Opportunities and Challenges of EthSwitch E-Payment System: A case study of Commercial Bank of Ethiopia

By: Genet Alemu

A Research Project Submitted to Addis Ababa University College of Business and Economics in Partial Fulfillment of the Requirements for Master of Arts Degree in Project Management

November 2018

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Advisor: -Abraraw Chane(PhD)

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma at AAU or other institution of higher learning.

_____ _____

Genet Alemu Date

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

_____

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Approved by

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Advisor	Signature
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Examiner	Signature
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Examiner	Signature

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Abstract

World is now at the edge of technology where the bank system is part of it using the advantage of technology towards paperless money. The main objective of this study is to identify the Challenges and Opportunities of EthSwitch E-Payment system project implementation from the perspective of the Commercial Bank of Ethiopia. Mixed research design was employed and primary data were collected through questionnaires and semi-structured interviews from management, employees and users of the system and analyzed using quantitative and qualitative methods. The finding of this study reveal that the most challenging factors to the implementation of EthSwitch Payment system is Lack of Technical support unavailability, lack of trained human resource, lack of coordination and cooperation among banks (issuer and acquirers), branches, districts and EthSwitch process is highlighted together with lack of clear legislation on consumer protection., technological and network problem specifically network failure and system failure, payment modality, security, infrastructure, foreign dependent technology, legal, regulatory issues and users' resistance to change are among the major challenges in the EthSwitch e-payment system.

On the other hand, the EthSwitch E-Payment system has lots of opportunities change in the society life style though it is slow technological advancement is some of the major opportunities identified by the study and also IT infrastructure development, NBE policy direction that enforces banks to adopt technological innovation. Hence the study recommends working on addressing CBE conduct a capacity building program to its staff, work to create homogenous response and coordination in payment among issuer, acquirer for quicker response to users using the Ethswitch E-Payment, work on upgrading with knowledge and availability of its call center to offer support 24hrs a day and 7 days a week.

System *the network connectivity problem, quality of devices, dispute management system to deal with customer grievance and capacity building on the human resource to deal with the challenge.*

Keywords: Electronic payment, EthSwitch Project Implementation, challenges, opportunities, Commercial Bank of Ethiopia.

Acronyms and Abbreviations

ATM	Automated Teller Machine
BSD	Banking Supervision Directorate
CBE	Commercial Bank of Ethiopia
CDMA	Code Division Multiple Access
CPO	Customer Payment Order
CSM	Customer Service Manager
DFS	Digital Financial Service
E-MONEY	Electronic Money
E-PAYMENT	Electronic Payment
EPS	Electronic Payment System
EVDO	Evolution Data Only/Evolution Data Optimized
GPRS	General Packet Radio Service
ICT	Information Communication Technology
IT	Information Technology
MCIT	Ministry of Communication and Information Technology
M-PESA	M for mobile, Pesa is Swahili for money
NBE	National Bank of Ethiopia
POS	Point of Sale
SPSS	Statistical Package for Social Sciences
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TAM	Technology Acceptance Model
TIN	Taxpayer Identification Number
VSAT	Very Small Aperture Terminal
WAP	Wireless Application Protocol
GHIPSS	Ghana Interbank Payment settlement system

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

As the world has marching towards paperless money, Ethiopia has also made remarkable progress in the modernization of the payment system over the past years. Notable developments include the establishment of an appropriate legal framework including payment system proclamation; implementation of the real time gross settlement system and the Automated Clearing House (ACH) system (EATS); introduction of check standards; implementation of state of the art core banking systems by banks and the NBE as well as the ongoing implementation of the EthSwitch to bring in interoperability for payment cards and mobile payments. (National Bank of Ethiopia, 2016).

These developments are essential for the overall national Payment system and to create the necessary foundations for an efficient retail Payment system and broader financial inclusion within our country. An effective retail Payment system is a great importance to Ethiopia's financial sector outlook and economic future; EthSwitch is a key infrastructure to establish interoperability between banks and in future possibly microfinance institutions as well. (National Bank of Ethiopia, 2016)**.**

Modern trends indicate that electronic payment systems have become a significant element in all trade and commerce activities globally. The scope of electronic payments extends from under one dollar to Multi-Million dollar transactions. Despite the benefits that electronic payment systems has brought to other economies such as the western developed countries, economies in Africa, which are still in the early stages of applying electronic payment systems are yet to experience its maximum economic and operational impact (Sumanjeet, 2009)**.**

In spite of the practice of modern payments system in the world with their attendant advantages for both consumers and financial institutions, it has not become main stream activities in Ethiopia.

The monetary authorities also bear the high cost of printing bank notes due to the short life cycle of notes, and the cost of moving large amount of cash from banks to banks and across the

country. Over-dependence on cash for transaction also implies that much cash is held outside the banking system, which naturally reduces the capacity of banks to lend to the productive sectors of the economy.

It is for some of these reasons that a forward-looking economy should seriously think of embracing the modern payments system, such as debit card, credit card, electronic money, electronic fund transfer, Automated Teller Machine (ATM) and POS terminals (Betru, 2017).

Access to a transaction account is a pre-condition and a stepping stone for broader financial inclusion which entails a full range of financial service of (including savings) meeting one's needs and gives people more choice across more places for conducting day-to-day transactions, by progressively extending the range and coverage of safe and efficient electronic payment instruments access channels and access points available to end users.

In order to foster interoperability of electronic retail payments including ATM and POS, Ethiopian Commercial banks, under the overall guidance of NBE, have established a national switch ("EthSwitch") the unifying e-Payment platform for Ethiopia. A number of banks had established their own switch before the EthSwitch project was started. Six banks having their own switch, and a consortium of six shareholding banks developed and has since operated their own switch company or ("premier switch solution") that provides a range of electronic banking and payment services including a shared network for ATMs and POS card transactions. These two smaller switch solutions were eventually interfaced with Ethswitch. As a consequence, all electronic retail payments including ATM and POS infrastructure in Ethiopia will eventually be fully interoperable (EthioPay, 2013).

EthSwitch (National E-Payment Switch), a centralized switch system which integrated all real-time and online payment systems in Ethiopia, is established through cooperation among all private and public commercial Banks in the year 2011. Being established with equal share investment by all private and public banks in Ethiopia, EthSwitch is an offspring of the National Payment Systems Development Strategy of Ethiopia which is crafted and led by the National Bank of Ethiopia. The National Bank of Ethiopia has taken the lead in the modernization of the E-payment process. Due to its overall responsibility for a sound payment system, the central bank has a key role in the development of the use of money as an effective means of payment

and established a proper project structure and project management and ensures that all stakeholders are involved in the project.

It fully aligns with the financial inclusion and the e-Government Strategies of Ethiopia. EthSwitch is a business company, with no profit maximization, but cost recovery and re-investment motives, which is governed by its owners (i.e., the banks), wherein the National Bank of Ethiopia is the Board Chairman. The National Bank of Ethiopia instructed the Ethiopian Bankers Association (EBA) to handle the National Card Switch project implementation to create interoperability among the ATMs and POS installed in the country. (EthioPay, 2013).

National e-Payment Switch is the National e-Payment Switch and related systems as well as the corresponding Data Center and Network Infrastructure and procedures operated by Ethiopay S.C.

EthSwitch (A national e-payment switch) intended to act as the front and back end processor that should be able to handle an unlimited number of devices, networks and host systems. The national e-payment switch has to be fully compliant with the payment networks. It unites and fully customized for the processing of payment environment it targets. It has to scale, accommodate all payment types and meet high standards of security and fraud management. At the same time, national e-payment switch should support innovations in order to enhance E-Payment for improving efficiency and productivity in both private and government banks in order to strengthen the national economy.

Ethswitch is also dedicated to contribute to the modernization of National Payment System in the country by optimizing economies of scale in investing on e-payment infrastructure through providing interconnectivity and interoperability among participants through shared network which complies with all relevant international standards (EthioPay, 2013).

The commercial bank of Ethiopia (CBE) has been using EthSwitch Payment system, nevertheless, to the best of the author's knowledge, there has been no single study conducted to examine the challenges and opportunities of implementing EthSwitch E-Payment system. The ways to deal with the challenges have not been established (EthioPay, 2013).

1.2 Background of the Company

The Commercial Bank of Ethiopia (CBE) was established as the State Bank of Ethiopia in 1942 and later legally established with its current name 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. The bank is pioneer to introduce modern banking to Ethiopia and acknowledged for playing a catalytic role in the economic progress and development of Ethiopia.

CBE with a vision of becoming a world class commercial bank by the year 2025 is also a pioneer in introducing ATM service for local users. Currently it has1280 branches, 400 billion Birr Asset, more than 18.8 million account holders, more than 2000 ATMs, 8400 POS, 1,736,768 Mobile and Internet Banking users and more than 7 million ATM Card holders.

1.3 Statement of the Problem

Despite the fast progress in the E-Payment system in the world, the economy in Ethiopia is still cash based, where majority of the transaction is using paper money.

Even cash, the most prevalent method in retail transactions, requires considerable resources to operate as an effective payments system. Cash exchanges transfer purchasing power directly and instantaneously, eliminating the expensive collection process required by checks. Nevertheless, cash is expensive to mint and print, and costly to keep in circulation. On behalf of the U.S. Treasury, the Federal Reserve issues cash, spending $650 million annually to make, store, and ship currency, as well as to detect and destroy unfit currency. Banks and businesses pay additional sums each year to collect, count, safeguard, and transport bills and coinage (Federal Reserve Bank of Cleveland, 2018).

EthSwitch is a Share Company which is established to implement first, the interconnectivity of all existing e-payment channels; and second, the interoperability of various e-payment instruments which are currently existing and used in Ethiopian Commercial Banks. The objectives are to achieve the single overarching goal of increasing non-cash transactions in Ethiopia.

EthSwitch National E-Payment System which has implemented Phase I project by interconnecting all One public and Sixteen private Commercial Banks Automated Teller Machine (ATMs) for interbank transaction using Smartvisa Technology and created interoperability environment on May 2016, with BPC Banking Technologies. It is a must-have

for governments, who want to control over their own financial infrastructure and independence while also significantly reducing the levels of cash usage. For banks, who want faster and more cost-effective innovation on a shared platform and still for some Banks, which needs direct connection without investing on switch and other technologies, EthSwitch is believed to add more value for businesses and Customers which are increasingly demanding more value, with goods customized to their exact needs, at less cost, and as quickly as possible.

To meet these demands, businesses need to develop innovative ways of creating value which often require different enterprise architectures, different IT infrastructures and different way of thinking about doing business. There is, consequently a growing need for a multiplatform solution, which can acquire transactions across many different channels; manage electronic payment devices, and also perform high-volume switching, routing and authorization services. To provides services such as cash-out, remittance, Bill Payment, Fee Payment, top-up Direct Debit /Credit Clearing and Settlement Reconciliation, e-Commerce… etc. However, EthSwitch has been facing different challenges on implementing national e-payment switch project. These concerns necessitate this study which is aimed at providing information on possible challenges.

- The 2016/17 fiscal year is the year EthSwitch has been in operation, However, on the average 42% of the transactions processed by EthSwitch had been declined by issuer Banks month by month throughout the fiscal year. From the total 7,700,142 transactions processed by the National e-payment Switch(ethiopay) in the 2016/17 fiscal year, a total of 2,208,662 transactions, i.e. 29% were declined and 29% the services were not offered and the revenue which could have been earned from these service was lost (Mitafa , 2017).
- The high delays in processing disputes were observed which in turn created grievances on the part of some Banks' customers (EthSwitch Board of Directors' Report, 2017).
- Delays in implementation and testing of phase II products (Card to Card transfer, ATM mini-statement, Top up, pin change, POS purchase and POS Balance enquiry, bill payment, internet and mobile) and services on part of member Banks, have negatively affected EthSwitch performance in project works(EthSwitch Board of Directors' Report, 2017).

- ∉ The measure taken by the major Bank, i.e. CBE to cease authorizing its Bank customer's transactions on other bank 'ATMs, from Feb 4, 2017 to May 22, 2017 has also negatively affected the national e-payment switch operations and corresponding revenue that could have been earned from the services rendered(Kokeb & Melkamu, 2017).

- ∉ Even though all Banks made equal investment on Ethswitch project, CBE is the first bank in Ethiopia to introduce ATM service for local users and that made huge investment electronic (ATM/POS) devices deployed over 1857 ATM and 8400 POS which created accessibility, but there is a challenge during its internal switch upgrade and migration from magix to ACI Base24 Switch. Hence, this paper tries to identify the challenges of EthSwitch e-Payment system Project Implementation from perspective of Commercial Bank of Ethiopia and tries to analyze them in a way to clearly know the reasons and acknowledge them in order to provide possible solutions.

Furthermore, while there are studies on e-payment system adoption such as ATM, there has been lack of literature on EthSwitch E-Payment system especially in the challenges and opportunities of its implementation in CBE (Elizabeth, 2017).

This concern necessitates this study which is aimed at providing information on challenges and opportunities to the EthSwitch E-Payment system implementation from perspective of CBE. Moreover, this project creates an opportunity to recommend ways to deal the challenges.

1.4 Research Questions

While conducting this research, an effort was made to answer the following questions;

1. What are the major challenges of EthSwitch E-Payment system in CBE?
2. What are the major existing opportunities of EthSwitch E-Payment system in CBE?
3. What are the alternative ways to deal the existing challenges of EthSwitch E-Payment system?

1.5 Objective of the Study

1.5.1 General Objective

The general objective of this study is to identify and analyze the Challenges and opportunities of EthSwitch E-Payment system Project implementation from perspective of CBE and thereby suggest possible ways of dealing with the challenges.

1.5.2 Specific Objectives

The study has the following specific objective

1. To identify the major challenges of EthSwitch E-Payment system Project implementation
2. To identify the major challenges of EthSwitch E-Payment system Project implementation
3. To explore the opportunities of EthSwitch E-Payment system Project implementation

1.6 Scope the study

In order to study all challenges and opportunities of EthSwitch E-Payment system Project implementation, it would require extensive research, more time, detail information. The focus of this study on opportunities and challenges of Ethswitch project implementation in the case of Commercial Bank of Ethiopia. The Bank is selected due to its huge financial position and in its engagement in various IT projects. The other private commercial Banks is out of the scope of this study. In addition, this study restricted its scope only on E-Payment processes of the four District offices in Addis Ababa.

1.7 Significance of the Study

The proposed research is significant mostly due to the fact that E- payment systems are now gaining familiarity in Ethiopia. EthSwitch is the first national Electronic payment that has been implemented in Ethiopia by connecting all the Automated Teller Machines (ATMs), and since its implementation there hasn't been any assessment yet. An empirical study in this area is expected to inform the stakeholders of how EthSwitch and other Electronic payments systems has or has not made any economic impact. The stakeholders involved All Commercial Banks of Ethiopia, NBE, other Financial Institutions and individuals.

Furthermore, this research is also expected to increase awareness of the challenges of electronic payments and serve as a guide for future implementation of such systems by developing countries with low level of technological infrastructure. A study in this direction I believe is very important.

1.8 Limitations of the Study

The study suffers from certain shortcomings either in its scope, source of information or personal analysis. The first limitation of this study is the absence of sufficient study in Ethiopia on the challenges and opportunities of EthSwitch E-Payment system Project implementation because it is a new technology in Ethiopia. The other limitation is data considered as confidential and a competitive asset was not easily available.

1.9 Organization of study

This study is composed of five chapters including the conclusion and recommendations parts. Chapter one, is an introductory part of the paper and deals with background of the study, statement of the problem, objectives, significance, scope, and limitations of the research. Chapter two is overview of EthSwitch E-Payment system, theoretical and empirical literatures are reviewed. In chapter three is about the research methodology, it explains research purpose, research design, study setting, data collection, population and sampling and data analysis techniques. The fourth chapter presents the analysis and result of the study. The last chapter will present conclusion and recommendation of the study.

1.10 Definition of Key Terms

National Switch A shared switch facility to connect all the country's banks and other financial institutions.

EthSwicth - A Brand Name of National payment switch

A cashless society - is a gradual movement of the payment system of an economy from the use of physical cash to a systemic adoption of other non- physical cash mode of payment in settlements of all types of transaction both in the public and private sectors of an economy.

Acquirer - financial institution that contract with merchants to accept payment cards for the payment of goods and services

Authorization - the consent given by a participant (or a third party acting on behalf of that participant) in order to transfer funds or securities.

Arbitration - The resolution of disputes outside the courts.

Terminal - Any device that allows cards as a means of transacting.

Interoperability - are set of arrangements/procedures that allow participants in different systems to conduct and settle payments or security transactions across system while continuing to operate in own respective system.

Issuer - financial institution and member of international payment system that hold contractual agreement(s) with, and issue cards, to card holder.

Transaction - act between cardholder and merchant or cardholder and financial institutions which result in the sale of goods/services and cash withdrawal.

Approval: An approval means that the dollar amount you specified will be reserved from the cardholder's available credit limit for future settlement.

Decline - A decline means that the customer's card cannot be used to complete the purchase.

Magnetic Stripe Card - the magnetic stripe ("magstripe") card is typically used for credit and debit cards in the United States. A limited amount of data, such as the card number, is stored on the magnetic band. Information is retrieved by swiping the card through a reader. Signature-based magnetic stripe cards are at higher risk for fraud than EMV cards. That risk is mitigated somewhat by requiring a PIN and using sophisticated encryption algorithms. Magnetic stripe cards can be configured for biometric authentication. However, the card cannot hold this information, so it must instead be stored on the switch database. This requires online access to the switch.

Smart Card - the smart card (also called "Chip and PIN") contains a chip that can hold substantially more information on the card itself than a magnetic stripe card, including biometric identification and some transaction history. Its benefits include offline capability and high security protection. EMV compliance requires smart card use, but not all smart cards are EMV compliant.

CHAPER TWO: LITERATURE REVIEW

2.1 Theoretical Literature

This 21st technology era revolutionizes ICT and now gives us a daily used word that starts with 'e' such us E- Payment. This study focus on switching of E-payment.

2.1.1 The challenges and opportunities of IT project management

IT project management involves a structured approach to planning, organizing, leading, and controlling information technology projects. There are various types of IT projects that an organization could undertake, including:

Software development and implementation

Hardware installations (e.g., servers, desktop computers, or telephony systems)

Network system upgrades

Data management

Project Life Cycle

For any IT project, the project will have a start point and an end point, and the part in between is known as the project life cycle. There are generally five phases for all projects. (Initiation, Planning, Execution, Monitoring and Controlling and Closing.) (Shane, 2018).

Internal IT projects should be strategic — even if you're implementing a new, more user friendly interface or upgrading to more powerful hardware, the true goals are objectives that affect the organization as a whole, such as:

Better stability and efficiency

Improved business intelligence and analytics

Supporting long-term IT needs with minimal disruption

Decreased security and compliance risk

Flexibility to harness future technology upgrades

IT Project challenges are

1. No project mandate

Without a mandate (mission and objectives) it's difficult for an at-risk project to recover. The mandate is a blueprint for your program. As McKinsey states, "This mandate should include business case, project justification, high-level requirements and success criteria." The mandate affects every key decision on the project, so put it in writing with an approved budget—and communicate it out to everyone who needs to know about it.

2. Unclear expectations

A mandate gets an IT project off on the right foot, but it's no substitute for gathering detailed requirements and expectations from all stakeholders. This sounds almost intuitive but project managers eager to start can overlook this critical step. Put these project details in writing; you'll refer to them throughout the project.

3. Poor communications between IT and the business

Communicating well with your internal client is a must. Business and IT often speak different language, so the project manager must translate. A big data project is challenging enough, so don't let miscommunication derail your efforts.

4. No user input

Its one thing to engage line-of-business managers in the project requirements, but don't forget the end users who will actually work with your project deliverables. Identify potential gaps between what business executives want and what their employees will use. Many IT projects involve transforming current business processes, so adoption by hands-on users is critical. You can make this adoption process smoother by listening to users at the start and then keeping them informed of project progress.

Here are 4 common changes to consider as solutions:

1. Budget

When allocated resources start to shrink, you're faced with re-juggling your project to stretch fewer resources further. To accommodate such changes, address the project objectives, features and timelines with your executive management. You might end up doing more with fewer resources, but before updating your project plan get your management's buy-in on how you accomplish that.

2. Scope

Managing scope creep is a key talent for IT project managers. Best practice is to include a process for handling scope changes in the initial project plan. This way, you have a better chance to address necessary changes in timeline and budget. If you didn't put a scope change clause in your original plan, you still need to negotiate time and resources.

3. Timeline

If new business conditions make your project more strategic, you might be asked to accelerate your delivery times. Before making promises, discuss and negotiate resource allocation (dollar and human), so you can realistically make the shorter timeline. The opposite problem may arise too—an unforeseen situation downgrades your project and you get more time. Then you face the challenge of keeping your people engaged on your project that is no longer as strategic as when you started Clerk T. (2012).

Lack trained on soft Skills and needs continuous training

One of the most common problems that project managers face is that they don't have a team of people that have the skills that are needed for the project. One of the ways through which this problem can be solved is by getting them enrolled in instructor-led online training. The training would help the manager know if the team has the needed skills and competencies or if there is a need to hire more people.

Needs continues infrastructure and software up grading

Needs a multi-stage plan to prevent new challenges and opportunities may affect future stages of the project. Proper architecture and sizing requires extensive testing and tweaking. Complex system, resources can fluctuate unpredictably. Minor software glitches, sales booms, end-of-quarter reporting demands, hardware faults, Internet outages and hundreds of other issues can combine to stress a system. If the IT infrastructure hasn't been carefully sized and built with sufficient redundancy to withstand these sorts of problems, it can lead to massive slowdowns or even outages, when the system can no longer cope.

IT project management requires precise planning lot of time for gathering information and to look at network and IT resources, business needs and goals, hosting and staffing preferences and many other factors before proposing a precise IT solution. All information has to be gathered and every detail has to be plotted out before the start. Otherwise, scope creep, inaccurate dependencies, cost overruns and missed waypoints can undermine the project from the beginning.

No project is completely risk-free; even with great planning and skilled partners, there's a chance something will break or go wrong. IT project managers. The risks of IT project management: each stage needs extensive testing and a backup, and core infrastructure needs failovers and rollbacks available at all times.

IT project managers must test under real-world conditions: Insufficient testing is one of the biggest problems in IT project management. Even if they test every subsystem individually, IT project managers can completely miss serious problems that will show up on go-live, or shortly thereafter. It may simply be because the people who put together the system don't understand the business end of it. Alternately, if the manager isn't providing managed IT services post go-live, they might decide that it isn't their responsibility. Whatever the reason, failing to test the landscape under real-world conditions can prove disastrous (Downey, 2016).

2.1.2 Growth of the Banking Payment System

The banking payments system is not just an instant creature of this century, it has been growing over centuries and with it the form of money. Where the payments system is heading has an important comportment on how money will be defined in the future. According to Frederic S. Mishkin, the payments system has grown and developed through time, as stated below.

Commodity Money: In history dated back, precious metals such as gold were used as the principal means of payment and were the main form of money. Later, paper assets such as checks and currency began to be used in the payments system and viewed as money. Money made up of precious metals or another valuable commodity is called commodity money, and from ancient times until several hundred years ago, commodity money functioned as the medium of exchange in all but the most primitive societies. (Mesfin, 2017).

The Fiat Money: The next stage in the payments system was fiat money, paper currency decreed by governments as legal tender (meaning that legally it must be accepted as payment for debts) but not convertible into coins or precious metal.

Checks: Another stage in the development of the payments system occurred with the development of modern banking: the invention of checks. The introduction of checks was a major innovation that improved the efficiency of the payments system. A check is an instruction from you to your bank to transfer money from your account to someone else's account when s/he deposits the check.

We are currently moving toward an electronic payments system in which paper is eliminated and all transactions are handled by computers. Despite the potential efficiency of such a system, obstacles are slowing the movement to the checkless society and the development of new forms of electronic money (or e-money).

E-Money: Electronic money (e-money) is money that exists only in electronic form (Mishkin, 2004). Electronic money (or "e-money") is a monetary value represented as a claim on the issuer which is stored on an electronic device and accepted as a means of payment by undertakings other than the issuer. E-money can be either hardware-based (i.e. stored on a device, typically a card) or software-based (i.e. stored on a computer server). (European Central Bank, 2010

According to R. Glenn & A. Patric (2014), money facilitates transactions in the economy. The mechanism for conducting such transactions is known as a payment system. The payments system has evolved over time from relying on payments made in gold and silver coins, to payments made with paper currency and checks written on deposits in banks, to payments made by electronic funds transfers. This payment system is the web of arrangements that allow for the exchange of goods and services, as well as assets, among different people. For the reason, the efficient operation of our economy depends on the payment system; a critical public policy concern is that it function s well. There are three broad categories of payments, all of which use money at some stages. These are cash, checks and electronic payments (Cecchetti & Schoenholt, 2015).

2.1.3 Electronic Payment

The innovation and expansion of inexpensive computers and the spread of the internet make it cheap to pay bills electronically. Date back to pay bills by mailing a check was a reality, but now banks provide a web site in which you just log on, make a few clicks, and thereby transmit your payment electronically. Not only do you save the cost of the stamp, but paying bills becomes (almost) a pleasure, requiring little effort. Electronic payment systems provided by banks now even spare you the step of logging on to pay the bill. Instead, recurring bills can be automatically deducted from your bank account. Electronic payments technology can not only substitute for checks, but can substitute for cash, as well, in the form of electronic money (or e-money), money that exists only in electronic form. The first form of e-money was the debit card. Debit cards, which look like credit cards, enable consumers to purchase goods and services by electronically transferring funds directly from their bank accounts to a merchant's account. Debit cards are used in many of the same places that accept credit cards and are now often becoming faster to use than cash. At most supermarkets, for example, you can swipe your debit card through the card reader at the checkout station, press a button, and the amount of your purchases is deducted from your bank account. Most banks and companies such as Visa and MasterCard issue debit cards, and your ATM card typically can function as a debit card (Mishkin, 2004).

As we look into the future and try to discern what will happen to money, we should remember that 150 years ago there was virtually no paper currency in circulation. The first credit card was issued in the early 1950s; the first ATM was installed around 1970. Not until the mid- 1990s

could we shop via the internet. Forecasting most of these developments, as well as any other trend in technology, is nearly impossible. After all, who could have predicted even 20 years ago that today we would be able to check our bank balances, buy and sell stocks, and pay our utility bills 24 hours a day, seven days a week from the comfort of our homes? (Cecchetti &Schoenholt, 2015). The developments in e-money are exciting and lead some commentators to predict a "cashless society." In reality, though, an entirely cashless (or checkless) society is unlikely for two key reasons. First, the infrastructure for an e-payments system is expensive to build. Second, many households, and firms worry about protecting their privacy in an electronic system that is subject to computer hackers. While the flow of paper in the payments system is likely to continue to shrink, it is unlikely to disappear (R. Glenn & A. Patric, 2014). According to Tan, (cited by Tella&Abdulmumin, 2015) E-payment is a payment system in which monetary value is transferred electronically or digitally between two entities as compensation or consideration for the receipt of goods or services. An entity in this regard refers to a bank, business, government or even an individual customer (Tan, 2004). According to this author, any payment not affected by paper-based instruments is considered an e-payment transaction. It should be noted that advances in technology in some parts of the world make it possible for cheques to be treated as e-payment instruments.

2.1.3.1 Types of Electronic Payment Methods

There are different types of electronic payment methods. According to Bill Maurer, electronic payments systems in the developing world can be divided most broadly between those that rely on a bank and those that rely on a non-bank entity. Those that rely on banks include:

E-money and Plastic: - It also includes debit and credit cards which stored-value or pre-paid devices, generally card based, relying on traditional magnetic stripe or chip technologies linked to a remote account. These are cards that have all the customers' information which are used for transaction any time they are needed. It could be credit card or debit card. Credit cards are plastic cards encoded with electromagnetic identification; it is incorporated with circuit on which value is loaded. It can be used by customers to perform transactions on ATMs by the issuing banks at strategic locations as well as point of sale terminals with designated signs of the producer of such card. It is preloaded with money. It is like a credit giving to customers by his bank. Debit card on the other hand is an electronic card with very advanced feature including the use of microchip,

whereby transaction is validated against the chip rather than a magnetic stripe. It enables the holder to make withdrawals and purchases charged directly to funds in his/her account and your money is immediately deducted from your account when used.

Internet-based payments: - It relies on an existing bank account and providing access and funds- transfer capabilities remotely via email or web application. Moreover, according to (Alabar & Timothy, 2012), cited by (Assefa, 2013)**.** Internet banking allows customers of a financial institution to conduct financial transactions on a secure website operated by the institution, which can be a retail or virtual bank, credit union or society. It may include of any transactions related to online usage. Banks increasingly operate websites through which customers are able not only to inquire about account balances, interest, and exchange rates but also to conduct a range of transactions (Alabar & Timothy, 2012)**.**

Mobile payments: - mobile phone based applications using chip, SMS, or WAP or other software driven mobile interface providing access to an existing bank account or credit card account. As per Tiwari, cited by M. Assefa, mobile banking (also known as M-Banking) is a term used for performing balance checks, account transactions, payments, credit applications and other banking transactions through a mobile device such as a mobile phone or Personal Digital Assistant (PDA). (Tiwari, 2007, Assefa, 2013).

Correspondent banking or branchless banking: - third-party systems in which a non-bank retail outlet serves as the agent for an existing bank using POS terminals already present in the retail outlet.

Point of Sale terminal (POS): -It is an electronic device used to process card payments at retail locations. It reads card information and it process payment on that card for the transaction effected immediately. This is an important infrastructure for an effective e-payment system and will enhance efficient cashless policy.

Those that do not require any bank involvement include:

E-purses: - Stored value and pre-paid cards not linked to an existing bank account. Can be recharged by retail agents of the non-bank entity or by third parties.

Mobile wallets: -Stored value and pre-paid mobile phone applications, based on an embedded SIM chip or other technology (e.g., M-PESA in Kenya), or based on an interface permitting access to a remote account with a non-bank entity.

2.1.3.2 Opportunity and Challenges of E-payment

E-payment types are being continually innovated and developed. The study by Bogota, 2013 titled " Electronic payment methods, e-commerce and economic activity: Theory and new evidence for developing and emerging countries" shows that electronic payments are not only an alternative for reducing costs with respect to other payment methods, such as cash and checks, but can also generate significant benefits for increasing economic development. The evidence shows that making payments by cash or check not only comprises 'costs' which include not only costs to produce it, but also costs for handling, printing, transporting, and securing it. In this sense, electronic payments have become a more efficient process and contribute to the improvement in the economic growth and market development in both developed and emerging countries.

Adoption of electronic payment has improved over the years however, the growth of E-payment has not been so rapid and this is due to several challenges that have faced e-payment adoption in the Banking industry. Challenges such as legal, infrastructure, security, regulatory and socio cultural challenges are facing e-Payments. Additionally, in Africa challenges such as undeveloped infrastructure, inadequate legal and regulatory framework, un-readiness by Bank and low level of credit card access hindering the progress of E-payment (Wondwosen et al., 2009).

Kumaga (2010) study shows that use of electronic payments in most African countries are not common. Tadesse and Kidan, (2009) highlights that legal and regulatory framework are some of the missing key components for electronic payments. Also infrastructure for electronic payments such as mobile network and internet are also not available in Africa. Kumaga (2010) highlights that banks are not adequately automated to allow electronic payments. InKumaga's view the infrastructural challenge is the main challenge which relate to networks, ICT accessibility, affordability, connectivity and usage (Marako, 2017).

2.1.4 Development of E-payment in CBE

Electronic payment is an automated payment or banking channels that allows delivery of banking services in an effective, efficient and convenient way via electronic channels such as ATM, POS terminals, mobile phones, internet and personal computers. The CBE is a first to introduce electronic payments in the country when it launched proprietary ATM system in 2002. However, the bank found it important to set up a new solution for electronic payment services which is capable of supporting its business growth requirements. Accordingly, the bank has implemented card payment services, mobile payment, and internet banking (E- Payment procedure, CBE, 2012). According to the newly revised E-payment procedure of the bank, electronic payment is spreading rapidly as it leads to much lower costs and greater competition in the financial services. The adoption and growth of e-payment facilities is becoming imperative towards creating a cashless society. The most recognized drivers for growth of e-banking include convenience, reliability, wider availability; affordability and usefulness of the services are increasingly sought for ease of livelihood of the populace at large. Electronic payment assists in attracting unbanked individuals into the banking system allowing improvement in personal money management along with enhanced financial empowerment (CBE, 2016).

CBE SWITCH

What is BASE24-eps? It is a Payment Engine, the next generation of ACI's world class BASE24 payments software, Acquires, routes, authenticates, authorizes, and switches financial payment-type transactions, acquires transactions from ATM, POS, other payment devices and interchanges / processors, supports consumer payment transactions initiated with credit, debit, and chip cards, Flexible authentication, authorization, journal perusal & extract/report using scripting, Acquire, route and switch (ACI, 2017).

2.1.4.1 E-Payment Switching and its Benefits

Switching refers to the routing of transactions between different payments systems. The component that links the systems at the center is, therefore, usually named as a Switch. We can understand from this that a switch is required mainly to facilitate interoperability of systems among the banks so that a customer of one bank will use the acquiring network of the other to make transaction of a certain sort like cash withdrawal on ATM or payment at merchant locations. A typical payment transaction passes through one or more switching platforms from

acquirer to network and on to an issuer's switching application. The switching systems drive transactions from initiation to destination. They are the cogs in the payments machine that never stop turning. These switches process billions of ATM and POS transactions in milliseconds every day. For example, MasterCard drives a network response time that averages 140 milliseconds per transaction, to process over 22 billion MasterCard branded transactions per year. Bank of Mauritius (2015).

With today's polymorphic payments landscape there is a real demand for smarter, more efficient payments systems - a necessity for the volumes being handled. The capability, reliability and efficiency of the payment switches are crucial in delivering today's customer expectations.

Thus, by establishing a central switch the banks could obtain the following major benefits; It facilitate their customer service by providing them a wide network to access their accounts, reduce the level of investment required on expanding acquiring network since they can share resources together, handle money transactions locally with a relatively cheaper unit cost without the need to use international networks like Visa and MasterCard.

According to a study in Mauritius, the national payment switch will provide several benefits to the card business, the merchants and customers.

Cost Savings: The current setup of card based payments is based on the concept of a one-to-one direct relationship with the payment processors resulting in multiple investments and processing costs. Switches are designed to be payment processor neutral and are therefore easily interfaced to virtually any payment processor. This processor neutrality, combined with insulation of the POS from payment processor connections, will give merchants as well card issuer's maximum flexibility when it comes to evaluating their payment processing relationships. Cost savings will therefore be achieved on multiple fronts, namely: Switch will allow direct routing of authorization requests and elimination of intermediate arrangements and related processing costs, Switch will also allow batch settlement of transactions instead of single transaction processing, The Switch will have direct connection with the credit card associations, thus eliminating per-transaction conveyance fees (estimated at about 10% per total merchant fees) charged by processors to route these transactions. Bank of Mauritius (2015).

Standardizations of Merchant Discount Rates: currently, in many countries the same merchant discount rate is applied to both credit and debit cards. In a transaction involving a credit card, the credit card company takes a risk by giving the merchant money and waiting to

collect it from the card holder at a later date. The credit card company therefore charges a fee to the merchant for taking the risk, as well as for the time and resources needed to process the transaction. On the other hand, for a transaction through a debit card, the customer enters a PIN number and authorizes money from his account to be transferred to the merchant's account. Since the transfer happens immediately, the merchant will know if the customer has sufficient funds to effect the payment and there is no settlement risk. Banks should therefore not charge fees for debit card transactions on the same basis as credit card transactions. In many countries, merchant fees on debit cards are lower than those applied on credit cards and are often flat fees which do not change with the value of the transactions. The National Payment Switch, by virtue of being a central infrastructure, will have operational rules that are set by a collaborative approach involving major stakeholders. This will provide an opportunity to adapt fees depending on the types of payment cards. Bank of Mauritius (2015).

Revenue Generation Opportunities: Payment switches are typically integrated and certified with multiple processors across numerous tender types and payment products. Merchants can therefore offer a wider range of payment and service options to customers. This will allow merchants to attract more customers and propose switch supported payment services such as phone cards, gift card trees. In fact, there will be a revenue opportunity cost if merchants fail to rapidly adopt such new payment products. Bank of Mauritius (2015).

Administrative Efficiencies: The Switch, aims at eliminating the inefficiencies of the current payment setup. The Switch has a direct impact on the following business areas: Centralized reporting: The entire settlement process will be centralized and save merchants from cost of reconciliations as the Switch will allow them to view their payment system from one reporting and interfacing system, Integrated POS. Most merchants in most case still operate payment terminals in such a way that card information is entered twice at the payment terminal – once via a card swipe and then again through a manually keyed entry into the POS system. A payment switch can help integrate payment terminals with POS systems and eliminate the need for double entry. It also removes the need to reconcile transaction record differences between the POS system and payment terminal. Bank of Mauritius (2015).

Low Cost Sharing of ATMS: Currently, customers have to pay a fee ranging from Rs35 to Rs80 when cash is withdrawn from the ATM of another bank. This is mainly due to interchange

fees that are paid in the process. With the National Switch, ATM sharing fees can be considerably reduced.

National Cards and Store Value: The Switch provides the ideal environment for the issue and use of a 'National Card' to further drive down costs of local transactions. National cards can also take the form of Electronic (Social) Benefits Transfer (EBT) cards which are stored-value cards issued by a Government agency to distribute pension, money for food, clothing and living expenses to a recipient enrolled in a special program (Social Security, low-income programs, etc.).

Internet and Mobile Payment Switching: In a switched environment, merchant fees relative to payment made over the internet are reduced. The Switch provides virtual terminals to merchants who can provide recurring billing to customers, print and send customizable receipts and have 24/7 access to free reporting. The options for mobile payments in the market are currently limited and suffer mainly from the issue of inter-operability. This means that a person must have an account with a specific service provider which in turn works with a specific bank in order to be able to make use of the service. The National Switch will provide a platform for switching payments to and from mobile devices making mobile payment inter-operable from a provider as well as banking perspective. Bank of Mauritius (2016).

Wireless Processing: The National Switch will enable wireless credit card processing technology which offers new flexibility and opportunities for all merchants, help in increasing sales, save time, reduce operating expenses and will be particularly beneficial for those merchants whose business takes them outside the traditional brick-and-mortar establishment. No more need to have a Second phone line or to rent phone lines at remote venues. In addition to the benefits related to individual banks, the nation will also Save considerable amount of cost which otherwise will be spent on cash note printing and distribution since the interoperability element will significantly help in reducing the circulation of cash (Mauritius, 2015).

2.1.4.2 EthSwitch National E-Payment System of Ethiopia

The National Bank of Ethiopia instructed the Ethiopian Bankers Association (EBA) to handle the National Card Switch project implementation to create interoperability among the ATMs and POS installed in the country. The common electronic transaction system for Ethiopian banks including National Card Payment Switching system which shall be owned and managed by all commercial banks in Ethiopia. From the experience of other countries banking services,

electronic payment systems are found to benefit commercial banks by extending bank customer base; reducing operating costs; enhancing customer service and improving banks' competitive advantage. For example, some proactive banks have considered cards as the strategic products to broaden their customer base, cut down paper-work, invoices and casher's service, and build competitive advantage over other banks without card products.

The Ethiopian Bankers Association technical team under the NBE identified the following business models;

1. Domestic Switching Only (DSO)

The Central Switch under DSO scope is to work only on switching i.e. routing of messages to each respective Banks' Switches. This model demands each bank to have its own Switches to interface to the Central Switch.

2. Payment Service Operator (PSO)

The Central Switch under PSO scope serves as third party processor for switching to banks. Here banks that do not have Switch can use the Central Switch as their switching devices for their ATMs/ POSs terminals. Banks who have implemented Switch already can also interface to the Central Switch. Hence, PSO handles all banks that have Switches and those that do not have Switches.

3. Payment Service Provider (PSP)

The Central Switch under PSP scope does like PSO but its difference is that the Central Switch Company with PSP acquires ATMs and POSs terminals by its own besides to other Banks' terminals.

4. Virtual Switch

Virtual Switch is where commercial banks didn't establish a company by its own but rather uses outsourcers who have good experiences with card payment system. The entire models described above i.e. DSO, PSO and PSP can be managed using external companies to form a virtual National Switch.

Board of Bankers Associations has accepted and approved the business model for the National Switch to be PSO (Payment Service Operator).Ethiopian Bankers Association (2011).

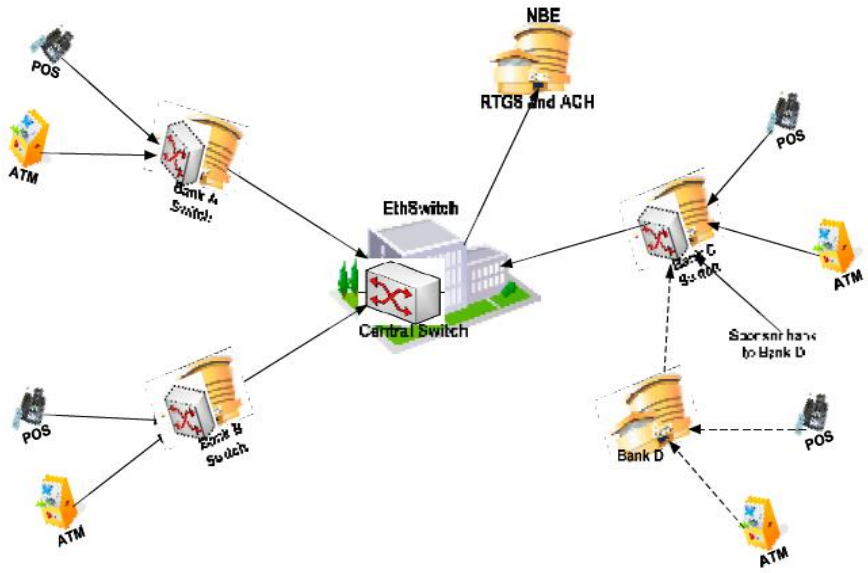

Figure 2.1 the Switch System in Ethiopia

Bankers Association of Ethiopia (2011).

2.2 Empirical Literature

2.2.1 Challenges, Opportunities and Solutions for E-Payment Switching System

According to Breckenridge the Bank of Ghana has introduced many reforms into the Ghanaian banking system.

These reforms were aimed at making payment system more efficient to improve the functioning of the interbank, money, and capital markets in the country. One of these key initiatives of the Bank of Ghana is the introduction of the E-zwich payment system through the Ghana Interbank Payment and Settlement Systems (GhIPPS) in 2008. The reason for the e-zwich project was to integrate the various financial institutions into one system in order to ensure safe and fast transfer of funds and reduce if not eliminate cash transactions. The E-zwich smart card was issued through the financial institutions to potential users to enable them instigate cashless business transactions. The E-zwich payment system was introduced with certain anticipated benefits for the individual users, the commercial banks and the economy as a whole (Breckenridge, 2010).

Some people predicted failure for the project, others think it has died a natural death and others are optimistic that, if the current usage and management challenges facing the e-zwich project are effectively tackled and addressed, there will be a turn around to enable the nation reaps the anticipated benefits from its implementation. This paper explores from a cross-section of the Ghanaian population and financial institutions, usage and management challenges associated with the e-zwich payment system with the intent of suggesting ways to improve use and management of the e-zwich payment system.

Payment systems may be physical or electronic and each has their own procedures and protocols. Standardization has allowed some of these systems and networks to grow to a global scale, but there are still many country and product specific systems. Examples of payment systems that have become globally available are credit card and automated teller machine networks. Specific forms are also used to settle financial transactions for products in the equity markets, bond markets, currency, futures, derivatives, options, transfer funds between financial institutions both domestically and using clearing systems and internationally using the swift network.

Kumaga, (2010:22 cited by Issahaku 2012) further observed that banks and other financial institutions are not adequately automated to enable e-banking and e-payment Taddesse & Kidan (2005 Cited by Issahaku, (2012) also noted that in most African countries the required infrastructure, legal and regulatory framework for electronic payments are lacking. In particular, e-payments infrastructure such as Internet and mobile networks are not widely available in Africa. Abrazhevich (2004:24) citing Schreft (2002) and Kutter&McAndrews (2001) indicated that there have been other attempts to classify payment systems.

According to Issahaku, (2012), e-zwich is the brand name for the National Switch and Smart card payment system. The E-zwich payment system is an innovative method for improving accessibility to banking and retail services in Ghana .The e-zwich system offers deposit taking financial institutions (i.e. Universal banks, Rural banks and Savings and Loans) a platform that enables them to interoperate. This enables e-zwich cardholders to perform banking and retail transactions at the outlets of other e-zwich financial institutions.

According to Hesse (2010), the e-zwich is an electronic clearing and payment system designed to establish a common platform and thereby link the payment systems of all banking and financial institutions in Ghana. It is an innovative and very secure way of paying for goods and services

throughout Ghana. The centerpiece of the e-zwich smartcard is that it is a biometric smartcard that can be used online and offline for financial transactions.

The working of the E-zwich smart-card technology is between the client and a merchant, or a client and a Point of Sale (POS) device or ATM, or a client and another client through any of the POS devices. The E-zwich smartcard contains both a current account and savings account wallet. Holders of the E-zwich smartcard can undertake transactions such as retail payments, money transfer, cash advance, cash withdrawals and deposits, third-party bill payments, salaries/pensions payments at any E-zwich point of sale terminal in the country.

Abrazhevich (2004) observe that, there are three benefits resulting from the development of electronic payment systems. These are reduced operational and payments processing costs, growing online commerce and decreasing the costs of technology.

E-zwich card is easier to obtain than a traditional account since all that is needed is one's fingerprints and valid photo identification (Konadu, 2011).

The introduction of the e-zwich led to mass registration of potential users and distribution of the E-zwich smart card. However, as time went by and the euphoria waned off despite intensive advertisement, the number increased at a decreasing rate. This brings about the question as to why more than five years after the introduction of the E-zwich payment system, it has not been able to drastically reduce if not eliminate, cash transactions in the Ghanaian economy.

Usability has been defined as the extent to which an application is usable and allows users' to accomplish specific goals efficiently and effectively while maintaining high satisfaction (International Organization for Standardization, 1998; Koohang & Ondracek, 2005; Miller, 2005; all cited by Chang, 2011). Neilsen (2000 cited by Chang, 2011) identified five ways by which usability is important to the user. These included: Efficiency, whereby the user understands how to use the device and the dexterity with which the user can perform tasks; the number of times the user commits error in using the device and the importance of user errors as well as the ease of correcting those errors; and the level of utility or satisfaction derived from using the device by the user.

In the implementation of the e-zwich payment system in Ghana, a number of challenges have affected the success of the e-zwich service. Among these are link failure, frequent breakdown of machines, slow process of service delivery and long queues. Others include inaccessibility of the POS device. Users do not have access to the POS device before and after banking hours as well

as weekends thereby preventing the e-zwich customer from making utmost use of the e-zwich smart card. Although, most of the banks have the POS device they cannot provide the service due to malfunctioning of the devices (Tetteh, 2013).

Issahaku, (2012), observes that, some of the service providers (the Banks) also identified challenges such as network connectivity problems, impatient customers, defects with regards to customers' cards due to improper handling, and low benefits to banks as a result of banks operating the service on behalf of GhIPSS.

Abrazhevich (2004) noted that issues such as trust, usability, applicability, security, and convertibility are extremely important because they can influence subsequent decisions of people whether to use a payment system or not. Notwithstanding the fact that the e-zwich payment system has been recognized as an efficient medium for conducting electronic payments, its adoption is associated with some challenges (Abor, 2004: cited by Issahaku, 2012).

Kasavana (2004) and Banda (2007 cited by Konadu 2011) observe that generally the slow rate of the adoption of cashless transactions in the past can be attributed to customer reluctance to use cards for small value transactions, lack of operator experience with new technology, perceived high costs, users' attachment to the use of physical cash and zero costs incurred in using cash from the users' perspective.

However, in the case of e-zwichIssahaku (2012) explained that lack of acceptance, ignorance, network lapses and lack of tips are the major challenges to the adoption of the e-zwich (Kumaga, 2010; cited by Issahaku, 2012). Tetteh (2013) observe that it is culturally more acceptable for Ghanaians to carry cash than carrying money in the form of a chip thus making it very difficult for them to accept electronic payment systems in general and the e-zwich smart card in particular. Further work done by Issahaku (2012) revealed other challenges that are militating against the success of the e-zwich service.

These include link failure, frequent breakdown of machines, slow process of service delivery and long queues. In addition, lack of accessibility to point of sales (POS) devices by users adds to the troubles of the payment system. Inadequate point of sale devices was the basic challenge faced when using the e-zwich smart card (Konadu (2011). According to Issahaku, (2012), these challenges seem to be fast defeating the objectives for which such a capital intensive system was deployed by the Bank of Ghana. Certainly, such an important project, into which so much has been invested, cannot be allowed to go waste.

According Boateng B. et al (2015). They studied the research from customer perspective.

The outcome of the study shows that still a large proportion of transactions in Ghana are cash and paper-based. The introduction of e-zwich payment system by the bank of Ghana was an innovation in the financial sector and a good initiative to reduce the over reliance on cash and paper-based payments. However, though significant progress has been made, there are still myriad of challenges to address. It is suggested that based on this studies finding that, in order to realize the benefits anticipated prior to the implementation of the e-zwich payment system, the Bank of Ghana, GhIPSS and other stakeholders should invest a considerable amount of resources into comprehensive education, training and support, relevant and efficient regulatory apparatus as well as enact supporting legal policies to drive the operation of the e-zwich payment system. Effective stakeholder engagement, improvement in the telecommunications infrastructure and affordability of the system are all implied to ensure the successful operation of e-zwich Payment System in Ghana.

Since the implementation of Phase I EthSwitch payment system in Ethiopia, which is a national switch and Ethiopay payment system about two and a half years ago, there has been a 42% decline volume of transaction month by month, high delay in dispute management system other many technologies related challenges. Related studies from Pakistan by Husseian1 Z. (2017). Empirical study was carried out in Pakistan which indicating the current issues encounter by the e-banking application in various banking industries. The analysis in this paper further reveals that approachability of internet in banking sector makes customer reluctant to access their bank accounts electronically. The usage of e-banking significantly affects the customer trust due to unavailability of

Cyber security and Boateng J. (2015). On challenges of Payment switch on cyber-attack & explores from a cross-section of the Ghanaian population and financial institutions, usage and management challenges associated with the e-zwich payment system with the intent of suggesting ways to improve use and management of the e-zwich payment system respectively. This project will create an opportunity to obtain feedback from the major stakeholders regarding the challenges they face. This research is intended to identify the real challenge and possible solution.

According to Jemal O. (2015) the study sought to establish the factors affecting electronic payment adoption by Matatu owners Sacco in Nairobi County. The study adopted a cross-sectional design and was guided by the following research objective; to establish the factors affecting electronic payment adoption by Matatu owners Sacco in Nairobi County. The study utilized primary data which was collected using a semi-structured questionnaire. From a population of 64 SACCOS, a 41% random sample was taken for the study. A 5- point Likert scale was used to measure the output of each item answered by the participants. Descriptive statistics were used to describe (and analyze) the variables numerically. The study revealed that factors affecting the adoption of e-payment technology range from capacity of owners, government policy, lack of adequate a legal and institutional framework and low ICT knowledge base.

A study conducted by Philipos L. (2016). About customer satisfaction and electronic banking service on some selected banks of Ethiopia listed that currently there are some factors which affect customer satisfaction in electronic banking service in selected banks (commercial banks of Ethiopia, Wegagen bank, and Zemen bank) of Ethiopia. Those are machine out of order, machine out of cash, no printing statements, cards get blocked, frequent breakdown of ATM service, unreliability of ATM service, lack of sufficient technicians in all bank who solve breakdown of ATM machine, lack of sufficient alternative system which substitute ATM service for the customer when temporary problem happen in the machine, lack of convenience of E-bank service, lack of mobile banking service, lack of reliable Telebanking, lack of credit card service, under-development of technological infrastructure, low level of relevant knowledge creation and innovation, interruption of network, lack of suitable and regulatory frame work for e-commerce, resistance to changes in technology among customers and service providers as result of fear of risk, lack of fair distribution of E-banking service in all over Ethiopia during his pretest of this study (Worku et al. 2016).

According to Worku et al (2016) The Impact of Electronic Banking on Customers' Satisfaction in Ethiopian Banking Industry (The Case of Customers of Dashen and Wogagen Banks in Gondar City) The paper tried to see all the above among 402 properly filled and returned questionnaires of e-banking customers and interview with four branches of the two commercial banks which have started e-banking service in Gondar city when this study was conducted. The study used tables, percentages, chi-square independency test to see the relationship between

demographic characteristics and e-banking, independency t-test to see the visits of branches before and after e-banking by customers is significant or not and regression analysis test has been conducted to explain the variables which determine customers' satisfaction in e-banking. The results of the study implied t that majority of users of e-banking are the young, the educated, salaried and students, business men and women are not actively using the service of e-banking and there is also a relationship between e-banking and demographic characteristics, e-banking currently provided for saving and current accounts holders only, e-banking has improved customer satisfaction, reduced frequency of bank hall for banking service, reduced waiting time for customers, there are customers who don't know the fee charged for being e-banking users, the bank customers' satisfaction increased after being e-banking users, enabled customers to control their account movements and there is high opportunity to expand e-banking service in the city.

According to (Ayana, 2012). adoption of E-banking in the Ethiopian banking industry with respect to the barriers which can influence firms from taking advantage of E-banking system and expected benefits derived by adopting the system (Bultum, 2012) .The study was conducted based on the data gathered from four banks in Ethiopia; three private banks (Dashen bank, Zemen bank and Wegagen bank) and one state owned bank commercial bank of Ethiopia (Ayana, 2012).

A mixed research approach was used to answer the research questions that emerge through the review of existing literature and the experiences of the researcher in respect of the E-banking system in Ethiopia. The study statistically analyzed data obtained from the survey questionnaire. A research Framework developed based on technology-organization-environment framework and Technology acceptance model to guide the study.

The result of the study indicated that, the major barriers Ethiopian banking industry faces in the adoption of Electronic banking are, security risk, lack of trust, lack of legal and regulatory frame work, lack of ICT infrastructure and absence of competition between local and foreign banks. The study also identified perceived ease of use and perceived usefulness as a driver of adopting E-banking system. A study was conducted based on the data gathered from four banks in Ethiopia; three private banks (Dashen bank, Zemen bank and Wegagen bank) and one state owned bank (commercial bank of Ethiopia) (Ayana, 2012).

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According to (Paul, 2013) study aims at understanding the role of ATM (Automated Teller Machine) and provided by various commercial banks in Odisha, and the paper concludes that ATM has become an integral part to the customers in the banking industry and it will continue as more progress and innovations are made in IT sector. Banking customers in different commercial banks of Odisha. Hence the findings of this research will help the banks in Ethiopia also to establish a customer oriented strategy to retain their customers' satisfaction in future.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In this chapter, the research design and methodology to be used in the study is described. The geographical area where the study was conducted (i.e. study setting), the study design and the population and sample are described. The instrument used to collect the data, including methods are also discussed.

3.2 Research Design and Approach

The preparation of the research design, appropriate for a particular research problem, involves usually the consideration of the means of obtaining the information; the availability and skills of the researcher and his staff (if any); explanation of the way in which selected means of obtaining information will be organized and the reasoning leading to the selection; the time available for research; and the cost factor relating to research, i.e., the finance available for the purpose. (Kothari, 2004).

For the purpose of this study, **Descriptive research design** is used after examining the objectives and research questions of the study .Descriptive research study is concerned with describing the characteristics of a population or phenomena and seek to determine the answers to who, what, when, where and how questions.

Qualitative research methods focus on discovering and understanding the experiences, perspectives, and thoughts of participants that is; qualitative research explores meaning, purpose, or reality. Quantitative research methods attempt to maximize objectivity, replica-ability, and generalizability of findings, and are typically interested in prediction.

Mixed methods research approach used , which combine qualitative and quantitative methods in ways that apparently bridge their differences in the service of addressing a research question had been chosen. Johnson and Turner (2003) have argued that the fundamental principle of mixed methods research is that multiple kinds of data should be collected with different strategies and methods in ways that reflect complementary strengths and non-overlapping weaknesses, allowing a mixed methods study to provide insights not possible when only qualitative or quantitative data are collected.

3.3 Study Setting

There are 15 district offices in Commercial Bank of Ethiopia out of which four districts are found in the capital city of Addis Ababa. For the purpose of this study I used the E-Payment processes of four district offices located at Addis Ababa thus, North Addis, South Addis, East Addis and West Addis and users from two branches namely Sumale Tera and Bethel.

3.4. Data Collection

3.4.1 Data Source

The main source of the data for the study are for the primary data CBE Management and officers a Ethswitch users, Ethswitch staff and for the secondary data published and unpublished related books, articles, reports and researches. Primary sources of data include interview and questionnaire, whereas secondary sources of data are generated through a review of relevant documents and official web pages.

3.4.2 Data Collection Technique

As stated earlier, the study applies a mix of qualitative and quantitative research methods. Quantitative is predominantly used as a synonym for any data collection technique (such as a questionnaire) that generates or uses numerical data. In contrast, qualitative is used predominantly as a synonym for any data collection technique (such as an interview) that generates or use non-numerical data. Hence, the study would adopt both quantitative and qualitative data gathering techniques. This method is called Triangulation.

As per Saunders et al. (2009), triangulation refers to the use of different data collection techniques within one study in order to ensure that the data are telling you what you think they are telling you. For example, qualitative data collected using semi-structured group interviews may be a valuable way of triangulating quantitative data collected by other means such as a questionnaire. Two questionnaires were used to collect the data. One for the users the system and the other one for management staff at different units of the bank. The questionnaires consist mostly of closed-ended questions. Moreover, qualitative data would be obtained through semi-structured interviews.

3.5 Population and Sampling

3.5.1 Target population

The population for this study, for both the qualitative and quantitative data collection methods, comprised of E-Payment Process (managers and E-Payment Business and technical team), CBE District Manager, CBE switch integration Manager and Officers, other staffs, users of the two Branches and Ethswitch Management staff (CEO, Project Director, Finance Director and Project Manager), a total of 100 population. Who has a direct experience in Ethswitch E-Payment system. The e-payment system more adopted in the urban area and the network infrastructure in Addis Ababa relatively developed.

3.5.2 Sampling techniques

To answer the research questions and to meet the objectives of the study, this thesis adopted a non-probability sampling called purposive sampling technique. Purposive or judgmental sampling enables us to use our judgment to select cases that will best enable us to answer our research question(s) and to meet our objectives. Purposive sampling is considered desirable when the universe happens to be small and a known characteristic of it is to be studied intensively. Also, there are conditions under which sample designs other than random sampling may be considered better for reasons like convenience and low costs (Kothari, 2004, Saunders et al, 2009).

3.5.3 Sample Size

According to Saunders et al, (2009), for all non-probability sampling techniques, other than for quota samples the issue of sample size is ambiguous and, unlike probability sampling, there are no rules. Rather the logical relationship between your sample selection technique and the purpose and focus of your research is important), generalizations being made to theory rather than about a population. Consequently, your sample size is dependent on your research question(s) and objectives.Therefore, since the objective of this study is to identify the challenge and opportunities of EthSwich in CBE, the researcher decided to take 35 respondents from districts and e-payment units of the bank and 15 respondents from branches and a total of 50 for the questioner and 6 for interview from CBE Switch Manager and Ethswitch Management a sample of 56 out of 100 populations. The process used for drawing the sample from the sample units is based on their familiarity with EthSwitch e-payment system.

3.6 Data Analysis Techniques

After collecting the data, it was organized and analyzed. In order to meet the objectives of the study, the collected data were analyzed based on the nature of the data. Accordingly, the data collected via questionnaires was analyzed with descriptive statistics using Statistical Package for Social Sciences (SPSS) V.20. Moreover, the data that were collected from the interview and reviews of documents were interpreted qualitatively.

CHAPTER FOUR

4.1 Introduction

Data collected using different techniques were analyzed in this section by using triangulation approach. A total of 50 questionnaires were distributed for E-Payment Processes managers and E-Payment Business and technical team), CBE District Managers, and other staffs, EthSwitch knowledgeable users of the two Branches .The Author managed to fully collect data from all the targeted 50 samples.

4.2 Demographic Information of the Respondents

Demographic profiles of the respondents who participated in the study were analyzed using descriptive analysis with the help of SPSS. The result of the survey is shown in Table 4.1 Demographic Characteristics of the Respondents as follows;

Table 4.1. Demographic Information of Respondents

		CBE Management & Officers			users	
1	Gender	Frequency Percent			Frequency	Percent
	Male	20	57%		10	67%
	Female	15	43%		5	33%
	total	35	100		15	100
2	Age					
	18-30	10	29%		8	53%
	31-40	18	51%		5	33%
	41-50	7	20%		2	13%
	Total	35	100		15	100
3	Education					
	Master's Degree	10	20			
	First Degree	32	64			
	Diploma and Lower	8	16			
	Total	50	100			

The demographic information of respondents who took part in the study, shown in Table 4.1, and Table 4.2 reveals that 15 (43%) were female while 20 (57%) were male from CBE management and Officers respondents while from users 5 (33%) are female and 10 (67%) are male. Moreover, the demographic information on CBE management and Officers the respondents' age reveals that 10 respondents representing (29%) have their age fall within 18-30 years of age; 18 (51%) respondents have their age fall within the age group of 31-40 years. A total of 7 (20%) respondents have their age fall within the age group of 41-50 years. From the users the demographic information the respondents' age shows that 8 respondents representing (53%) have their age fall within 18-30 years of age; 5 (33%) respondents have their age fall within the age group of 31-40 years. A total of 2 (13%) respondents have their age fall within the age group of 41-50 years.

Regarding the respondents' educational qualification, the results as shown in the table 4.1 indicates that 10 (20%) have Master's Degree and majority 32(64%) of the respondents have first degree. 8 (16%) respondents from are holders of diploma and lower level. Source: Survey Result (Nov. 2018).

The demographic information of respondent's show that most of the staff and users are young and male that can easily adopted and uses new Technology, if they trained well.

Table 4.2. General Information about EthSwitch

Variable	Category	Frequency	Percent
CBE Job Position	CBE Switch Integration Officers & Managers	11	31%
	CBE District Managers	4	11%
	E-payment officers	15	43%
	Other staff	5	14%
	Total	**35**	**100**
Service Year	1 - 3 years	5	14%
	3 - 5 years	12	34%
	5 - 7 years	10	29%
	More than 7 years	8	23%
	Total	**35**	**100**
Years of experience with EthSwitch	0 - 1 year	8	23%
	1 - 2 years	9	26%
	2 - 3 years	12	34%
	3 - 5 years	6	17%
	Total	**35**	**100**

On the respondents' job position shown on Table 4.2, the results indicate that majority (i.e. 15 (43%) of the respondents are E-Payment Officers, followed by CBE Switch Integration Officers and Managers 11 (31%, and only 4 (11%) are District managers while 5 (14%) others staff.

On the years of experience 8 (23%) have more than 7 years of working experience, 10 (29%) with 5–7 years of experience, 12 (34%) 3 to 5 years' experience and 5 (14%) with 1 -3 years' experience.

On the years of experience on EthSwitch from CBE respondents 8 (23%) have 1 – 3 years of experience, 9 (26%) have 1 -2 years' experience, 12 (34%) have 2 – 3 years of experience on EthSwitch while 7 (17%) have more than 3 years of experience.

The experiences of CBE respondents with EthSwitch E-Payment systems show that the Technology is new to the banking system in Ethiopia.

Table 4.3 General Branches Information about EthSwitch

Variable	Category	Frequency	Percent
How did you start using EthSwitch System	I requested the bank to acquire the service	4	27%
	The bank lodged the request to me.	11	73%
	Total	**15**	**100**
Which payment do you prefer	Cash	9	60%
	Cards	6	40%
	Total	**15**	**100**

Source: Survey Result (Nov 2018)

Majority of the EthSwitch users 11 (73%) were initiated by the bank while the rest 4 (27) they themselves requested the bank to start using.

When we look into the payment mode preference of users, the highest percentage of the participants, 9 (60%) replied to prefer cash, and the remaining 6 (40%) prefer to accept e-payment. The preference for to use cash instead of card show that there is insecurity in the payment system.

4.3 Challenges, Opportunities and User Satisfaction of EthSwitch E-Payment System

4.4 Operational Challenges Ethswitch

Respondent Types	Questions: Operational Factors	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean
Users	Employees of the bank have the knowledge to answer user questions related to EthSwitch	2(13%)	5 (33%)	5 (33%)	3 (21)	-	15/4 (3.75)
>>	Technical support is available 24 hours, 7 days a week	-	1 (7%)	4 (27%)	5 (33%)	5 (33%)	15/4 (3.75)
>>	Low support and follow up by the bank	1 (7%)	3 (20)	6 (40%)	4 (27%)	1 (7%)	15/5 (3)
>>	A specific legislation on user protection related to the usage of EthSwitch is in place	-	1 (7%)	4 (27%)	5 (33%)	5 (33%)	15/4 (3.75)
CBE Management and Officers	Employees of the bank have the knowledge to answer user questions related to EthSwitch	10 (29%)	5 (14%)	8 (22%)	8 (22%)	4 (11%5)	35/5 (7)
>>	Unclear strategy towards EthSwitch	1 (3%)	5 (14%)	8 (22%)	17 (49%)	4 (11%5)	35/5 (7)
>>	Low support and follow up NBE	10 (29%)	5 (14%)	8 (22%)	8 (22%)	4 (11%5)	35/5 (7)
>>	Lack of Coordination and cooperation between banks, branches, districts and EthSwitch process	8(22%)	17(49%)	1 (3%)	5(14%)	4 (11%)	35/5 (7)
>>	Limited top management Support	5 (14%)	8 (22%)	2 (6%)	5 (14%)	15 (43%)	35/5 (7)
>>	Increases cost of the Bank		5 (14%)	15 (43%)	15 (43%)		35/3 (11.66)
>>	EthSwitch banks inclusion is involuntary		1 (3%)	17 (49%)	15 (43%)	2 (6%)	35/4(8.75)
>>	A specific legislation on user protection for EthSwitch services is in place	1 (3%)	8 (22%)	2 (6%)	17 (49%)	15 (43%)	35/5 (7)
>>	Lack of immediate responses by the national E-Payment Switch in transferring money to the beneficiary bank	5 (14%)	8 (22%)	2 (6%)	5 (14%)	15 (43%)	35/5 (7)

4.3.1 Operational Challenging Factors

The operational factors assessment from users and CBE managers and officers is shown down here at as it is given in the above table, regarding operational factors related to EthSwitch system, only 2 (13%) of the users strongly agree that employees of the bank have the knowledge to answer customer questions related to EthSwitch. Moreover, in the response to the same question by management and officers of the bank are higher 10 (29%). When we see by users of EthSwitch for other values 5 (33%) agree, 5(33%) neutral and 3 (21%) disagree while no one strongly disagree. When we see by management and officers of the bank for other values 5 (14%) agree, 8(22%) neutral and disagree, 4 (11%) strongly disagree.

Concerning technical support availability for 24 hours and 7 days a week among users of EthSwitch for strongly agree zero, 1 (7%) agree, 4(27%) neutral, 5 (33%) disagree and5 (33%) for strongly disagree and for Low support and follow up by the bank users respond 1 (7%) for strongly agree, 3 (20%) agree, 6(40%) neutral, 4 (27%) disagree and1 (7%) for strongly disagree the users also respond for a specific legislation on users protection related to the usage of EthSwitch is in place for strongly agree zero, 1 (7%) agree, 4(27%) neutral, 5 (33%) disagree and5 (33%) for strongly disagree.

Among management and officers of the bank the response for Unclear strategy towards EthSwitch1 (3%) strongly agree, 5 (14%) agree, 8 (22%) neutral, 17 (49%) disagree and 4 (11%) strongly disagree.

Furthermore, 10(29%) of the CBE management and officers think that there is Low support and follow up from banks, 5 (14%) agree, 8 (22%) neutral, 8(22%) disagree with it, the remaining 4(11%) are strongly disagree. On the other hand, regarding coordination and cooperation among banks, branches, districts and EthSwitch process, 8(22%) of the management and officers strongly agree, 17(49%) agree, 1 (3%) neutral, 5(14%) disagree and 4 (11%) strongly disagree.

The interview sessions also indicated that there is a limited top management support and lack of immediate response by the national bank in transferring EthSwitch money.

In general, along with the analysis of in-depth interviews conducted with key informants, data from questionnaire surveys indicate that among other things, Lack of Technical support

unavailability, employees' lack of knowledge, lack of coordination and cooperation is highlighted together with lack of clear legislation on user protection.

According to the qualitative in-depth interview with the EthSwitch System Integration Management, ET Switch SC, company was established by the banks in Ethiopia and the National Bank of Ethiopia. The company started its service by connecting all Automated Teller Machines (ATMs) and it aims at integrating all real-time and online E-payment systems in Ethiopia. ET Switch was not the first switch that was introduced in Ethiopia. Nevertheless, it was only this one that managed to connect all of the existing switches and payment system in the national e-payment system.

The respondents in depth interview also explained frequent devices failure, low quality of the device, frequent break down of the machine, lack of sufficient maintenance and lack of relevant knowledge in addition, dalliance from the vendors when support required due to foreign dependent technology lack of homogenous response and coordination in payment system among issuer, acquirer, slow response to the users based on the settled standard, Manually reconciliation of a bulk of transaction is tire some due to lack of full functionality report and dispute management system as the major challenges in the EthSwitch.

However, it currently faced with a transaction decline of 40 percent per month. This is said to be attributable to delay of switch migration from magix to ACI Base24, connection interruption and failure of bank’s system.

4.3.2 Opportunity Factors of EthSwitch E-Payment System

The EthSwitch is not just a system with challenges but it has also some blessings assessment from users and CBE managers and clerks is shown down here at Table 4.3.2

Table 4.5 Opportunities of EthSwitch

Question: Opportunities -		Strongly Agree f (%)	Agree f (%)	Neutral f (%)	Disagree f (%)	Strongly Disagree f (%)	Mean f (%)
Users	Affordability questions related to EthSwitch	2(13%)	7 (53%)	5 (34%)		-	15/3 (5)
	Growing acceptance of EthSwitch	5 (33%)	6 (40%)	4 (27%)			15/3 (5)
CBE Management and Officers	ICT Infrastructure Development questions related to EthSwitch	10 (29%)	5 (14%)	8 (22%)	8 (22%)	4 (11%5)	35/5 (7)
	NBE policy direction that enforce banks to adopt technological innovation	5 (33%)	5 (14%)	8 (22%)	17 (49%)		35/4 (8.75)
	Change in the society life style (The ongoing digital and technology revolution)	10 (29%)	5 (14%)	8 (22%)	8 (22%)	4 (11%5)	35/5 (7)

As it is given in the above table, regarding EthSwitch opportunities, only 2 (13%) of the users strongly agree and 7 (53%) agree on affordability of EthSwitch. The users also expressed the Growing acceptance of EthSwitch with a sum of 73% strongly agree and agree.

Moreover, in the response to the question to CBE management and Officers on ICT Infrastructure 10 (29%) strongly agree, 5 (14%) agree, 8 (22%) neutral and disagree whereas 4

(11%) strongly disagree. However, on the NBE policy direction 17(49%) disagree and there is also a mixed view on the change in the society life style.

4.3.3 Satisfaction Level of EthSwitch E-Payment System

The success of EthSwitch depends upon the users satisfaction level towards that product or service; hence the overall satisfaction level of EthSwitch E-Payment System perceived satisfaction level is stated down here as follows in Table 4.3.3.

Table 4.6 User Satisfaction on EthSwitch

Question: Users Overall Satisfaction on EthSwitch	**Are you satisfied by the service**	
	YES	**NO**
Response	**12 (80%)**	**3 (20%)**

As consolidated in the above table 4.3.3 From EthSwitch E-Payment users respondents 12 (80%) replied Yes and only 3 (12%) respond No. Based on the data, the conclusion is that regarding the user overall perceived satisfaction on EthSwitch most of the respondents are satisfied by the service they got.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the Major Findings

To achieve the aims of the thesis through answering the three research questions which are ;the major challenges of EthSwitch E-Payment system in CBE, the major existing opportunities of EthSwitch E-Payment system in CBE and the alternative ways to deal the existing challenges of EthSwitch E-Payment system; a mixed research approach was employed and the research design had the following major features: Self-administered questionnaires distributed to 15 users and 35 CBE management and Officers, semi structured interviewees with key informants who are directly managing and working on the EthSwitch system.

The overarching business goal for technology decisions was to reach as many people as possible at low cost. To achieve Opportunity's goal of financial inclusion, its banks must offer multiple delivery channels for financial services. These channels must meet business criteria for cost effectiveness while also expanding access for clients.

Even though, the EthSwitch system gives opportunity for Ethiopia to test the blessing of global technological advancement, there are still challenges for the full utilization and benefit from it.

Besides lots of benefits that EthSwitch E-Payment systems bring to Ethiopia, CBE and individuals, it also has its own challenges. The challenges as discussed in the study the main challenges include

66% users of the systems responded lack of support, uptime rate of the system and lack of specific legislation on users protection related to the usage of EthSwitch is in place.

In addition 61%Lack of Coordination and cooperation among banks (issuer and acquirers), branches, districts and EthSwitch process are considered as challenges in EthSwitch E-payment system.

The data collected form an interview shows that technological and network problem specifically network failure and system failure, human resource, payment modality, security, infrastructure,

legal, regulatory issues and users' lack adequate knowledge about the system are among the major challenges in the EthSwitche-payment system.

Moreover, operational factors related to EthSwitch, low support and follow up, Besides, lack of specific legislation on users protection related and lack of immediate responses by the bank in solving problems are also among the pointed out challenges by the respondents.

Generally, beside the said challenges in EthSwitch E-Payment System, the study illustrated some existing opportunities. More than 55% of CBE Management and Officers responded change in the society life style though it is slow, inevitable technological advancement is some of the major opportunities identified by the study. Additionally, IT infrastructure development, NBE policy direction that enforces banks to adopt technological innovation is also amongst the existing opportunities recognized by the study.

The study showed that more than 50% of the users agree on affordability of EthSwitch E payment system, the Growing acceptance of the system and the perceived satisfaction of users is very high showing positive trend as an opportunity for future adoption of the service.

For the alternative solution we can use the global switch as another service. Global switch interconnect a vast portfolio of service providers giving direct connections to flexible and diversified network to directly connect to major internet and cloud Exchanges.

5.2 Conclusions

Hence, based on the above summary of the major findings, on the study made on the challenges, opportunities and alternative solution of Ethswitch E-payment system it can be concluded that the increasing acceptance and more concern to EthSwitch E-Payment System by users and CBE Management as well as higher satisfaction level of users and understanding the usefulness and futurity of the system, IT infrastructure development and NBE policy direction are among the existed opportunities in the expansion of EthSwitch.

On the other hand, technological network connection and system failure, other issues such as lack of aware and capable human resource, low support and follow up, lack of coordination and cooperation are major challenges for EthSwitch system which leads to transaction decline.

5.3 Recommendations

Considering the findings from the analysis of the collected data, the following recommendations are forwarded in order to deal the challenges of EthSwitch E-payment system in the commercial bank of Ethiopia.

- To solve the network connectivity failure, CBE should identify the causes of the problem; whether it is related to the EthSwitch internal system or incompatibility of the software and hardware, or the network provided by Ethio Telecom and then take proper action to avoid the problem and to insure an efficient inter-bank clearing and settlement infrastructure for the interoperability of the networks of ATM.
- CBE should improve hold a capacity gap assessment among its own staffs and conduct a capacity building program in order to make the staffs with the capacity of responding to the users with confidence and full knowledge on the EthSwitch System.
- CBE should work on upgrading with knowledge and availability of its call center to offer support 24hrs a day and 7 days a week.
- CBE should work to raise public awareness on the EthSwitch E-Payment system in order to reduce technology resistance and increase in number users and volume of use
- CBE should work to solve the devices failure, slow maintenance, through active collaboration with vendor.
- CBE also should work to create homogenous response and coordination in payment among issuer, acquirer for quicker response to users using the EthSwitch E-Payment system.
- CBE should work for a legal framework to be implemented to solve disputes and put in place a viable dispute management system which is timely and efficient.
- The NBE should also put a mechanism to monitor the right implementation of standards and tools or devises for EthSwitch E-Payment system.
- The NBE should also develop or update a comprehensive regulatory and legal framework to protect EthSwitch users the banks from loss related to system failures, any misuse, frauds, device, etc.

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Annex I Questionnaire of CBE staff

Addis Ababa University

College of Business and Economics

Questioner to be filled by CBE management and Officers

Thanks for taking time with me. This questionnaire is prepared to gather information from management and officers of the CBE for accomplishment of Master of Art in Project Management at Addis Ababa University College of Business and Economics. The purpose of the study is to identify the Opportunities and Challenges of Ethswitch E-Payment System: a Case study of Commercial Bank of Ethiopia

Your genuine and well thought response to the questions will enhances the purpose of the study.

The information you provide will be used only for academic purpose & it will be kept confidential. You are not supposed to write your name.

I thank you in advance for your cooperation. You may use the following mobile number for any inquiry.

Genet Alemu

Section I: Demographic profile

Please indicate the following by ticking" √"on the spaces in front of the response options:

1. Gender: Male ☐ Female ☐
2. Age: 18- 30 ☐ 31 -40 ☐ 41-50 ☐ above50 ☐
3. Educational level: High School ☐ Diploma holder ☐ First-degree holder Masters or above ☐
4. Job position

   CBE Switch Officer ☐

   CBE Switch Manager ☐ District Manager ☐

   Other (if any)_____

5. Service Year

1-3years ☐ 3-5years ☐ 5-7years ☐ Morethan7years ☐

6. For how long have you been doing ATM terminals related activities?

Lessthan1year ☐ 1-2years ☐ 2-3years ☐ years 3-5 ☐

Section II: Challenges, Opportunities and User Satisfaction of EthSwitch

The following are believed to be some challenges on EthSwitch, please indicate the level of your agreement.

NB.1-SA=Strongly Agree 4-D=Disagree

2-A=Agree 5-SD=Strongly Disagree

3-N=Neutral

A. Operational Challenging Factors

No	Description	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Employees of the bank have the knowledge to answer user questions related to					
2	Un clear strategy towards EthSwitch					
3	Low support and follow up					
4	Lack of Coordination and cooperation between banks, branches, districts and EthSwitch process					
5	Limited top management Support					
6	Increases cost of the Bank					
7	EthSwitch banks inclusion is involuntary					
8	A specific legislation on user protection for EthSwitch services is in place					
9	Lack of immediate responses by the Ethswitch bank in transferring money to the beneficiary bank					

B. <u>Opportunities Factors</u>

No	Description	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	ICT Infrastructure Development questions related to EthSwitch					
2	NBE policy direction that enforce banks to adopt technological					
3	Change in the society life style (The ongoing digital and technology revolution)					

Please provide any additional comments and/or clarifications on specific systems' features that May not be properly captured in this questionnaire._____

_____

Thank You!

Annex II: Interview

Addis Ababa University
College of Business and Economics

Interview Question to be answered by EthSwitch and CBE Switch Management

1. What are the major challenges of implementing EthSwitch E-Payment System?
2. What are the opportunities of using EthSwitch E-Payment System?
3. What do you propose to deal the above challenges?
4. What can be said about general attitudes of the public towards EthSwitch E-Payment System?
5. Is there any policy direction or legal frameworks at NBE to enforce EthSwitch E-Payment System?
6. Could you please elaborate me the trend of EthSwitch E-Payment System in the CBE any other issues related?

Addis Ababa University

College of Business and Economics

Thanks for taking time with me. This questionnaire is prepared together information from user of EthSwitch National E-Payment System for accomplishment of Master of Art in Project Management at Addis Ababa University College of Business and Economics. The purpose of the study is to identify the **Opportunities and Challenges of Ethswitch E-Payment System: A case study of Commercial Bank of Ethiopia**

Your genuine and well thought response to the questions will enhances the purpose of the study.

The information you provide will be used only for academic purpose &it will be kept confidential. You are not supposed to write your name.

I thank you in advance for your cooperation. You may use the following mobile number for any inquiry.

Genet Alemu

Section I: Demographic profile

Please indicate the following by ticking" √"on the spaces in front of the response options:

1. Gender: Male ☐ Female ☐
2. Age: 18- 30 ☐ 31 -40 ☐ 41-50 ☐ above50 ☐
3. Educational level: High School ☐ Diploma holder ☐ First-degree holder ☐ Masters or above ☐

Section II :Challenges, Opportunities and User Satisfaction of EthSwitch

The following are believed to be some challenges on EthSwitch, please indicate the level of your agreement.

NB.1-SA=Strongly Agree 4-D=Disagree

2-A=Agree 5-SD=Strongly Disagree

3-N=Neutral

A. Operational Challenging Factors

No	Description	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Employees of the bank have the knowledge to answer users questions related to EthSwitch					
2	Technical support is available 24 hours, 7 days a week					
3	Low support and follow up by the bank					
4	A specific legislation on users protection related to the usage of EthSwitch is in place					

B. Opportunities Factors

No	Description	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Affordability questions related to EthSwitch					
2	Growing acceptance of EthSwitch innovation					

C. Users General Satisfaction

Question: Users Overall Satisfaction on EthSwitch	Are you satisfied by the service	
	YES	NO
Response		

Please provide any additional comments and/or clarifications on specific systems' features that May not be properly captured in this questionnaire._____

_____

Thank You!