist Moges

Addis Ababa, Ethiopia
January, 2021



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A Thesis

**Submitted to College of Natural and Computational Sciences of Addis Ababa University in
Partial Fulfillment of the Requirements for the Degree of
Master of Science in Information Science**

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Advisor: Gashaw Kebede (PhD)

Addis Ababa, Ethiopia

January, 2021

Declaration

I hereby declare that the thesis is my original work and it has been written by me under the supervision and guidance of my advisor. I have accordingly acknowledged all the sources of information which have been used in this thesis. This thesis has not been submitted for any degree in any university previously.

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This thesis has been submitted for examination with my approval as university advisor.

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Study of CBE's Mobile Banking Usage

By
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Acknowledgements

This thesis becomes a reality with the kind support of many individuals; I would like to extend my sincere thanks to all of them.

Foremost, I would like to express my sincere gratitude to my advisor Dr. Gashaw Kebede for providing invaluable guidance throughout this research. His dynamism, vision, sincerity and motivation have deeply inspired me. It was a great privilege and honour to work and study under his guidance. I am extremely grateful for what he has offered me.

I would like to express my special gratitude to my companion who is always by my side and he has helped me a lot in doing this study.

I would like to express my special thanks to employees and management of Commercial Bank of Ethiopia for their cooperation during the data collection phase.

My thanks and appreciations also go to my friends and people who have willingly helped me out with their abilities.

Abstract

Now days, banks all over the world are changing their traditional or window based service to branchless. Ethiopian banks are also introducing different E-banking products but it is at infancy level and cash is still the dominant medium of exchange. Mobile banking is one type of E-banking product which is used to make financial transactions. But customers of Commercial Bank of Ethiopia are not satisfied with it. So understanding its success factors of is important for both customers and the bank itself. In this research, the researcher extended the Delone and McLean IS success model to the mobile banking by adding self-efficacy and trust as a success variable. This study aims to analyze the relationship between system quality, information quality, service quality, trust and self-efficacy to user satisfaction and use. In addition, the study aims to analyze the relationship between user satisfaction and use to a net impact. The model was tested by using partial least square structural equation modeling approach. It is both quantitative and qualitative study that was conducted in the form of a survey of 286 mobile banking users of Commercial Bank of Ethiopia and interview questions for some employees of Commercial Bank of Ethiopia. Both purposive and convenience sampling were applied to select bank branches and respondents respectively. Both SPSS V.20 and Smart PLS V2.0M3 were applied to analyze the demographic data and test the proposed model respectively. The findings revealed that information quality, system quality, self-efficacy has positive and significant effect on system use and user satisfaction. And service quality and trust have positive and significant effect on user satisfaction but negative and insignificant effect on system use. Finally, user satisfaction and system use have positive and significant effect on net impact. Based on the finding and conclusion, the study recommended that the bank should work on information quality, system quality and service quality of mobile banking to increase the usage of mobile banking service and its customer satisfaction. Beside this, the Bank should build its customer trust on mobile banking so as to boost its customer satisfaction and mobile banking usage.

Keywords: D&M IS success model, Structural equation modeling, Mobile banking, PLS-SEM

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List of Acronyms

ATM	Automated Teller Machines
AVE	Average Variance Extracted
CBE	Commercial Bank of Ethiopia
D&M	DeLone and Mclean
E-banking	Electronic Banking
E-channels	Electronic Channels
IQ	Information Quality
IS	Information Systems
LV	Latent Variable
NI	Net Impact
PLS-SEM	Partial Least Square - Structural Equation Modeling
POS	Point of Sales
SE	Self-Efficacy
SEM	Structural Equation modeling
SerQ	Service Quality
SPSS	Statistical Package for Social Sciences
SQ	System Quality
SU	System Use
TAM	Technology Acceptance Model
Tr	Trust
US	User Satisfaction
USSD	Unstructured Supplementary Service Data
XHTML	Extensible Hyper Text Mark-up Language

CHAPTER ONE

Introduction

1.1. Background of the study

Electronic Banking (E-banking) is defined as a “remote banking service provided by authorized banks, or their representatives through devices operated either under the bank’s direct control or under the outsourcing agreement” (Khan, 2017). E-banking services provide the customer to access their accounts, to move their money between different accounts or to make payments via e-channels. Financial institutions invest a lot on E-banking in order to reduce cost which is associated with serving customers physically, shorten processing periods, increase speed and improve the flexibility of business transactions (Shih and Fang, 2004). The advantages generated by these services accelerate the development of financial institutions (Daniela, Simona, & Drago, 2010).

Mobile banking refers to provision of banking through mobile devices such as mobile phone or tablet. It has a unique competitive edge over traditional banking because it allows customers to perform banking transactions irrespective of place and time. It has an advantage of easy access anywhere, control over money, availability on 24-hour basis, and reduction in the cost of handling banking transactions. However, it is still underused despite its advantages as expected due to its security, privacy, trust, and risk related issues (Sadiku, Tembely, Musa, Momoh, 2017).

According to Garrity & Sanders (1996), Information Systems (IS) success is a measure of the degree to which the person evaluating the system believes that the stakeholder is better off. The focus of measuring IS success is on the investigation of the effect of a system on individual performance, business process performance, and organization performance. According to Bokhari (2005), the main purpose of introducing IS into an organization is to improve both individual decision-making performance and overall organizational efficiency and effectiveness. The expected gains in terms of organizational goals through IS implementation and adoption are concerned with the success of the system.

Commercial Bank of Ethiopia mc (CBE) is the only state-owned commercial bank and pioneer in introducing Automated Teller Machines (ATMs) service for local users in 2001 with eight ATMs located in Addis Ababa (Worku, 2010). CBE has more than 22 million account holders, more than 2.5 million mobile and internet banking users, and more than 8 million active ATM cardholders as of June 30th 2019 (Commercial Bank of Ethiopia, 2019). According to CBE's annual performance report (2019/20), CBE has acquired/accepted Visa on November, 2005, MasterCard on April, 2014 and China Union Pay (CUP) on December, 2018. Its E-banking channels transactions account for 37% of the total bank transactions. However, as the researcher tried to analyze documents at CBE, a high number of customer complaints come to CBE's customer contact center related to E-banking services.

Based on this complaint, the researcher used the IS success (updated Delone & McLean 2003) model to determine the source of the complaints. D&M IS success model is appropriate because first, it has a user satisfaction construct which used to measure user satisfaction since all complaints are the reflection of user satisfaction. Second, we don't know what the origins of the complaints are except estimation as we are users. At the end of this study, the bank problems need to be fixed. So, by taking this model, the researcher tried to see where the problem is? Is it in connection with Information Quality (IQ)? Is it in connection with System Quality (SQ)? Is it in connection with Service Quality (SerQ)? Is it in connection with self -Efficacy (SE)? Or is it in connection with Trust (T)?

The study used the entire model of D&M IS success model but our origin is the complaint of customers. Basically, user Satisfaction can measure the complaints but all variables may contribute to this study. In addition to the model, the researcher added other variables Self-Efficacy (SE) to know the customer's belief in their capacity and Trust (T) to know and the willingness of customers to perform online banking which may contribute to the user satisfaction. So the researcher tried to consider all these variables to do this study and to see the effect of user satisfaction.

1.2. Statement of the Problem

Even though CBE has delivered different digital banking services to its customers by using different systems, a portion of its customers are still dissatisfied.

CBE has customer contact center which provides service for both external and internal customers 24 hours a day 7 days a week to solve customers' problems/challenges while using its products and services. Based on the complaint records of the bank, on average 140,000 up to 161,200 calls come to the customer contact center by both internal and external customers each week (CBE quarter report, 2019). From the total customers' call, 55 % of calls are customer complaints related to different problems while using CBE's banking services and products and the rest is information requests and other questions (CBE quarter report, 2019). According to CBE's customer contact center weekly report, most of the customer complaints are related to non-working of payment cards ATM, Mobile banking, internet banking, and CBE birr. So this report shows how much customers of CBE are dissatisfied with the services and products of their bank.

In addition to this, managers and team leaders of the customer contact center have also explained that customer complaints are very high related to digital banking. They know the complaints but they don't know why such problems are happening.

There have been various instance where failure of CBE's digital service were reported in the public platform. Somali digital media (2019) mentioned that CBE has stopped its services in all its branches and affects all online banking and other online services for more than 12 hours. Moreover, Ethiopian Reporter (2019), has strengthened the above idea by explaining CBE's banking service quality is at infancy level and its customers have faced long queues to get ATM service and other banking services.

Although, limited researches have shown that different factors affect satisfaction of customer of CBE's digital service. For instance, a study conducted by Mohammed (2018), on effects of E-banking services on customer satisfaction at CBE, revealed that the quality dimensions: reliability, efficiency, responsiveness, and contact have a strong impact on e-banking customer satisfaction in CBE. A study by Bacha (2015), on an assessment of customer satisfaction with

ATM banking, indicated that all service quality attributes significantly influence customer satisfaction.

Furthermore, a study by Adugna (2019), on the effect of e-banking attributes on customer satisfaction, revealed that service quality dimensions; reliability, service security and ease of use have a strong influence on e-banking user's satisfaction level. On the other hand, Befikadu (2019), a study on E-banking service quality of Ethiopian banks, revealed that e-banking services like POS and Internet banking are not adequately used by the customer and the major problem is they experience longer steps in processing transactions.

However, most of the prior studies conducted to identify customer E-banking and mobile banking satisfaction focused on only system quality rather than considering other variables found in D&M IS success model. However, examining all variables in D&M IS success model along with other variables make the research more inclusive. To the researcher's level of understanding of previous related works, no such study used D&M IS success model along with other variables to study both mobile banking and E-banking success in Ethiopia.

This research is aimed to further shed light on the mobile banking success at CBE and come up with possible solution to address the problems reported by customers by conducting a comprehensive study of mobile banking success using D&M IS success model. For attaining this purpose and framing the research problem, candidate variables and associated positive relation concerning to customers' satisfaction and use behaviour are hypothesized to be tested based on intensive literature in chapter two.

1.4. Objective of the study

1.4.1 General objective

The general objective of this research is to study CBE's mobile banking success using the extended D&M IS success model with the aim of identifying the causes of the problems reported by customers.

1.4.2. Specific objectives

To achieve the aforementioned general objectives, the following specific objectives are identified.

- Analyze the relationship between system quality, information quality, service quality, trust and self-efficacy to user satisfaction and use of mobile banking.
- Analyze the relationship between user satisfaction and use of mobile banking to a net impact.
- Put and forward a useful recommendation for practitioners on mobile banking success in CBE to focus on the factors.

1.5. Significance of the study

Studying CBE's mobile banking success enables the researcher to recognize the root causes that make customers dissatisfied. This recognition in turn will add new findings to the existing knowledge of mobile banking success in CBE context. Since CBE is the leading bank with many card banking and mobile money solution active users, such kinds of researches are important to build on the existing knowledge and also useful for other private banks in Ethiopia.

It will be valuable in addressing the needs of bank customers and taking measures to improve their satisfaction. The findings of this research are also likely to be used as input for strategic decisions in increasing customers' satisfaction level when using CBE's mobile banking services and products. Increasing the quality of mobile banking services can be used to increase the satisfaction level of the customers, so that the bank will get more customers and finally will have a competitive advantage.

The theoretical significance of this study is the study is an original attempt to establish a conceptual model and its dimensions to outline the factors which affect IS success within the context of the banking industry. This was done by drawing information from the literature review of the subject and empirical data gathered from a questionnaire survey. The contradiction of results for some previous studies increases the significance of the present research, particularly in the demographic and situational characteristics area. The significance of the research findings of this thesis lies in the benefit of the results to both researchers and practitioners in this field. The identification of the factors affecting mobile banking success will

ensure that future research in this area will be able to use this as a stepping stone, as well as assisting banks in their success plans.

1.6. Scope

This research focuses on studying and analyzing mobile banking success by applying D&M IS success model. Due to time and resource shortage, only 286 sample sizes are considered in this study.

1.7. Ethical considerations

The proposal of this research was approved by Addis Ababa University, School of Information Sciences Graduate Committee (SGC) with acceptable ethical considerations. All basic principles of ethical considerations and standards have been noted during all phases of the research process that includes respect for participants, respect to the organizations involved, keep confidentiality and avoiding any acts of misconduct like intentional misinterpretations and using findings for harming the society.

1.8. Thesis Outline

This thesis is organized into five chapters. **Chapter 1** contains an introduction, statement of the problem, objectives, and significances of the research, scope, limitation, and ethical considerations to conduct this study. **Chapter 2** reviews the literature on mobile banking technology, information system failure and success, failure factors, and information system success models with related works in the area. **Chapter 3** presents the research methodology to collect and analyze the data of the research. **Chapter 4** contains data analysis whereas conclusion and recommendations presented in **chapter 5**.

CHAPTER TWO

Literature Review and Related Works

2.1. Literature Review

2.1.1. Information System Success and Failure

IS gives the benefit of improving profitability, improving performance, for an effective and efficient business processes for organizations (Malik, 2019). Failure and success in the IS field are well-known words and extensively researched. But they are difficult to define. Researchers have focused for decades on both outcomes by providing several explanations (Dwivedi et al, 2015). Organizations want to ensure that their investments on IS are successful. So it is important to identify whether the systems meet the organization's goals or not. Due to IS's success complexity, interdependent, multidimensional nature, attempts to define makes it inexplicit (Malik, 2019). However, to address this issue D&M made extensive research and identified six dimensions of IS success (DeLone & McLean, 1992) which we will see in detail in next topic.

IS failure studies focus on the shortfall between the actual and requirement performance. IS failure will happen on both large and small organizations. For example, According to Wilson & Howcroft (2002, p.237), "System failure is constituted by the system not working properly: it does not perform as expected, it is not operational at the specified time and it cannot be used in the way intended". This means the system may become partially unused and it fails to produce expected benefits and services. They also defined system failure from the user side as "when the end-users are dissatisfied or when they resist using it".

Ewusi-Mensah (2003, p.7), also defined information systems failure as "either the implemented system not meeting the user expectations or inability of creating working or a functioning system".

On the other hand, as per Flowers (1996), any of the following is the situation where IS failure occurs:

- When the system as a whole does not operate as expected and its performance is sub-optimal.

- On implementation, if it does not perform as originally intended or if it is rejected by users and under-utilized.
- If, the cost of the development exceeds any benefits the system.
- Due to problems with the complexity of the system, or the management of the project and if the IS development is abandoned before it is completed.

Heeks (2002, p.2), classified IS failure as total and partial. Total failure is “an initiative never implemented or in which a new system is implemented but immediately abandoned”. Partial failure is “an initiative in which major goals are unattained or in which there are significant undesirable outcomes”. On the other hand, Lyytinen & Hirschheim (1987), in their analysis of the literature on IS failure identified four distinct categories of IS failures which are:

Correspondence failure: if the project did not correspond with the specification or fail to meet the objective, it will be considered a failure and leads to rejection.

Process failure: This is where the development process results in an unworkable system and failed to produce the promised system within the budget or time scale.

Interaction failure: when the system fails to attract users and did not match the user's requirements.

Expectation failure: this is the inability of the IS to meet specific stakeholders group expectations. It is perceived as the difference between the actual and desired situation for the members of a particular stakeholder group.

Moreover, Nelson (2007, p.70 - 72), analyzed IS projects and identified classic mistakes that determine the likelihood of an IS fails and he categorized these mistakes into four groups:

Process: - focuses on IT project management process and technical project management methodologies.

People: - is factors related to the people involved in a project related to motivation.

Product: - is related to the project's characteristics like size and urgency, performance, robustness, and reliability and

Technology: - is based on the use and misuse of modern technology.

In a similar effort, Standish Group (1995, p.2), classified software projects into three types,

- **Successful software projects:** the projects are completed on time, on budget, with all features and functionality.

- **Challenged Software projects:** the projects are completed and operational but over budget, over the time estimate, and offer fewer features and functions than originally specified.
- **Impaired software projects:** projects are cancelled at some point during the development cycle.

2.1.2. E-banking technologies

E-banking is an automatic service that eradicates traditional banking services for bank customer's based on information technology platforms. Initially, it was limited to some banking products but with technological advancement, the range of services has increased. Newly discovered benefits by banks help for e-banking growth. To achieve its promises it is highly relied on Information Communication and Technology (ICT) (Daniela, Simona, & Drago, 2010). Electronic banking (E-banking) technology includes different services, ranging from automatic teller machine (ATM) services and direct deposit to automatic bill payment (ABP), the electronic transfer of funds (EFT), and computer banking (PC banking) (Kolodinsky, Hogarth, & Hilgert, 2004). The below are main types of E-banking technology.

ATM (Automated Teller Machine): - Information and communications technology (ICT) evolution has brought development and adoption of newly advanced technologies in commerce and financial sector. One of the modern technologies in the financial sector is the ATM system (Mwatsika, 2016). An ATM which is also known as an automated banking machine or cashpoint or cash machine allows users to access money 24 hours a day 7 days a week. It is a computerized telecommunication device that provides the customers of a bank to make financial transactions without the need for bank tellers (Bharath, Dhananjaya, Anoop, & Raghavendra, 2012).

ATM is become extremely popular among users by its convenient mode of transactions. Banks are offering new choices for their customers as using ATM have given new incentive in dimensions of service quality. The acceptance of ATM banking among people is increasing day to day and this growth increased the business interest in measuring and managing ATM banking service (Sindwani & Goel, 2012). ATM service includes mini bank statement, cash withdrawal, cash deposit, transfer of funds from one account to another, balance inquiry, purchase of some utilities like electricity and air time, bill payments, and tax payments that makes easy to get the service (Tillya, 2013).

POS (Point of Sales): - Begona, Dolore, and Zaida 2014 (as cited in Ganjikhah et al, 2017) explanation, POS is a device that provides automatic transfer of purchasing price from seller's account with a network connection to bank systems. It also includes different services such as view account balance, account billing, postponing a purchase, and daily reports for its owners. According to Stubbs (2019), every time a customer makes purchases at the store, they're completing POS transaction. POS serves as the hub where everything like sales, inventory, and customer management merges.

POS can be in a physical store, where POS terminals and systems are used to process card payments or a virtual sales point. POS transaction can occur both in person and online, with receipts generated either in print or electronically. They are increasingly interactive in the hospitality industries that allow customers to place orders and reservations and pay bills electronically (Hayes, 2019).

Mobile Banking: enables to make financial transactions by using mobile devices such as cell phone and tablet. It enables the bank customers to transfer money, pay for goods, and find ATM location instantly; this makes it preferable by many peoples. Generally, mobile banking enables banking anywhere at any time (Chen, 2019). Access to the database is made through a password and a customer code. Customers can check their balance and make adjustments between accounts. Mobile banking services can be easily used whether in the home country or abroad. If a client is abroad and wants to access his/her bank account, that can be done through the mobile phone operator. It is a fast, secure, and efficient service. It offers up-to-date information on the status of the clients' bank accounts, whatever the location of clients, or the schedule of the bank (Daniela, Simona, & Drago, 2010).

According to (Daniela, Simona, & Drago, 2010), Mobile banking has the following advantages:

- access to the bank 24 hours a day, 7 days a week, through mobile phone;
- smaller fees for electronic payments than for traditional payments;
- reduced transportation costs and time-saving;
- offline link to the bank;

Internet Banking: enables customers of a financial institution to access their accounts online via mobile devices, personal computers and tablets. Customers connect to a bank portal and thus can check their accounts and do bank transfers from any computer connected to the internet. For

authentication, a customer code and a password are provided. It is a service which concerns individual and companies who are customers of a certain bank and have access to the Internet. This service allows them to access their bank accounts through a web browser connected to the site of the bank. The only costs customers pay is for internet connection fees as it doesn't need special software (Daniela, Simona, & Drago, 2010). Internet banking can be used from the home or the office, as well as an internet café. To handle their account users just need an internet browser (Chovanová, 2006).

Phone Banking: is the provision of banking services using a classic telephone line. A bank customer can obtain the necessary information on dialling a telephone number specified in advance. The customer's identity is determined using contractually agreed terms before processing the requested banking service. Bank customers can obtain information different banking products services by using this service. One advantage of this service is that it requires no additional technical equipment apart from a telephone. Making payments for goods and services in cash or non-cash forms as well as depositing money in financial institutions and managing these resources is an inherent constituent of economic life (Chovanová, 2006).

Home Banking: allow customers of a bank to access the bank accounts through a software module that is installed on their PC and accesses the server connected to the bank's database. Customers can check their accounts, do bank transfers, and obtain financial and banking information (exchange rates, interest rates, etc.). Home banking is powerful software located in one or more computers at the customers' headquarters. When the bank found authorized customers, they can access a multi cash server connected to the bank's databases (Daniela, Simona, & Drago, 2010).

2.1.3. E-banking trend in CBE

CBE is legally established in 1963 and it is a pioneer bank in Ethiopia. Since then, it has been playing significant roles in the development of the country (Commercial Bank of Ethiopia, 2019). CBE has introduced E-banking in 2001 by installing eight ATMs located in Addis Ababa. However, being the pioneer in introducing ATM-based payment system, CBE lagged its services due to a lack of infrastructure. Following CBE's backwardness, Dashen bank has reintroduced E-banking and installed ATMs for its cardholders. After some years Wegagen bank also joined the E-banking market (Worku, 2010). Afterward CBE has turned to E-banking investment and it has

become the leading bank in its account holders, card banking users, and mobile money solution users. Currently it has more than 22 million account holders and 2.5 million mobile and internet banking users, 8 million active ATM cardholders. The number of ATMs and POS machines has also reached 3108 and 9500 respectively as of June 30th, 2019 (Commercial Bank of Ethiopia, 2019). CBE has launched the following banking products and services.

Automated teller machine (ATM)

Currently, CBE has more than 3108 ATMs all over the country. It has to give different functionalities like cash withdrawals, balance inquiry, foreign exchange, fund transfer, balance inquiry for CBE's and other local bank customers including international VISA and MasterCard users. Most customers of CBE use ATM than other E-banking channels. But the bank's goal is to create a cashless society for the future (Commercial Bank of Ethiopia, 2019).

Point of Sales (POS)

CBE cardholders use payment cards for purchasing goods and services from where CBE POS devices available. Merchants accept payments and process transactions through POS terminals. They can also use it to withdraw money at branches (Commercial Bank of Ethiopia, 2019).

Domestic Visa Cards

CBE issue different types of local and international debit cards to use on different ATM and POS terminals (Commercial Bank of Ethiopia, 2019).

Mobile Banking (MB)

CBE has delivered its mobile banking services to its customers as per their needs by using USSD (Unstructured Supplementary Service Data), XHTML, smart applications, android applications, windows mobile 7 &8, and iPhone mobile banking channels (Commercial Bank of Ethiopia, 2019). According to its official website, CBE's mobile banking has the following main functionalities:

- **My account balance:** enables to check today's remaining balance.
- **Own account transfer:** enables to transfer fund from one account to another of your own CBE account.
- **Make Payment to Beneficiary:** to transfer fund to any pre-defined CBE account holders who are registered permanently as beneficiary.

- **Payment to others:** transfer funds to any CBE account holder.
- **Local money transfers system (LMTS):** to transfer money to anyone who has or has no account at CBE.
- **Manage beneficiary:** enables to add, delete, and list beneficiaries.
- **Transfer to CBE birr wallet:** transfer money by using one's mobile number.
- **ATM locations:** enables to check of CBE's ATM locations.
- **Exchange rate:** enable the customer to view today's exchange rate of different country's currency.
- **Pay bill:** enables to pay bills that the customer consumes.

Internet Banking (IB)

CBE has also delivering it services by using internet banking. The service provided by the bank through the internet using a secured browser. The functionalities are check account balances, check account transaction details, create/view /cancel standing orders, create/view /delete beneficiary, make local money transfers, sending and receiving messages to/from the bank securely (Commercial Bank of Ethiopia, 2019).

CBE Birr

The other new service offered by CBE is CBE Birr. It is a CBE Mobile service that provides services like mobile payment, mobile transfer and agent banking. It has much functionality like fund transfer, cash deposit and cash withdrawal at agent outlets, make payment (a bill, goods, services), top-up, cash out and account management (Commercial Bank of Ethiopia, 2019).

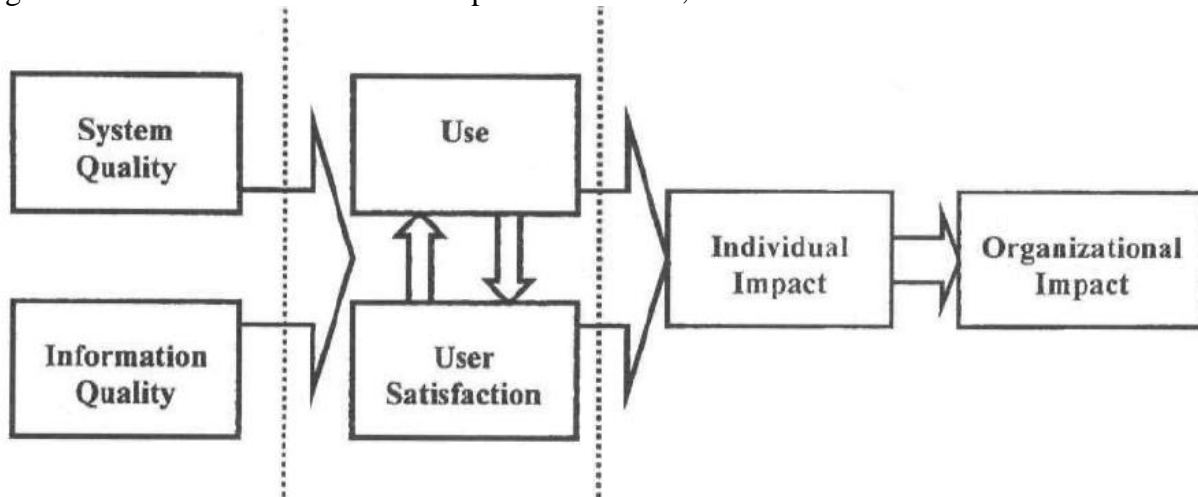
2.1.4. Information System success models

2.1.4.1 The DeLone and McLean model

Defining IS success was vague due to its complex, interdependent, and multidimensional nature. To solve its vagueness, DeLone & McLean (1992), developed the IS success model as a comprehensive framework for measuring the performance of IS. It consists of six interrelated dimensions of IS success: System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact. It means that: "Systems Quality and Information Quality individually and together can affect both use and user satisfaction. Moreover, the amount

of Use can affect the degree of User Satisfaction positively or negatively and the contrary being true. Use and user satisfaction are antecedents of individual impact; and finally, this impact on individual performance have some organizational impact”.

Figure 1: D&M IS Success Model adopted from D&M, 1992 IS success model



2.1.4.2 Updated DeLone and McLean IS success model

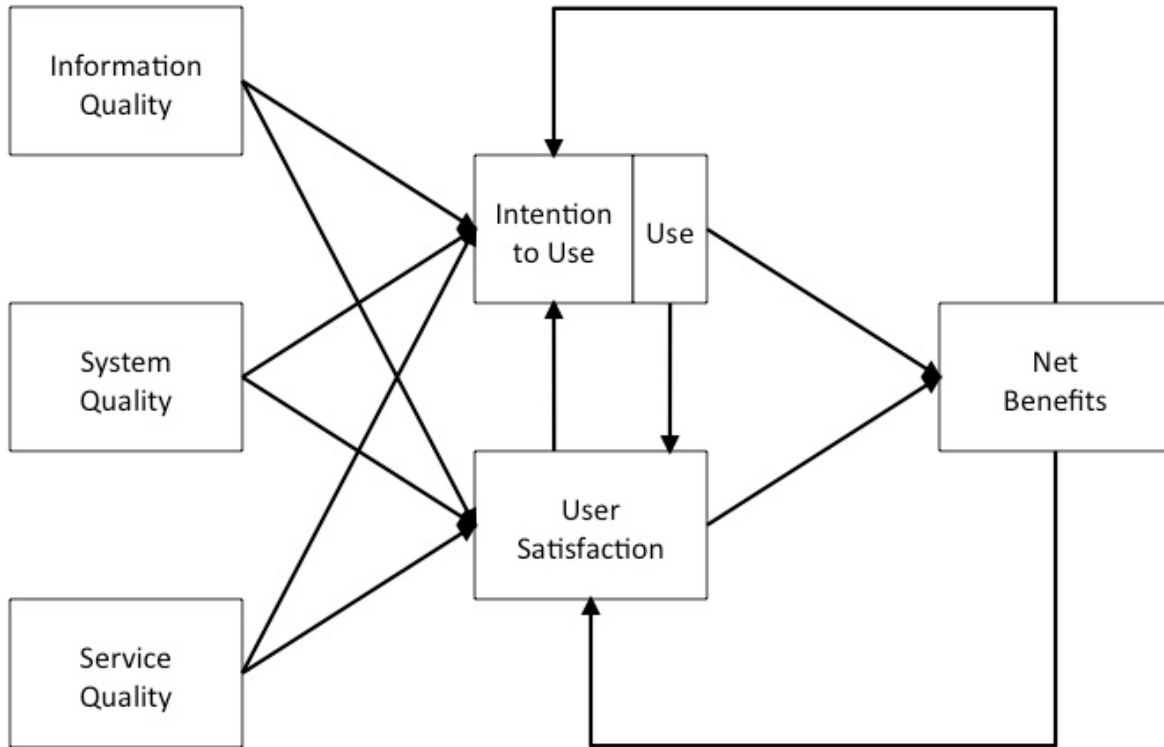
Many researchers have requested that the previous D&M IS success model is incomplete, they suggested that other dimensions should be included to the model. After ten years of the publication of their first model DeLone and McLean (2003) proposed an updated IS success model. First, they added Intention to Use to Use construct, it means Use must precede User Satisfaction in a process sense, but a positive experience with Use will lead to greater User Satisfaction in a causal sense. Generally, higher User Satisfaction leads to Intention to Use higher, which will subsequently affect Use.

Second, they added Service Quality to their model because SERVQUAL has become prominent within the IS success literature (DeLone & McLean, 2016). Third, they merge Individual Impact and Organizational Impact into a single Impact which is Net Benefit to make the model simple (DeLone & McLean, 2003).

Fourth, D&M realizes that ISs are dynamic and they added feedback loops into the model. There are feedback loops to User Satisfaction and to Use, causing a new iteration of more (or less) Use

and greater (or lesser) User Satisfaction, depending upon the Impacts positivity and negativity (Delone & McLean, 2003).

Figure 2: Updated IS Success Model (Delone & McLean, 2003)

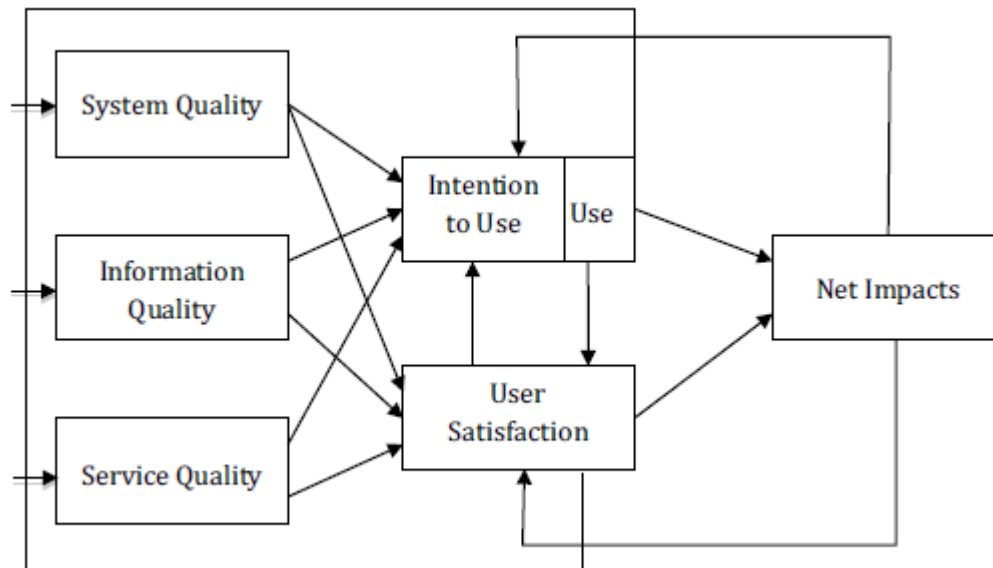


At the end, following to the publication of the 2003 updated D&M Model; they have made two additional changes. First, they have reconsidered Net Benefits and concluded that Net Impacts would be a better title because Benefits implies only positive results. But they intend to recognize that both positive and negative outcomes could occur. With positive outcomes, this would lead to more Use and higher User Satisfaction. On the other hand, negative outcomes would discourage Use and lead to lower User Satisfaction (DeLone & McLean, 2016). Second, they recognize the need for an additional set of feedback loops. To capture this graphically, feedback arrows are shown leading from Use and User Satisfaction back to System Quality, Information Quality, and Service Quality (DeLone & McLean, 2016).

So, the updated model consists of six interrelated dimensions of IS success: information quality, system quality, service quality; intention to use; user satisfaction; and net impact. The arrows demonstrate the proposed associations between the success dimensions' model (Delone &

McLean, 2003). The model can be interpreted as a system that can be evaluated in terms of information quality, system quality, and service quality; these characteristics affect subsequent use or intention to use and user satisfaction. Certain impacts will be achieved by using the system. The net impacts will (positively or negatively) influence user satisfaction and further use of the IS (Urbach & Mueller, 2011).

Figure 3: Updated DeLone and McLean 2003 IS Success Model (modified).



In the section below, the researcher discusses each variable in the D&M model. They are defined as:

Information Quality (IQ): According to Petter, McLean, & Delone (2008), IQ is the desirable characteristics of the system outputs. It can be described in terms of outputs that are useful for business users, relevant for decision making, and easy to understand as well as outputs that meet users’ information specifications (Al-Mamary, et al., 2014). The attributes are relevance, accuracy, conciseness, completeness, understand-ability, currency, timeliness, and usability (DeLone & McLean, 2016). High quality of information produced can improve the skills of decision making and it can become a competitive advantage of an organization (Azemi, Zaidi, & Hussin, 2018). According to Knight & Burn (2005), the Quality of Information is influenced by three factors:

- The perception of the user,
- The information itself, and

- The process of accessing the information.

System Quality (SQ): is the desirable characteristic of an IS. Some attributes ease of use, system flexibility, system reliability, and ease of learning, as well as system features of intuitiveness, sophistication, flexibility, and response times (Petter, McLean, & Delone, 2008).

It measures of the IS itself. These measures typically focus on usability aspects and performance characteristics of the system under examination (Urbach & Mueller, 2011). Delone & McLean (2003), measured system quality in terms of ease of use, functionality, reliability, flexibility, data quality, portability, integration, and importance.

Service Quality (SerQ): it represents the quality of the support that the users receive from the IS department and IT support personnel such as training, hotline, or helpdesk (Urbach & Mueller, 2011). Its dimensions are responsiveness, accuracy, reliability, technical competence, and empathy of the personnel staff (Petter, McLean, & Delone, 2008). It is a critical component of customer insights about the services. The firm should match the expected service and perceived service to each other to achieve customer satisfaction (Hisam, Sanyal, & Ahmad, 2016).

Intention to Use (IU): is the expected future consumption of an IS or its output (Petter & McLean, 2009), whereas, use is the degree and manner in which employees and customers utilize the capabilities of an information system (DeLone & McLean, 2016). It is measured as the frequency of use, time of use, number of accesses, usage pattern, and dependency (Delone & McLean, 2003).

User Satisfaction (US): is the users' level of satisfaction with reports, Websites, and support services (DeLone & McLean, 2016). User Satisfaction is a subjective evaluation of the various individual, organizational, and societal consequences of IS Use (Seddon P. B., 1997).

Net Impacts (NI): the extent to which information systems are contributing (or not contributing) to the success of individuals, groups, organizations, industries, and nations. For example: improved decision-making, improved productivity, increased sales, cost reductions, improved profits, market efficiency, consumer welfare, creation of jobs, and economic development (DeLone & McLean, 2016).

2.1.4.3. Gable and Sedera IS Impact Model

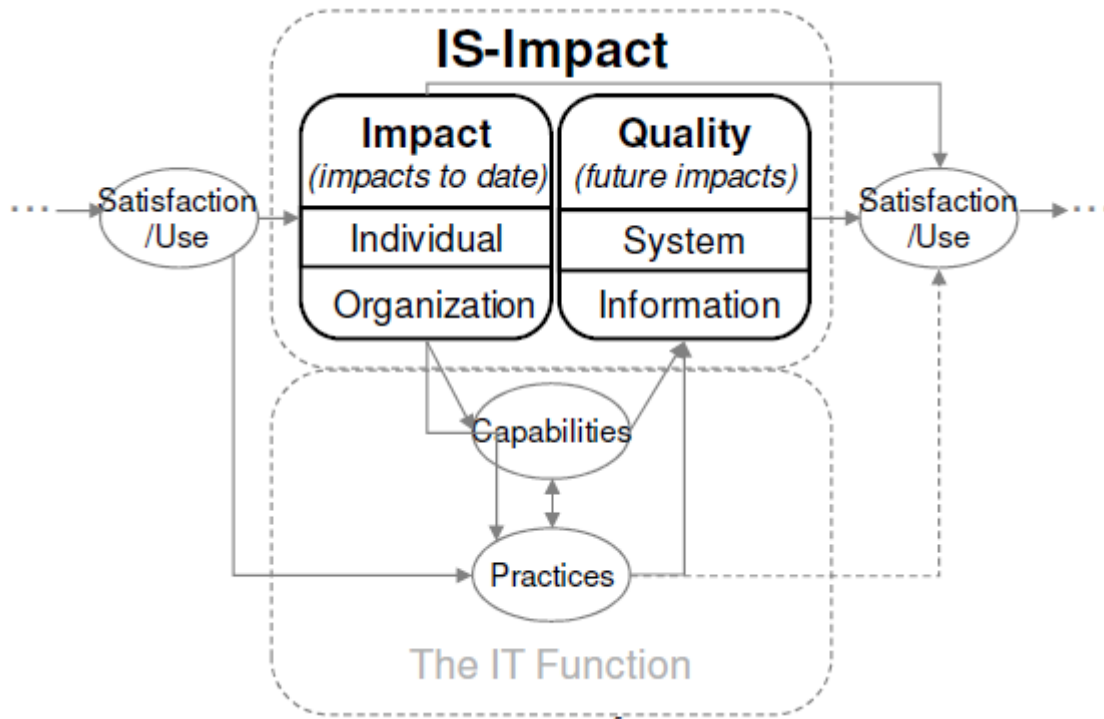
Gable, Sedera, & Chan (2008), defined IS Impact of an IS as “a measure at a point in time of the stream of net benefits from the IS, to date and anticipated, as perceived by all key user groups”.

The model represents the stream of net benefits from IS, to date and anticipated, as perceived by all key-user-groups and measures are formulated to be robust, economical, and simple, yielding results that are comparable across diverse systems and contexts, and from multiple user perspectives. The model includes four dimensions in two halves. The ‘impact’ half measures benefits to date or Individual and Organizational Impact; the ‘quality’ half, uses System Quality and Information Quality as proxies for probable future impacts (Gable et al. 2008).

On the other hand, Gable, Sedera, & Chan (2008), completed an investigative inventory review which was used for the model. They constructed A Priori model that was used for IS and ERP system success measurement. A Priori Model consists of five constructs and forty -one sub-constructs. The D&M variables were used as the basis of the initial ERP success model and were merged with the associated measures from Gable et al. (2008). When estimating an ERP, the model demonstrates a picture of the organization ‘s experience at a point in time. The impact dimensions are an assessment of profits that have been pursued (positively or negatively) from the ERP system.

A priori model represents five ERP Success dimensions that are Information quality, System quality, Individual impacts, Organizational impacts, and Satisfaction. The priori ERP Success model includes forty-one measures of success: include fifteen measures of system quality, ten measures of information quality, eight measures of organizational impact, and four measures for satisfaction and four measures for individual impact (Gable et.al. 2008).

Figure 4: The IS-Impact Model as mapped into IS-Net5 from (Gable et al. 2008)



System Quality: is a measure of the performance of the IS from a technical and design perspective (Gable , Sedera, & Chan, 2008).

Information Quality: is a measure of the quality of an IS outputs: namely, the quality of the information the system produces in reports and on-screen (Gable , Sedera, & Chan, 2008).

Individual impact: is a measure of the extent to which the IS has influenced the capabilities and effectiveness, on behalf of the organization, of key-users (Gable , Sedera, & Chan, 2008).

Organizational impact: is a measure of the extent to which the IS has promoted improvement in organizational results and capabilities (Gable , Sedera, & Chan, 2008).

Satisfaction: it is a single measure for IS evaluation (Gable , Sedera, & Chan, 2008).

2.1.4.4. Technology Acceptance Model (TAM)

It was developed by Fred Davis in 1986 to predict User Acceptance of Technology and based on the Theory of Reasoned Action. TAM aims to understand the acceptance of technology by consumers, and their computer use behaviour. TAM has occurred as a very powerful model for adopting the IS by consumers and has become the most used model by researchers (Venkatesh, 2000). It is built upon the association between two independent (Perceived Usefulness and

Perceived Ease of Use) and one dependent variable (attitude towards use) (Lai, 2017). According to Davis D. F. (1989) perceived usefulness and perceived ease of use are defined as follows:

Perceived usefulness (PU) - is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis, 1989). It means whether or not someone perceives that technology to be useful for what they want to do.

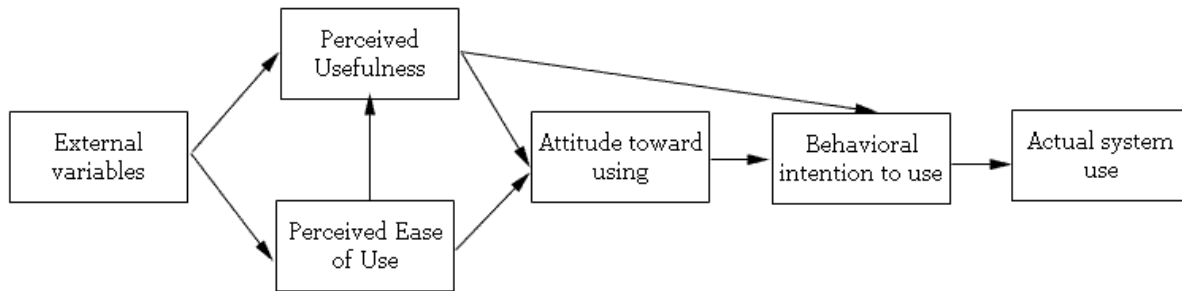
Perceived ease-of-use (PEOU) - is "the degree to which a person believes that using a particular system would be free from effort (Davis, 1989)". If the system is difficult to use and the interface is complicated, no one has a positive attitude towards it and everyone will be discouraged. Davis (1989), studies revealed the strong relationship between the two determinants, PU and PEOU, and usage behaviour. Moreover, PU has shown more strong correlation with system use than PEOU. The author justified that users are willing to adopt new technology to some extent difficulty if they have got it useful to improve their performance. However, only being easy to use will not be a determinant factor to use a system unless it brings some improvement (usefulness) on performance. However, Venkatesh & Davis (2000), explained TAM has become well-established as a robust, powerful, and parsimonious model for predicting user acceptance. Venkatesh & Davis (2000), create an extension of TAM which are TAM2 and TAM3 by adding social factors, subjective norm and organizational factors to TAM attributes.

Hu, Chau, Sheng, & Tam (1999), suggested that many factors influence initial acceptance of technology, but fundamental determinants like perceived ease of use and perceived usefulness play a greater role in continued acceptance. TAM specifies PU, PEOU, and Attitude towards usage (ATU) as main factors for IS usage and acceptance. In TAM, attitude towards usage is referred to as the measurement of the positive or negative attitudes of individuals in deciding to use the IS. PU, PEOU and ATU represent attributes of the systems such as overall design and features of the system, the user's skills and capabilities, and user's attitude towards the system which is an important factor that determines whether users will utilize the system.

TAM2 is a theoretical TAM (Venkatesh & Davis, 2000). This study explained further about PU and usage intentions in terms of social influence and cognitive instrumental processes. The model integrates additional three variables (subjective norm, voluntariness, and image) from social influence processes and four variables (job relevance, output quality, result demonstrability, and PEOU) from cognitive instrumental processes that significantly influenced

user acceptance. TAM3 is a further extension of TAM developed by integrating different determinants of PU in TAM2 and the model of the determinants of PEOU (Venkatesh & Bala, 2008). The model includes external four different types of conditions: individual differences, system characteristics, social influence, and facilitating conditions which are determinants of both PU and PEOU (Venkatesh & Bala, 2008).

Figure 5: Technology Acceptance Model.



2.1.5. E-banking and developing countries

Different factors like competition, business environment, globalization, technology advancement have forced banking and financial services to change. E-banking is the wave of the future and provides huge benefits to customers. But it has also challenges like security, lack of knowledge of end users, failure of bank transitions and user interface (Havasi, Meshkany, & Hashemi, 2013). The application of E-banking can help developing nation banks to reduce operating costs and provide a better fast service to their customers. However, there is a huge gap between well-developed nations and least developed nations in terms of development and application of e-banking services. There is a huge population in developing countries, but the people are not familiar or not using at all the E-banking services offered by commercial banks. Developing countries have also lack high quality IT professionals to design, develop, and operate e-banking systems (Yang & Ahmed, 2009).

2.1.6. Factors of IS failure

Although the IS was operational for some time, there are some factors which lead to failure. The reason for this is that a range of human and organizational factors prevented the organization from embracing the full impact of the system (Irani, Sharif, & Love, 2001). As Lyytinen &

Robey (1999), only the advancement in technologies are not sufficient to improve the failures of information system rather organizations fail to learn from their experience in systems development because of limits of organizational intelligence, disincentives for learning, organizational designs, and educational barriers are reasons for failures in the IS. The following are major failure factors of an IS which are described by (Ganesh & Mehta, 2010) and other authors.

1. Intense customization

Customizing ISs depends on the clients' and vendor's needs. As per Mukoya (2009) too much customization can bring forth many complications at the design and implementation phase of developing the system. This requires a high degree of skills and technical expertise that should be possessed by the team members to design highly-customized systems, and later this will lead to intense need and maintenance efforts after the system goes live.

2. Lack of knowledge transfers

Knowledge transfer across projects moves knowledge from project sources of knowledge to project recipients with the goal of improving performance and capabilities (Landaeta, 2008).

3. Users' resistance to change

Users often resist IS implementations and it has been established that this can cause an implementation to fail. User attitudes, which form and change during IS implementations, can cause either resistance or acceptance but little research has employed to help and understand how user attitudes form and change during IS implementations (Campbell & Grimshaw, 2016). As Shang and Su (2004), different strategies are suggested to manage user resistance from user participation and job redefinition up to some forceful actions. However, managers follow only one approach or a limited set of strategies regardless of the situation.

4. Lack of top management support

Top management support of IS refers to the degree to which top management understands the importance of the IS function and the extent to which it is involved in IS activities. As per Mukoya (2009), IS failure put vast amount of emphasis on insufficient support from senior

management and leadership through setting unclear purpose from employing a certain project, incapability to manage complexity, under-nourishing initiatives, failure to anticipate short-term disruptions, inability to demonstrate the invisible progress and eventually disregard for the stability and maturity of the used technology as a major cause of IS failures. In addition to this, the absence of top management support is a critical barrier to IS use and the lack of some organisations' productivity has been attributed to IS failure (Brynjolfsson 1993). According to Glaser (2005), the top management failures are the main reasons for the failures of IS projects. The writer elaborates top management failures are: - inadequate support from senior management, insufficient leadership by starting a vague project, inability to manage complexity, failure to anticipate short-term interferences, incapability to display the unseen progress, ignorance for the stability and maturity of the used technology.

5. Poor planning (PP)

Proper planning is vital for the successful implementation of project. As per Mukoya (2009) planning is that in reality being able to perform a project according to what has been planned is an exception rather than a norm. As per Goedeke, Mueller, & Pankratz (2017), lack of overall plan for developing, implementation, and operating the product will lead the IS failure.

6. Weak requirement specification

The requirement specification is task-specific. As per Mukoya (2009) the importance of the clear definition of the project requirements and scope relies first on assigning the suitable resources for the project in addition to the accurate estimation of the time and budget needed. However weak definition of the project scope and requirements will give some space for scope creep, which will end up with complex changes that are beyond the project plans, and increasing the conflicts within the project. As per Davis, et al, (1992), the information requirements component would refer to how the users themselves respond to the system capabilities.

2.1.7. Summary of literature review

E-banking is an electronic payment system enables bank customers to make financial and non-financial transactions over the internet. It gives different services like fund transfers, deposits, and online bill payments to the customers. However, in developing countries, customers are lack to entertain these benefits for different reasons. Eventhough, CBE is providing different E-banking products and services to its customers but the customers are not satisfied with the services and products offered by their bank according to customer complaint records of the bank.

Failure and success in the IS field are well-known words and extensively researched. But they are difficult to define. Researchers have focused for decades on both outcomes by providing several explanations. Due to IS's success complexity, interdependent, multidimensional nature, attempts to define makes it inexplicit. However, to address this issue D&M makes extensive research and identified six dimensions of IS success. Different models that are used to measure IS success were discussed in the literature. Among them, Delone and McLean's (2016) IS success model is very popular and effective to measure IS success. Most researchers used D&M IS success model in their study. This study used all variables from the updated D&M IS success model, plus an additional two variables to make the study more significant. Generally, this study tried to combine all variables from the updated D&M IS success model and with an additional two variables to study CBE's mobile banking success.

2.2. Review of Related Empirical Studies

2.2.4. Review of Related Empirical Studies outside Ethiopia

Christiyaningsih & Kurniasih (2014), conducted a study on "analysis of Mobile Banking Success Using a Respecification of D&M Information Success Model". The objective of the study was to analyze factors that affect the success of mobile banking using the D&M model. Purposive sampling was applied to collect data from 200 respondents using questionnaires. Structural equation modeling was used to analyze data. The results of the study indicated that: (1) SQ, IQ, US and NB variables influence Use, (2) SQ and IQ variable have influence toward User Satisfaction, (3) US variable has influence toward NB, (4) NB variable has no influence toward

US, (5) Use variable does not influence NB. However the study excluded service quality dimension and the sample size is small.

Widjaja, Chen & Gonchig (2018), researched “investigating factors affecting central bank information systems success: The case of the Central Bank of Mongolia (CBM)”. The objective was to identify the significant factors contributing to the success of CBM’s ISs. They were empirically investigated factors that could potentially affect the success of the external and the internal IS of the central bank of Mongolia drawing from the DeLone and McLean (2003) IS success model and Seddon and Kiew’s (1997) path model. The data analysis was conducted using a quantitative method for the external IS and a mixed method for the internal IS. Both questionnaire and interview was used to collect data. PLS-SEM using SmartPLS V2.0M3 statistical software. The result of this study indicated that CBM’s internal IS showed majority of proposed hypotheses were significantly supported. There is insignificant relationships among system quality, service quality, usefulness, and satisfaction. But the study has limited sample size.

Aldholay & Isaac et al. (2018), research on an extension of Delone and McLean IS success model with self-efficacy. The objective was to extend the D&M model by incorporating self - efficacy construct as an antecedent to the US and Use to predict student performance. The questionnaire method of data collection was used to collect data from 448 students. Data analysed using confirmatory factor analysis and structural equation modelling via AMOS. The findings of the study showed that overall quality (SQ, IQ, SerQ) and Self efficacy have a positive impact on the US and system usage. System usage significantly predicts the US and both US and system users have a positive impact on student performance. They used all variables in D&M model but they added only one variable self-efficacy, including other variables may better contribute to the study.

Michel & Cocula (2017), did research titled “impact of the three IS qualities on user satisfaction in an information-intensive sector”. The objective was to theorize the relationships among the three types of quality in the context of a highly informational sector, and empirically test these relationships in the banking domain to understand how various components of quality influence each other and subsequently influence satisfaction. To test their hypotheses, they collected data

from the principal two French retail banks by using an online questionnaire. The result showed that in a highly information-intensive sector, the model, therefore, confirms that the principal antecedents of information quality are system quality and service quality, and that information quality determines satisfaction. System and service quality have a significant influence on information quality which, in turn, exercises a significant influence on satisfaction. They considered only quality dimensions.

Jaafreh (2017), did research titled “evaluation Information System Success: applied DeLone and McLean Information System Success Model in the context banking system in KSA”. The objective was to propose and test an evaluation model that can be used to evaluate the success of information systems from the users’ perspective by formulating hypotheses. Data collected from employees of the banking sector in KSA by using a questionnaire to test the relationships between variables. The finding of the study provided empirical support for the existence of a positive relationship between the dimensions of the IS success model. IS quality dimensions (information system, system quality, service quality) have a significant positive influence on user satisfaction and use. Just information quality has a significant positive influence on intention to use, but system quality and service quality, not significant. Also, use and intention to use have a significant positive influence on user satisfaction. Finally user satisfaction, Use, and intention to use have a significant positive influence on net benefit.

Kutlu & Alkaya (2015), conducted research titled “measuring the Delone and Mclean model of information systems success applied to the banking sector of Turkey”. The objective was to find factors that evaluate the information system success of the banking sector which is called “net benefits” by formulating hypotheses. The survey method is used as a data collecting tool to determine factors that measure information systems’ success. The study is conducted via a google survey tool and face to face interviews with bank employees in Turkey. The study revealed that Information quality is not a factor of IS success. System, service, and information quality of banking had positively contributed to user satisfaction. But they have not positively contributed to the user. Information quality doesn’t contribute to the model. IS success (net benefits) depends on three independent variables as information quality, system quality, and user satisfaction.

2.2.5. Review of Related Empirical Studies in Ethiopia

Damen (2018), made a study on factors affecting customers' satisfaction regarding the electronic payment system. The objective was to investigate factors that affect customer satisfaction referring to the e-payment system in CBE. Data is collected by using both questionnaires and interviews from 126 customers and 3 CBE staffs. The result showed that lack of awareness and information, lack of governmental support, security risk, lack of trust, shortage of skilled professionals, lack of adequate infrastructure, the functionality of technology, and economical problem are the challenges of using an electronic payment system. However, sample size 126 is too small to collect data from both customers and staffs. There is no need of research to know the the challenges of using electronic payment system because the interview questions are directly asked like what are the key challenges in your institution to practice e-payment system?

Sisay (2019), did on the effect of e-banking service quality on customer satisfaction. The objective was to examine the effect of e-banking service quality dimensions on customer satisfaction with CBE. Primary Data was collected via self-administered 360 questionnaires from customers of CBE. The results of this study indicated that E-banking service quality was directly associated with customer perceived service quality. The results of the study indicated that all service quality dimensions influence customer satisfaction with e-banking. Security and Ease of Use dimensions have been rated as the most and least significant Service Quality Dimension respectively. The study considered only service quality variable which may leads to wrong result.

Ejigu (2016), studied on E-Banking service quality and its impact on customer satisfaction. The objective of the study was to examine the effect of E-Banking service quality on customer satisfaction. Data collected through questionnaires from a sample of 190 bank customers by using stratified sampling. The results of the study indicated that except assurance, all service quality dimensions (tangibility, reliability, responsiveness, and empathy) have a positive and significant effect on customer satisfaction. The results also indicated that customers were most satisfied with the responsiveness dimensions of E-Banking service quality. The study was considered only one quality dimension that is service quality and it is not clearly stated about sample size determination.

In general, very few related works are identified regarding E-banking success in Ethiopia and there are no works done by using the D&M model plus with additional variables. This study aims to study CBE's E-banking success by using all variables in the D&M model and other additional variables that are significant. So, it will be unique in Ethiopia to the extent of using all variables in the D&M model and other additional variables.

CHAPTER THREE

Research Design and Methodology

3.1. Introduction

Research methodology is a way to systematically solve the research problem and a science of studying how research is done scientifically (Kothari, 2004). Under this section the researcher presents source and method of data collection, target population and sampling frame, sampling techniques and sample size, method of data analysis, analysis techniques, variable definition and hypotheses of the study and model specification.

3.2. Research design

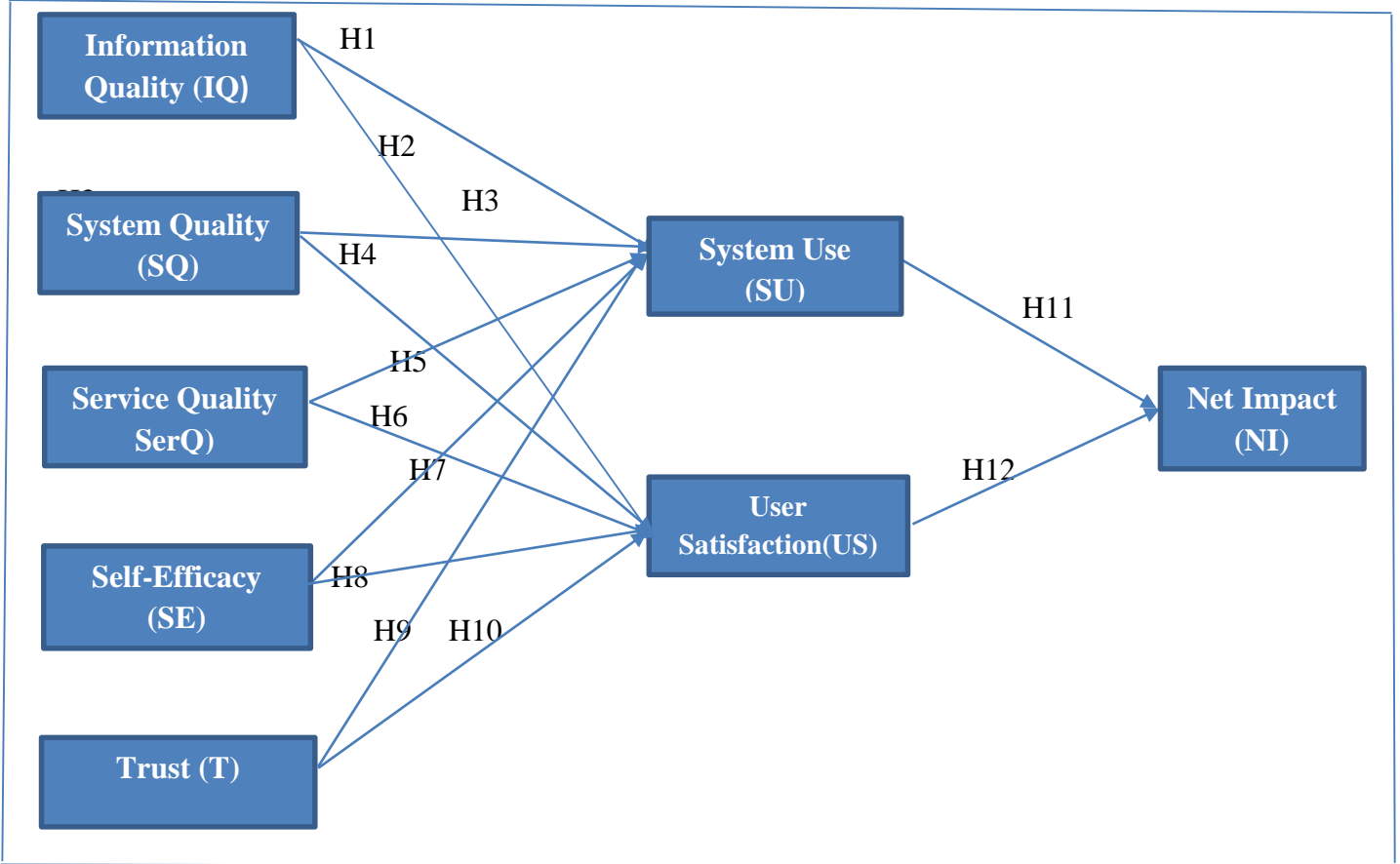
Research design is important because it makes research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money (Kothari, 2004). Causal research design is characterized by the prior formulation of specific research questions and hypotheses. The main aim of causal research is to identify any causal link between the factors or variables that pertain to research problem (Creswell, 2014). Since this research is aimed at to test the hypotheses of cause and effect relationships between variables, it follows causal research design.

3.3. Research Model and Hypothesis Development

3.3.1. Proposed research model

The proposed conceptual research model for this research is composed of eight variables and twelve relations as shown below. While the variables are represented by rectangular blocks, relations are represented by using arrows where the head represent the dependability direction.

Figure 6: Conceptual model for this research adapted from Delone & McLean, (2003).



3.3.2. Hypothesis development

The researcher adopted IS success model which is the most comprehensive model and used by many researchers as a theoretical framework to study IS success. IS success model (D&M IS success model) is an IS theory which seeks to provide a comprehensive understanding of IS success by identifying, describing, and explaining the relationships among six of the most critical dimensions of success (Delone & McLean, 2003). According to the refined model of D&M a system can be evaluated in terms of information, system, and service quality; these characteristics affect successive use or intention to use and user satisfaction. Certain benefits will be achieved by using the system. The net benefits will (positively or negatively) influence user satisfaction and the further use of the IS (Urbach & Mueller, 2011).

For hypotheses development, all variables are directly taken from updated D&M IS success model with additional two variables with explanations. These variables are Information Quality (IQ), System Quality (SQ), Service Quality (SeRQ), System Use (SU), Net Impact (NI), Self-Efficacy (SE) and Trust (T) which significantly affect IS success. The reason for adding variables on D&M IS success model is that Delone & McLean (2002) recommend that changing and extending D&M model variables are advisable since the current IS success model has multidimensional and contingent nature. So this study adds two variables which is self efficacy aims to know the ability of technology usage of the customer and trust to know the trust of technology. Hence, explanations of main variables and associated hypotheses are presented as follows.

Information Quality (IQ)

Information quality is the desirable characteristics of the system outputs. The output of the IS should to be relevant to the purpose for which it is required, easy to understand, accurate or less error, concise, complete or contains all the required information, currency, quick availability and timely to support information needs, and usability (Al-Mamary, et al., 2014). Information quality is often seen as a key antecedent of user satisfaction (Urbach & Mueller, 2011). Delone & McLean (2003), confirmed that information quality has strongly associated with system use and user satisfaction as users will perceive an IS as useful when it provides high quality information. In contrast, an IS will be considered useless when the information generated is not high quality. Hence, in this research the researcher hypothesized the positive relation as follows:

H1: IQ has positive effect on Mobile Banking usage.

H2: IQ has positive effect on user satisfaction (US).

System Quality (SQ)

System quality is the desirable characteristics of an IS. It consists of ease of use, system flexibility, system reliability, ease of learning, intuitiveness, sophistication and response time (Al-Mamary, et al., 2014). According to Urbach & Mueller (2011), the success dimension system quality constitutes the desirable characteristics of an IS and, thus, includes measures of the IS itself. These measures typically focus on usability aspects and performance characteristics of the system under examination. As per Delone & McLean (2003), there are causal relationship

between system quality and system usage. As the system has higher quality, it is expected to lead to higher user satisfaction. Finally, user satisfaction leads to positive impacts on individual productivity and organizational productivity improvements. Hence, in this research the researcher hypothesized the positive relation as follows:

H3: SQ has positive effect on Mobile Banking usage.

H4: SQ has positive effect on user satisfaction (US).

Service Quality (SerQ)

According to Jaafreh (2017), Service Quality is defined as “Quality of the service or support that system users receive from the IS organization and IT support personnel in general or for a specific IS. For example: Responsiveness accuracy, reliability, technical competence, empathy of the personal staff”. The success dimension service quality represents the quality of the support that the users receive from the IS department and IT support personnel, such as, for example, training, hotline, or helpdesk (Urbach & Mueller, 2011). As per widjaja et al (2018), IS with an excellent service quality will enhance the degree of usefulness. Because the IS being evaluated in this study is highly focused on providing good services to its users, it is crucial to examine the relationship between service quality and usefulness. Delone & McLean (2003) also recommended that service quality be added as an important dimension IS success given the importance of IS support, especially in the e-commerce/digital banking environment where customer service is crucial. Hence, the below hypotheses are formulated based on the above description.

H5:SerQ has positive effect on Mobile Banking usage.

H6:SerQ has positive effect on user satisfaction (US).

Self-Efficacy (SE)

Self-efficacy is one’s belief or judgment of what can be done with the skills possessed within a particular realm (Bandura, 1977). As individual characteristics vary significantly, it is a vital variable in terms of technology usage (Mahdavian , Wingreen , & Ghlichlee , 2016). As Bandura (1997, p. 391) self-efficacy refers to “people’s judgments of their capabilities to organize and execute courses of action required to attain designated types of performances”. Mehmood et al (2014), also define self efficacy as one’s confidence in having the skill and knowledge to carry

out banking transactions through computer and internet. They differentiate self-efficacy in three dimensions namely: generalizability, magnitude and strength. Generalizability is the degree to which one's belief is limited in a particular domain or not. In the context of digital banking this skill can be what users can do with such skills. On the other hand, magnitude refers to the level of proficiency expected which means individual with high self-efficacy magnitude perceive themselves competent enough to accomplish difficult tasks. Whereas strength refers to the confidence one has in his or her abilities to perform a task. Hence, the below hypotheses are formulated based on the above description.

H7: SE has positive effect on Mobile Banking usage.

H8: SE has positive effect on user satisfaction (US).

Trust (T)

Trust is defined as a willingness to rely on an exchange partner in whom one has confidence (Moorman et al. 1992). Trust become one of the consideration factors in choosing the banking service. Trust plays a vital role in the acceptance of the digital banking, the reliability and availability of the system when the user needs service is an important factor affecting adoption of digital banking service (Kusumawati & Rinaldi, 2020). Trust is an important indicator of IS impact on an individual specially in the banking industry (Koo, Wati, & Chung, 2013). Hence, in this research the researcher hypothesized the positive relation as follows:

H9: Trust has positive effect on Mobile Banking usage.

H10: Trust has positive effect on user satisfaction (US).

System Use (U)

Use is the degree and manner in which employees and customers utilize the capabilities of an information system (DeLone & McLean, 2016). Use is measured as frequency of use, time of use, number of accesses, usage pattern, and dependency (Delone & McLean, 2003). In addition to this, they also suggested that the nature, quality, and appropriateness of the system use are also important. The use of a system depends on the users' evaluation of that system. Bokhari (2005) evaluate the system use as if the system improves the users' task performance or decision

quality, then they tend to use the system otherwise they may avoid to use a system unless its use is mandatory. Hence, the below hypothesis is formulated based on the above description:

H11: System Usage has positive effect on net impact (NI).

User Satisfaction (US)

According to Seddon & Kiew (1994), user satisfaction is the pure like and dislike feeling result from using something. The indicators used to measure this variable are needs, efficiency, effectiveness and enjoyment. According to Delone & McLean (2003), satisfaction with IS can have a significant influence on Net Benefits. As per Hammoud et al (2018), E-Banking has become one of the essential banking services that can, if properly implemented, increase customer satisfaction, and knowing the relative importance of service quality dimensions can help the banking industry focus on what satisfies customers the most. Hence, in this research we hypothesized the positive relation as follows:

H12: User Satisfaction has positive effect on net impact (NI).

Net Impact

As per Delone & McLean (2016), net impact represent the end point measure of success. Delone & McLean (2003) also depict net impact as the extent to which IS are contributing to the success of the different stakeholders. In order to know the impact of system use and user satisfaction and former separate dimensions individual impact and organizational impact, the D&M success model construct net impact. The result of net impact may be both positive and negative outcomes could occur. With positive outcomes, this would lead to more Use and higher User Satisfaction. On the other hand, negative outcomes would discourage Use and lead to lower User Satisfaction (Delone & McLean 2016).

3.4. Research Methodology

Research Paradigm

In research, it is important to first identify the research paradigm that fits with the research objectives. Paradigm is a basic belief system that guides the investigations. Research paradigms address the philosophical dimensions of social sciences and they classified in to: positivism, interpretivism, realism and constructivism. Positivists usually believe that reality is given

objectively and that measurable characteristics independent of the observer (investigator). Positivist studies usually try to test the hypothesis in an effort to improve the phenomena's predictive knowledge (Majeed, 2019). This research aims to identify factors that affect mobile banking usage by formulating hypotheses, so it follows positivist theory.

Research Approach

According to Kothari (2004), depending on the research questions and the type of the data, one can follow qualitative approach, quantitative or mixed approach. Quantitative research method is based on the measurement of quantity and applicable to phenomena that can be expressed in terms of quantity. In quantitative research, the measurement and classification requirements of the information that is gathered demand that study designs are more structured, fixed and predetermined in their use to ensure accuracy in measurement and classification (Kumar, 2011).

Qualitative research

To study mobile banking success in CBE, quantitative research is more preferable as related to hypotheses formulation. Hence, this research basically follows quantitative research method.

3.4.1. Data Collection

Questionnaire is quite popular, particularly in case of big enquiries. It is economical and simple data collection method appropriate for quantitative research type (Kothari, 2004). It is one of the most widely used data collection technique within the survey strategy as each respondent is asked to respond to the same set of questions (Saunders, Lewis, & Thornhill, 2009). This paper contains two types of questionnaire i., e close ended questions for bank customers and open ended questions for bank employees. For the variables information quality and system quality the questionnaires are adopted from Delone & McLean (2016) model with minor amendments to meet the research objectives and for the other variables namely service quality, self-efficacy, trust, user satisfaction and net impact the questionnaires are adopted from different prior researches as depicted in table 1. The questionnaire was prepared in English language. To reduce the ambiguity of the questionnaire for bank customer respondents, it was translated to national language which is Amharic language by a licensed official language translator. The questionnaire has two components one for demographic data and other for main items to measure each construct items.

The first section or the demographic component is composed of age, gender, income, education level and mobile banking experience in CBE. The second group contains a group of 30 items adapted from DeLone & McLean (2016) and other previously done researches are presented in the below table 1. These items are measured using a 5-point Likert scale, ranging from “[1] = strongly agree” to “[5] = strongly disagree”. “Use/system usage of mobile banking” construct has been measured in terms of frequency and variety using 5-point Likert scale from “[1] = Never” to “[5] = Always”. The below table shows basic variables and their constructs.

Table 1: Basic variables and construct items

Variables	Item code	Construct items	Reference
Information Quality (IQ)	IQ1	Mobile banking provides output that seems to be exactly what is needed.	(DeLone & McLean, 2016)
	IQ2	Information needed from mobile banking is always available.	
	IQ3	Information from mobile banking is in a form that is readily usable.	
	IQ4	Information from mobile banking is easy to understand.	
	IQ5	Information from mobile banking appears readable, clear, and well formatted.	
System Quality (SQ)	SQ1	Mobile banking is easy to use and learn.	(DeLone & McLean, 2016)
	SQ2	Mobile banking meets my requirements.	
	SQ3	Mobile banking includes necessary features and functions.	
	SQ4	Mobile banking requires only the minimum number of fields and screens to achieve a task.	
	SQ5	Mobile banking user interface can be easily adapted to one’s personal approach.	
Service Quality	SerQ1	I was trained to use Mobile banking when I started to use at CBE.	(Nizamani et al, 2017), (Manchanda &

(SerQ)	SerQ2	The responsible service personnel provide personal attention when I experience problems with the Mobile Banking	Mukherjee, 2014), (Rammutloa, 2017)
	SerQ3	The responsible service personnel are always highly willing to help whenever I need support with the Mobile Banking.	
	SerQ4	The responsible service personnel have sufficient knowledge to answer my questions with respect to the Mobile Banking.	
	SerQ5	The responsible service personnel provide services related to the Mobile Banking at the promised time.	
Self-Efficacy (SE)	SE1	I feel confident finding information by using mobile banking.	(Aldholay, Isaac, Abdullah, Abdulsalam, & Al-Shibami, 2018)
	SE2	I do not need anyone to teach me how to use Mobile Banking because I can learn it by myself.	
	SE3	Mobile banking is characterized by the frankness and clarity of the services that it offers to me.	
	SE4	I use Mobile Banking because someone has shown me how to do it.	
	SE5	I feel confident finding information by using mobile banking.	
Trust (T)	T1	I trust Mobile Banking.	(Koo, Wati, & Chung, 2013)
	T2	I trust the information presented by Mobile Banking.	
	T3	I feel Mobile Banking would provide me with good service.	
User	US1	I am satisfied with the performance of the	

Satisfaction (US)		Mobile Banking service.	(Jagannathan, Balasubramanian, & Natarajan, 2016)
	US2	I am pleased with the experience of using the Internet Banking service.	
	US3	My decision to use the Internet Banking service was a wise one	
	US4	I am satisfied with the system efficiency.	
Net Impact (NI)	NI1	I perceived Mobile Banking would be available 24 X 7.	(Jagannathan, Balasubramanian, & Natarajan, 2016)
	NI2	I perceived Mobile Banking would save my cost and time.	
	NI3	I perceived Mobile Banking would be available irrespective of geographical limits.	
System Usage of Mobile Banking (SU)		Request remaining balance	
		Request financial mini statement	
		Transfer money between your accounts	
		Transfer money to another person's account	
		Transfer to CBE Birr wallet	
		Transfer to your beneficiaries	
		Check ATM location	
		Transfer to any non CBE customer	
		Request foreign exchange information	
		Pay bills	

3.5. Target Population and Sampling Design

The target population of this research includes all active CBE mobile banking users and CBE's employees. Sample design is definite plan for obtaining a sample from a given population and a technique or a procedure that the researcher would adopt in selecting items for the sample (Kothari, 2004).

Studying the whole population is not manageable and economical. Hence sampling is important to manage the population and to save time and cost. Purposive sampling method involves

purposive or deliberate selection of particular units of the universe for constituting a sample which represents the universe (Kothari 2004). So, purposive sampling technique is appropriate for this study to select the six bank branches. These are Addis Ababa branch, Arat Killo branch, Finfine branch, Mexico branch, Paulos branch and Tefera Degife branch. The branches are selected because they are large and entertain large number of customers, so it makes easy to find target respondents. Convenience sampling is applied when population elements are selected for inclusion in the sample based on the ease of access (Kothari, 2004). Convenience sampling technique is applied to select individual participants from six selected branches of the bank. Convenience sampling method is used for selecting customers based on the ease of access while they visit bank branches.

3.5.1. Sample size determination

Sampling is the process of selecting just a small group of cases from out of a group (Walliman, 2011). Sampling requires careful determination of sample size because it is based on the characteristics of this sample that we make inferences about the population. Increased sample size is more likely to increase statistical significance (Hinkin, 1995).

Schwab's "thumb rule of 10" (as cited in Hinkin, 1995) suggested an item-to-response ratio should be at least 1:10 for each set of scales to be factor analyzed. Schwab's rule has been found applicable for this study to determine the minimum sample size requirement due to it gives larger sample size than other sampling method. As the research has 22 basic items for independent variables, it requires a minimum of 220 respondents. Considering additional 20% to increase statistical significance and additional 10% contingency for unsuccessful responses, total of 286 sample sizes was determined for data collection and distributed to six branches of CBE.

Based on the above sample size and distribution plan, the actual primary data has been collected from each branch starting from October 31 up to November 7, 2020 for a week. In all branches, the data was collected primarily on the spot by researcher assigned persons. A total of 286 close ended questionnaires were distributed to six branches and 280 questionnaires were returned and from 280 questionnaires 10 questionnaires were incomplete. Finally, the researcher used 270 valid questionnaires which is 95.6 % of the sample size.

3.6. Data Analysis Tools and Techniques

Data analysis refers to a variety of specific procedures and methods. It involves goals; relationships; decision making; and ideas, in addition to working with the actual data itself. In general, data analysis includes ways of working with information (data) to support the work, goals and plans (Richmond, 2006). So the collected data should be well organized and analyzed to test the proposed hypothesis using statistical techniques.

To analyze the collected data, it was coded and well organized by using Microsoft Excel 2016 so as Microsoft Excel is easy to manage the coded data. Then it was saved in comma delimited (csv) file format as it is suitable for SmartPLS software and in Excel (.xlsx) file format as it is suitable for SPSS (Statistical Package for Social Sciences) software. SPSS was used to analyze descriptive analysis of the demographic data of respondents which is suitable and user-friendly tool for determining basic frequency based statistical measures.

Structural equation modeling (SEM) is a multivariate statistical framework that is used to model complex relationships between directly and indirectly observed (latent) variables (Stein, Morris, & Nock, 2012). Partial least squares structural equation modeling (PLS-SEM) has become a popular tool for analyzing relationships between latent variables, measured by sets of observed variables. Model specification in PLS-SEM involves the structural model and the measurement models. The structural model represents the structural paths between the constructs, whereas the measurement models represent the relationships between each construct and its associated indicators (Sarstedt & Cheah, 2019).

Smart PLS has a friendly user interface and advanced reporting features (Wong, 2013). According to (Lowry & Gaskin, 2014) if a model is mixed between formative and reflective indicators, and has several interaction items, PLS will be most appropriate analysis approach. so the researcher selected PLS tool to test the model. However SmartPLS latest version (3.2) doesn't have free version for academic purposes and supports only 100 and less samples. So SmartPLS V 2.0M3 was used for path coefficient models as it requires only registration with valid e-mail address to get license.

CHAPTER FOUR

Data Analysis and Discussion

4.1 Introduction

In the previous three chapters, the researcher defined the problem, articulated the objectives, reviewed literatures relevant to the topic and set methodologies to solve the problem. This chapter will discuss the overall data analysis process and discussion. It has four sections. Under section 4.2 the descriptive statistics for the demographic information of respondents are presented and analyzed. Under section 4.3, the structural and measurement models of reflective indicators and formative constructor are analyzed and discussed. In addition to this, path coefficient for each variable are presented and discussed. Finally, findings and discussion are summarized under section 4.4.

The aim of this research is to analyze the relationship between system quality, information quality, service quality, trust and self-efficacy to user satisfaction and use of mobile banking and the relationship between user satisfaction and use of mobile banking to a net impact. To achieve the objective, the researcher formulated the hypotheses by extending D&M IS success model. The study follows quantitative research design and the target populations are customers of CBE who uses mobile banking service. A total of 286 close ended questionnaires were distributed to six branches of CBE and a total of 270 usable questionnaires were collected within a week. The data collection process was challenging as people have negative attitude to fill the questionnaire. But with a high endeavor can achieve the target. After the data collection process was completed, the next step was to code the collected data in to MS excel which eases inserting and retrieving of data. Then the coded data was cleared from missing values. And the final stage was export to SPSS V.20 to analyze the descriptive data and Smart PLS V 2.0M3 to test the model. The data was analyzed by using structural equation modeling.

4.2 Descriptive Statistics

4.2.1 Demographic characteristics

Respondents' demographic detail consists of five characteristics that include gender, age, monthly income, educational level and CBE's mobile banking experience. All five personal

characteristics were represented in the questionnaire as multiple-choice item in which the respondents marked only one of the given answers that describes them.

4.1.1.1 Respondents per their gender

Gender values were represented by 1 for “Male” and 2 for “Female”. As shown in table 2, 65.6% of the respondents were males whereas 34.4% of the respondents were females.

Table 2: Respondents frequency per gender

Gender	Frequency	Percent
Male	177	65.6
Female	93	34.4
Total	270	100

Source: Demography information of respondents and generated through SPSS

4.1.1.2 Respondents per their age

Respondents’ age values were classified in to five groups that ranges in number of years as [18 to 25], [26 to 35], [36 to 45], [46 to 55] and [above 55] and coded as 1, 2, 3, 4 and 5 respectively. The study considered only respondents whose age is eighteen and above since eligible customers who can use mobile banking in CBE are those who are eighteen and above. As shown in the below table 3, the respondents whose age ranges from 26 up to 35 years counted 54.1% whereas age range of 18-25 years counted 23%. In addition to this, the cumulative percentage of respondents whose age is 45 and less are counted 91.5%.

Table 3: Respondents frequency per age

Age (in years)	Frequency	Percent
18-25	62	23
26-35	146	54.1
36-45	39	14.4
46-55	20	7.4
Above 55	3	1.1
Total	270	100.0

Source: Demography information of respondents and generated through SPSS

4.1.1.3 Respondents per their educational level

Education level indicates the respondents' academic level and it is categorized as [High School], [Diploma], [1st degree], [2nd Degree], [PHD] and [others]. It is coded from 1 to 6 respectively. As shown in the below table 4, the respondents who have first degree and above counted for 82.6%. This confirms that, most of mobile banking users are university level educated.

Table 4: Respondents frequency per education level

Educational level	Frequency	Percent
High school	12	4.4
Diploma	35	13
First Degree	160	59.3
Second Degree	61	22.6
PHD	2	0.7
Total	270	100.0

Source: Demography information of respondents and generated through SPSS

4.1.1.4 Respondents per their monthly income

The other demographic profile is average monthly income which shows the respondents' an average monthly monetary earning in Birr. It is categorized in five groups labeled as [1000 and below], [from 1001 to 3000], [from 3001 to 5000], [from 5001 to 10000] and [10001 and above]. It is coded as 1, 2, 3, 4 and 5 respectively. As shown in the below table 5, most of the respondents 48.9% earn an average monthly income of Birr 5,001 up to 10,000.

Table 5: Respondents frequency per monthly income

Monthly income	Frequency	Percent
1000 and below	2	0.7
1001 up to 3000	27	10
3001 up to 5000	53	19.6
5001 up to 10000	132	48.9
10001 and above	26	20.8
Total	270	100.0

Source: Demography information of respondents and generated through SPSS

4.1.1.5 Respondents per their mobile banking experience in CBE

The last respondents' demographic profile is their mobile banking experience in CBE in years. It is categorized in four groups labeled as [1 year and below], [from 2 to 5], [from 6 to 10], [11 years and above]. It is coded as 1, 2, 3 and 4 respectively. As shown in the below table 6, most (57.4%) of the respondents' experience ranging from 2 up to 5 years.

Table 6: Respondents frequency per monthly income

Mobile Banking Experience	Frequency	Percent
1 year and below	78	28.9
2 up to 5 years	155	57.4
6 up to 10 years	36	13.3
above 11 years	1	0.4
Total	270	100.0

Source: Demography information of respondents and generated through SPSS

4.3 Structural and Measurement Models

4.3.1 Introduction

Structural equation modeling (SEM) is a multivariate statistical framework that is used to model complex relationships between directly and indirectly observed (latent) variables (Stein, Morris, & Nock, 2012). It has two components i.e. structural and measurement models. The structural model represents the structural paths between the constructs, whereas the measurement models represent the relationships between each construct and its associated indicators (Sarstedt & Cheah, 2019).

SEM is flexible which allows for conducting and combining variety of statistical procedures like multiple regressions, factor analysis, ANOVA and so on. SEM handles the relation between latent variables (LV). Its main feature is to compare empirical data. The comparison then leads to assessing the matching of model and data. If the fit is acceptable, it is assumed that the relationship between latent (structural model) and observed variables (measurement models), and the assumed dependencies between LVs are regarded as being supported by the data (Nachtigall, Kroehne, Funke & Steyer, 2003).

SEM has two types of measurement scales that are formative and reflective. Formative measures are indicators that cause the LV and are not interchangeable among themselves where as reflective measurement is an observed variable that is assumed to be an effect (consequent) of a LV. In this study US, SU and NI are formative LVs whereas IQ, SQ, SerQ, Tr and SE are reflective LVs. This study used both measurement and structural model to meet its objectives. Reflective and formative of measurement scale of SEM presented in the next section.

4.3.2 Measurement model for reflective indicator

As per Wong (2013) reflective indicators analyze the model by using indicator reliability, internal consistency reliability and discriminant validity, whereas formative indicators analyze the model by using outer weight (not outer loadings!) and convergent validity.

Internal Consistency Reliability

Most of the social science researches used Cronbach's alpha to measure internal consistency reliability but it tends to provide a conservative measurement in PLS-SEM (Wong , 2013). It has a range from 0 to 1 which is 0 for completely unreliable whereas 1 for completely reliable. According to George & Mallery (2003) provide the following rules of thumb: "Alpha value > .9 – Excellent, Alpha value > .8 – Good, Alpha value > .7 – Acceptable, Alpha value > .6 – Questionable, Alpha value > .5 – Poor, and Alpha value < .5 – Unacceptable". Cronbach's alpha values of most variables are greater than 0.7 (except Net Impact). The NI Cronbach's alpha value is 0.55 it is poor but acceptable.

Table 7: Composite reliability and Cronbach's α measures of the reflective model

	Composite Reliability	Cronbach's Alpha
SU	0.867728	0.834136
IQ	0.876618	0.819427
NI	0.738285	0.549761
SE	0.838370	0.736758
SQ	0.832643	0.747177
SERQ	0.830153	0.744698
Tr	0.881826	0.796193
US	0.836160	0.734579

Source: Smartpls

Indicator Reliability

Indicator reliability describes the extent to which a variable or set of variables is consistent regarding what it intends to measure. It measures how much of the indicators variance is explained by the corresponding latent variable (Urbach & Ahlemann , 2010). The Indicator reliability values greater than 0.7 is preferred. Whereas if the study follows exploratory research design, it is recommended that the indicator reliability values should be 0.5 (Urbach & Ahlemann , 2010 ; Wong , 2013).

Table 8: Indicator Reliability measures with Factor loadings for reflective indicators

Variables	Indicators	Indicator Reliability Outer Loadings (λ)	Composite Reliability (ICR)	Convergent Validity (AVE)	Discriminant validity Square roots of AVE
System Use	SU1	0.577440*	0.867728	0.404061**	0.6343
	SU10	0.645623*			
	SU2	0.484694*			
	SU3	0.723559			
	SU4	0.823080			
	SU5	0.540081*			
	SU6	0.718272			
	SU7	0.639084*			
	SU8	0.422759*			
Information Quality	SU9	0.677984*	0.876618	0.591491	0.7688
	IQ1	0.612201*			
	IQ2	0.871709			
	IQ3	0.661614*			
	IQ4	0.850367			
Net Impact	IQ5	0.813590	0.738285	0.513525	0.7166
	NI1	0.834499			
	NI2	0.700506			
Self-Efficacy	NI3	0.588792*	0.838370	0.571734	0.7561
	SE1	0.571115*			
	SE2	0.683250*			
	SE3	0.905257			
Service Quality	SE4	0.821245	0.830153	0.507780	0.7176
	SERQ1	0.369760*			
	SERQ2	0.778598			
	SERQ3	0.808806			

	SERQ4	0.750484			
	SERQ5	0.760639			
System Quality	SQ1	0.687849*	0.832643	0.504702	0.7042
	SQ2	0.784395			
	SQ3	0.843569			
	SQ4	0.525540*			
	SQ5	0.668802*			
Trust	TR1	0.883978	0.881826	0.714821	0.8485
	TR2	0.904473			
	TR3	0.738223			
User Satisfaction	US1	0.898655	0.836160	0.571406	0.7473
	US2	0.793729			
	US3	0.479090*			
	US4	0.786453			

Source: Smartpls

*Shows low loading factor below the preferred value (.7), ** shows low AVE below the threshold (.5)

As per the above table 8, the outer loading (indicator reliability) for the reflective indicators is higher than the recommended level except for System Usage (SU1, SU2, SU5, SU7, SU8, SU9, SU10), Information Quality (IQ1 and IQ3), Self-Efficacy (SE1 and SE2), Service quality (SerQ1), User Satisfaction (US3) and System Quality (SQ1, SQ4 & SQ5). However, Urbach & Ahlemann (2010) suggested that items with lower loadings should be removed if the loading factors are smaller than 0.4. Hence SerQ1 is eliminated.

Convergent Validity (AVE)

Convergent validity measures the degree to which individual items reflecting a construct converge in comparison to items measuring different constructs (Urbach & Ahlemann, 2010). A commonly measurement criterion of convergent validity is the Average Variance Extracted (AVE) which is proposed by (Fornell & Larcker, 1981). Urbach & Ahlemann (2010); Bagozzi & Yi (1988) as cited in (Wong, 2013) recommend that AVE values should be greater than 0.5 as it indicates average LV can explain more than half of the variance of its indicators. As per table 8, almost all values of AVE are greater than the recommended one which is 0.5 except for SU.

Discriminant Validity

Discriminant validity assess whether the items do not unintentionally measure something else and it concerns the degree to which the measure of different constructs different from one another (Urbach & Ahlemann , 2010). There are two measures of discriminant validity in SEM while using PLS namely cross-loading and Fornell-Larcker criterion. The first measure is obtained by correlating each component scores with all other items, whereas as the second measure requires an LV to share more variance with its assigned indicator than with any other LV. Accordingly, the AVE of each LV should be greater than the LVs highest squared correlation with any other LV Chin 1998, as cited in (Urbach & Ahlemann , 2010). As per table 9, square roots of AVE's are greater than the value of correlations. This implies that discriminant validity is well established.

Table 9: AVE, Square root of AVE's and correlations

	AVE	SU	IQ	NI	SE	SQ	SerQ	Tr	US
SU	0.404	0.6356							
IQ	0.591	0.2317	0.7687						
NI	0.513	0.6505	0.2854	0.7162					
SE	0.571	0.1445	0.4163	0.1313	0.7556				
SQ	0.504	0.2623	0.5986	0.2426	0.4819	0.7099			
SerQ	0.507	0.0690	0.3243	0.0312	0.3664	0.3754	0.7120		
Tr	0.714	0.0912	0.4411	0.0979	0.4907	0.4424	0.3509	0.8449	
US	0.571	0.1880	0.5174	0.2461	0.5712	0.5251	0.6107	0.5969	0.7556

Source: Smartpls

Bold on the diagonal are the square roots of AVEs while off diagonals are correlations of each variable

4.3.3 Measurement Model for Formative Constructor

Unlike to reflective measurement model, formative measurement model analyzes the model's outer weight (not outer loadings!) and construct validity (Wong, 2013).

Outer model weights and Significance

By using Smart PLS, the researcher can generate T-statistics for significant testing of both inner and outer model through bootstrapping procedure (Wong, 2013). As per Wong (2013) and Hair

et al (2017) indicator's outer weight should have a t-value greater than 1.96 for .05 significances. If it is less than 1.96 and the corresponding outer loading of the same indicator is also below 1.96, removing the indicator is recommended for a better solution. It is also advisable bootstrapping should run by set of 5,000 samples and number of bootstrap cases should be the same as the number of valid observations (i.e. 286). Accordingly, the researcher tests outer model weight and significance by using bootstrapping procedure.

Table 10, clearly indicates that T-values of formative indicators are significant (greater than 1.96) except IQ -> SU, SE -> SU, SQ -> US, SERQ -> SU, Tr -> SU and US -> NI which is not significant at $P < .05$. However, in formative model, dropping an item should require concrete theoretical evidence than statistical measure (Urbach & Ahlemann (2010); Desta (2018)).

Table 10: Outer model weight and T-value

	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T Statistics
SU -> NI	0.6264	0.6251	0.0564	11.1017
IQ -> SU	0.1323	0.1374	0.0826	1.6023
IQ -> US	0.1494	0.1499	0.0512	2.9153
SE -> SU	0.0395	0.0418	0.0747	1.1067
SE -> US	0.1747	0.1742	0.0460	3.7975
SQ -> SU	0.2107	0.2090	0.0915	2.3022
SQ -> US	0.0916	0.0932	0.0544	1.6837
SerQ -> SU	-0.0491	-0.0507	0.0715	1.0924
SerQ -> US	0.3563	0.3584	0.0502	7.0952
Tr -> SU	-0.0616	-0.0599	0.0803	0.7673
Tr -> US	0.2833	0.2812	0.0420	6.7399
US -> NI	0.1284	0.1300	0.0780	1.6455

Source: SmartPLS

Construct Validity

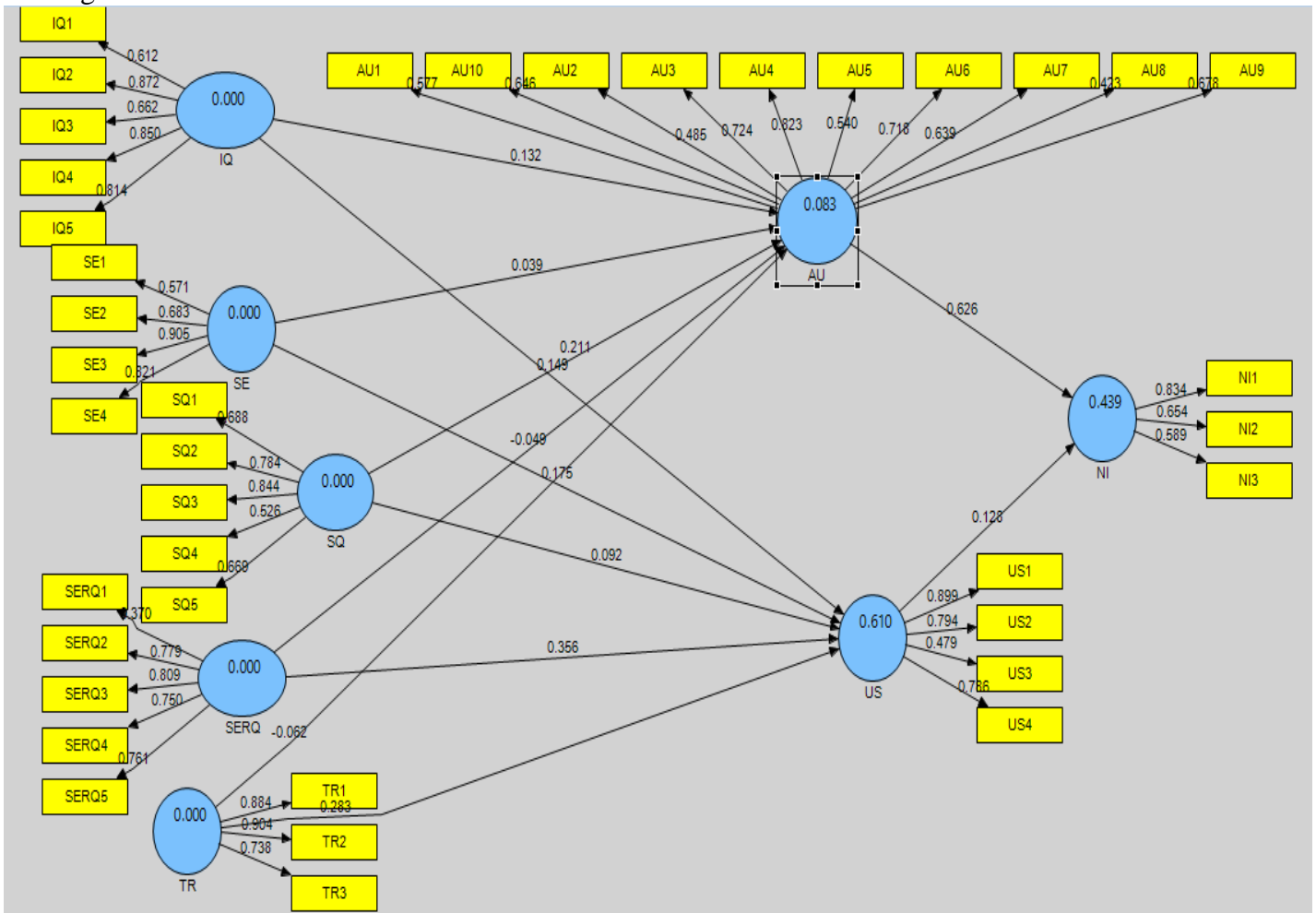
Construct validity measures inter-construct correlation between formative and all other constructs and it should be less than 0.7 of discriminant validity value. This means that the constructs differ sufficiently from one another (Urbach & Ahlemann , 2010). As a result, from the above Table 9, the correlation between the formative LV (Net Impact) and all other constructs ranges from .03 to .65 that confirms construct validity is well addressed.

4.3.4 Structural Model Assessment

Determination coefficient (R^2)

Evaluating path modeling results involve the development of global goodness-of-fit criteria the goodness-of-fit are primarily assessed through the coefficient of determination (R^2) values (Desta, 2018). As shown in the below Figure 6, R^2 for User satisfaction (US), System use (SU) and Net Impact (NI) is 0.610, 0.083 and 0.439 respectively. This means that 61% of variance in US is explained by the five exogenous factor included in the model. Moreover 44% of variance in NI is explained by two exogenous factors that include in the model below. According to Wong (2013) this rates is categorized under “moderate” range. Whereas SU explained only by 8% which is grouped under “weak” rate.

Figure 7: Structural and measurement model



Source: PLS-SEM result

However, the model is found weak in explaining the variance in system usage, there are evidences that show other researchers have found similar results. For instance, Khechine & Lakhal (2018) found that only 12% explained variance for the system use on their technology adoption study.

Path coefficient assessment

SEM analysis provide the standardized path coefficients, p-values, and variance that explained by the endogenous variables which are used in establishing the extent of the relationships existing among the variables (Ojo, 2017). Table 11, indicates that the summary of path coefficient along with t-value to show whether the initial assumed relations are confirmed or not.

Table 11: Path Coefficient and T-value

Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Error (STERR)	T-Statistics (O/STERR)	Path coefficients	Impact on hypothesis
H1 IQ -> SU	0.1323	0.1374	0.0826	1.6023	0.132**	Confirmed
H2 IQ -> US	0.1494	0.1499	0.0512	2.9153	0.149**	Confirmed
H3 SQ -> SU	0.0395	0.0418	0.0747	1.1067	0.211**	Confirmed
H4 SQ -> US	0.1747	0.1742	0.0460	3.7975	0.092*	Confirmed
H5 SerQ -> SU	0.2107	0.2090	0.0915	2.3022	-0.048ns	Disconfirmed
H6 SerQ -> US	0.0916	0.0932	0.0544	1.6837	0.356***	Confirmed
H7 SE -> SU	-0.0491	-0.0507	0.0715	1.0924	0.083*	Confirmed
H8 SE -> US	0.3563	0.3584	0.0502	7.0952	0.175***	Confirmed
H9 Tr -> SU	-0.0616	-0.0599	0.0803	0.7673	-0.062ns	Disconfirmed
H10 Tr -> US	0.2833	0.2812	0.0420	6.7399	0.283***	Confirmed
H11 US -> NI	0.1284	0.1300	0.0780	1.6455	0.128**	Confirmed
H12 SU -> NI	0.6264	0.6251	0.0564	11.1017	0.626***	Confirmed

Source: PLS-SEM result

***p < 0.001, **p < 0.01, *p<0.05, ns: not significant

H1: IQ -> SU

The first hypothesis that Information quality has a positive impact on system usage of mobile banking has been supported by $\beta = .132$. As per Wahyudi et al (2017), in this study information quality measured by the completeness, less error and accuracy of the generated information from mobile banking. This means that when the financial institution provides complete, relevant, understandable, accurate, concise and on time information to the customer, the mobile banking usage will increase. The interviewees response confirms that if the customer gets high information quality from the mobile banking service then their satisfaction will increase. The study result is similar to that of other researchers like Vijai (2018), and Mueller & Urbach (2011).

H2: IQ -> US

The second hypothesis is that information quality also has positive impact on mobile banking user satisfaction. It is statistically significant with beta value of 0.149. Due to the above result, the researcher accepts the hypothesis that information quality has positive and significant impact on mobile banking service of CBE. In the banking sector which is highly information intensive sector, information quality highly affects the satisfaction of the customers. If the information quality of CBE mobile banking is high, the users will be more satisfied with the service. The interviewees also confirm that if the customer gets high information quality from the mobile banking service then their usage will be increase. This result is consistent with Widiastuti, Haryono, & Said (2019) and Landrum & Prybutok (2004) which conclude that information quality and user satisfaction of mobile banking user have positive relationship.

H3: SQ -> SU

In this study system quality measures ease to use, system flexibility, system reliability, ease to learning, intuitiveness, sophistication and response time. Accordingly, the result revealed that system quality has positive and statistically significant relationship with beta value of 0.211. Due to the above result, the researcher accepts the hypothesis that system quality has positive and significant impact on system usage of mobile banking service of CBE. This result suggested that system quality of mobile banking like accessibility, easy to use, flexibility and reliability has positive effect on the usage of the mobile banking service. If CBE's mobile banking system has

acceptable quality in terms of accessibility, flexibility, reliability and easy to use, the customer usage of the service will increase. The result is consistent with Al-Fraihat, Joy, & Masa'deh (2019) which conclude that system quality has significant positive impact on customer mobile banking service usage.

H4: SQ -> US

The fourth hypothesis is that system quality also has positive impact on mobile banking user satisfaction. The result shows that it is statistically significant with beta value of 0.092. Due to the above result, the researcher accepts the hypothesis which is system quality has positive and significant impact on user satisfaction of mobile banking of CBE. This result suggested that if mobile banking of CBE has the high assessment on system quality, then the customer satisfaction of mobile banking is high. This result is in line with Riskayanto (2019) and Vijai (2018) who found strong positive relation between system quality and customer/user satisfaction.

H5: SerQ -> SU

The service quality in this study is seen from the timely provision of service, immediate response to inquiries; the provision of professional service and the provision of personalize services. The fifth hypothesis is that service quality has positive impact on mobile banking usage. However, the result shows that it has negative impact on mobile banking usage but statistically insignificant with beta value of -0.049. Due to the above result, the researcher rejects the hypothesis which is system quality has positive and significant impact on mobile banking satisfaction at CBE. This result suggested that the CBE mobile banking service quality may have been negatively affecting frequency of usage of the services among its users. The possible justification for the result will be the number of CBE's Mobile banking users are increasing but the level of service that the bank give is the same or stagnant and poor network. However as per interviewees respond the Bank give mobile banking service support through branch and customer contact center to enhance the usage of the service. The service quality thus needs to be improved to increase the usage of the customer. This result is consistent with the study of Zaidi, Siva, & Marir (2014) who found service quality having insignificant effect on system usage of mobile banking.

H6: SerQ -> US

In this hypothesis, the researcher project that service quality has positive and significant effect on customer satisfaction of mobile banking service of CBE. The result also confirms that service quality has positive and significant effect on mobile banking customer satisfaction with beta value 0.356. Due to this result the researcher accepts the hypothesis. Service quality is important in digital banking world. This result suggested that if CBE can improve the service quality of mobile banking, then the level of customer satisfaction will increase. The other justification for the result is that if CBE adjust the service quality of mobile banking in line with the number of mobile banking users and new technology, then the customer satisfaction will increase. The result is in line with Riskayanto (2019) which states that service quality has a positive effect on user satisfaction.

H7: SE -> SU

The seventh hypothesis is that self-efficacy has positive and significant effect on mobile banking usage. It is statistically significant with beta value of 0.083. Due to the above result, the researcher accepts the hypothesis saying self-efficacy has positive and significant impact on system usage of mobile banking of CBE. This result suggested that when the customer has confidence on his/her ability to perform mobile banking activities, the usage of mobile banking will increase. The result is consistent with Mutahar et.al (2017) who concludes that self-efficacy has significant positive impact on mobile banking usage.

H8: SE -> US

Self-efficacy also has positive and significant effect on mobile banking customer satisfaction. It is statistically significant with beta value of 0.175. According to the above result, the researcher also accepts the hypothesis of self-efficacy has positive and significant impact on customer satisfaction of CBE mobile banking user. This result suggested that if the customer entertains or able to use mobile banking service to produce the desired transactions/output, the satisfaction of the customer will increase. This result is in line with HS & Pujani (2014) who states that self efficacy has a positive an significant impact on customer satisfaction.

H9: Tr -> SU and H10: Tr -> US

The ninth and tenth hypotheses are that trust has a positive and significant relationship on system usage and customer satisfaction. Trust is one's belief in the reliability, truth, or ability of someone or something. According to the result the relationship between trust and mobile banking usage is insignificant with beta value -0.062, whereas the relationship between trust and user satisfaction is significant with beta value 0.283 with $p < .001$. The insignificant relationship result suggested that if the customers don't trust the service, their usage will decrease. The other possible justification is that the society of our country are not familiar with technology and digital banking (even if most of the respondents are university level educated), this may create fear to use new technologies. On the other hand, the significant relationship result suggested that if the customer trusts the mobile banking service, the satisfaction of using mobile banking will increase. Moreover, if the customer once builds their trust on technology and digital banking service, the satisfaction of mobile banking will increase. This result is in line with Chung & Kwon (2009).

H11: US -> NI

User satisfaction is the response and feedback that the user raises after using the information system (Widiastuti et al. 2019). According to the result, user satisfaction has positive and statistically significant relations with net impact with beta-value of 0.128. Due to the above result, the researcher accepts the hypothesis that user satisfaction has positive and significant impact on net impact of mobile banking at CBE. The study measured net impact by availability of mobile banking system, cost and time reduction and geographical boundary. The result suggested that if CBE's mobile banking service is available at any time, and minimize time and cost of the user, then their satisfaction will increase and finally they are satisfied with the mobile banking service of CBE. This result is consistent with many researches for instance Widiastuti et al (2019) which revealed that user satisfaction has positive and significant impact on net benefit. Another research which was done by Al-Fraihat et al (2019), also stated that perceived user satisfaction has positive and significant impact on net benefit. Riskayanto (2019) also stated that perceived user satisfaction has a positive and significant impact on net benefit. perceived

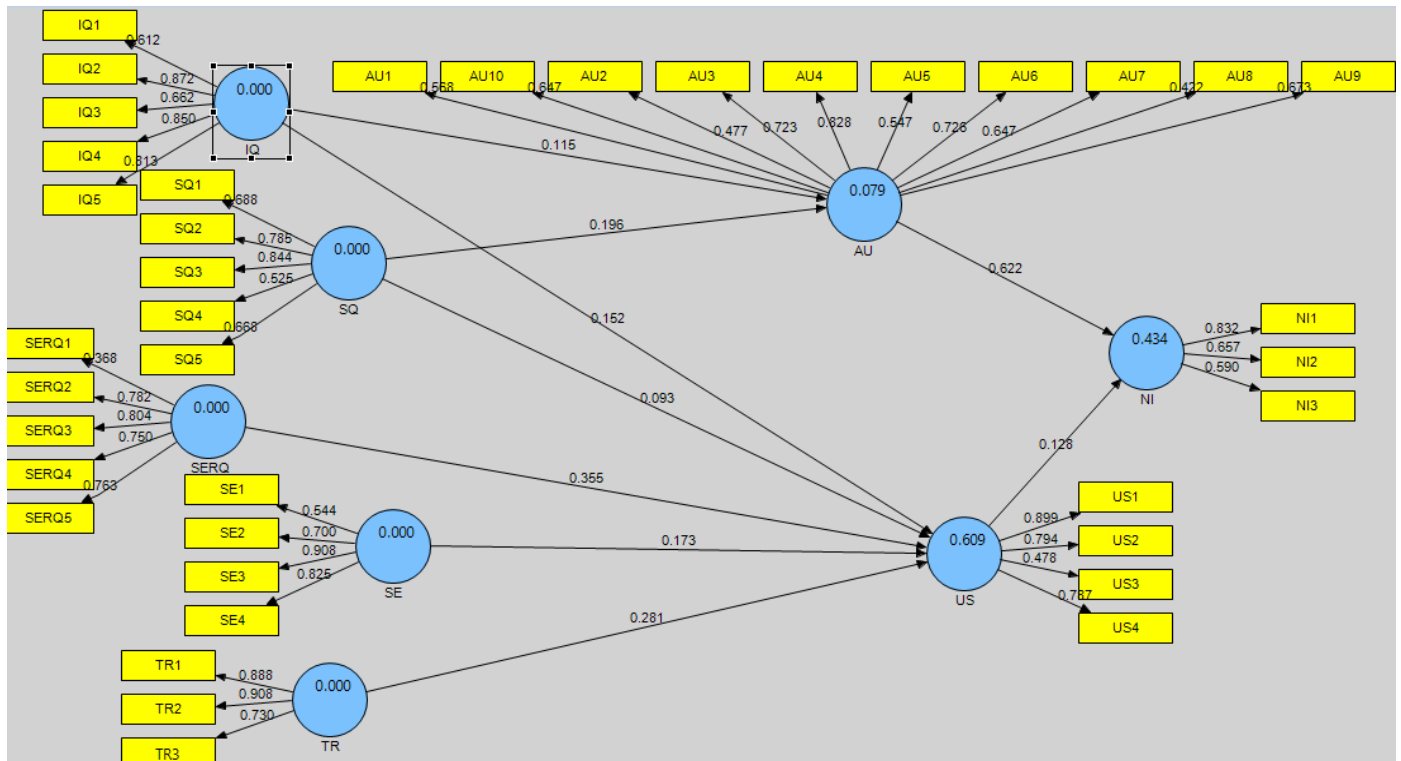
H12: SU -> NI

System use is the degree and manner in which employees and customers utilize the capabilities of an information system (DeLone & McLean, 2016). As per the result, system usage has positive and strong statistically significant relationship with net impact with beta value of 0.626. According to the above result researcher accepts the hypothesis saying system usage has positive and significant impact on net impact. The researcher assumes that the mobile banking service will be successful if the system is available at any time, minimize cost and time and unlimited with geographical boundary. Hence the customer uses mobile banking service due to the availability of mobile banking system, its time and cost saving and unrestricted by geographical boundary. Thus mobile banking usage has impact on net impact. This result in line with many researches for example Al-Fraihat et al (2019), which find out system use has positive and significant impact on net impact. The second research that was done by Widiastuti et al (2019), also revealed that system usage has positive and significant impact on net impact. The third study which was done by Riskayanto (2019), also find out system use has positive and significant impact on net impact.

Refined path modeling

The researcher refined path modeling after removing the unsupported and insignificant relation from conceptual model. Accordingly, the new model has been tested using PLS algorithm after the unsupported relations between SerQ and SU, Tr and SU were removed. While revising path coefficient, the SE and US relation also became insignificant so the researcher decided to remove the relation from conceptual model. Finally, as it is shown in figure 7 the refined path model consists of only relation with positive β coefficients and significant $p < .05$.

Figure 8: Refined path coefficient based on findings



4.4 Summary of interview

4.4.1 Challenges of CBE Mobile Banking Service

The interviewees point out that the main challenge of CBE mobile banking service specially at initial stage is that “Network problem, this happens due to that the Bank gives mobile banking service through USSD (SIM based) and application/web based (need internet access) and there is network interruption in the country and the internet access is not the same throughout the country so this is the great problem”.

4.4.2 Reasons for Mobile Banking usage problem

The interviewees said that “the Mobile Banking usage problem comes from both the customer and Bank side”. From the Bank perspective when the system is continuously interrupted, customers lose their interests to use the service and then decreased their level of satisfaction. From the customer perspective due to lack of awareness and low understanding of the service, the customer fails to use the mobile banking service.

4.5 Summaries of findings and discussions

The study has analyzed the demography information of 270 mobile banking users of CBE. The user's demographic information contains gender, age, education level, monthly income and mobile banking experience. The study found that most of the respondents are male, age range from 26 up to 35 years and most of the respondents are university level educated. In addition to this, most of the respondents experienced mobile banking for 2 and above years.

The study tested both structural and measurement models. The researcher used repeated tests to see how the proposed model fits to the sample customers. For measurement model the researcher used reliability, indicator reliability and ICR tests and the result have been found acceptable except for very few cases as suggested by Garson (2016), Henseler et al (2009) and Wong (2013). Convergent and Discriminant validity test was also assessed to check how well the indicators were converged to their construct and at the same time not indicating something else. AVE values were dominantly used to check these validities and almost in all cases the results were satisfactory. Discriminant validity was assessed and meets the requirement by comparing the square roots of AVE values with the corresponding paired correlation values. Cross-loadings were also used to check whether the perfect diagonal has occurred that indicated high convergent and discriminant validity.

Path coefficient analysis conducted and the result confirmed that the initial assumptions for almost all hypotheses are accepted while some others were rejected. These findings have been compiled in the below Table 12 for easy understanding and comparison. As it is shown in this table, information quality, system quality, service quality, trust and self-efficacy has positive and significant effect on use satisfaction in line with the study hypothesis. This implies that if the bank aggressively works on information, system and service quality in terms of providing high standard service, then the mobile banking user satisfaction will increase. In addition to this, when the customer trusts the mobile banking service and able to operate the service by him/herself the satisfaction level of the customer will increase.

On the other hand, information quality, system quality, service quality, trust and self-efficacy have positive and negative effect on system use. Regarding significance some of the relationship has significant whereas others are insignificant. The possible justification for insignificant result

between trust and system use might be that the society of our country are not familiar with new technology and digital banking (even if most of the respondent are educated), this may create fear of technologies. The other insignificant result was service quality and system use. The possible justification for the result might be the number of CBE's Mobile banking user increasing from time to time and now a day it reaches 4.6 million customers but the level of service that the bank give is the same or stagnant. This may reduce the level of the mobile banking users.

Table 12: Summary of expected and actual signs of explanatory variables on the dependent variables

Explanatory Variable	Expected result	Actual result
H1 IQ -> SU	Positive and Significant	Positive and Significant
H2 IQ -> US	Positive and Significant	Positive and Significant
H3 SQ -> SU	Positive and Significant	Positive and Significant
H4 SQ -> US	Positive and Significant	Positive and Significant
H5 SerQ -> SU	Positive and Significant	Negative and insignificant
H6 SerQ -> US	Positive and Significant	Positive and Significant
H7 SE -> SU	Positive and Significant	Positive and Significant
H8 SE -> US	Positive and Significant	Positive and Significant
H9 Tr -> SU	Positive and Significant	Negative and insignificant
H10 Tr -> US	Positive and Significant	Positive and Significant
H11 US -> NI	Positive and Significant	Positive and Significant
H12 SU -> NI	Positive and Significant	Positive and Significant

CHAPTER FIVE

Conclusion and Recommendation

5.1 Conclusion

Mobile banking services is one of the banking product/service that enables customers to access their accounts through cell phone, computer or other devices, transfer their money between different accounts or making payment, pay bills and request balance. The focus of measuring IS success is on the investigation of the effect of a system on individual performance, business process performance, and organization performance. The aim of this study was to assess CBE's mobile banking success using D&M IS success model with the aim of identifying the causes of the problems reported by customers. The study reviewed literatures in two aspects. The first aspect theoretical part that reviewed different theories and the second aspect reviewed related empirical studies which were done both in Ethiopia and outside Ethiopia.

To achieve the research objective, the study used causal research design which is characterized by identifying any causal link between the variables. The study develops twelve hypotheses from eight variables (information quality, system quality, service quality, system use, net impact, self-efficacy and trust). The study used both purposive and convenience sampling technique and the sample size is 286. The data were collected through questionnaire from CBE's mobile banking customers. The collected data were analyzed by SEM analyzing technique by using PLS and SPSS software.

The researcher did statistical test which is measurement model for reflective indicators like internal consistency reliability using Cronbach alpha, indicator reliability, convergent validity (AVE) and discriminated validity gave acceptable results. On the other hand, measurement model for formative constructor like outer model weights and significance and construct validity were tested and also gave acceptable result.

Structural and measurement model evaluation were done and the complete lists of supported hypotheses are:

H1: IQ has a positive and significant impact on customer's usage of mobile banking service

H2: IQ has a positive and significant impact on customers' Satisfaction of mobile banking service.

H3: SQ has a positive and significant impact on customer's usage of mobile banking service

H4: SQ has a positive and significant impact on customers' Satisfaction of mobile banking service.

H6: SerQ has a positive and significant impact on customers' Satisfaction of mobile banking service.

H7: SE has a positive and significant impact on customer's usage of mobile banking service.

H8: SE has a positive and significant impact on customers' Satisfaction of mobile banking service.

H10: Tr has a positive and significant impact on customers' Satisfaction of mobile banking service

H11: US has a positive and significant impact on customer's net impact of mobile banking service.

H12: SU has a positive and significant impact on customers' net impact of mobile banking service

In contrast, the complete lists of rejected hypotheses are:

H1: SerQ has a positive and significant impact on customer's usage of mobile banking service

H2: Tr has a positive and significant impact on customers' usage of mobile banking service.

5.2 Recommendation

5.2.1 Recommendations for the Institution

The finding of this research is very helpful to understand CBE's mobile banking success. The study specifically used Mobile banking service of CBE which is one of the most widely used E-banking services in the bank. Finally, based on the findings, the study recommends the following:

From the findings of the model test, the study confirmed that ten hypotheses are significant and the rest two hypotheses are insignificant. Accordingly, the study recommends for CBE to take action on the area. For instance, information quality has significant and positive effect on system usage and user satisfaction. CBE should focus on Information quality of mobile banking to

increase the usage of mobile banking service and its customer satisfaction. This can be achieved by assessing the customer feedback which is generated from mobile banking user and enhance the quality of mobile banking. Moreover, the bank should work on mobile banking application to make easy to understand, readable, short and precise to its customer.

System quality has significant and positive effect on system usage and user satisfaction. The Bank should focus on mobile banking system quality to increase the usage of mobile banking service and its customer satisfaction. This can be achieved by adding more service like viewing ATM location, exchange rate and others service to all mobile banking application users. In addition to this, the bank should shorten processing paths especially on USSD mobile banking channel to minimize customers' boredom for longer steps to get the service.

Service quality has significant and positive impact on mobile banking user satisfaction. Accordingly, the bank should train its employee especially branch front line performers regarding mobile banking so as to be able to answer/handle customer request/complain. Moreover, the bank should re-organize the external contact center and separate digital banking operator to boost the mobile banking customer satisfaction.

Self-efficacy is the fourth factor that affects mobile banking customer satisfaction and system usage mobile banking. It is known that if the customer started to use a system and finds it useful, it builds confidence to use that system frequently. Hence the bank should find alternative way that will expose customers to try mobile banking service. Of course currently, our country has high motivation and effort to move from conventional banking to digital banking as a country. Moreover, the bank, government and non-government organization should enforce the customer for mobile banking service usage.

Trust is the fifth factor that affects mobile banking customer satisfaction and system usage of the customer. The bank should work on the accuracy of information regarding timely availability of information. Moreover, the bank should add more local language on both mobile banking application and USSD channel and also on SMS alert message to boost the customer trust on CBE mobile banking service.

Finally, user satisfaction and system usage has significant effect on CBE's mobile banking service. The bank should improve information quality, system and service quality to increase the usage and the customer satisfaction. On the other hand, the bank should also improve its customer trust on mobile banking service and self-efficacy.

Generally, the interviewees also accept all my recommendation and add other recommendation as the Bank has plan to add more local language on mobile banking and more service such as integration with third party (utility payments), interoperability with other local commercial banks through EthSwitch and others.

5.2.2 Recommendations for future research

Researches on mobile banking success are not addressed well in developing countries especially in Ethiopia. Therefore, there is a need to conduct a research on area especially on the following two areas which are limitations of this research.

The first recommendation for future researcher is to conduct mobile banking success using DeLone and Mclean model on all E-banking channels like Mobile banking, Internet banking, POS and ATM users and other Mobile money services as this study tried to cover only Mobile Banking.

The second is, in this research, only two variables were added (i.e Trust and Self-efficacy) other than D&M model. Future researchers may study by adding other more variables to see other effects.

The third recommendation is future researcher may conduct research on E-Banking success on private commercial banks as the private commercial banks increases their market share from time to time.

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Appendices

Questionnaire

Questionnaire to identify factors that makes customers dissatisfy when using mobile banking service of the Commercial Bank of Ethiopia



Addis Ababa University
College of Natural and Computational Science
School of Information Science

Dear Sir/ Madam

My name is Kidist Moges, a postgraduate student at Addis Ababa University, School of Information Science. In Partial fulfillment of the program requirement, I am undertaking a research on “**Study of CBE’s Mobile Banking Usage**” by taking mobile banking system of Commercial Bank of Ethiopia (CBE) as a case. I have accordingly prepared this survey questionnaire. As a user of mobile banking at CBE, you are one of the appropriate customers to participate in this survey. Your honest responses to each question and statement are extremely valuable to the outcome of this research. All responses will be kept in strict confidentiality and hence would not affect any one in any case.

I would like to thank you in advance for your kind participation, genuine and on-time response to the questionnaire. For clarification, please use the following contact information.

Telephone: +251 929045710

E-mail: m.kidist25@gmail.com

Thank You!

Instruction: Please tick (√) where appropriate in the box to indicate your answer to the question.

SECTION A: DEMOGRAPHIC DATA

- 1) What is your Gender? Male Female
- 2) What is your age? 18-25 years 26-35 years 36-45 years 46-55 years above 55 years
- 3) What is your level of education? High school Diploma First degree Second degree PHD other
- 4) What is your income per month? 1000 and below 1001 - 3000 3001 - 5000 5001 – 10000 10001 and above
- 5) Your mobile banking experience in CBE? 1 year and below 2 - 5 years 6-10 years 11years and above

General Instructions

Put a tick mark (√) under the appropriate column which shows your choice against each statement.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Information Quality					
Mobile banking provides output that seems to be exactly what I needed.					
Information I needed from mobile banking is always available.					
Information from mobile banking is in a form that is readily usable.					
Information from mobile banking is easy to understand.					
Information from mobile banking appears readable, concise, clear, and well formatted.					
System Quality					
Mobile banking is easy to use and learn.					

Mobile banking meets my requirements.					
Mobile banking includes necessary features and functions.					
Mobile banking requires only the minimum number of fields and screens to achieve a task.					
Mobile banking user interface can be easily adapted to one's personal approach.					
Service Quality					
I was trained to use Mobile banking when I started to use at CBE.					
The responsible service personnel provide personal attention when I experience problems with the Mobile Banking					
The responsible service personnel are always highly willing to help whenever I need support with the Mobile Banking.					
The responsible service personnel have sufficient knowledge to answer my questions with respect to the Mobile Banking.					
The responsible service personnel provide services related to the Mobile Banking at the promised time.					
Self-efficacy					
I feel confident finding information by using mobile banking.					
I do not need anyone to teach me how to use Mobile Banking because I can learn it by myself.					
Mobile banking is characterized by the frankness and clarity of the services that it offers					

to me.					
I use Mobile Banking because someone has shown me how to do it.					
Trust					
I trust Mobile Banking service.					
I trust the information presented by Mobile Banking.					
I feel Mobile Banking would provide me with good service.					
User Satisfaction					
I am satisfied with the performance of the Mobile Banking service.					
I am pleased with the experience of using the Mobile Banking service.					
My decision to use Mobile Banking service was a wise one					
I am satisfied with the system efficiency.					

Use (system usage) of Mobile Banking	Never	Rarely	Sometimes	Often	Always
Request remaining balance					
Request financial mini statement					
Transfer money between your accounts					
Transfer money to another person's account					
Transfer to CBE Birr wallet					
Transfer to your beneficiaries					
Check ATM location					
Transfer to any non CBE customer					

Request foreign exchange information					
Pay bills					

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Net impact					
I perceived Mobile Banking would be available 24 X 7					
I perceived Mobile Banking would save my cost and time					
I perceived Mobile Banking would be available irrespective of geographical limits					

አዲስ አበባ ዩኒቨርሲቲ
የተፈጥሮ ሳይንስ ኮሌጅ
የኢንፎርሜሽን ሳይንስ ት/ቤት



Addis Ababa University
College of Natural Science
School of Information Science

Date: June 10, 2020
Ref No. SIS/75/2020/2012

To:- Commercial Bank of Ethiopia
Addis Ababa

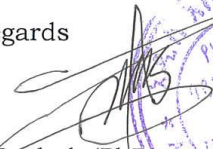
Subject:- Student Kidist Moges

Dear Sir /Madam,

Student Kidist Moges (ID.No GSR/387-/11) is graduate student at the School of Information System, Addis Ababa University. She is currently conducting a MSc. Thesis research under the title “Exploring Factors that Leads to information System use Failure in Commercial Bank of Ethiopia”.

I would like to thank you in advanced for all the assistance that you would provide to the student.

With Regards


Tibebe Beshah (PhD)
Head, School of Information Science



☒: 1176 Email: information_cci_cns@aau.edu.et ☎: +251-(11)-122-991

አርማ
አዲስ አበባ ዩኒቨርሲቲ

የኢትዮጵያ ንግድ ባንክ የኤሌክትሮኒክስ ባንክ አገልግሎት ስኬትን ለማጥነት የቀረበ ቃለ መጠየቅ
አዲስ አበባ ዩኒቨርሲቲ የተፈጥሮ እና ኮምፒዩተር ሳይንስ ት/ቤት
የኢንፎርሜሽን ሳይንስ ትምህርት ክፍል

ውድ አቶ/ወ/ሮ(ተሳታፊ)

ስሜ ቅድስት ሞገስ ይባላል። በአዲስ አበባ ዩኒቨርሲቲ በኢንፎርሜሽን ሳይንስ ትምህርት ቤት የድህረ ምረቃ ተማሪ ነኝ ፕሮግራሙ የሚፈልገውን በክፍል ለማሟላት የኢትዮጵያ ንግድ ባንክ የኤሌክትሮኒክስ ባንክ አገልግሎት ስኬት ማጥናት ላይ የምርምር ዕሁፍ እያዘጋጀሁ እገኛለሁ። በዚህ መሰረት ይህንን የዳሙሳ ቃለ መጠየቅ አዘጋጅቻለሁ። በኢትዮጵያ ንግድ ባንክ የሞባይል ባንክ አገልግሎት ተጠቃሚ እንደመሆንዎት በዚህ አውደ ጥናት ውስጥ ለመሳተፍ ትክክለኛ ደንበኛ ናት።

ለእያንዳንዱ ጥያቄ እና መግለጫ የሚሰጡት ተአማኒነት ያለው ምላሽ ለዚህ ጥናት ውጤት በጣም ወሳኝ ነው። ሁሉም መልሶች በሚስጥራዊነት የሚያዙ ሲሆን በማንኛውም መንገድ ማንንም አይጎዳም።

በዚህ ቃለ መጠየቅ ለሚያደርጉት ቀና ትብብር እና በጊዜ ለሚሰጡት ምላሽ በቅድሚያ ላመሰግንዎት እወዳለሁ። ለተጨማሪ መረጃ እባክዎትን የሚከተለውን ስልክ ይጠቀሙ።

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አመሰግናለሁ !



ክፍል ሀ: የስነ ህዝብ መረጃ

አጠቃላይ መመሪያ

ሰቃሰ መጠይቁ ትክክለኛ መልሶችን ለመግለጽ እባክዎትን በመልስዎት ላይ ምልክት ያስቀምጡ

1. ጾታዎ ምንድን ነው ? ወንድ ሴት
2. እድሜዎት ስንት ነው? 18-25አመት 26-35 አመት 36-45 አመት 55 አመት በላይ
3. የትምህርት ደረጃዎት ምንድን ነው? ሁለተኛ ደረጃ ዲፕሎማ መጀመሪያ ዲግሪ ሁለተኛ ዲግሪ ፒኤችዲ ሌላ
4. በወር የሚያገኙት ገቢ ምን ያህል ነው 1000 እና ከዛ በታች 1001-3000 3001-5000 5001-10000 10001 እና ከዛ በላይ
5. በኢትዮጵያ ንግድ ባንክ ውስጥ የሞባይል ባንክ አገልግሎት መጠቀም ከጀመሩ ምን ያህል ጊዜ ሆንዎታል? 1 ዓመት እና ከዛ በታች 2-5 ዓመት 6-10 ዓመት 11 ዓመት እና ከዛ በላይ

ክፍል ለ: የሞባይል ባንክ አገልግሎት መጠቀም ካለመቻል ጋር የሚገናኙ ምክንያቶች እና ተግዳሮቶች

ሰቃሰ መጠይቁ ትክክለኛ መልስዎትን ለመግለጽ እባክዎትን በመልስዎት ላይ ምልክት ያስቀምጡ

	በክፍተኛ ሁኔታ እስማማለሁ	እስማማለሁ	ድምጽ መስጠት አልፈልግም	አልስማማም	በክፍተኛ ሁኔታ አልስማማም
የመረጃ ጥራት					
የሞባይል ባንክ አገልግሎት በትክክል እኔ የምፈልገውን አይነት ውጤት ያቀርብልኛል።					
በሞባይል ባንክ አገልግሎት የምፈልገው መረጃ ሁልጊዜ የሚገኝ ነው።					
ከሞባይል ባንክ አገልግሎት የሚገኘው መረጃ በቀላሉ አገልግሎት ሊሰጥ የሚችል ነው።					
ከሞባይል ባንክ አገልግሎት የሚገኘው መረጃ ለመረዳት ቀላል ነው።					



ከሞባይል ባንክ አገልግሎት የሚገኘው መረጃ የሚነበብ፣ አጭር፣ ግልጽ እና በጥሩ ፎርማት የሚቀርብ ነው።					
የሲስተም ጥራት					
የሞባይል ባንክ አገልግሎት ለመጠቀም እና ለማወቅ ቀላል ነው።					
የሞባይል ባንክ አገልግሎት የእኔን መመዘኛ መስፈርቶች ያሟላል።					
የሞባይል ባንክ አገልግሎት አስፈላጊ አገልግሎቶችን እና ጥቅሞችን ያካትታል።					
የሞባይል ባንክ አገልግሎት የሚፈልገው ተግባራትን ለማከናወን ጥቂት መስኮችን እና ስክሪኖችን መሙላት ብቻ ነው።					
የሞባይል ባንክ አገልግሎት የተጠቃሚ ገፅ ለግለሰብ አቀራረብ አመቺ በሆነ መንገድ ሊዘጋጅ የሚችል ነው።					
የአገልግሎት ጥራት					
በኢትዮጵያ ንግድ ባንክ መጠቀም ሲጀምር በሞባይል ባንክን እንዴት እንደምጠቀም ስልጠና ተሰጥቶኛል					
የሞባይል ባንክን የሚቆጣጠረው ባለሙያ በሞባይል ባንክን አጠቃቀም ችግር ሲያጋጥመኝ ወዲያውኑ መፍትሄ ይሰጠኛል።					
ሞባይል ባንክን የሚቆጣጠር ባለሙያ በተመለከተ ድጋፍ በሚፈልግበት በማንኛውም ጊዜ ሊረዳኝ ፍቃደኛ ነው።					
የሞባይል ባንክን ለመቆጣጠር ሃላፊነት					



የተሰጠው ሰው ሞባይል ባንክንግ ጋር የተያያዘ ጥያቄዎቹን ለመመለስ በቂ እውቀት አለው።					
ከሞባይል ባንክንግ አገልግሎት ጋር በተያያዘ የሚሰጥ ባለሙያ በተባለው ጊዜ ውስጥ አገልግሎት ይሰጣል።					
በአራስ ውጤታማነት					
የሞባይል ባንክንግ በመጠቀም መረጃ ሳገኝ በአራስ መተማመን ይሰማኛል።					
የሞባይል ባንክንግ አጠቃቀም በአራሴ ስለተማርኩኝ ማንም እንዴት እንደምጠቀም እንዲያስተምረኝ አልፈልግም።					
ሞባይል ባንክንግ የሚታወቀው በሚያቀርብልኝ አገልግሎት እውነታነት እና ግልጽነት ነው።					
ሞባይል ባንክንግ የምጠቀመው እንዴት እንደምጠቀም የሆነ ሰው እንዴት እንደሚጠቀም ስላሳየኝ ነው።					
አምነት					
የሞባይል ባንክ አገልግሎትን አምናለሁ።					
የሞባይል ባንክ አገልግሎት ላይ የሚቀርበውን መረጃ አምናለሁ።					
የሞባይል ባንክ አገልግሎት ጥሩ አገልግሎቶችን እንደሚያቀርብልኝ ይሰማኛል።					
የተጠቃሚ እርካታ					
በሞባይል ባንክ አገልግሎት የሥራ አፈጻጸም በጣም ረክቻለሁ።					



በሞባይል ባንክ አገልግሎት ልምምድ ደስተኛ ነኝ።					
የሞባይል ባንክ አገልግሎት መጠቀም መወሰኔ የጠበብ ውሳኔ ነው።					
በሲስተም ውጤታማነት ረክቻለሁ።					
የተጣራ ተጽዕኖ					
የሞባይል ባንክ አገልግሎት 24 X 7 መኖሩን ተገንዝብያለሁ።					
የሞባይል ባንክ አገልግሎት ገንዘቤን እ ጊዜያዊ የሚቆጥብ መሆኑን ተገንዝብያለሁ።					
የሞባይል ባንክ አገልግሎት በስነ-ምድራዊ አቀማመጥ ገደቦች ሳይገደብ የሚቀርብ መሆኑን ተገንዝብያለሁ።					



የሞባይል ባንክ አገልግሎት አጠቃቀም	በጭራሽ	በጣም አልፎ አልፎ	አልፎ አልፎ	አንድ አንድ ጊዜ	በጣም በተደጋጋሚ	ሁል ጊዜ
ቀሪ ሂሳብ መጠየቅ						
የፋይናንስ መግለጫ መጠየቅ						
በሂሳብ መካከል ገንዘብ ማስተላለፍ						
ወደ ሌላ ሰው ሂሳብ ላይ ገንዘብ ማስተላለፍ						
ወደ ሲ.ቢ.ኢ ብር ዋሌት ላይ ገንዘብ ማስተላለፍ						
ለተጠቃሚ ማስተላለፍ						
የኤቲኤም ቦታ ማረጋገጥ						
የኢትዮጵያ ንግድ ባንክ ደንበኛ ላልሆነ ማንኛውም ሰው ማስተላለፍ						
የውጪ ምንዛሬ መረጃ መጠየቅ						
ክፍያዎችን መክፈል						

