Challenges and Prospects on Using ICT in Banks Service Delivery during COVID-19: The Case of Commercial Bank of Ethiopia

By

Anteneh Behailu

A Thesis Submitted to

The MBA Program

College of Business and Economics

Presented in Partial Fulfillment of the Requirements for the Degree of Master of Business Administration in Management

ADVISOR: Salehu Anteneh (PhD)

Addis Ababa University

Addis Ababa, Ethiopia

June, 2021

Statement of Declaration

This research project is my original work and have not previously been submitted for a degree at this or any other University, and that all references materials contained therein have been duly acknowledged.

Signature..... Date.....

Anteneh Behailu

Reg No: GSR/0938/12

This research project has been submitted for examination with my approval as the University supervisor.

Signature ..... Date.....

Dr. Salehu Anteneh,

Associate Professor, Department of Management

Certification

Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by **Anteneh Behailu**, entitled: **Challenges and Prospects on Using ICT in Banks Service Delivery during COVID-19: The Case of Commercial Bank of Ethiopia** and submitted in partial fulfillment of the requirements for the award of the Degree of Master in Business Administration compiles with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the Examining Committee:

Examiner _____ Signature _____ Date_____

Examiner _____ Signature _____ Date_____

Advisor: Dr. Salehu Anteneh Signature _____ Date _____

_____

Chair of Department of Graduate Program Coordinator

Acknowledgement

I wish to take this opportunity to first and foremost acknowledge the entire University of Addis Ababa for giving me an opportunity to undertake my research in the institution. I also wish to express my sincere gratitude to my lecturers all through my course work and in particular my project supervisor, Dr. Salehu Anteneh for guidance, immense contribution in checking my work and making corrections and encouragement in making this research report a reality. I am forever grateful that he could find time to see me through this research report despite his busy schedule. Meeting you was indeed a true experience.

I would also wish to acknowledge the contribution of my classmate Natnael Berhe, his great input and support helped in ensuring the research project was a success.

I would wish to thank the Commercial Bank of Ethiopia which enabled me pursue this course without a hitch. Their support on my research cannot be underestimated. The staff members who were respondents in this report were amazingly supportive and I wish to thank each one of them immensely.

Anteneh Behailu

Table of Content

List of Tables

List of Figures

Acronyms

ATM – Automatic Teller Machine

CBE – Commercial Bank of Ethiopia

COVID -19 – COrona VIrus Disease of 2019

E Banking – Electronic Banking

IB – Internet Banking

ICT – Information and Communications Technology

IT – Information Technology

MB – Mobile Banking

MIS – Management Information System

NBE – National Bank of Ethiopia

PoS – Point of Sale

SPSS – Statistical Package for the Social Sciences Terms of Reference

Abstract

There have been many developments in Information and Communication Technology (ICT) which have completely revolutionized the way institutions conduct business. This is clearly being seen during this COVID-19 time in banks. In the banking sector, developments in ICT have been more driven by the need to improve operational efficiency and customer service among other vital operational reasons. Information and Communication Technology has enabled customers to access their accounts at any location at any time, know the transactions that affect the customer accounts through the transaction notification service subscribed by the customer. This study attempts to understand and evaluate the current usage, the challenges and prospects of the ICT service deliveries (ATM, MB, IB, PoS and CBE Birr) in Commercial Bank of Ethiopia during COVID-19. Branch Managers, Customer Service Officers (CSO) and ICT staffs of some branches of Commercial Bank of Ethiopia were the primary source of data for working on this paper and to adopt Qualitative research approach through the review of existing literature and interviews held with different staffs. According to findings the challenges include: customer's culture on cash based transaction, not literate enough to understand the usage of the services, network and infrastructural inferiority are an obstacle to use the ICT service delivery systems during COVID-19. On the other hand, the prospects include: COVID-19 pandemic has driven consumers to rely more heavily on digital channels and ICT service delivery systems are the best means to reduce the transmission of the virus, key developments taken by Ethio Telecom are making us near to ICT services and reducing visit of bank branches and directives in relation to the introduction of the new currency are making customers more ICT service delivery users. There are also some recommendations stated.

Key Words: Transaction, Culture, Covid-19 pandemic, Digital Channel

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Throughout the ages, humanity has experienced many pandemics that annihilated large numbers of the population. These pandemics include the Marseille plague in 1720, the worldwide cholera pandemics between 1817 and 1923, the cholera pandemic of the Ganges River delta in India from 1817 to 1823, the Spanish flu between 1918 and 1919, the Asian flu in 1957, 1958, and 1968, the Hong Kong flu in 1968, and the 2009 (H1N1) Swine flu. At the end of 2019, a new pandemic emerged in Wuhan City in the Hubei Province of China, which has been named COVID-19 (AAP FactCheck, 2020). The COVID-19 pandemic has become a global health and economic challenge since its outbreak in December 2019.

No one could have expected that the world would be on lockdown to stop the spread of COVID-19. The novel coronavirus disease has forced health authorities and government officials to urge people into quarantine, allowing them to leave the safety of their homes under specific circumstances – purchasing essential items, work, or seeking medical attention. With people only going out to get essential items and for work, the world comes to a standstill to ensure disease control and prevention. The severity and reach of the coronavirus pandemic have drastically changed our everyday lives. In the middle of all the chaos and confusion the virus brings, it seems that information technology has a crucial role in maintaining a sense of normality and is a way for prevention. Especially, the business world finds itself relying heavily on IT to keep critical operations and projects running smoothly. The service sector of our country especially, the banking industry is facing problems.

COVID-19 has radically impacted consumer behavior world-wide. Before the pandemic, consumer expectations were changing, and through Information and Communication technology transformation programs, banks were shifting the way they deliver products and services to consumers. We are facing with a unique time in banking history in Ethiopia as a result of the pandemic. (https://www.ey.com/en_us/banking-capital-markets/four-ways-covid-19-is-reshaping-consumer-banking-behavior)

ICT in banks has been widely used in developed countries and is rapidly expanding in developing countries. In Ethiopia, however, cash is still the most dominant medium of exchange and still peoples are using banknotes in banks, and electronic payment systems are at an embryonic stage. In the face of rapid expansion of electronic payment systems throughout the developed and the

developing world, Ethiopia's financial sector cannot remain an exception in expanding the use of the system (Matteos K., 2016).

Developments in information and communication technologies have revolutionized service delivery in today's business world. Information systems born from new and sophisticated technologies have presented creative ways to offer services. New information and communication technologies have played a critical part in the development of banking service delivery during COVID-19. This pandemic has greatly influenced banks' business and marketing strategies. With technology, new services and efficient delivery channels have been developed and established. Internet banking, mobile banking and automated teller machines are examples of these delivery channels.

Commercial bank of Ethiopia continues to invest heavily in ICT with a wide adoption of Information System (IS) networks in an endeavor to improve service delivery, catch up with global development, manage transaction costs and widen the range of value-added services and products offered. The development of flexible, user-friendly banking services relies significantly on Information and Communication Technologies (ICT).

1.2 Statement of the Problem

The unprecedented Covid-19 virus has disrupted our life completely and caused over million deaths so far worldwide (WHO, 2020). Nonetheless, the virus has also presented banks with an opportunity to reassess their relationship with customers and come up with innovative solutions by devising a flexible business strategy to ensure business continuity.

In the present serious condition, customers are progressively mindful of observing gaps among banks corresponding to their service quality and how utilizing proficient innovations and updating/ redesigning their status intermittently when required. So, banks need to create powerful strategies to draw in and hold clients for example, advancing features advantages and value of the services (Laukkanen, 2016). Today's business environment requires ICT to be part and parcel of service delivery. New information technology systems play a big role, that of providing efficient channels to serve customers. Customers are also able to perform self – service operations through platforms such as Internet Banking and Mobile Banking.

To better understand the probable effect of COVID-19 on banking services in Ethiopia, we have to make a research on the extent of the problems and its probable effects. There is no saying how long the preventive measures of the pandemic will last, and given the rate of change we see surrounding the COVID-19 situation, it is important to look at the long term.

However, ICT intervention for such widespread case needs definite analysis in order to explore several open issues like how much capability ICT technology holds in developing and developed countries, what opportunities lie on the usage of ICT technology in such vulnerable situation, what could be the possible threats while depending on ICT technology to mitigate the unprecedented situation caused due to pandemic spread of novel Coronavirus. Therefore, further investigations and analysis are required to explore such issues raised due to the ICT interventions for the containment of the pandemic spread of COVID-19.

According to Cooper (2010) the way to differentiate an organization with a good information system and one with a poor information system is on the way they deliver their services. A good information system enables the organization to be quick and efficient. It also balances what the customers' needs are and the service providers needs. Additionally, it combines the best of technology and people. Many banks have implemented information systems as a strategic tool in operations and customer service delivery in an endeavor to improve on efficiency and competitive advantage. These systems are mostly used by customer service staff; however, customers also access these systems for self service needs such as Internet banking and mobile banking.

Even if banks are discouraging branch level services and are heartening customers to use other non-branch channels like ATM, Mobile, POS (Point of sale), Internet banking and others. However, most people are physically going for service to branches even if they are able to perform self – service operations through platforms such as Internet Banking, ATM and Mobile Banking. And also the Ethiopian banks are criticized for the use and less adoption of technology. So the research will try to investigate the challenges faced by the Commercial Bank of Ethiopia when trying to use ICT for service delivery during COVID-19 pandemics and prospects of Information Technology in the banking sector and its effect to bring the sector to the new normal.

Various studies have been made on related topics on the contribution and service delivery of ICT in the banking sector focusing from the customers perspective (Dawit M., 2017; Girma A., 2016; Alayu C., 2015). But this research examines ICT usage particularly during COVID-19 and the challenges faced and prospects from the Manager's, Customer service officer's and ICT management staff member's perspective. The research tries to examine the ICT usage during the pandemic in Commercial Bank of Ethiopia and compare it with the usage before the pandemic.

1.3 Objectives of the Study

1.3.1 General Objective

The objective of this research is to investigate the challenges faced by banks in using ICT for effective service delivery during COVID-19, the prospects and interventions of ICT in containment of the pandemic spread of novel Coronavirus.

1.3.2 Specific Objectives

The specific objectives of the study are:

- To assess the level of ICT usage for service delivery in Commercial Bank of Ethiopia before and after COVID-19.
- Establish the challenges faced on using ICT to deliver service in Commercial Bank of Ethiopia during COVID-19.
- To determine the prospect of ICT usage for service delivery in CBE.

1.4 Research Questions

This study sought to answer the research questions;

1. What is the ICT service delivery usage in Commercial bank of Ethiopia during COVID-19 in relation to the 'stay home' policy for the pandemic?
2. What are the challenges on using information and communication technologies for service delivery in Commercial bank of Ethiopia especially during the age of the pandemics?
3. What will be the prospect of the ICT usage for service delivery in CBE?

1.5 Significance of the Study

This study is expected to be of great significance to the following stakeholders: Banking sector, managers, Government and Customers in general. The information gathered through this research will provide useful data to the banking sector and other organizations in terms of empowering the stakeholders through positive application of technology in addressing the key issues and challenges that affect effective use of technology. The findings of this study will shed more light on sound strategies that the managers can put in place to increase the level of customers' use of technology while accessing banking services during the period of the COVID-19 pandemic. The outcome will also help the government to know problems in the banking sector and the financial sector and to help them. This study will also enable the customers to be aware of the various banking channels to

migrate to and enhance quick banking services through the use of alternative channels and to stay home and prevent the pandemic.

1.6 Scope and Limitation of the study

The objective of the study is to examine the challenges affecting the banks' to fully apply information and communication technology for service delivery during the age of Covid-19 in Ethiopia. Hence, the research evaluated the extent of usage of Information Communication Technology for service delivery during COVID-19. Only Commercial Bank of Ethiopia is considered for the research. With respect to area of coverage, only randomly selected sample of branches in Addis Ababa who are highly dependent on IT usage were covered.

Geographically, the study targeted Commercial Bank branches which are situated only in Addis Ababa Town, Ethiopia.

1.7 Assumptions of the Study

The researcher assumed that the data obtained from the respondents will be accurate, correct and valid and that the respondents are honest in giving responses through the interviews. The researcher also assumed that the variables under study will not change during the entire research period.

1.8 Organization of the Research Report

The research report expected to comprise five chapters, which include:

Chapter one: contains background of the study, statement of the problem, basic research questions, objective of the study, significance of the study and delimitation of the study.

Chapter two include review of related literatures.

Chapter Three: Methods of the Study Under this chapter; the subjects/participant of the study; the sources of given data; the data collection tools/instruments employed; the procedures of data collection; and the methods of data analysis.

Chapter Four: Data Analysis and Interpretation; this chapter summarize the results/findings of the study, and interpret and/or discuss the findings. Here, there will be expected to make extensive use of the literature review.

Chapter five: Summary of Findings, Conclusions, Recommendations and Limitations for further works; this chapter comprises summary of findings, conclusions, limitations of the study and recommendations. Summary of findings should be drawn from the results discussed under chapter four, conclusions should be drawn from the summary of findings, and specify any limitations that could have effect on conclusions.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviewed previous literature on information and communication technologies both locally and internationally. This chapter contains literature related to factors affecting banks' use of information and communication technology in service delivery during the pandemic, challenges and prospects of ICT in banking sector. This chapter is divided into various parts namely: Covid-19 and ICT, Ethiopian banking sector before the pandemic, ICT and banking, ICT practices in Ethiopian Commercial banks and Service Delivery. The review has eight sections.

2.2 Covid-19 and ICT

Scientists and medical researchers have differed over the exact definition of a pandemic, but one thing everyone agrees on is that the word describes the widespread occurrence of a disease, in excess of what might normally be expected in a geographical region. Cholera, bubonic plague, smallpox, and influenza are some of the most brutal killers in human history. Disease pandemics like smallpox and tuberculosis have existed throughout history. One of the most destructive pandemics had been the Black Death (also regarded as The Plague), which in the 14th century destroyed an estimated 75–200 million individuals. Many important pandemics also include the influenza pandemic in 1918 (Spanish flu) and also the influenza pandemic of 2009 (H1N1). Present pandemics contain HIV/AIDS, and the coronavirus pandemic of 2019/20. (Pandemic.[https://en.wikipedia.org/wiki/Pandemic]).

Beginning in December 2019, in the region of Wuhan, China, a new ("novel") coronavirus began appearing in human beings. It has been named Covid-19, a shortened form of "coronavirus disease of 2019." While it was initially seen to be an epidemic in China, the virus spread worldwide within months. The WHO declared Covid-19 a pandemic in March, and by the end of that month, the world saw more than a half-million people infected and nearly 30,000 deaths.

The newly discovered Coronavirus caused the COVID-19 or the Coronavirus disease bearing the symptoms of fever, dry cough, tiredness, aches and pains, sore throat and shortness of breath. Coronaviruses (CoV) represent a large family of viruses with the capability of several common to severe and complicated health conditions including Severe Acute Respiratory Syndrome (SARS-CoV) and Middle East Respiratory Syndrome (MERS-CoV). COVID-19 is the novel coronavirus

which initially appeared in the form of acute pneumonia (44 cases) in the Chinese city of Wuhan from December 31, 2019 through January 3, 2020.

Within the end of January, over 7,800 cases were being reported from different countries including Asia, Europe, USA, Canada and many more outside China when immediately World Health Organization (WHO) declared Coronavirus outbreak as global public health emergency. As the cases began to grow rapidly and healthcare systems became unable to handle the condition, in the following months with 118,000 cases in more than 110 countries over the world, WHO declared COVID-19 as pandemic.

In Ethiopia, the first confirmed case was reported on March 14, 2020 – just two months after the first confirmed case outside of China on 13 January 2020. Despite a slow rate of initial community transmission, the recent pace of confirmed infections has accelerated, with a peak of 1829 daily new cases reached on August 21, 2020. Ethiopia is highly exposed to the pandemic because of the long border shared with its COVID - 19 affected neighboring countries such as Djibouti, Sudan, South Sudan, Kenya and Somalia; international movements and the level of negligence observed among the society to implement protective measures recommended by World Health Organization and Ethiopian Ministry of Health.

The Pandemic has suddenly posed socio-economic challenges as well as adversely affecting the performances of organizations throughout the world. The impact of Covid-19 is not related only a global health emergency, but is also leading to a major socio cultural crises. It spreads almost in all countries in the world and continues affecting the world society. Countries throughout the world are now imposing social distancing measures and stay-at-home orders to reduce the impact of COVID-19 on the society. The lockdown imposed to avoid spreading the virus attack, affect all societies, from individual, business and governments. The severe impact was everywhere and in all directions: social, economic, financial, and political. And during all these social distancing restrictions, removing work from office to home and operate online financial services, especially payments.

Since the whole world is fighting against the pandemic spread of COVID-19, the role of Information and Communications Technology (ICT) to enhance public awareness and prevention, surveillance, diagnosis, treatment and coordinate response for COVID-19 has become more significant. Thus, the ICT interventions can be treated as one of the most effective, widely used and popular modes around the world to fight against the pandemic spread of COVID-19. A number of ICT based initiatives has been taken around the world; for example, developing dashboard or web portal to provide the updated statistical report on Coronavirus, digital interactive maps, robot and

drone technologies to support medical staff, thermal imaging and temperature detection software applications, smart helmets to detect potential virus carriers, awareness measures and emergency calling information or hot-line numbers (Akib Z., Muhammed N., Tarannum Z. & Mohammed S. 2020).

Galaz (2009) in his work "Pandemic 2.0: Can Information Technology Help Save The Planet?" highlighted how the information technology can contribute in pandemic situation. In this research, Galaz discussed how the information technology can facilitate to provide early warning about the epidemic, create the networks for global health governance, provide communication support in a low cost, establish network among the social organization, and the likes during pandemic.

2.3 History of Banking

Banking is one of the oldest professions in human history, it also flourished with civilizations. Since humans started using money, bank services were in use throughout history. Modern banking established as we know it today was established in Italy and Greece in the 15th century. Today, banks are one of the most important institutions for a modern economy to work in any country. From different historical sources, the first foundations of the banking service in the world were put by goldsmiths and silversmiths (Gedey, 1990). They have a safe box to put, and they were the most trusted they used to receive gold, silver and various jewelries to put with them. Therefore, an individual or merchant puts his wealth under their custody, for their service they charge a small amount of money and give the customer a receipt to guarantee their acceptance. Then they started using, money paying instrument what we now call this document as 'check'. However, as time goes by, the goldsmiths and silversmiths observed that their customers wouldn't take their jewelry soon, and those clients, whenever they face shortage of money they started lending to this people and started to get profit from their service. They encouraged depositing and lending and rather than making the customers to pay a charge for depositing, they started to pay them interest and introduced the public to work with money. It is believed that, ancient Assyrians, Babylonians, Athenians, Romans and Abyssinians also used the banking service (Gedey, 1990). For further development of the bank there is the need for technological transformation in banking industry which is electronics banking.

2.4 Ethiopian Banking Sector before the Pandemic

Although the history of banking system dates back to 15th century AD, modern banking in Ethiopia started in 1905 with the establishment of Abyssinian Bank in agreement with the Anglo-Egyptian

National Bank. In 1932, the Ethiopian government purchased the Abyssinian Bank and renamed it as the Bank of Ethiopia which is the first nationally owned Bank on the African continent. During the five-years of Italian occupation (1936-41), all other Banks were closed and branches of Italian Banks were opened in the main towns. After the country became independent from the five year Italian occupation, Barclay Bank of Great Britain was established and remained in business between 1941 and 1943. Following this, in 1943, Ethiopian government established the State Bank of Ethiopia which had been operating as both commercial and central bank until 1963. Latter, it was re-organized into today's National Bank of Ethiopia (NBE) and the Commercial Bank of Ethiopia. In addition, many other private Banks were established; and just before the 1974 revolution all these Banks were in operation in the country (Gedey, 2002; Addison & Geda, 2001).

All privately owned financial institutions including: three commercial Banks; 13 Insurance companies; and two non-Bank financial intermediaries were nationalized in January 1975 by the military regime. Subsequently, the nationalized Banks were re-organized in to: National Bank of Ethiopia (NBE); Commercial Bank of Ethiopia (CBE); Agricultural and Industrial Bank which was renamed lately as the Development Bank of Ethiopia (DBE) and Housing and Saving Bank re-named lately as Construction and Business Bank which was merged with CBE few years ago. Following the regime change in 1991 and the liberalization policy in 1992, many private Banks came in to existence the first of which was Awash Bank (Obo, 2009; Addison & Geda, 2001).

As of May 2020, there are 18 Banks that are in operation out of which two are state owned and the remaining 16 are private commercial Banks. In addition, recently about eleven private Banks are in the process of establishment and they are mobilizing the capital required for banking business (NBE, 2020). All these Banks are domestic and the Ethiopian banking sector is closed to foreign influences.

Though Banks are not being hit by COVID-19 directly as other trading businesses, they are at therefore front of public attention. Within few weeks after the start of the pandemic, Banks experienced a level of disruption that will change everything that had been the norm in banking services. Interview with Bank presidents by Ethiopian reporter (12 April 2020) indicates that, there has not only been a major change in the way financial institutions conduct business, but in the way employees do their work and the way clients manage their finances are changing. The number of people visiting bank branches is decreasing from week to week. People are withdrawing their cash from banks to use it for consumption purpose in case the government announces "stay at home" (Ethiopian Reporter, 1 April 2020).

Aimed at assisting businesses which will be affected by the spread of the COVID-19, the majority of the Banks including Commercial Bank of Ethiopia, Development of Bank of Ethiopia, Awash Bank, Dashen bank, United Bank, Wogagen Bank, NIB International Bank, Oromia International Bank, Oromia Cooperative Bank, Zemen Bank, Berhan Bank, Enat Bank, Bank of Abyssinia and Abay Bank have started taking actions.

The majority of these Banks are encouraging clients to use electronic banking modalities such as ATM, Mobile banking, Internet banking instead of physically going for service to branches. The Banks have increased the amount of daily cash withdrawal using ATM cards to more than 10,000 Birr from the previous 5,000 Birr. The majority of the Banks have also waived the transaction fee charged in using these electronic banking facilities. The advancements in digital technology are making the crisis more bearable and are enabling businesses to keep working with access to key services (communication, payments, credit, collaboration, etc.), while enabling social distancing and helping to fight COVID-19.

2.5 Information Communication Technology and Banking

ICT generally involves technologies dedicated to information collection, processing, storage and communication. According to O'Brien (2002) an information system combines people, hardware, software data resources and communication networks to collect, transform and distribute information in an organization. Additionally, McCumber (2005) defines information systems as a discrete set of information resources organized for the collection, recording, processing, maintenance, use, sharing, dissemination, or disposition of information. A firm's information system in many cases consists of many subsystems that support the different functional areas. These functional areas include; Sales & Marketing, Production, Finance, Supply Chain and Human Resources, which are integrated to operate within the information system to serve the firm as a whole (Ferreira, Erasmus, & Groenewald, 2009).

Developments in Information systems (IS) are driven by ICTs and enable the provision information that helps people and their organizations make decisions and perform tasks better, i.e. more effectively and efficiently. Information systems can be differentiated through their functions and the services they provide within the firm (Daft, 2008). The organizational structure and division of tasks and responsibilities within a firm largely determines the type of IS to be used. In spite of the fact that a few organizations have a flat organizational structure, most organizations have a

hierarchical structure. Similarly, categorization of IS within such firms tends to mirror their hierarchies factoring the tasks at each specific level (Ralph & Reynolds, 2010).

ICT is at the core of the banking business via ensuring productivity, innovativeness, fast transactions, real-time fund settlement etc. Technology makes banking smoother and seamless for the users. Ethiopian banks are criticized for the use and less adoption of technology. However, technological services are available like: ATM's, core banking systems, National payment systems (clearing services), SWIFT, POS, mobile, internet, debit cards, real time gross settlement, wallet banking etc. Ethiopian banking system is one of the most underdeveloped compared to the rest of the world. In Ethiopia cash is still the most dominant medium of exchange and electronic- banking is not well known, let alone used for transacting banking business. All banks in Ethiopia are too late to move with technological advancement and they should clearly chart out the time schedule for their integration and technological advancement. But unlike other E banking delivery channels all most all banks have installed ATMs at convenient locations for their cardholders. Currently, debit service only gives for Visa and master cards and clients of respective banks can withdraw cash and can buy goods and services by using the debit card. (Worku, 2010)

The main thing is to create awareness among the banking community regarding the available banking services. In addition, there is a lot to do in the technological front through introducing new and upgrading existing technologies. Offering e-cheques systems, National electronic fund transfers allowing funds transfer -mainly from any bank branch to any individual having an account with any other bank branch. The recent introduction of cash limit and national IT strategy also indicated the need for automation and calls out the need for digital path in the Ethiopian banking industry. Therefore, banks should pursue such path in their own, under consortium and with the support from the National Bank of Ethiopia.

2.5.1 Automated Teller Machines (ATMs)

An Automated Teller Machine (ATM) is a computer terminal, a cash vault and a record keeping system which are put together in one unit. The unit permits a bank's customer to enter the bank's database with a special plastic card which contains a personal identification number (PIN). The customer may also access the system by punching a code into a computer terminal which is linked to the bank's computerized records. The service is available 24 hours a day (Rose, 1999). ATMs are mostly located outside banks, shopping malls, airports, petrol stations among other convenient places where customers are more available. Once the customer has gained access to their account over an ATM they can virtually transact on any of the services supported. ATMs offer a wide range

of services which include; making deposits, funds transfer between accounts, bill payments, and withdrawals among other services. Banks have increasingly implemented ATMs for competitive advantage. ATMs complement bank tellers and this has saved the customer time as customers have an alternative to queuing in banking halls. Rose (1999) notes that there is continuous service to the customer and improved productivity to banks.

As developing economies continue to evolve, many banks operating in these economies have similarly undergone major technological changes. The changes are aimed at improving the quality of banking products and services in an endeavor to meet customer needs and keep up with competition. As such, the use of ATMs represents significant developments in the application of technology to design strategic tools for service delivery. Being an innovative service delivery channel, the ATM should provide services to the satisfaction of customers because this is an essential determinant of its technological success (Wu & Wang, 2007). Other studies have shown that banks use an ATM as a strategic tool for satisfying customer needs, enhancing employees' efficiency, and gaining competitive advantage. Some banks also use them signify their technological advancement. Using an ATM, customers can access their bank accounts in order to make cash withdrawals and check their account balance. ATM's rely on authorization of a financial transaction by the card issuer or other authorizing institution via the communications network. Many banks charge ATM usage fees for transactions.

2.5.2 Mobile Banking

Mobile banking (M-banking) is one of the latest developments in E-banking and is also referred to as wireless internet applications of banking (Scornavacca & Hoehle, 2007). M-banking introduces a new channel for banking services, especially for remote areas where the internet is still unavailable. Strategic implications and customer perception of M-banking services are explored with a focus on the consumer value creation and a better understanding about the customer-perceived value of M-banking services (Laukkanen 2016).

M-banking presents numerous benefits for both customers and banks (Leow, 1999). To the customer it provides expanded access, significant time saving and ultimate convenience. Similarly, from a banks point of view, the cost of delivering services is significantly lower in a mobile based service setup compared to branch-based service setup. M-banking has almost all the benefits achieved by ATMs on service delivery; however, the channel does not have the capability to dispense cash like ATMs do. The channel enables customer to conduct business even after the traditional bank hours, as a result accruing continual productivity for the bank. Additionally, the

delivery channel offers banking services to customers at the convenience of their offices or homes. Hence M-banking provides an alternative to going to the bank branch/ATM which saves customers' time.

2.5.3 Internet Banking

Internet banking involves the communication with a bank including the performance of transactions through the international network. Thus internet banking allows the client to perform banking transactions and obtain other information within the scope shown at the website of the bank. Mathias and Sahut (1999) define internet banking as systems that enable bank customers to access accounts and general information on bank products and services or any other banking activity held on the internet through a PC or other intelligent device.

Internet banking according to Essinger (1999) aims to give customers access to their bank accounts via a website enabling them to perform certain transactions on their account. The access is given if the client complies with stringent security checks in place. It involves the provision of traditional (banking) services over the internet. Internet banking by its nature offers more convenience and flexibility to customers coupled with a virtually absolute control over their banking. Thus, service delivery is informational (informing customers on bank's products) and transactional (conducting banking services).

As an alternative delivery channel for banking, internet banking has all the impact on productivity attributable to tele-banking and PC-banking. It is also the most cost-efficient technological means of yielding higher productivity. Furthermore, internet banking eliminates the barriers of distance / time and provides continual productivity for the bank to unimaginable distant customers. Financial institutions' websites have the capabilities to perform a variety of functions ranging from basic information provision to full transactional capability. Knight et al. (1999) identifies four separate levels of information provision; the basic level, an Internet presence merely provides information about the financial institution. There is no interaction between the institution and customer other than a possible e-mail link. The next level allows the institution to receive information, such as an electronic loan application, thus the customer can provide their details to the bank for follow-up. The third level offers the customer the opportunity to share information, such as account balances or transaction details. The highest level identified also allows the customer to process information.

Sathye (2005) with respect to the adoption of Internet banking found that two factors; difficulty in use and security concerns are major hindrances why customers do not want to use internet services. Tan and Thompson (2000) in their study in which factors that impacted on the adoption of internet

banking services were investigated, found that a customers' attitude and perceived behavioral control-factors significantly influenced their intentions to use the services.

2.5.4 Point-of-Sale Transfer Terminals (POS)

This system allows consumers to pay for retail purchase with a check card, a new name for debit card. This card looks like a credit card but with a significant difference. The money for the purchase is transferred immediately from account of debit card holder to the store's account (Malak, 2007).

2.6 ICT Practice in Ethiopian Commercial Banks

Certainly the banking industry in Ethiopia is underdeveloped and therefore there is an all immediate need to embark on capacity building arrangements and modernize the banking system by employing the state of the art technology being used anywhere in the world. With a growing number of import-export businesses, and increased international trades and international relations, the current banking system is short of providing efficient and dependable services and therefore all banks operating in Ethiopia should recognize the need for introducing electronic banking system to satisfy their customers and meet the requirements of rapidly expanding domestic and international trades, and increasing international banking services.

Undeniably the largest state-owned bank, Commercial Bank of Ethiopia, history of the bank dates back to the establishment of the State Bank of Ethiopia in 1942. CBE was legally established as a share company in 1963. In 1974, CBE merged with the privately owned Addis Ababa Bank. Since then, it has been playing significant roles in the development of the country.

Currently CBE has more than 22 million account holders and the number of Mobile and Internet Banking users also reached more than 2.5 million as of June 30th 2019. Active ATM card holders reached more than 8 million.

Commercial Bank of Ethiopia introduced ATM service for local users in 2001 with its fleet of eight ATMs located in Addis Ababa. Moreover, CBE has had Visa membership since November 14, 2005. However, due to lack of appropriate infrastructure it failed to reap the fruit of its membership. Despite, being the pioneer in introducing ATM based payment system and acquired Visa membership, CBE lagged behind Dashen Bank, which worked aggressively to maintain its lead in electronic payment systems.

Dashen bank, a forerunner in introducing ICT for e-banking in Ethiopia, has installed ATMs at convenient locations for its own cardholders. The Dashen Bank ATM is available 24 hours a day,

seven days a week and 365 days a year providing service to Dashen Debit Cardholders and International Visa Cardholders coming to the country. At the end of June 2009, Dashen bank has installed more than 40 ATMs in its area branches, university compounds, shopping malls, restaurants and hotels.

Available services on Dashen Bank ATMs are: Cash withdrawal, Balance Inquiry, Mini-statement, Fund transfer between accounts attached to a single card and PIN (Personal Identification Number) change Currently, the bank gives debit service only for Visa cards. Dashen bank clients can withdraw up to 3,000 birr in cash and can buy goods and services of up to 5,000 birr per day. Expanding its leadership, Dashen Bank has begun accepting MasterCard in addition to Visa credit cards. Dashen won the membership license from MasterCard in 2008.

Harnessing its leadership with advanced banking technology, Dashen Bank signed an agreement with iVery, a South African electronic payment technology company, for the introduction of mobile commerce in April 21, 2009. According to the agreement, iVery Payment Technologies has licensed its Gateway and MiCard e-payment processing solution to Dashen Bank. This would make Dashen Bank the first bank in Ethiopia to acquire e-commerce and mobile merchant transactions. Although Dashen's new technology is one step ahead in that it allows transfer of funds from one's account to others, the younger United Bank was the first to introduce telephone and Internet banking systems - including text messages (SMS) - by the end of 2008.

Wegagen Bank has signed an agreement with Technology Associates (TA), a Kenyan based IT firm, for the development of the solutions for the payment system and installation of a network of ATMs on December 30, 2008.

The memorandum of understanding signed by three private commercial banks to launch an Automated Teller Machine (ATM) and Point of Sale terminal (POS) network, in February 2009 is welcoming strategy to improve electronic card payment system in Ethiopia. Three private commercial banks - Awash International Bank S.C., Nib International Bank S.C and United Bank S.C. – have agreed in principle to establish a ATM network called Fettan ATM network. If everything goes as planned, Fettan ATM will install over 140 ATM machines and over 340 POSs across Ethiopia. There will be one ATM at every branch of the consortium banks, all domestic airports serviced by commercial service, shopping complexes and merchants. The agreement is the first significant cooperation between competing banks in Ethiopia, which others should be encouraged to follow as there is no single bank in Ethiopia that can afford to provide extensive geographical coverage and access (Binyam Tamene, 2009).

The first ever electronic banking gateway was signed between Ethiopian Commodity Exchange (ECX) and Dashen Bank and CBE. The electronic banking system being developed with both banks is designed to give a secure electronic data sharing gateway between clients, banks and ECX, facilitating a smooth transaction (Abiy Demilew, 2008). As the CBE continues to move at a snail's pace in its turnkey solution for Card Based Payment System, Dashen Bank remains so far the sole player in the field of electronic banking since 2006. The agreements signed by other private banks to introduce E-banking are welcoming.

2.7 Service Delivery

According to Chavira (2013) a service is a means of delivering value to customers by facilitating the outcome customers want to achieve without ownership by customer of the specific process roles and risks. Service delivery is a set of processes that provide the architecture on how the service will be rendered (such as service creation, session control and protocols). In order to provide superior and unmatched services there is a need to integrate both telecommunication and information technology capabilities (Burnes, 2004). Customer care on the other hand involves putting systems in place to maximize customers' satisfaction and should be a prime consideration for every business to keen on keeping their customers happy. This is because sales and profitability depend on a satisfied customer. For customer service roles such as receptionists and sales staff, customer care should be a criterion when recruiting and a core element of their job description and training (Athanassopoulos, 2000).

Banking is a customer oriented service industry. Effectiveness and efficiency are critical particularly with respect to providing services to customers for the industry to be successful. Nagabhushanam (2013) defines an effective and efficient service as that which satisfies the needs of a given customer consistently over time. Service quality is a key component in creating and sustaining worthy relationships with customers and keeping abreast with their ever changing needs (Njoka, 2013). In the study, Njoka (2013) notes that banking service providers are using information technology to reduce costs and more importantly create value based services for their customers in order to remain competitive. ICT enabled services help to promote quality service, productivity and overall customer satisfaction. Some of the ICT enabled service delivery channels in use in the banking industry include automated teller machines (ATMs), internet banking, POS, mobile banking and wallet banking.

2.8 Challenges on Using ICT in Service Delivery

The study that was conducted by Isaac (2005) indicated that the challenges for the adoption of E-banking in Africa are security, human face i.e. customers still value personalized and responsive services from their bankers, poor and/or lack of technological infrastructure especially in the rural areas, lack of proper legislation governing e-transactions and preference to paper money, as opposed to "virtual" cash in transactions etc.

Otieno (2008) conducted a study on the challenges in the implementation of mobile banking in the banking industry. The study established that there was a great impact of mobile banking information systems on service level in the institutions where they were implemented. However, a number of factors posed challenges to the implementation, these factors were security, legislation and user related challenges. In security there was a strong feeling that mobile banking systems were not secure and reliable, the legislation that governs use and operation of mobile banking systems was not clearly defined and that banks did not have a clear guideline from the regulator on the way to offer such services. Users were also not keen on adopting mobile banking services as a result of security fears and the fact that they were still accustomed to the normal banking systems. However, the study also noted that the following factors did not pose a challenge to the implementation of mobile banking information systems; these were managers, employees, finances, and technology. Managers in general needed to be aware of challenges of implementing IS and devise ways to minimize and reduce the possibility of such challenges occurring to ensure a successful implementation.

According to Glushko (2008) other challenges in the implementation of ICTs in the banking industry include the poor integration with back office activities and system downtime on customer's self-service platforms which often leads to slow response time which has a detrimental effect on customer satisfaction. That lack of effective synchrony between the back end and front end can result to slow responses and which greatly affects the reliability of the system, therefore adversely affecting customer service delivery.

Furthermore, customers are influenced by the extent of integration and consistency between the front stage and back stage. The front stage or back stage distinction reconciles the conflicting views about the desirability or inevitability of variability in service delivery. Variability in the front stage often arises when an empowered employee improvises or innovates to satisfy a customer making an unexpected request or complaint (Alter, 2012). Implementation of ICTs in service delivery in many instances removes the capacity for employees to improvise or innovate.

Banking in Ethiopia faces numerous challenges to fully adopt ICT and E-banking. Research result studied by Wondwossen & Tsegai (2005) forward the following challenges:

- Low level of internet penetration and poorly developed telecommunication infrastructure: Lack of infrastructure for telecommunications, Internet and online payments impede smooth development and improvements in e-commerce in Ethiopia.

- Lack of suitable legal and regulatory framework for e-commerce and e-payment: Ethiopian current laws do not accommodate electronic contracts and signatures. Ethiopia has not yet enacted legislation that deals with e-commerce concerns.

- High rates of illiteracy: Low literacy rate is a serious impediment for the adoption of E-banking in Ethiopia as it hinders the accessibility of banking services. For citizens to fully enjoy the benefits of E-banking, they should not only know how to read and write but also possess basic ICT literacy.

- High cost of Internet: The cost of Internet access relative to per capital income is a critical factor. Compared to the developed countries, there are higher costs of entry into the e-commerce market in Ethiopia. These include high start-up investment costs, high costs of computers and telecommunication and licensing requirements.

- Absence of financial networks that links different banks (Banks are not yet automated): Most of the banking-transactions currently taking place use credit and debit cards supplied by Visa and MasterCard. For conducting E-banking, the use of credit or debit cards is mandatory thus requiring the need for specialized systems which are not currently available.

- Frequent power interruption: Lack of reliable power supply is a key challenge for smoothly running E-banking in Ethiopia.

Even though there are many challenges in adopting ICT service deliveries, the banks in Ethiopia are taking the following action to respond to the government call for the pandemic:(Tesfaye B. (PHD), 2020; Tinsae K., Dharmendra K., Pramod K., 2020)

- They are working to create awareness for its staff as well as customers about COVID-19 Pandemic.

- Mobile transfer limits have been increased (National Bank of Ethiopia).

- The majority of the banks in Ethiopia are encouraging clients to use electronic banking modalities such as ATM, Mobile banking, Internet banking instead of physically going for service to branches. They made this to minimize customers visit to the branches that contributes to the spread of the virus. But still peoples in Ethiopia are using bank notes in banks. So, the researchers tried to state an advice for the ministry of finance of Ethiopia to create awareness programs towards using of contactless payment platforms including mobile applications and electronic bank transactions by ensuring ease of its use, security and privacy (Tinsae K., Dharmendra K., Pramod K., 2020).

- The Banks have increased the amount of daily cash withdrawal using ATM cards to more than 10,000 Birr from the previous 5,000 Birr. The majority of the Banks have also waived the transaction fee charged in using these electronic banking facilities.

- Even if one of the notable achievements of the Ethiopian banking sector over the past decade was the large-scale expansion in the branch network across capital and outlying regions, the pandemic negatively affects the branch expansion rates. The effect of pandemic obviously affects the branch expansion rate across the banking industry as banks are discouraging branch level services and are heartening customers to use other non-branch channels like ATM, Mobile, via providing incentives such as revoking of fees, increasing transaction limits etc.;

However, a considerable concern rises in cyber-attack and fraud, as consumers, businesses and employees are trying to adapt to this new environment. Crisis and rapid change always create an opportunity for bad actors (Lukic, 2015). According to Alghazo, Zafar and Latif (2017) the most common factor for security threat is Internet banking users' sharing of their login credentials with others knowingly or unknowingly. This may lead to compromising of the user account and may lead to security breaches. In early May 2020, the National Intelligence and Security Service (NISS) warned banks about the rising incidence of fraud. In connection to this, NISS reported about 538 cyber-attacks in the country; the majority of which occurred after coming of the pandemic. Specially, NISS reported resistor of 110-million-dollar theft attempt from commercial bank of Ethiopia using cyber attach on May 10, 2020. (Mersha D., & Worku A., 2020)

According to Harrison (2012), it is hypothesized that many of the factors affecting the successful adoption of new technologies such as E-commerce and E-banking are generic in nature and that the successful adoption of internet technologies in part depends on how these are used in conjunction

with the other technologies and management practices that form a technology cluster. However, the most critical challenges can be ascribed to the very limited information and communication infrastructure available in most developing countries.

Considering the above literature, we can summarize the factors and the main challenges for ICT usage as customer awareness and the high illiteracy rate, security challenges, infrastructure and technology challenges and challenges from government legislation that governs ICT services. So, an interview was conducted with the bank managers, ICT staffs and customer service officers in-order to know the main challenges they are facing during Covid-19 making the above stated challenges as a basis and how the challenges are related with the adoption of ICT service deliveries in the bank during the Covid-19. In addition, to know why despite the efforts to go cashless, many Ethiopians continue to use cash and visit branches even if they know the virus is deadly. And also the interview led us to know the prospect of ICT in banks.

2.9 Prospect of E- Banking service

According to Sergeant (2000), the benefits of ICT service deliveries are manifold and are to be seen from the point view of the banks themselves, customers and even the regulators: for banks, ICT brings different and arguably lower barriers to entry; opportunities for significant cost reduction; the capacity to rapidly reengineer business processes; and greater opportunities to sell cross border. For customers, the potential benefits are more choice; greater competition and better value for money; more information; better tools to manage and compare information; and faster service.

From customers point of view: Bank Away (2001); Gurău (2002), explained about the main advantages of ICT service deliveries for customers as follows:

- Reduced costs in accessing and using the banking services.
- Increased comfort and timesaving: the transactions can be made 24 hours, without requiring the physical interaction with the bank.
- Quick and continuous access to information: Corporations will have easier access to information as, they can check on multiple accounts at the click of a button.
- Better cash management: E-banking facilities speed up cash cycle and increases efficiency of business processes as large variety of cash management instruments is available on internet sites.
- Convenience: All the banking transactions can be performed from the comfort of the home or office or from the place, a customer wants to From banks, point of views the main advantage of e-banking for banks as follows

- 24/7 availability: The banking apps ensure 24/7 availability, unlike the banks. If you want to transfer a certain amount beyond the banking hours, you can easily do that with the help of the mobile application, as the application provide 24/7 availability. Usually the banks are closed on Saturdays and Sundays, and you are not able to transfer the money on these days even if it is urgent, you have to wait for the next working day, but with the mobile application you can even transfer money on Saturdays and Sundays, as they are available and accessible 24/7.

Robinson (2000), believe that supply of internet banking services enable bank to establish and extend relationship with customers. Benefit for the users are numerous as well and include convenience of the services, lower cost of transaction and more frequent monitoring of accounts among others. The basic characteristics of internet banking are to help bank perspective to save costs, to save time and money, to minimize the likelihood committing errors, to fulfill undergraduate student‟s convenience, to lower the transaction costs.

In addition, according to (Mahdi, 2004) ICT service deliveries has benefits to economy: Electronic Banking as already stated has greatly serviced both the community and the banking industry. This has resulted in creation of a better enabling environment that supports growth, productivity and prosperity. Besides many tangible benefits in the form of reduction of cost, reduced delivery time, increased efficiency, reduced wastage, banking electronically controlled and thoroughly monitored environment and discourage many illegal and illegitimate practices associated with banking industry like money laundering, frauds and embezzlements. As ICT provide opportunity to banking sector to enlarge their customer base, a consequence to increase the volume of credit creation which results in better economic condition. Besides, ICT has also helped in documentation of the economic activity of the masses.

CHAPTER THREE
RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter will present the methodological framework applied to solve the research problem and to answer the research questions. The chapter starts with the chosen research design, research approach and study area. Afterwards, the sample selection and the data collection methods will be presented. It also gives a description of the respondents including information on the study population, the number of respondents and how they were selected.

3.2 Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. In fact, the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 2004).

According to Robson (2002), the three purposes of conducting research are generally the following: explorative, descriptive and explanative. Explorative research is characterized as the seeking of new insights, the looking around, and the asking of questions or the bringing of some phenomenon into new light. Explanative research aims at gaining an explanation of a specific situation or problem, generally in the form of causal relationships. Finally, Descriptive research is a type of research that is mainly concerned with describing the nature or condition and the degree in detail of the present situation. Creswell (2003) stated that the descriptive method of research is used to gather information about the present or existing condition.

In order to attain the objective of the study and answer the research questions, the researcher conducted descriptive research. A descriptive study sets out to collect, organize and summarize information about the matter being studied. To describe is to draw a picture of what happened, how things are proceeding, what a situation or person or event is like, or of how things are related to each other. It is concerned with making complicated things understandable (Keith, 2006). The major purpose of descriptive research is description of the state of affairs as it exists at present. This method is chosen because it is a sound to identify and explain the issues, challenges and prospects of ICT for service delivery in Commercial Bank of Ethiopia during COVID-19, which was based

on obtaining information from the opinions of the respondents (Branch Managers and Customer service Officers and other ICT management staff members). Sullivan (2001) states that descriptive technique of a research is used to discover facts or descriptive reality to snatch of phenomenon under investigation. He explained descriptive research is a picture or accounts of what exist sometimes summarized in numbers, percentage or other statistics and is characterized by the prior formation of specific research question or hypothesis.

3.3 Research Approach

In order to attain the objective of the study and answer the research questions, the researcher adopted mixed research approach. Mixed method research is an approach to enquiry that combines or associates both quantitative and qualitative forms. It involves philosophical assumptions, the use of quantitative and qualitative approaches and the mixing of both approaches in the study (Mark, Philip, and Adrian 2009).

The rationale of using a mixed approach is to gather data that could not be obtained by adopting a single method (Creswell, 2003). Hence, the basis of such approach helps to neutralize the limitations of applying a single approach in connection with the qualitative and quantitative nature of the research questions.

3.4 Study Area

The area chosen for this study is Addis Ababa because head office of the Commercial Bank of Ethiopia that represents the whole branches and district offices are located here and also the most ICT users of the bank are located in the capital city of the country, Addis Ababa.

3.5 Target Population

In research methods, population is the entire aggregation of items from which samples can be drawn (Yahiya, 2011). Commercial bank of Ethiopia has 1,646 branches in Ethiopia and above 128 branches in Addis Ababa. The target population of the study is the submission of the Branch managers, Senior customer service officers and ICT management staff members from the branches of the four districts in Addis Ababa.

3.6 Sampling Techniques and Sample size

Researchers usually draw conclusions about large groups by taking a sample. A Sample is a segment of the population selected to represent the population as a whole. Ideally, the sample

should be representative and allow the researcher to make accurate estimates of the thoughts and behavior of the larger population. Samples are chosen to represent the relevant attributes of the population. The researcher also notes the caution by Graziano and Raulin (1997) where the samples are not perfect representative of the population from which they are drawn, therefore the researcher unlikely to be able to generalize the conclusions to the entire population.

Non probability sampling (or non-random sampling) provides a range of alternative techniques to select samples based on your subjective judgment (Mark, et al 2009). The researcher used non-probabilistic sampling technique to conduct purposeful sampling. Purposive sampling enables to use judgment to select information-rich samples that will best enable to answer your research question(s) and to meet objectives.

From the total population, the research covered 4 branches. Since there are four districts in Addis, one branch was selected from each district. These branches was selected by considering their number of customers and transactions held daily and also their highly dependence on information technology services in daily operation and considering their representativeness of the population. The researcher used purposive sampling techniques to select appropriate persons who are believed to provide sufficient and appropriate information because of their experience and positions. So branch managers, senior customer service officers and ICT managers from each branch were selected for the interview.

3.7 Data Collection

Data collection is done from the Head office, Management Information System (MIS) department and from each of the four districts: North Addis, East Addis, South Addis, and West Addis Districts. The study was conducted by collecting data both from primary and secondary sources. Primary data was collected from the respondents based on an interview.

The researcher used semi-structured interviews which has features of both structured and unstructured interviews. In order to be consistent with all participants, the researcher prepared a set of pre-planned core questions for guidance such that the same areas were covered with each interviewee. As the interview progresses, the interviewees were also given an opportunity to elaborate or provide more relevant information if he/she opts to do so. So the qualitative data was collected through the interview. The interview was held in-order to explain the ICT service delivery usage in Commercial Bank of Ethiopia during COVID-19, challenges on adopting ICT for service

delivery in Commercial Bank of Ethiopia during COVID-19 and prospect of the ICT usage for service delivery in CBE.

Additionally, apart from the primary data, the secondary data gathered from the database of the Management Information System department of the Head Office and district offices, quarterly and annual reports of the Commercial Bank of Ethiopia and National Bank of Ethiopia, bank's websites, business news, articles and previous researches.

The secondary data was specifically about the ICT service deliveries attainment before and after the pandemics regarding the total number of transactions held. This data was also used for quantitative analysis. These data helped to analyse the use of ICT services in the fight against the pandemic and to assess the level of ICT usage for service delivery in Commercial bank of Ethiopia before and after COVID-19.

3.8 Data Analysis Techniques

The process of data analysis begun with the categorization and organization of data in search of patterns, critical themes and meanings that emerge from the data. The goal is to create descriptive, multi-dimensional categories that provide a preliminary framework for analysis.

An important aspect of data analysis is the search for meaning through direct interpretation of what is observed by themselves as well as what is experienced and reported by the subjects. During analysis, the non-standardized and complex nature of the data that was collected needed to be condensed (summarized), grouped (categorized) or restructured as a narrative to support meaningful analysis (Mark, et al, 2009).

Then, the collected quantitative data entered into statistical package for social scientists (SPSS) and analyzed by using descriptive statistics. For this study descriptive analysis was chosen because of its simplicity and clarity. Percentages, diagrams and tables were used for the analysis of the collected data. Typically, descriptive statistics (also known as descriptive analysis) is the first level of analysis. It helped to summarize the data and find patterns. So the quantitative data was analyzed to know the changes between ICT service delivery usage before and after the pandemic, to compare with other countries and determine the ICT usage prospects.

The Quantitative data analysis carried out with different steps.

- First summarized on a data summary sheet.

- Editing, coding and verification then subsequently entered into SPSS.
- Finally, the data was analyzed with statistical procedures.

Demographic data was also analyzed using frequencies and percentages and presented using tables. The objective on the extent to which Commercial Bank of Ethiopia is using ICT in service delivery during the pandemic was analyzed using frequencies and percentages.

Qualitative data analysis works a little differently from quantitative data, primarily because qualitative data is made up of words, observations, images, and even symbols. Furthermore, Wolcott(1994) cited in Creswell (2003; pp. 184), suggested that qualitative research is fundamentally interpretative i.e. the researcher makes an interpretation of the data. Thus, the data that was collected from the interview and reviews of documents were interpreted qualitatively. To sum, the analysis of quantitative data and interpretation of qualitative data combines to seek convergence among the results (Creswell, 2003). Narrative analysis approach was used to analyze content from various sources, such as interviews of respondents, and observations. The research questions were answered by focusing on the ideas shared by the interviewed people.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter deals with presentation and analysis of the data. To find the major out puts of the study and to give important recommendations, the collected data should be analyzed and discussed, accordingly the analysis and important findings from the collected data are discussed below. Basically, data analysis is the gear of the research to reach to its goal and achieve what has been promised all along. In this part of the data analysis, reports about the current situation and challenges and prospects related to the COVID-19 of ICT service deliveries in the Commercial Bank of Ethiopia are illustrated using verbal descriptions supported with graphical presentations. The interview was conducted in 4 branches of Commercial Bank of Ethiopia. So, the following section discusses in detail about ICT service delivery usage in Commercial bank of Ethiopia during COVID-19 in relation to the 'stay home' policy for the pandemic and clearly states the challenges and prospect to the adoption of ICT service delivery systems in CBE especially during the age of COVID-19.

4.2 ICT Service Delivery Usage in CBE before and after COVID-19

4.2.1 Total Transaction Numbers

Banks are at the front-line of the economic disruption brought by the COVID-19 pandemic. The Coronavirus pandemic continues to shape the way people around the world live their daily lives. Both social distancing and calls to stay home to avoid unnecessary interactions have meant rethinking how you approach daily tasks, including managing your money. The COVID-19 health crisis has led to a strong increase in contactless and digital transactions. To show this change in this research data from CBE Head Office, Management Information System(MIS) Department, is collected to show the total transactions held within the four districts (East, West, North and South) between the two consecutive years. i.e. the year before the pandemic which is between March 2019 and April 2020 and the year after the pandemic from April 2020 to March 2021 because the first confirmed case in Ethiopia was reported on March 14, 2020. Due to the COVID-19, an increment is seen on the usage of ICT banking service deliveries comparing to the previous years. This increment trend has persisted for a number of years, but have been magnified by the pandemic. This increment is explained by the interviewees that even if, most of the technologies have been in

existence and usage since before the COVID-19 outbreak. However, their usefulness and application has been vastly accelerated because of this crisis.

There are four basic ICT service deliveries for the customers those are, ATM (Automatic Teller Machine), POS (Point of Sales), Internet Banking and Mobile Banking. As shown in Table 1, the largest proportion of transactions in CBE is held using ATM, the second one is Mobile Banking, the least service is given for Internet Banking. The number of transactions held using the four major ICT instruments is shown in the table below.

Table 1: Total number of transactions held using the ICT service deliveries

ATM Transactions	**April 2019 - March 2020**	***Male = 116,710,196 (82.3%)***	***Total = 140,680,222***	**33.12 % Increment**
		Female = 23,970,026 (17.7%)		
	April 2020 - March 2021	***Male = 150,186,582 (78.6%)***	***Total = 190,865,791***	
		Female = 40,279,209 (21.4%)		
Mobile Banking Transactions	**April 2019 - March 2020**	***Male = 2,394,887 (81.8%)***	***Total = 2,927,322***	**487.45% Increment**
		Female = 532,435 (18.2%)		
	April 2020 - March 2021	***Male = 13,544,011 (78.9%)***	***Total = 17,197,337***	
		Female = 3,653,326 (21.1%)		
Internet Banking Transactions	**April 2019 - March 2020**	***Male = 28,302 (82.7%)***	***Total = 34,218***	**17.2% Decrement**
		Female = 5,916 (17.3%)		
	April 2020 - March 2021	***Male = 24,673 (87.1%)***	***Total = 28,329***	
		Female = 3,656 (12.9%)		

POS machine Transactions	**April 2019 - March 2020**	***Male = 1,477,775 (74.9%)***	***Total = 1,974,087***	**22.9% Increment**
		Female = 496,312 (25.1%)		
	April 2020 - March 2021	***Male = 1,724,041 (71.7%)***	***Total = 2,427,778***	
		Female = 703,737 (28.9%)		

Source: CBE Head office MIS Department

4.2.2 Current ICT Service Deliveries Usage

Automated Teller Machine (ATM), Mobile Banking, Internet Banking, and point of sales (POS) are the major ICT instruments in CBE. And now CBE Birr is also becoming one of the major digital service delivery mechanisms.

Currently, CBE has more than 27.5 million account holders and the number of Mobile and Internet Banking users also reached more than 4.6 million as of Dec. 31st 2020. Active ATM cardholders reached more than 6.4 million. So, active ATM cardholders in relation to the total account holders reached more than **23.2 %**. On the other hand, Mobile and Internet Banking users in relation to the total account holders reached more than **16.7 %.**

Moreover, in this year a total of more than 1.4 million ATM Cards, 9,200 Internet Banking and 1.8 million Mobile banking new users have been recorded. And also 2.6 million CBE Birr customers and above 7,600 CBE Birr agents have been introduced in this year. The total number of CBE Birr agents are more than 10,441 and total number of registered CBE Birr customers/ accounts reached 3.08 million as of December 2020.

In addition, 2.5 million new account holders are recorded in this year. Total number of branches has arrived to 1,646. As the President of the Commercial Bank of Ethiopia stated on an interview held in December 2020 ‘At this time, almost 53% of the bank’s transaction takes place using the digital service delivery systems. This clearly shows us that the bank takes a huge focus on the ICT sector.’ (2nd-QuarterReport, 2020/21)

These results imply that the society understands the ICT service delivery systems helps to perform banking activities within a short period of time without a risk for the virus. Moreover, they know

that by using Mobile Banking system they can simply check their balance, transfer funds up to 100,000 Birr per day and pay their bills online with just a click of mouse and a touch of button.

ATM is also being used to withdraw 10,000 Birr per day which was limited only by 5000 Br per day before the pandemic of COVID-19. On the other hand, using Internet Banking by corporates is more convenient in terms of saving time and delivering of bank service to customer 24 hours a day and 7 days a week. In line with this the findings by Balachandher et al. (2010) revealed that, one of the implications of E-banking is that it should reduce the need to visit bank branches to get services. This will directly lead us to the best method to fight COVID-19.

Among this service deliveries, Mobile Banking is being highly recommended for customers in CBE during COVID-19 because ATM and POS machines need the presence of the customers to branches or ATM hubs which is against the stay home policy and the transmission methods of the virus. While Internet banking is not given to individuals but rather to corporates and organizations. In addition, Mobile Banking can be used to transfer the daily limit of 100,000 Br per day for an individual customer.

The result obtained from secondary data gathered from Management Information System (MIS) of the Head Office of CBE regarding those four major ICT service delivery systems are presented in-detail in the following sections.

4.2.3 ATM Transaction before and after COVID-19

Access to cash for many in society was remaining essential during the current lockdown. Given this, the ATM was playing an even more critical role in ensuring that customers have access to cash and wider banking services while branches have reduced hours or closures, or customers want to avoid face-to-face or in branch interactions completely.

The line graph below prepared using the total transaction numbers held in Addis Ababa before and after the pandemic in between April 2019 to March 2020 i.e. the year before the case of COVID-19 in Ethiopia was reported and between April 2020 to March 2021 i.e. the year after the pandemic of COVID-19 was reported in Ethiopia, As the data collected from the MIS department of CBE, it has been held a total of 143,680,222 transactions the former year (The year before COVID-19) and 191,265,791 transactions in the latter year (The year after COVID-19). This is showing an increase of around 33.12% compared with the former one-year transaction before the pandemic. This increment on the ATM transaction numbers in the year after the pandemic of COVID-19 is high compared to the previous years, said the managers during interview. In addition, this increment is

high because of the fear of the customers to visit branches due to the pandemic and awareness created on customers by the bank, said the Customer Service Officers.

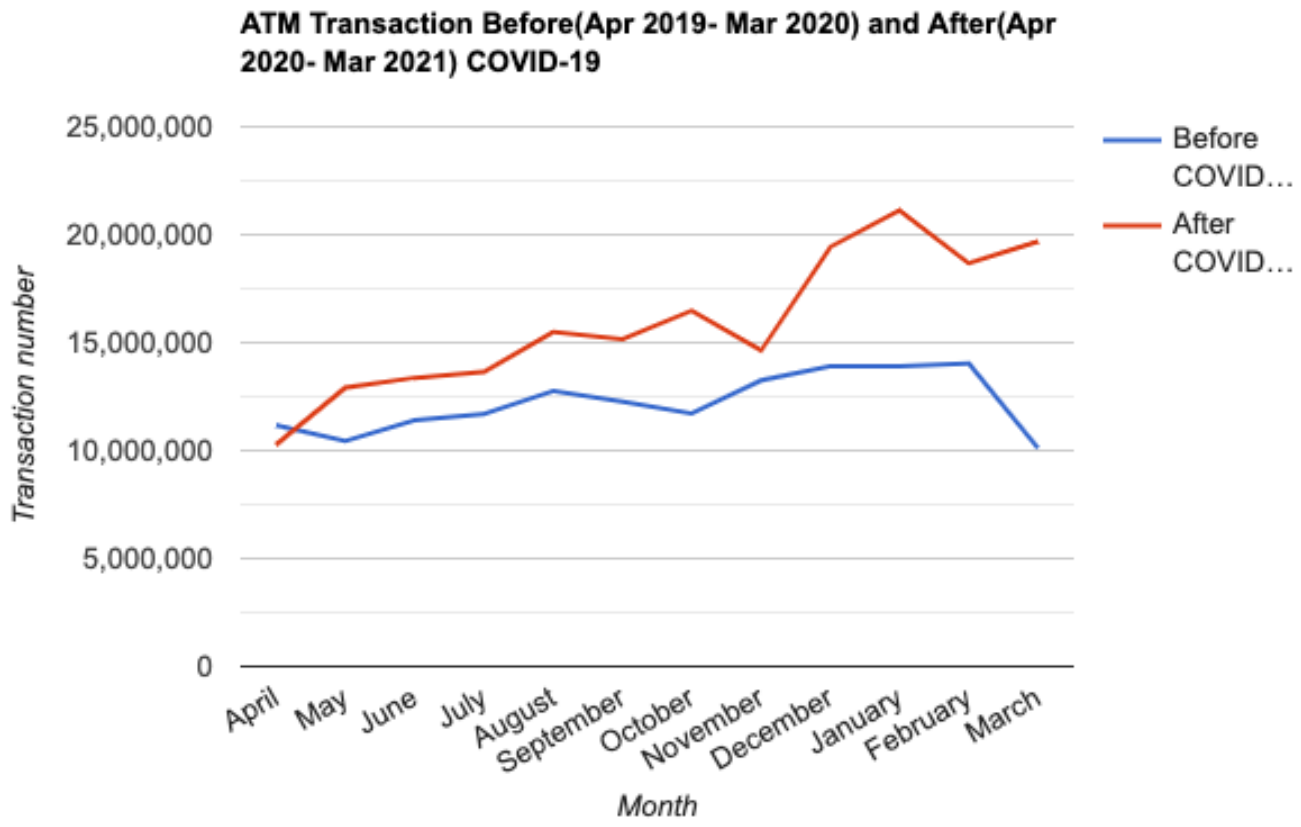

Fig. 1: Transactions held using ATM before and after COVID-19

4.2.4 Mobile Banking Transaction before and after COVID-19

Mobile Banking is on the high rise due to Covid-19 pandemic. Among the four major service deliveries, mobile banking is showing the highest increase in usage. And the managers that were interviewed stated that they were doing their best and highly recommending customers to use Mobile Banking during COVID-19. There is a high transaction migration toward Mobile Banking.

Even if, adoption of ICT service deliveries has been faster for the younger generation, however, in time of the pandemic shutdown, older generations are increasingly adjusting to the benefits of convenience inherent in mobile banking said the Customer Service Officers (CSO) that were interviewed.

As we can see from the above graph, the transaction number of the mobile banking has increased rapidly in the year after the COVID-19. The percentage increase shown is the highest from all the service deliveries. It has shown an increase of more than five times which is around 487.45 %

increment compared with the former year's transaction. As the data collected from the Head Office shows, it has been held a total of 2,927,322 transactions in the former year (The year before COVID-19) and 17,197,337 transactions in the latter year (The year after COVID-19).

As customers are becoming more comfortable with Mobile banking, and a drastic increase in the adoption of this banking is seen, an opportunity is created for banks to provide an ICT experience that exceeds the previous level of service customers would typically expect.

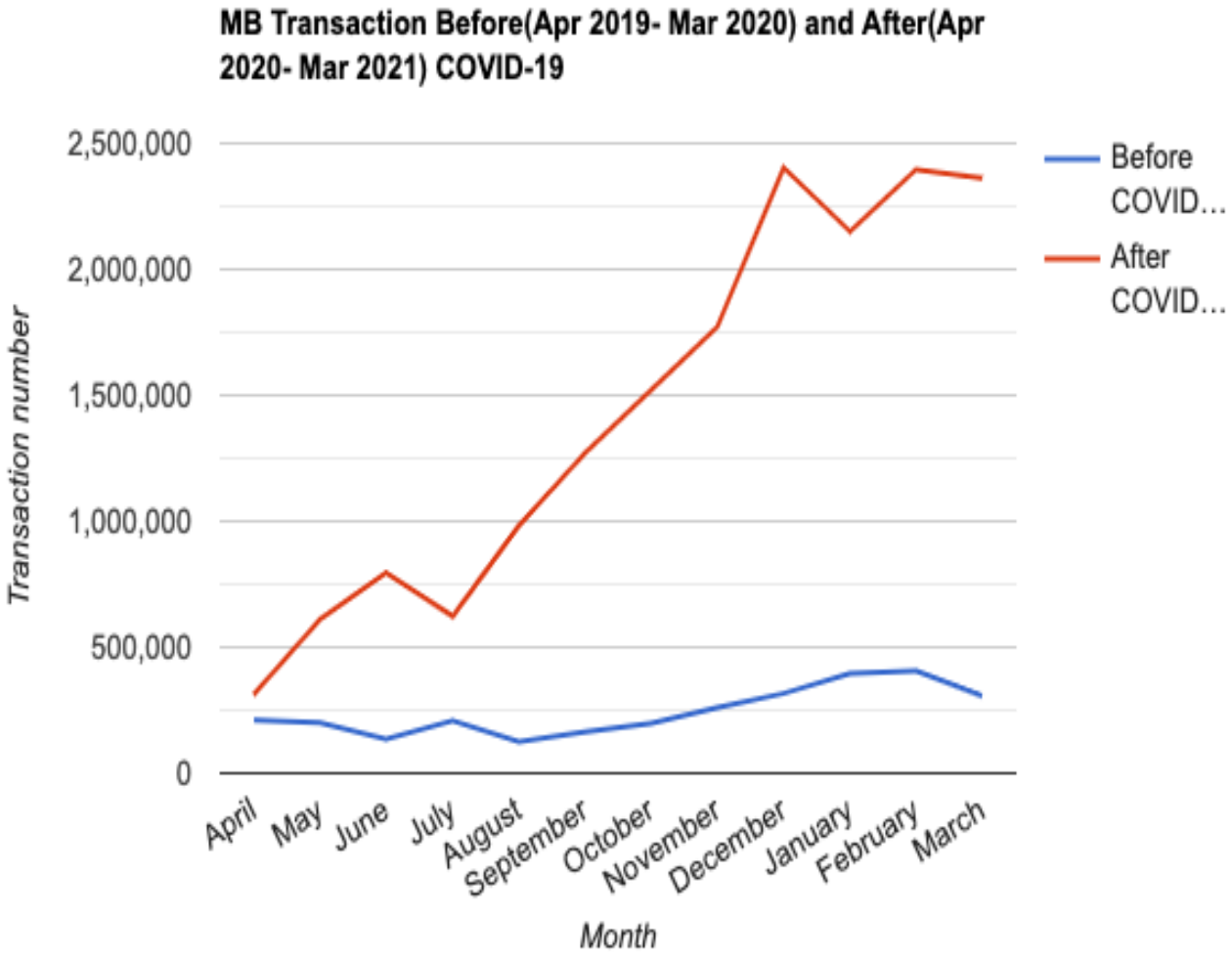

Fig. 2: Transactions held using Mobile Banking before and after COVID-19

4.2.5 Internet Banking Transaction before and after COVID-19

A percentage decrease during the pandemic has been shown on Internet Banking transactions. Since Internet banking is only for corporates and not allowed for individual customers, it doesn't show an increment rather decrement said the managers this is because of the close of most of the

corporates due to the pandemic. The total number of transactions held after March 2020 has shown a 17.2 percent decrement in relation to the transactions number on the year before the pandemic. i.e., From 34,218 total transactions number to 28,329 between the two consecutive years before and after COVID-19, as the data from the MIS department of Head office shows.

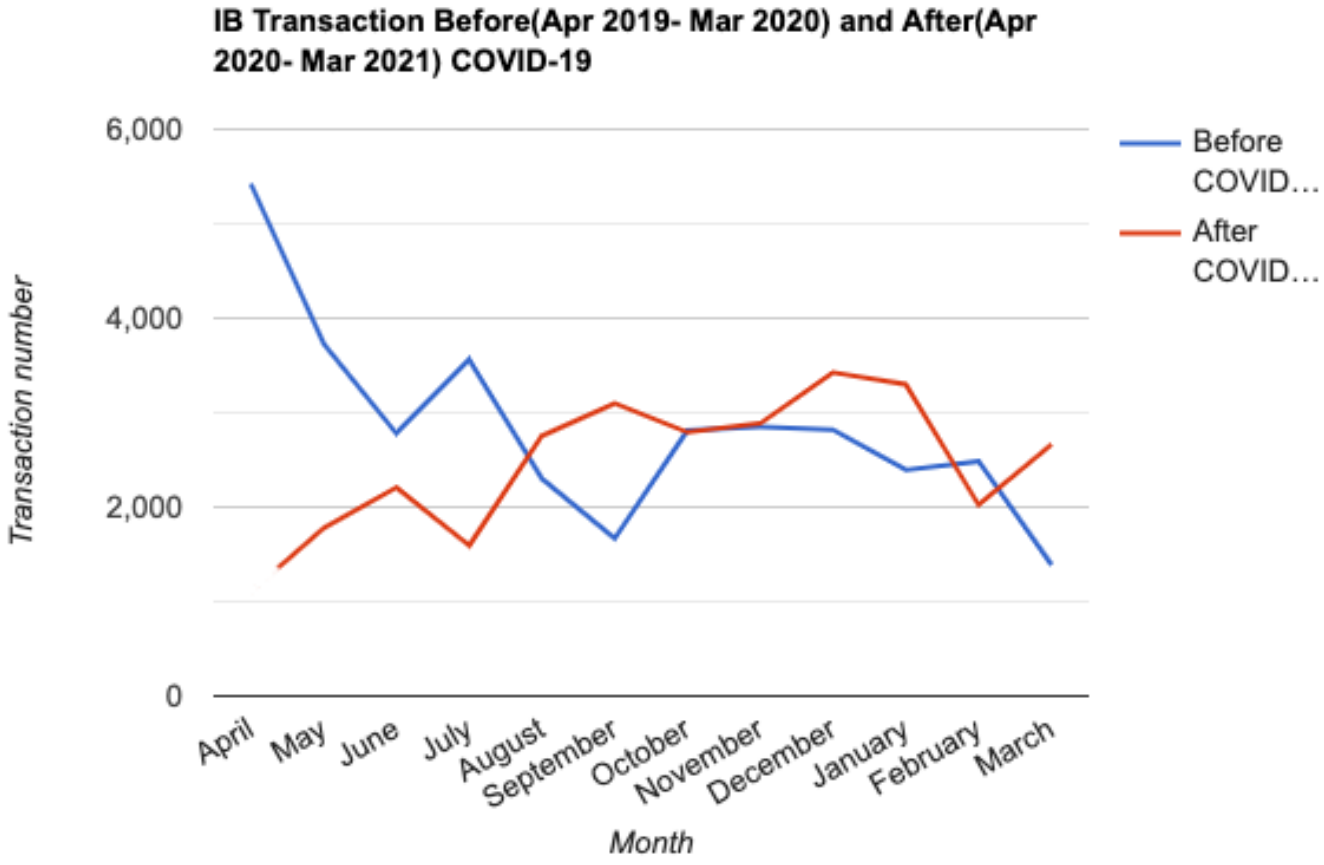

Fig. 3: Transactions held using Internet Banking before and after COVID-19

4.2.6 POS Transaction before and after COVID-19

CBE cardholders use payment cards for purchasing goods and services from where CBE POS device available. Merchants accept payments and process transactions through POS terminals. Currently, there are more than 9,500 POS terminals of CBE.

And recently, Customers are trying to change their POS payment practice because of the pandemic. This is clearly because the change is towards avoidance of cash, which is considered by some as a vector of the virus. So, contactless payments by POS are among the preferred alternative methods, also motivated during the pandemic.

There is about a 22.9 percentage increase from the former year's total transaction number, as the total transaction number increases from 1,974,087 (April 2019 to March 2020) to 2,427,778 (April 2020 to March 2021).

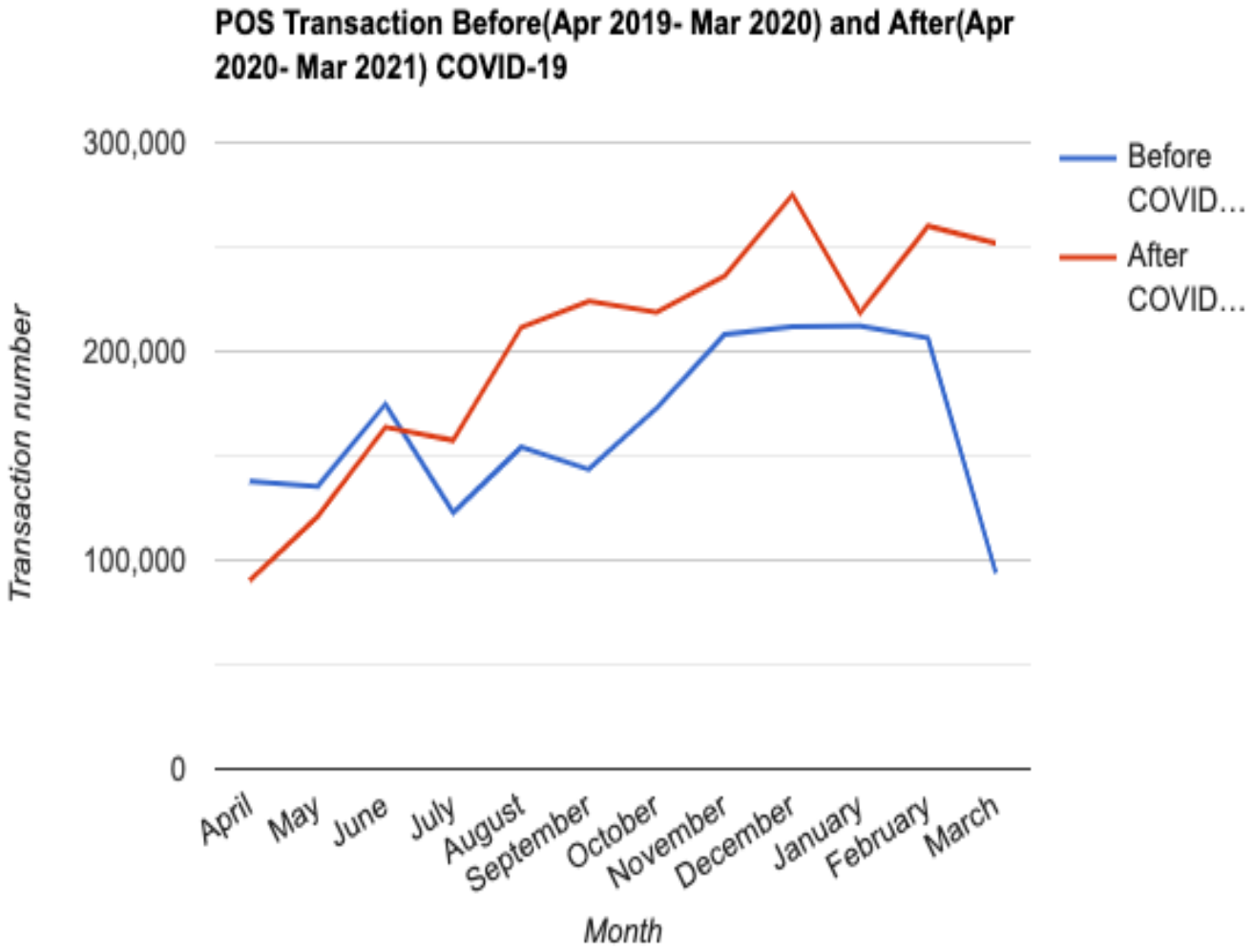

Fig. 4: Transactions held using POS machine before and after COVID-19

4.3. Challenges to the Adoption of ICT Service Delivery Systems in CBE

4.3.1 Culture

The main challenge stated by all the interviewees is that "In a business environment where physical structures, paper trails and cold cash are highly valued, digital banking adoption rates across the country is still in progress. Visits to bank branches still tend to be the norm."

Cash-based transactions have been hard to shake off rapidly. Most transactions in Ethiopia are still cash-based as the informal sector has a substantial share in the economy. To get round this, the National Bank is trying to introduce a cash withdrawal and limits on transfer. Even-though, these directives of NBE are directly related to the introduction of the new currency that the Ethiopian government has unveiled new banknotes as a part of its efforts to curb cash hoarding, illegal trade activities, and illicit financial flows in an already struggling economy. The directives will also have a direct impact on the usage of ICT delivery services.

This cultural challenge is not related to literacy, said the managers of Hedase and Addisu Gebeya. They stated that because '*This problem was also faced from the literate university students on their registration process of this year. Even if, we have made the registration system in an online manner they were asking for receipts and slips. They were not filling comfortable since this paper-based and cash based documentation culture is hard to shake off rapidly*'.

In addition, '*The society believes a transaction when they touch the cash. So this culture was a big challenge while adopting the ICT service deliveries during the pandemic. Even though 'stay home' policy is stated in the country, customers make transactions by coming to the branches.*' said the Customer Service Manager at Hedase Branch.

Concerns that cash can be a potential carrier of bacteria or viruses is nothing new; there are some scientific literature that has looked at the ability of pathogens to survive on banknotes and coins. Bacteria and viruses are present on a wide variety of surfaces that people come into contact with in everyday life; cash is just one of those many surfaces. According to study conducted to assess microorganisms harbored by banknotes on 2010 (Vriesekoop, F., Russell, 2010), different bacteria's, viruses and drugs was isolated from banknotes.

4.3.2 Illiteracy

Technical illiteracy was also frequently mentioned as a challenge by the interviewees especially by the Customer Service Officers (CSO) as a hindrance for the growth of ICT service deliveries usage in the bank during COVID-19. Still peoples are using bank notes in banks in-spite of the pandemic. This is because of they are not literate enough for using the technology. This challenge needs to be tackled as a whole by teaching the society. But they stated that this challenge is not that much relevant in Addis Ababa instead in other cities of the country since adult literacy in the capital city is the highest among all of the country's cities, at over 93% for males and almost 80% for females stated by World Population review in 2021. But this challenge is focused by the Manager of Paulos Branch in Autobus Tera by saying" This *illiteracy challenge can be directly related to the location*

of the branch. And this challenge is seen in our branch since most of the customers that are around Merkato and most of the businessmen found here are not that much literate for using the ICT services so they need to come to the branch even if the virus is deadly. From my experience, this technical illiteracy rate is not that much on branches in Bole and Mexico."

4.3.3 Security

The other challenge raised on the interview was security related issues. The Managers and ICT staffs of the four branches stated that '*We can't state security as a major challenge to adopt ICT service deliveries during COVID-19 because security was not that much an issue to individual customers in our branches.'* All the four branch managers stated that there were no huge cases of hacking targeted to our individual customers during COVID-19, instead there were some issues targeted to the Financial system of the country. In December 2019, INSA disclosed that a group of hackers attempted to immobilize the Ethiopian financial system through a distributed denial-of-service (DDoS) attack. INSA stated that it briefly shut down Ethiopia's internet infrastructure in response. In June 2020, after the coverage period, ISNA disclosed that three different groups attempted to attack Ethiopia's network structure. INSA alleged that the attack originated in Egypt, linking it to the controversial Renaissance Dam project (www.insa.gov.et) .

However, there will be a considerable concern in cyber-attack and fraud, as consumers, businesses and employees adapt to this new environment. In early May 2020, the National Intelligence and Security Service (NISS) warned banks about the rising incidence of fraud. In connection to this, NISS reported about 538 cyber-attacks in the country; the majority of which occurred after coming of the pandemic. Specially, NISS reported resistor of 110 million dollar theft attempt from Commercial Bank of Ethiopia using cyber-attack on May 10, 2020 (furtherafrica.com).

4.3.4 Infrastructure

4.3.4.1 ECONOMIC

The other main challenge is the infrastructure especially network which is related directly with Ethio-telecom. The interviewed ICT staffs and managers stated that the space for independent initiatives in the ICT sector is extremely limited, with Ethio Telecom holding a firm monopoly on fixed-line and mobile services. But, in May 2020, the government announced its intent to sell a 40 percent stake in Ethio Telecom. In June 2020, after the coverage period, the Ethiopian Communications Authority (ECA), the ICT regulator established in 2019, reported receiving 11 complete submissions from operators applying for two new telecommunications licenses offered by

the government. And an estimated $40 million of the $300 million World Bank loan finalized in September 2019 is committed to support the diversification of the telecommunications sector, including the restructuring and partial privatization of Ethio Telecom. So, this will have a great impact in the telecommunication sector which will have a direct answer for the infrastructure especially the network said the interviewees.

In addition, Mobile Banking will be expected to rise further considering the number of households in Ethiopia witnessing a marvelous increase of portable electronic devices; for example, mobile telephone penetration rate of Ethiopia (telecom density) was 41.8% in 2016/2017; while mobile density was 43% in 2017/2018. Correspondingly in the year 2018/2019, mobile subscribers were 42.92 million which increased to 44.4 million 2019/2020 (NBE, 2018). The number of internet users in Ethiopia also increased by 534 thousand (+2.6%) between 2019 and 2020. The number of mobile connections in Ethiopia increased by 7.2 million (+18%) between January 2019 and January 2020.

But for this time the available infrastructure is enough to hold our customers said by the branch Manager of Hedase, Megenagna branch.

Moreover, the manager of Megenagna branch indicated: *Our bank was aggressively doing on the provision of high-quality service to customers by employing different technological innovation, for example the bank introduces CBE birr system on 2018 which has a different database system, it offers service to customers simply by their phone using their phone numbers to register. CBE Birr shall mean a CBE Mobile service that provides services like mobile payment, mobile transfer and agent banking. The highest amount one customer can deposit through CBE Birr is twenty-five thousand (25,000) only. This system has been used very actively during this COVID time. Since, it would enable customers to complete many purchases and payments simply sitting in their home in relation to the stay home policy. It helps customers to view their balances, transfer cash to other CBE birr users, and pay bills. CBE Birr is a mobile based banking whereby the bank selects, trains and authorizes agents to provide banking services on behalf of the bank through a mobile phone. Banks could also offer mobile banking services through which customers can check their balance and transfer funds by short message service (SMS), as well as phone banking to check balances and make account inquires by phone. However, some people and customers in the banking industry speculate that underdeveloped telecommunications infrastructure may hinder the visibility and practicality of the system. But in my opinion this idea is not acceptable and I want to say that the infrastructure that is available now is more than enough for this time. Let us use the available system and it is better to improve it step by step when we face a challenge on usage.*

4.3.4.2 SOCIAL INFRASTRUCTURE

The other factor stated by the interviewees was an issue of social infrastructure related to housing which enhances the quality of standard of living of people and leads to the welfare of the economy. According to the interviewees, social infrastructure is a key factor to decrease the customer visit of branches and a main factor in an effort to prevent the society from the virus. In recent situation, everything no matter how simple or small piece of technology, is a must to be provided to people. The basic needs of a human being must be fulfilled so to pay Water bills, Electricity bills and for bill of traffic charges customers should not always needs to visit branches. But for the customers the low infrastructural development of the country for this services poses a great deal of difficulty to fight the pandemic by decreasing branch visits. So, necessity has similarly forced paper-based activities.

According to the customer service manager of Addisu Gebeya"*... Technology inferiority is the most pressing challenge in the country. Personally, I doubt even the reliability of the existing local technology produced in the country due to their low quality...*".

So the Managers and other Customer Service Officers interviewed state that in-order-to make a cashless society CBE is doing better to have basic necessity payments from everywhere using the digital methods. For showing this progress they stated some agreements made with institutions especially within the past two years. For example, after the recent agreement Commercial Bank of Ethiopia (CBE) and the Addis Ababa Water and Sewerage Authority (AAWSA) they agreed to collect water bills for its 550 thousand customers through any of the CBE transaction mechanisms. Customers can now pay their water bill using CBE Birr using the short code 878787. Customers should have a CBE Birr account and should know their customer number before trying to make the payments. Customer number can be found from the previous payments bills which were done at Lehulu Payment Center (Kifiya). Also, Electricity bill payment (short code 707070), prepaid and post-paid telecom payments (Wi-Fi, Postpaid, etc.), Traffic Charges bill (short code 979797), Flight tickets, and other payments like DSTV (short code 888100), School fees, Cinema and a lot can also be paid via mobile phones from where you are, using system of CBE Birr, Internet Banking and Mobile banking. Therefore, delivering a digital payment system reduces cash flow risk and modernizes its service delivery which will help us to fight the COVID-19 pandemic.

4.4 Prospect of the ICT Usage for Service Delivery in CBE After COVID-19

As a result of the COVID-19 crisis, there are many prospects affirmed by the interviewees which are stated briefly in this part.

- The COVID-19 pandemic has driven consumers to rely more heavily on digital channels for their banking needs. Consumers are becoming more tech-savvy and increasingly searching for ways to conduct their business through digital banking. Since consumers fear the infection, they may switch to a cashless society and the adoption of alternative integrated payment methods may be powered by mobile wallets. Personal mobile devices will become a user's central operating device, enabling payments to peers and to businesses. Internet banking may also become more viable as the functionality of ICT service delivery systems grows, and customers adapt to the new ways of conducting their financial activities. Then as consumers get more comfortable, and find that managing their money digitally is easier and safer, they will stop visiting bank branches altogether even after the pandemic ends.
- Commercial Bank of Ethiopia updated its Mobile banking app to allow customers to get credit, pay utility bills and transfer cash more easily and the app can be used all over the world whenever there is an internet connection.
- The other opportunity for ICT service usage is the one of the key developments taken by Ethio Telecom that sharply lowered rates for residential and business fixed-line broadband customers in February 2020, making internet access much more affordable. And also Ethio Telecom is trying to introduce Wi-Fi to our homes in a rapid manner with low rate. This access will lead to increment on usage of the ICT service delivery systems.
- The government is preparing to allow non-financial institutions to offer mobile-money services, opening up banking to local phone companies. This will be also another opportunity for the digital systems.
- The CBE Birr have a great opportunity to Commercial Bank of Ethiopia, agent, customer and merchants. For Commercial Bank of Ethiopia, CBE Birr helps to mobilize resource, to create cashless society which will have the great impact in fighting the pandemic. According to study conducted to assess microorganisms harbored by banknotes, different bacteria's, viruses and drugs was isolated from banknotes.

In addition to increase customer base and market share, to provide banking services via agents where the Bank branches are not able to provide the service there are some geographic areas where

opening the Bank Branch is not feasible at all, to complement the financial inclusion strategy of the country, to meet the demand for financial service that has been continually rising as the economies grow in various areas, to bring proximity of banking services to the lower part of the population and to meet the demand for financial service that has been continually rising as the economies grow in various areas. For Agent and Merchant, CBE Birr provides a source of income. For customer, it helps through the unbanked society to provide the bank service, to sophisticate the bill payment system of utilities, Air time recharge /top up etc. (Sewalem, 2018).

- The other opportunity stated was the introduction of the new currency that the Ethiopian government has announced as a part of its efforts to curb cash hoarding, illegal trade activities, and illicit financial flows in an already struggling economy.

This publicized new measure by the NBE on September 14, 2020 replaced the Birr notes of 10, 50 and 100 and introduced a Birr 200 note, which did not exist before. These new notes have already began circulating in the market replacing the old ones. It has been reported that the currency change is aimed at gathering currency circulating informally and outside of financial institutions; curb corruption and contraband; and support financial institutions confront currency shortage. The currency change comes few months after the NBE issued a directive limiting cash withdrawals for individuals and companies from commercial banks and micro-finance institutions. This directive (Directive No. FIS/03/2020) seems to be an extension of the government's effort in curbing illegal transactions and promoting non-cash transaction. Accordingly, the directive sets a daily and monthly cash withdrawal limit on both companies and individuals. Companies and other judicial entities may not undertake cash withdrawal of more than ETB 300,000.00 (three hundred thousand Birr) on a single day and a maximum of ETB 2,500,000.00 (Two Million Five Hundred Thousand Birr) in one month. The directive also limits the cash withdrawal amount for individuals to a maximum of ETB 200,000.00 (Two Hundred Thousand Birr) a day and ETB 1,000,000.00 (One-million Birr) in a month. These maximum limits are the aggregate of cash withdrawal and cashing of cheques by a single company or individual customer from different branches and deposit account in a day or month. The daily withdrawal limit has since been reduced to ETB 50,000.00 (Fifty Thousand Birr) for individuals and ETB 75,000.00 (Seventy-five Thousand Birr) for judicial entities (NBE May, 2020).

The directives related to this measure will have a great impact on the prospect of ICT service delivery usage because if a person is limited with holding only some cash and if the law of account to account transfer is going to implemented, he/she will have only a chance of transfer and make payments using the digital methods so they will prefer not to come to branches instead to use the

ICT service deliveries to make payments and transfers to others. This will maximize the prospect of the ICT service deliveries particularly Mobile and Internet banking.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSION, RECOMMENDATIONS

5.1 Introduction

This chapter as a whole presents the concluding remarks for the main findings in chapter four and important recommendations as per the main problems investigated in this research study respectively. The basic intent of this chapter is to present the overall overviews of the research by summing up the main findings of the analysis part and give future research directions. Accordingly, the first section of the chapter starts with concluding and summarizing the overviews of the study and its main findings. Then in next section based on the study finding the researcher highlight some recommendations for the target populations the study pivoting on.

5.2 Summary of Findings

Ethiopian banks are criticized for the use and less adoption of technology because of different challenges. However, technological services are available like: debit cards, real time gross settlement, ATM's, core banking system, National payment systems (clearing services), SWIFT, POS, mobile, internet, wallet banking etc. The challenges and opportunities on using ICT in banks service delivery during Covid-19 are identified in this research as:

- Cultural and regulatory reasons are to blame for most of the skepticism regarding ICT services. In other words, digital banking has evolved to the extent that has been optimal or feasible within cultural and regulatory constraints. However, with the Covid-19 outbreak, authorities, employees, and customers have all pushed for increased ICT use. Commercial Bank of Ethiopia has been encouraging more cashless transactions to prevent the transmission of the Coronavirus.
- In addition, network and infrastructural inferiority are an obstacle to use the ICT service delivery systems during COVID-19.
- The Covid-19 pandemic has speeded up the pace of the ICT service delivery usage in CBE, possibly by this year, as many people have been forced to try ICT service deliveries. Even if, Commercial Bank of Ethiopia has not suspended transaction charges to encourage the process, but awareness given by banks and policies and directives by the National Bank are promoting the ICT services to provide a better service and to increase bank revenues.

- The recent move by the NBE to limit the cash withdrawal amount by individuals and businesses as well as the crafting of digital strategy are some indicators of such thought from the regulatory and government organs. This recent introduction of cash limit and national IT strategy also indicated the need for automation and calls out the need for digital path in the Ethiopian banking industry. Therefore, CBE should pursue such path in its own, under consortium(association) and with the support from the National Bank of Ethiopia.
- Restrictions on stay homes by authorities have also made the idea of banking from the comfort of homes more attractive. Necessity has similarly forced paper-based activities that formed barriers to ICT usage owing to cultural and regulatory factors.
- The future of ICT service delivery in CBE appears bright, but it will require hard work and careful consideration of the benefits and drawbacks, as well as learning from the successes and failures of other countries.

This analysis improves the understanding of the ICT service delivery usage of Commercial Bank of Ethiopia during COVID-19 and can provide useful information to the Commercial Bank of Ethiopia, experts and supervisory authorities. And also the study will add a know-how to existing usage of ICT service deliveries being on the impact the COVID-19.

5.3 Conclusions

This study identified challenges and opportunities on using ICT in banks service delivery during COVID-19. The data was analyzed by using descriptive analysis and narrated qualitatively. Based on the findings the researcher concluded that:

- Advances in digital technology are making the crisis more bearable, allowing businesses to continue operating with access to critical services (communication, payments, credit, collaboration, and so on), while also permitting social distancing and aiding in the fight against COVID-19.
- Branches will become less about rows of tellers handling day-to-day transactions that can now be completed online. Changing the pattern of branches in this way will also help to maintain any ongoing social distancing.
- The transition towards digital was inevitable for routine activities like checking balances, payments and transfers. Many of these activities are habits, and once habits are embedded they are unlikely to change. So, with even more people banking this way because of COVID-19, these routine activities will stay digital.

- The COVID-19 pandemic has changed the way that people exchange money and shop. In response to social distancing guidelines, more people are shopping online, meaning fewer cash payments. As well as prompting a shift towards online shopping, COVID-19 has also affected how people pay for things in shops. This is partly due to retailers' actions, but also due to consumer preference. The Government has advised retailers to minimize contacts around transactions, for example, by considering using contactless payments. In line with this, many retailers, including major supermarkets, have been encouraging consumers to use contactless payments, while still accepting cash.
- This outbreak should be used as an opportunity to increase ICT service deliveries usage and include more people in the digital economy. The use of e-banking and digital payment systems may place extra pressure across networks; so Ethio-telecom need to work hard on network expansion in this regard.

5.4 Recommendations

Based on the research findings and conclusions above, the following are recommended for Commercial Banks in Ethiopia and sectors related with banks to improve ICT service delivery usage:

- People will continue to need essential banking services through these hard times. While encouraging extensive use of remote services, banks should continue to operate branches and ATMs with proper precautions and appropriate safeguards. This strategy will take into account the needs and desires of all consumer segments, including the elderly, who are both more vulnerable to COVID-19 and less likely to adopt digital channels.
- At the same time, banks should encourage and support customers to use digital and other virtual channels, wherever possible. To encourage customers to use remote channels and digital products, institutions can launch positive and safety-oriented messaging aimed at reducing reliance on branches for services that are digitally available while also providing tutorials online and by phone and increasing remote support options.
- They can also enhance their current digital offerings, identifying key functionalities that can be improved quickly; for example, they can increase the limit for online activities, and they can simplify the procedure to reset passwords.

- Ministry of Finance of Ethiopia has to create awareness programs towards using of contactless payment platforms including mobile applications and electronic bank transactions by ensuring ease of its use, security and privacy. This suggestion is also forwarded by WHO.
- The Government must allow Telecom Firms to Provide . This service will allow users to store, send, and receive money using their mobile phone. And they can also buy items in shops or online, pay bills, school fees, and top up mobile airtime. They can also withdraw cash at authorized agents. So this will decrease branch visits. So we must learn from our neighbors such us Kenya.
- As long as ICT presents opportunities for economic and social development, devising ICT policy and strategies, allocating the proper amount of budget and resource, creating a partnership with stakeholders and establishing suitable environment should be a primary duty and responsibility of a state. Governments, especially the developing ones, are often cash-strapped or have a multitude of other shortfalls which impact ICT development. In this case, establishing a network or partnership with private industry where some costs are shared along with the risks in improving the situation will be an alternative solution.

5.5 Areas of Further Research

This study has identified challenges and prospects of ICT service deliveries from perspective of Commercial Bank of Ethiopia. As every study has limitation the study also has limitation related to including other banks. In addition, this study has not included responses from external organs such as Ethio Telecom and ATMs hardware managing companies and other infrastructures providing organizations are not included in the study.

The researcher recommends further studies to include other private and government banks, telecom company and hardware service providing companies. In addition, the research is done only in Addis Ababa so it's better to make further research in the cities of the country. To reach at a better generalization, further studies are recommended to include in the other cities.

References

1. AAP FactCheck. (2020). COVID-19 pandemic not a case of history repeating itself. Retrieved from www.aap.com: https://www.aap.com.au/covid-19-pandemic-not-a-case-of-history-repeating-itself/.

2. Abiy Demilew (2008) capital, weekly news paper March, 17, 2008.

3. Addison T. & Geda A. (2001). Ethiopia's New Financial Sector and its Regulation: *Discussion paper No.2001/55*, UNU/WIDER, https://www.researchgate.net/publication/313011588.

4. Alayu C. (2015). Assessment on the Challenges and Prospects of E-Banking: In The Case of Commercial Bank of Ethiopia.

5. Alter, S. (2012). Work system perspective on service, service systems, IT services, and service science. *Retrieved 08/16/2015, from USF Scholarship Repository:* http://repository.usfca.edu/at/45.

6. Akib Zaman, Muhammad Nazrul Islam, Tarannum Zaki, and Mohammad Sajjad Hossain (2020). ICT Intervention in the Containment of the Pandemic Spread of COVID-19: An Exploratory Study.

7. Athanassopoulos, A.D. (2000) Customer satisfaction cues to support market segmentation and explain switching behaviour, *Journal of Business Research* 47: 191-207.

8. Binyam Tamene (2009), Daily Monitor, February, 20, 2009.

9. Burnes, B. (2004). Managing change: A strategic approach to organizational dynamics. *New Jersey: Prentice Hall*.

10. Chavira, R. (2013, December 16). ITIL Foundations: What is a service? Retrieved 9 7, 2015, from Yale information technology services: http://www.its.yale.edu.

11. Creswell, W 2003, Research Design: Qualitative, Quantitative and Mixed Approaches, " 2nd edition. Sage publication, California.

12. Essinger, J. (1999). The virtual banking revolution: The customer, the bank and the future (1Ed). *London: International Thomson Business Press*.

13. Ferreira E., Erasmus A., & Groenewald D. (2009). Administrative management (2nd Ed.)

14. Galaz (2016). Pandemic 2.0: Can information technology help save the planet? Environment: Science and Policy for Sustainable Development 51 (2009) 20–28.

15. Girma A. (2016). The Impact of Information and Communication Technology on Performance of Commercial Banks in Ethiopia.

16.https://combanketh.et/wp-content/uploads/2020/08/AnnualReport-2019-20.pdf

17.Glushko, R. J. (2008). Designing a service science discipline with discipline. *IBM Systems Journa*l, 47 (1), 15-28.

18.Keith. (2006). Developing Effective Research Proposals: *SAGE. Publications London*. Thousand Oaks. New Delhi.

19.Laukkanen T (2016). Consumer adoption versus rejection decisions in seemingly similar service innovations: The case of the internet and mobile banking. *Journal of Business Research* 69(7): 2432-2439.

20.Leow, H.B. (1999). New distribution channels in banking services. *Banker's Journal Malaysia*, 110, 48-56.

21.Malak, J 2007, Readiness of the Palestinian banking sector in adopting the electronic banking system: exploratory study, MA thesis, The Islamic University of Palestine.

22.Matteos K. (2016). Challenges and Prospect of E-Banking in Ethiopia.

23.Mathias G., Sahut. J. (1999). Right to Information Technology and Telecommunications. Banking and Internet (2), 6-18.

24.Mersha D., & Worku A. (2020). Effect of COVID-19 on the Banking Sector in Ethiopia. *Horn of African Journal of Business and Economics (HAJBE)*, 28-38.

25.Nagabhushanam, M. (2013). Influence of demographic profile on acceptance of Internet Banking in a non metro city in Tamil Nadu, India. *Journal of Internet Banking and Commerce*, 12-13.

26.Njoka, S.K. (2013). Assessment of M&E systems of local NGOs in Kenya, *An Unpublished MBA Project, University of Nairobi*

27.Nyapara, O.E. (2012). The relationship between information communication technology usage on efficiency among commercial banks in Kenya, *An Unpublished MBA Project, University of Nairobi*

28.Obo, D.D. (2009). Microfinance in Ethiopia, Elixir or poison (PhD Thesis). I*nstitute of social studies, Netherlands*.

29.Otieno, B.J (2008). Challenges in the implementation of mobile banking information systems in commercial, *An Unpublished MBA Project, University of Nairobi*

30.Ralph M. & Reynolds G. (2010). Principles of information systems. *Boston: Cengage Learning*.

31.Robson C (2002) Real World Research. Blackwell, (2nd edition)

32.Saythe, M. (2005), The Impact of internet banking on performance and risk profile: Evidence from Australian Credit Unions. *Journal of Banking Regulation*, 163- 174.

33.Sewalem S. (2018), The challenges and Opportunities of Implementing E-payment Projects. In case of CBE Birr Project.

34.Sumani Yahiya (2011), Prospects and Challenges of Electronic Banking in Ghana, A Case Study of SG-SSB Bank Limited, research paper, Nkrumah University of Science and Technology, Accra.

35.Sullivan T. (2001). Methods of social research (p.163). *Fort Worth, TX: Harcourt College Publishers.*

36.*Tesfaye Boru Lelissa (PHD) (2020). The Impact of COVID 19 on the Ethiopian Private Banking System*

37.Vera A. CNN. Here's a complete list of every state health department's Coronavirus website (2020). https://edition.cnn.com/2020/03/16/health/coronavirus-us-state-websites-trnd/index.html [Accessed April 2, 2020].

38. Vriesekoop, F., Russell, C., Alvarez-Mayorga, B., Aidoo, K., Yuan, Q., Scannell, A., ... & Menz, G. (2010). Dirty money: an investigation into the hygiene status of some of the world's currencies as obtained from food outlets. *Foodborne pathogens and disease*, *7*(12), 1497-1502.

39. https://furtherafrica.com/2020/05/12/ethiopia-intelligence-intercepts-us110m-cyber-fraud/

40. www.comrbnket.et

41. https://combanketh.et/commercial-bank-of-ethiopia/about-cbe/

Annex 1

Interview

Addis Ababa University

College of Business and Economics

Department of Business Administration

Dear Sir/Madam

I am Anteneh Behailu, M.B.A. student in the Department of Business Administration at Addis Ababa University. I am undertaking a research on the topic "**Challenges and Prospects on Using ICT in Banks Service Delivery during COVID-19: The Case of Commercial Bank of Ethiopia**" for the partial fulfillment of the requirements of the degree in Masters of Business Administration. The aim of this interview is to assess the challenges and prospects on using ICT service deliveries during COVID-19. This interview is designed to be conducted with Managers, Customer service Officers and ICT staff of the purposely selected 4 branches of Commercial Bank of Ethiopia and with the relevant bodies from the Head Office.

The results of the study will have a paramount important to the institutions, owners, clients, concerned government offices and policy makers and others. To this end, this interview is prepared to gather pertinent information. I sincerely assure you that the information you provide will be used only for academic purposes. Your involvement is regarded as a great input to the quality of the research results. Your honest and thoughtful response is invaluable.

Thank you in advance for your participation.

Yours faithfully,

Anteneh Behailu

Tel Phone 0911-530727

antenehbehailu@aau.edu.et

A. Name of the Branch _____

B. Your Position _____

C. Work Experience _____ years

Questions for Interview

1. How do you evaluate the ICT service delivery usage in this branch during COVID-19 in relation to the 'stay home' policy for the pandemic?

2. Can you state new strategies and implementations taken by the bank for an effective implementation of ICT during the pandemic?

3. Do you think that you offer ICT service delivery methods to your customer in the appropriate manner and which E-banking outlet do you offer more to your customers during the pandemic? Why? Why not others?

4. What are the challenges on using information and communication technologies for service delivery during COVID-19?

    - Can you explain briefly that the challenges from customer's awareness on ICT and the high illiteracy rate on ICT usage has the same effect on the adoption before and after the pandemic?

    - Do you believe that the existing IT infrastructure is enough to provide ICT services to all your customers without interruption?

    - Do you think that government policy and policies from the National Bank of Ethiopia have impact on the adoption of ICT service deliveries during the pandemic?

    - Do you have the capability to resist cyber-attacks and prevent fraud that rises as customers are trying to adapt the new environment of the ICT during the pandemics?

    - Can you state any financial and economic challenges to the adoption of ICT banking services faced on your branch during COVID-19?

Can be shaped based on the interviewee i.e. For the Customer Service officers the question will focus on “the challenges from the customer side”, For the manager the question will focus on “the challenges from the bank and government” and For the ICT staffs by saying challenges from the System, security and infrastructure.

5. What major actions should be taken to highly improve the current usage of ICT service deliveries in-order to prevent the transmission of the virus?

6. What possible opportunities and prospects are there to the Information technology usage in the banking sector after COVID-19 and its effect to bring the sector to the new normal?

Annex 2

Total Transactions Number

Between April 2019 to March 2020(Before COVID-19) and from April 2020 to March 2021(After COVID-19).

Table 2: ATM Transaction Number Before and After COVID-19

ATM Transaction Number Before COVID-19		ATM Transaction Number After COVID-19	
April 2019	11,171,111	April 2020	10,274,928
May 2019	10,450,097	May 2020	12,919,614
June 2019	11,394,939	June 2020	13,371,447
July 2019	11,684,523	July 2020	13,635,727
August 2019	12,764,068	August 2020	15,484,305
September 2019	12,264,111	September 2020	15,160,260
October 2019	11,727,350	October 2020	16,479,076
November 2019	13,251,672	November 2020	14,641,457
December 2019	13,917,480	December 2020	19,431,093
January 2020	13,911,650	January 2021	21,133,258
February 2020	14,029,853	February 2021	18,673,480
March 2020	10,113,368	March 2021	19,681,146
Total = 146,680,222		***Total = 190,865,791***	
Male = 115,210,196		***Male = 150,386,582***	
Female = 25,470,026		***Female = 40,479,209***	

Table 3: Internet Banking Transaction Number Before and After COVID-19

Internet Banking Transaction Number Before COVID-19		Internet Banking Transaction Number After COVID-19	
April 2019	5,424	April 2020	1,107
May 2019	3,727	May 2020	1,779
June 2019	2,783	June 2020	2,208
July 2019	3,565	July 2020	1,590
August 2019	2,297	August 2020	2,756
September 2019	1,669	September 2020	3,099
October 2019	2,812	October 2020	2,792
November 2019	2,849	November 2020	2,887
December 2019	2,821	December 2020	3,425
January 2020	2,395	January 2021	3,301
February 2020	2,484	February 2021	2,023
March 2020	1,392	March 2021	2,662
Total = 34,218		***Total = 28,329***	
Male = 28,302		***Male = 24,673***	
Female = 5,916		***Female = 3,656***	

Table 4: Mobile Banking Transaction Number Before and After COVID-19

Mobile Banking Transaction Number Before COVID-19		Mobile Banking Transaction Number After COVID-19	
April 2019	209,918	April 2020	312,642
May 2019	200,312	May 2020	610,174
June 2019	136,341	June 2020	796,281
July 2019	207,340	July 2020	623,347
August 2019	124,765	August 2020	981,257
September 2019	163,298	September 2020	1,270,449
October 2019	198,721	October 2020	1,520,679
November 2019	261,244	November 2020	1,772,593
December 2019	316,348	December 2020	2,402,786
January 2020	396,362	January 2021	2,150,223
February 2020	405,253	February 2021	2,395,785
March 2020	307,420	March 2021	2,361,121
Total = 2,927,322		***Total = 17,197,337***	
Male = 2,394,887		***Male = 13,544,011***	
Female = 532,435		***Female = 3,653,326***	

Table 5: POS Machine Transaction Number Before and After COVID-19

POS Users total Transaction Number Before COVID-19		POS Users total Transaction Number After COVID-19	
April 2019	137,861	April 2020	90,238
May 2019	135,256	May 2020	121,058
June 2019	174,783	June 2020	163,592
July 2019	122,658	July 2020	157,415
August 2019	154,218	August 2020	211,435
September 2019	143,597	September 2020	223,978
October 2019	172,896	October 2020	218,870
November 2019	208,226	November 2020	235,903
December 2019	211,913	December 2020	274,967
January 2020	212,183	January 2021	218,500
February 2020	206,529	February 2021	260,045
March 2020	93,967	March 2021	251,777
Total = 1,974,087		***Total = 2,427,778***	
Male = 1,477,775		***Male = 1,724,041***	
Female = 496,312		***Female = 703,737***	