

ST.MARY'S UNIVERSITY
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*Assessment on the performance of ATM AT commercial bank of
Ethiopia*

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January, 2018

ADDIS ABABA, ETHIOPIA

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of Masters of General Business Administration

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DECLARATION

I Yamlaksira Belete declare that this research study is my original work; prepared under the guidance of Temesgen Belayneh (PHD) All sources of material used for the thesis have been duly acknowledged. I further confirm that the thesis has not been presented for a degree in any other university.

Name

St. Mary's University, Addis Ababa

Signature

January, 2018

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Abbreviation and Acronyms

24/7: twenty four hours a day seven days a week

ATM: Automated Teller Machine

CBE: Commercial Bank of Ethiopia

E-banking: Electronic banking

ECX: Ethiopian Commodity Exchange

EFT: Electronic funds transfer

E-payment: Electronic Payment

ETV: Ethiopian Television

FOREX ATM: Foreign Exchange Automated Teller Machine

IB: internet banking

MB: mobile banking

NGO: Non-Governmental organization

PC: Personal computer

PDA: Personal Digital Assistant

PIN: personal identification number

PSS: Premium Solution Switch

POS: Point of sale

SST: Self-service technology

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Abstract

Commercial Bank of Ethiopia was the first bank in Ethiopia to introduce ATM service for local users. According to latest reports CBE alone is administering >60% of the country's ATMs. Currently not all ATMs the bank has deployed are performing to the standard the bank expects and requires from them. The core objective of the study is to assess the performance of Commercial Bank of Ethiopia's ATMs and forward workable recommendations for a better performance .In order to realize the research objective and answer the research questions an institution based cross-sectional study design was adopted. Purposive sampling was employed to include all 200 employees from head office E-payment sub process. Both primary and secondary sources of data were used. The primary sources of the data serves as main sources of the study; it was collected from the employees at head office E-payment using questionnaire. A descriptive statistical summary using statistical instrument like measures of central tendency and measure of variability was used. To facilitate interpretation process of the research data frequency tables, graphs, and pie charts were used. The study found that power and network problems (μ : 4.8), (μ : 4.67), unavailability of cash in the ATM machine (μ : 4.8), lack of continuous follow-up from responsible organ for the ATM (μ : 4.9), lack of awareness at branch (μ : 4.68) and absence of support & maintenance off working hours to be major factors acknowledged by the study participants that affect ATM performance significantly, thus the bank should focus on these areas in order to bridge the performance gap and improve customer satisfaction regarding ATM services.

Key words: Commercial Bank of Ethiopia, E-banking, ATM, E-payment, performance, affecting factors

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Banking is one of the oldest professions in human history, it also flourished with civilizations. Since humans started using money, bank services were in use throughout history. Modern banking as we know it today was established in Italy and Greece in the 15th century. Today, banks are one of the most important institutions for a modern economy to work in any country (Gedey, 1990).

It was in 1905 that the first bank, the “Bank of Abyssinia”, was established based on the agreement signed between the Ethiopian Government and the National Bank of Egypt, which was owned by the British. According to NBE data as of 2016 the banking sector in Ethiopia is composed of 16 private and 1 state-owned commercial banks, one state-owned development bank, 17 private and one state-owned insurance companies, more than 30 microfinance institutions, and few emerging lease-finance companies. Under the supervision of the NBE, the Ethiopian banking sector is rapidly growing, developing its outreach and exhibiting strong financial soundness.

The banking sector has been experiencing changes and evolutions through the years and services are designed to be more technology oriented. This makes electronic banking a basic tool for banks throughout the world. ATMs provide bank customers with 24 hour access to banking products/services; they are easy to use and are faster than human tellers in the banking halls. ATM systems are believed to have improved the operational efficiency of banks and customer service in the banking sector (Banker and Kauffman, 1988; Glaser, 1988; Laderman, 1990).

Electronic banking is the automated delivery of new and traditional banking products and services directly to customers through electronic medium. This system allows customers to access their accounts, transact business, make enquiries and have prompt responses from banks (Parisa, 2006).

In Ethiopia the birth of modern banking goes back to the imperial era. However, adoption of E-payment into the banking practice is a recent phenomenon which is even doesn't hit a couple of

decades. However, it has counted more than 60 years for introduction of card payment to the banking industry and even the introduction of internet and mobile banking with non-bank player into the payment system is about a 50 years later innovation but it has changed the payment landscape dynamically. The introduction of front end technologies and security since then has speed up the industry and helped countries like China with age of 20 years to be a competitor in E-payment with countries of more than 60 years history. To the latest, our country's banking sector is one of those countries with embryonic E-payment.

ATM has become one of the important banking service channels. Banks are expanding their ATM network to meet market demand and are facing operating costs and benefits together.

Automated Teller Machine (ATM) is a product of technological development developed to enhance quick service delivery as well as diversified financial services such as cash deposits, withdrawals, funds transfer, transactions such as payment for utilities credit card bills, cheque book requests and other financial enquiries. All financial institutions are using this method/system, aggressively encouraging all their customers to take advantage of these services on the grounds of ease process but an unannounced financial generation to the bank (Odusina, Ayokunle Olumide, 2014)

ATMs are similar to small bank branches, which provide limited service without full time bank employees. From this perspective; ATMs are alternative media for simple banking transactions. Compared to crowded bank branches with long queues, people prefer to use ATMs for their simple daily transactions especially for cash withdrawals. Although some more complicated banking transactions and even credit applications can be handled by ATMs, people see ATMs mostly as cash dispensers.

Recognizing this fact, the CBE has strived to improve the service quality, in addition to the traditional banking service offering different alternative channels considered as strategy, among these alternative channels Automated Teller Machine (ATM) is one.

This study assesses the current performance of CBE's ATM; identify causes that lead to current performance gap and to pinpoint better experiences. Finally, the study, based on findings, is expected to forward relevant and workable recommendations towards improving the performance of ATM in the Commercial Bank of Ethiopia.

1.2 Statement of the Research Problem

The Commercial Bank of Ethiopia (CBE) has set a vision to become a world class bank by 2025 and vigorously working toward this end. So as to reach on this target the bank adopts some international modern banking practice. For this purpose, the bank establish a processes called E-payment, with a mission of creating cash less society and the E-payment is responsible for the provision and support on the ATM, POS mobile banking and internet banking. CBE is the first bank to introduce Automated teller machine to Ethiopia (ETV, 2012).

ATM banking performed the lowest in ATMs not out of order, employee effectiveness in solving ATM problem, employee speed in responding to ATM problems, returning fast swallowed cards, quick replacement of lost cards, accessibility of employee to solve ATM problems, easy access to ATMs, accessibility of wide range of service and number of ATMs per station. (Gezahegn Bacha 2015)

CBE has strived to improve the service quality, in addition to the traditional banking service, offering different alternative channels considered as strategy. Among these alternative channels Automated Teller Machine (ATM) is one.

In light of this, the CBE has deployed 1042 ATM (as of June 2016) at different location so as to tap the business opportunity and promote electronic payment system which in turn will contribute to improved service excellence by easing the burden on branches.

However, currently not all ATMs the bank has deployed are performing to the standard the bank expects and requires from them. In fact most of the ATMs face multiple service interruptions causing great customer dissatisfaction and complaints and loss of revenue for the bank. This customer dissatisfaction will in time lead to customer disloyalty there by driving customers away from the bank and in to the arms of competitors.

Therefore it is vital that different factors that adversely affect the performance of CBE's ATM should be studied and solutions for them proposed and implemented as soon as possible if the bank is to keep its customers satisfied, its revenue growing and achieve its ultimate goal of being a world class bank in 2025. Thus, this proposal is developed to undertake a comprehensive study on the performance of the ATM in the Commercial Bank of Ethiopia (CBE).

The aim of this study is to assess the current performance of CBE's ATM and to identify the factors what lead to the current performance gap and to finally forward practicable recommendations.

1.3. Research Question

Based on the general research problem raised above, the proposed study has tried to answer the following research questions.

1. What is the current performance of CBE's ATMs?
2. What are the causes for the current performance gap in the CBE's ATMs?
3. Which districts have best/better performance on ATM?
4. What measures should be taken to improve the performance of CBE's ATMs?

1.4. Objective of the Study

This study comprises the following general and specific objectives.

1.4.1 General Objective of the study

The core objective of the study is to assess the performance of Commercial Bank of Ethiopia's ATMs and forward workable recommendations for a better performance.

1.4.2 Specific Objective of the Study

The specific objectives of the study, in line with the research problem, research questions and the general objective of the study, are:

1. To assess the current performance of CBE's ATMs.
2. To identify causes that lead to current performance gap.
3. To pinpoint better performing districts.
4. To forward relevant and workable recommendations.

1.5 Significance of the Study

All organizations are alarmed with the best way of improving performance to guarantee sustainable growth that will lead to achievement of organizational goal. This study will later benefit the bank to offer competitive services and keep an expanding base of satisfied customers to remain

competitive and profitable. This is evident through banks' investment drive in improving and increasing delivery channels, product/service reach and customer communication. It will help the bank to improve efficiency, to increase profitability and to bring operational excellence. To the customers of the bank it is serving by providing a machine with high performance, the study will contribute towards identifying ways by which the bank's ATM service will be a reliable, safe, secure, fast, and convenience. The proposed research is also expected to open door for other researchers for further researches.

1.6 Scope and limitation of the study

1.6.1 Scope of the study

Including the state owned bank CBE, most private banks give ATM service for their customers. However, as it is very difficult to assess all ATMs performance in the sector; the scope of the study is limited to the ATMs under the Commercial bank of Ethiopia and population is limited to employees at Head Office E-payment sub process only. Specifically, the study has primarily assessed the actual three quarter performance of the ATM service and tried to identify the gap in there towards its performance improvement.

1.6.2 Limitation of the study

This study is limited in scope and sample size, but it can contribute to further study on performance of ATMs in the banking sector. The study assessed the ATM performance of one bank, even though the bank has the lion share of total number of ATMs in the country the measurement tool might not be applied for all banks. Due to money and time constraints the researcher was not able to gather data from customers and branches. The sample group would have been all-encompassing. These difficulties make it very difficult for the researcher to undertake detailed and wide study with respect to the case.

1.7 Organization of the Study

This study consists of five chapters. Chapter one is an introduction comprising the back ground of the study, the statement of the problem, the research questions, the objective of the research, the significance of the study, and scope of the study. Chapter two presents a review of related literature.

Chapter Three deals with research methodology, which includes research design, population, sample and sampling procedures, instruments, data collection procedure and data processing. Chapter Four, deals with results and findings. Chapter Five deals with the conclusion of the research findings and possible recommendations. Finally, reference, questioners, and appendix are present.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Background of the company

The Commercial Bank of Ethiopia (CBE) is the largest commercial bank in Ethiopia. In 1963, the Ethiopian government split the State Bank of Ethiopia into the National Bank of Ethiopia, the central bank, and the Commercial Bank of Ethiopia (CBE). In 1958, the State Bank of Ethiopia established a branch in Sudan that the Sudanese government nationalized in 1970. The government later merged Addis Bank into the Commercial Bank of Ethiopia in 1980 to make CBE the sole commercial bank in the country (Mauri, 2008)

Currently CBE has more than 13.3 million account holders. It has more than 1140 branches stretched across the country. The bank combines a wide capital base with more than 29,000 talented and committed employees and is the leading African bank with assets of 384.6 billion Birr as on June 30th 2016.

The number of Mobile and Internet Banking users also reached more than 1,352,000 as of September 30th 2016 (68% active users). Active ATM card holders reached more than 3 million (61% active users). CBE has opened four branches in South Sudan and has been in the business since June 2009.

CBE is the first to introduce Western Union Money Transfer Services in Ethiopia early 1990s and currently working with other 20 money transfer agents like Money Gram, Atlantic International (Bole), Xpress Money, Dawit and 16 others.

The bank has strong correspondent relationship with more than 50 renowned foreign banks like Commerz Bank A.G., Royal Bank of Canada, City Bank, HSBC Bank and others. CBE has a bilateral arrangement with more than 700 others banks across the world. The company has opened two branches in South Sudan and has been in the business since June 2009 and it has a reliable and longstanding relationship with many internationally acclaimed banks throughout the world (Commercial Bank of Ethiopia, 2014).

CBE is pioneer in introducing modern banking to the country. The bank has been utilizing electronic payment system while increasing the usage and coverage of the service throughout the

country to create cashless society. CBE plays a catalytic role in the economic progress & development of the country and it was the first bank in Ethiopia to introduce ATM service for local users.

Commercial Bank of Ethiopia over the years has been experiencing significant change and developed in its information and communication technology. Among the development, one is an automated teller machine (ATM) service continues to grow in importance in the banking sector. The bank continues to invest in new and efficient technologies that can handle more functions that include foreign exchange ATMs to attract more customers and achieve customer satisfaction with the banks.

According to latest reports CBE alone is administering over 60% of the country's ATMs, which is 1,042 local and FOREX ATMs spread all over the country which are available in branches, malls, business centers, government organizations, NGOs, and International organizations. ATMs which are serving also as foreign currency exchange devices.

2.2 Definition of E-banking

E-banking has a variety of definitions all refer to the same meaning, the following section show some of these definitions. E-banking is a form of banking service where funds are transferred through an exchange of electronic signal between financial institutions, rather than exchange of cash, checks, or other negotiable instruments (Kamrul 2009). E-banking, also known as electronic funds transfer (EFT), is simply the use of electronic means to transfer funds directly from one account to another, rather than by check or cash (Malak 2007).

The term of E-banking often refers to online banking/Internet banking which is the use of the Internet as a remote delivery channel for banking services (Furst & Nolle 2002, p.5). With the help of the internet, banking is no longer bound to time or geography. Consumers all over the world have relatively easy access to their accounts 24 hours per day, seven days a week.

Another definition of E-banking is that "E-banking is the use of a computer to retrieve and process banking data (statements, transaction details, etc.) and to initiate transactions (payments, transfers, requests for services, etc.) directly with a bank or with other financial service provider

remotely via a telecommunications network” (Yang 1997, p.2). It should be noted that electronic banking is a bigger platform than just banking via the internet.

E-banking can be also defined as a variety of platforms such as internet banking or (online banking), TV-based banking, mobile phone banking, and PC (personal computer) banking (or offline banking whereby customers access these services using an intelligent electronic device, like PC, personal digital assistant (PDA), automated teller machine (ATM), point of sale (POS), kiosk, or touch tone telephone (Alagheband 2006, p.11). Different forms of E- banking system were discussed as follows.

1. Automated Teller Machines (ATM) - It is an electronic terminal which gives consumers the opportunity to get banking service at almost any time. To withdraw cash, make deposits or transfer funds between accounts, a consumer needs an ATM card and a personal identification number (PIN).

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

3. Internet / extranet banking- It is an electronic home banking system using web technology in which Bank customers are able to conduct their business transactions with the bank through personal computers.

4. Mobile banking- Mobile banking is a service that enables customers to conduct some banking services such as account inquiry and funds transfer, by using of short text message (SMS).

Banks offer Internet banking in two main ways. An existing bank with physical offices can establish a Web site and offer Internet banking to its customers in addition to its traditional delivery channels. A second alternative is to establish virtual branchless or Internet-only, Bank almost without physical offices. Virtual banks may offer their customers the ability to make deposits and withdraw funds via ATMs or other remote delivery channels owned by other institutions (Furst & Nolle 2002, p.5).

2.3 E banking in Ethiopian banking industry

The appearance of E-banking in Ethiopia goes back to the late 2001, when the largest state owned, commercial bank of Ethiopia (CBE) introduced ATM to deliver service to the local users. In addition to eight ATM Located in Addis Ababa, CBE has had Visa membership since November 14, 2005. But, due to lack of appropriate infrastructure it failed to reap the fruit of its membership. Despite being the pioneer in introducing ATM based payment system and acquired visa membership, CBE Lagged behind Dashen bank, which worked aggressively to maintain its lead in E-payment system. As CBE continues to move at a snail's pace in its turnkey solution for Card Based Payment system, Dashen Bank remains so far the sole player in the field of E-Banking since 2006. (Gardachew 2010)

Dashen bank, a forerunner in introducing E-banking in Ethiopia, has installed ATMs at convenient locations for its own cardholders. Dashen's ATM is available 24 hours a day, seven days a week and 365 days a year providing service to Debit Cardholders and International Visa Cardholders coming to the country. At the end of June 2009, Dashen bank has installed more than 40 ATMs in its area branches, university compounds, shopping malls, restaurants and hotels. In the year 2011 the payment card services have witnessed significant strides, Dashen's ATM service expanded to 70 and 704 POS terminals (Ayana Gemechu 2012)

Available services on Dashen Bank ATMs are: Cash withdrawal, Balance Inquiry, Mini statement, Fund transfer between accounts attached to a single card and Personal Identification Number (PIN) change. Currently, the bank gives debit card service only for Visa cards. Dashen bank clients can withdraw up to 5,000 birr in cash and can buy goods and services up to 8,000 to 13000 birr per day. Expanding its leadership, Dashen Bank has begun accepting MasterCard in addition to Visa cards. Dashen won the membership license from MasterCard in 2008.

Harnessing its leadership with advanced banking technology, Dashen Bank signed an agreement with iVery, a South African E-payment technology company, for the introduction of mobile commerce in April 21, 2009. According to the agreement, iVery Payment Technologies has licensed its Gateway and MiCard E-payment processing solution to Dashen Bank. Dashen's Modbirr users can transfer 500 birr to other Modbirr users in 24 hours a day. This would make

Dashen Bank the first private bank in Ethiopia to acquire E-commerce and mobile merchant transactions (Amanyehun 2011). Although Dashen's new technology is one step ahead in that it allows transfer of funds from one's account to others, the first ever E-banking gateway was signed between Ethiopian Commodity Exchange (ECX) and Dashen Bank and CBE. The E-banking system being developed with both banks is designed to give a secure electronic data sharing gateway between clients, banks and ECX, by facilitating a smooth transaction (Abiy 2008)

By the end of 2008 Wegagen Bank has signed an agreement with Technology Associates, a Kenyan based information technology firm, for the development of the solutions for the payment system and installation of a network of ATMs on December 30, 2008,

Zemen Bank, the only Ethiopian bank anchored in the idea of single branch banking, by launching full-blown internet banking, a service which is new to Ethiopian banking industry in the year 2010. The bank tested the venture through its first phase of the online service, and now it is already started the full-fledged version, which enable customers to make online money transfer freely. Previously, the online banking service, delivered by the bank, only gave access to bank statements and exchange rate information. The new and never-been-tried service proposed by the bank is to include free account money transfer, corporate payroll uploading system where employers could upload payroll to the system and make payments to individual worker's accounts online and online utility bill settlement system, when utility companies are ready(Asrat 2010).

The agreement signed by three private commercial banks to launch ATM and POS terminal network, in February 2009 is welcoming strategy to improve electronic card payment system in Ethiopia. Three private commercial banks - Awash International Bank S.C., Nib International Bank S.C. and United Bank S.C. have agreed in principle to establish an ATM network called Fettan ATM network. If everything goes as planned, Fettan ATM will install over 140 ATM machines and over 340 POSs across Ethiopia. There will be one ATM at every branch of the consortium banks, all domestic airports serviced by Commercial service, shopping complexes and merchants. The agreement is the first significant cooperation between competing banks

in Ethiopia, which others should be encouraged to follow as there is no single bank in Ethiopia that can afford to provide Extensive geographical coverage and access (Binyam 2009).

2.4 E banking in CBE

2009 /10 was the year E-payment was introduced to CBE, by then only 8 ATMs were deployed; following ATM other E-payment channels were introduced, in 2010 Point of sale terminals and in 2013 mobile and internet banking.

E-payment business requirement and set up a new system and solution, and launched a new card payment program in the year 2009, with global payment network standards. The new system was implemented initially with a business volume to support 50 ATMs and 250 POSs and 50,000 cards and with designed scalability of 400% business volume growth. Starting from 2011 cardholders start to use their cards on CBE POS. Even though CBE has gone through various reforms in order to move the E-payment history of the country one step forward from the outset, different initiatives were designed as strategy to identified different areas how CBE could excel its progress and undertaken different initiatives during this period starting from 2010. Accordingly since that the process has started to be led by strategy and come through one strategic period with different achievement.

The year 2013 also laid another remarkable product and/or delivery channels diversification with introduction of MB and IB in trend of CBE progress towards bringing cash light society. The introduction of MB and IB has increased CBE delivery channels into four including ATM and POS which had been introduced before.

Furthermore, in order to speed up the deployment of POS, CBE has outsourced its POS deployment starting from April 2015 to Habesha Capital Plc. for deployment of 6,000 POS over one year. This also increased CBE POS by 6,000 from 1,886.

Starting from 2010/11, the bank was able to increase its cardholders to 2,748,754, POS to 1886 and its ATMs to 644 as end of June 2015 11 over the following 5 consecutive years. The number of card products has also reached to seven for domestic debit cards and four for international debit cards and two private prepaid cards. The number of ATM, POS and cardholders are significantly increased over the last five years. Adding the 2015/16 budget year, CBE E-payment has shown the following progress.

Table2.1 CBE E-payment channels Progress

Particulars	2009/10 Base line	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16 (end of June 2016)
No. of ATM machines	8	42	58	258	433	639	889
No. of POS	-	7	23	206	244	1,886	6,269
No. of cardholders	14,000	28,945	61,040	300,470	973,762	1,604,363	2,800,502
No. of MB users	-	-	-	9,236	119,912	458,909	1,139,837
No. of IB users	-	-	-	215	6,581	7,838	26,519

Source: corporate strategy implementation report (2010/11-2014/15) and CBE annual performance report (2015-2016)

During the revised E-payment strategy starting from 2013, CBE has shown a tremendous progress in both deploying delivery channels and card holder recruitment. As a result a significant performance improvement has been recorded over the last three years. As instance during the 2015/16 fiscal year the number of transactions via mobile banking reached 868,464, with a total value of birr 3.5 billion, and the number of fund transfer transactions via internet banking had been 50,436 with a transaction volume of birr 1.7 billion during the review period as per CBE annual performance report (2015/16). The total number of cardholders grew to 2.8 million and the active cardholder position with minimum standard (cards that have been activated with at least one financial transaction at ATMs), is still below 56.4%. Despite it has been improving from its position of 48% in the preceding year. The number of transactions via ATM reached 28.6 million during the fiscal year, with a total value of birr 23.9 billion, and the number of transactions via POS had been 2.0 million with a transaction volume of birr 3.6 billion during the review period.

In terms of creating accessibility, E-payment channels are increasing significantly and simultaneously the numbers of users are also increasing from time to time. Accordingly the payment landscape of the industry is involving non-cash payments increasingly.

Currently there are over 200 employees in four teams working at head office level exclusively in E payment sub process under four managers and 8 team leaders, in addition there are E-payment teams in all 14 districts the bank administrate. (Commercial bank of Ethiopia 2016 e-payment channels progress report)

2.5 ATM: Automated Teller Machine Definition

ATM: Automated Teller Machine is a self-service technology (SST) which enables a customer to have access to their bank accounts via a secure communication network and with no personal contact between the bank teller and the customer.

The ATM consists of the hardware, the software and communication modules for the transaction to be completed. The hardware consists of the normal computer box which is loaded with operating system software windows. There is also the magnetic card reader where the customers insert their cards for identification as well as for the commencement of the transaction process; the operator keyboard is used by the customer to respond to the prompts whereas the screen displays the ATM prompts and responses in the transaction process. The ATM usually has two printers. One records the details of the transaction whereas the other one prints out receipts for the customer such as transaction details or balance enquiries. There is also what is known as the vault which consists of a cash dispenser and depository. (Donald Mushabati 2008)

The customers use plastic cards with magnetic stripes and /or a chip/ smart to access their bank accounts. The identity of the customer is verified by them entering their personal identification number (PIN) upon request by the ATM. upon verification the customer is then able to gain access into the main computer as the bank via the communication link for the transaction to be completed.

The introduction of Automated Teller Machine (ATM) that intends to reduce the number of customers in the banking halls as customers now can go to the closest ATM for withdrawals. Customers can accesses to withdraw their money 24-hours and reduce queues in front of the banks. Today, the ATM is an intelligent self-service device. Financial institutions across the world use

them to promote sells of new services, enhance customer experience; improve efficiency and increase profitability.

The use of Automated Teller Machines (ATM) has increased over the years and ATMs have become one of the important banking service channels. ATMs are similar to small bank branches, which provide limited service without full time bank employees. From this perspective; ATMs are alternative media for simple banking transactions. Compared to crowded bank branches with long queues, people prefer to use ATMs for their simple daily transactions especially for cash withdrawals. Although some more complicated banking transactions and even credit applications can be handled by ATMs, people see ATMs mostly as cash dispensers.

Although ATM systems have high fixed costs, they have lower variable transaction processing costs according to studies. With that proficiency ATMs could be substituted for employees that provide services on demand deposits accounts thereby be able to reduce the number of transactions processed by human tellers. That would allow banks to reduce direct customer service employment (Kantrow, 1989).

2. 5.1 Types of ATM

ATMs may either be on premise or off premise depending on their location. On premise ATMs are located near or inside the bank premises and are typically more advanced. They are also multi-function to complement the capabilities of an ideal bank branch and are usually expensive.

Off premise ATMs are located at places like shopping malls, supermarkets and filling stations and are usually less expensive Mono-function devices.

There are two types of ATMs developed over time in terms of functionality:

Mono-function ATM: this is where only one type of transaction is carried out such as cash dispensing.

Multi-function ATM: this where the machine carries out several functions such as accepting deposits, dispensing cash and giving out mini- statements, and foreign exchange service.

These ATMs may either be in lobby (inside a building) or external “through the wall” type. The banks have various reasons for selecting a particular type of ATM which may include things such as device cost, installation location, customer wait times, desired reliability and historical preference. (Donald Mushabati 2008)

2.6. ATM in CBE

The state owned Commercial Bank of Ethiopia is the first bank to introduce electronic payment system by installing 8 ATMs in 2009/10 in Addis Ababa, by accepting both international visa and master cards.

2.2 CBE's ATM progress report

Year	No of ATM deployed	No of transaction	Amount of transaction
2011/2012	58	128,230	95,845
2012/2013	258	149,568	135,695
2013/2014	433	4,809,660	3,987,698
2014/2015	644	16,322,782	13,236,262
2015/2016	889	28,154,588	22,942,855

Commercial bank of Ethiopia 2016 e-payment channels progress report

2.6 How CBE monitors its ATMs' performance

At head office of E-payment under technical team there is a sub team who is in charge of monitoring all ATMs owned by the bank using a monitoring tool called APTRA vision (Gasper Vintage), which is used to identify problems that might occur to the ATM. APTRA vision integrates online monitoring, reporting capabilities, Automatic dispatching Via SMS or E-mail. CBE started using Gasper Vintage/APTERA Vision in the month of July 2015. The Bank measures its performance by its INSERVICE or UPTIME hours and OUT OF SERVICE or DOWN TIME.

In Service (up time): amount of available time that the ATM was giving service without significant problem. Reasons for the ATM to be out of service

1. Supply Out: the amount of available time that the ATM was out of service due to cash out.

1.1 When All Cassettes are empty:

The number of notes in all cassettes is below 100 notes or empty.

1.2 When some cassettes are empty and some others are faulty or removed

- Faulty cassette: cash can't come out of cassette as required.
- Removed cassette: cassette not inserted properly.

1.3 All cassette faults:

- Too many pick failure because of the number of notes or the way notes are inserted in the cassette
- Jam (inside the cassette) because of the number of notes or the way notes are inserted in the cassette

1.4 All Cassettes removed: when all cassettes removed for replenishment, inserted properly or not closed properly.

2. Hardware Faults: This presents the amount of available time that the ATM was out of service due to a hardware fault.

2.1 Dispenser Failures

- Cash Jam: Cash notes get jammed in the dispensing mechanism making it impossible to dispense cash.
- Shutter Failure: Shutter of the dispenser gets damaged due to various reasons.
- Cassette failure: cassettes holding notes are damaged due to various reasons.
- Transporter belt failure: the transporter belt of the dispenser is damaged.
- Cash handler failure: when the handler fail due to various reasons.
- Dispenser Cable failure: when the dispenser cable fails due to various reasons.
- Dispenser board failure: when the dispenser board fail due to various reasons.
- Suction mechanism failure: the mechanism used to suck notes from the cassettes fails

2.2 Electronic Pin pad failures

- Hardware failure: the pin pad gets damaged due to various reasons.
- Pin pad losing key: the pin pad loses its encryption key.

2.3 Card Reader failures

- Hardware failure: the card reader gets damaged due to various reasons.
- Card jam: a card gets jammed in the card reader rendering it useless.

3. Communication/Network: can be because of network problem or power interruption. Since there is no other option of reporting separately and the power interruption, it is included on the network issues.

3.1 Network problem ET case or cable unplugged: Because of various reasons the connection from Ethio Telecom may be interrupted.

3.2 Power off: when power cable is unplugged or the ATM is shutdown, more over EEPCO power cuts.

4. Host Down: amount of available time that the ATM was out of service due to

4.1 ATM down from central switch: the ATM network connection is up but the service is denied from the switch deliberately.

4.2 New ATM definition: while defining an ATM on Magix (switch) we need to restart a port (group of ATMs) to include that new ATM in the group.

5. Daily Balancing/ATM in supervisor mode: the amount of available time that the ATM was out of service because the ATM was open for replenishing cash, fixing the ATM. (APTRA Advanced NDC Reference Manual 2008)

2.7 Benefit of ATM

There are multiple advantages in providing a self-service technology for banks and plays vital role in empowering customers in having the service they required at their own convenient time and place.

2.7.1 Benefit of ATM for the customer:

- **Personalized Bank Service** ATM use increases the perception of control. Empirical studies have demonstrated that consumer benefits of using SSTs and in this regard ATMs include being control (Dabholkar, 1996). This means the customer is in control of the technology with regard to ease of use and the user friendly on screen menus that guide the customers as they transact on the ATM.
- **Convenience** is one aspect as the customers have access to their bank accounts 24 hours a day, 7 days a week and so they can transact as and when they feel like. Another dimension to it is the location of these ATMs in strategic places like shopping malls as well as at filling stations. Actually the more locations there are available to the user the more valuable is the

access to the system customers also do not need to rush to the bank during the bank's normal operating hours.

- **Saving time and cost** is another customer benefit as the customers will save time by accessing their accounts at convenient times. The ATM is consequently a product of innovation with implications for consumer demand.
- **Consistency:** this refers to availability of the ATM service 24 hours a day without much variation.(Ayana Gemech 2012)
- **Reliability:** this refers to how much the customer can depend on the ATM service in times of great need such as an emergency.
- **Security:** The risks of carrying huge sums of cash have been reduced as customers have the convenience of withdrawing only the cash they wish to use at particular times. The strategic location of these ATMs at shopping malls, filling stations, hospitals and universities also helps in reducing the risk of carrying huge sums of cash.
- **Multi-Tasking:** ATMs are able to offer a combination of services on a single machine such as withdrawals, balance inquiry, mini statement, and foreign exchange and fund transfer without the customer having to go through a string of bank attendants to get these services. This helped in reducing the amount of time customers were depending on queues in the bank waiting to be served.
- **Real Time Account Information** – Because customers can access their accounts anytime, they can get up to date, real time information on the money in your accounts.
- **Fund Transfer:** Transfers between accounts with the same financial institution online can be done almost instantaneously. Not only is there no hold on the money being moved around, you can do it whenever you like and from wherever. (Omari Richard 2012)

2.7.2 Benefit of ATM for the bank

Banks have become the principal deployer of ATMs. Two reasons for this are that they want to increase their market share, although due to the prevalence of ATMs, it is not likely to be the primary means by which ATMs increase profitability for most banks; or/and above a certain level of operations, the cost of a single transaction performed at an ATM is potentially less than the cost

of a transaction conducted from a teller, as ATMs are capable of handling more transactions per unit of time than are tellers (Laderman, 1990).

- **Enhance customer satisfaction:** Ensure continuity of service to cardholders in emergency or disaster situations which aid in increase customer satisfaction and enhance service to constituents
- Branded off-premise ATMs extend the bank's visibility to current customers, providing visible reassurance of their banks reach beyond the branch.
- ATMs enable banks to re-design branches into more sophisticated customer services and sales outlets.
- ATMs reduce queues in banking halls.(Gezahegn Bacha 2015)
- **Tool for efficiency:** Improve operational efficiency and profitability of the issuing banks.
 - Many repetitive and tedious tasks have now been fully automated resulting in greater efficiency, better time usage and enhanced control.
 - Reduce queue on the counters create a less intense environment; ease work load and manual labor.
 - Employees effort will be diverting to service standardization and operational efficiency in sated of redundant and routine work, Learning and innovation will take place.
- **Increase in Business:** this refers to the increase in the number of ATM transactions as a result of the facilities that the ATM has to offer such as 24 hours 7days service.
- **Improved Revenue:** reducing the amounts that are paid to bank tellers as well as overtime pay for back office staff. It also to an extent takes into consideration the cost or renting bank premises in some cases. (MeazaWondemu2013)
- **Increased productivity:** increased input by the bank staff in terms of work as a result of the ATMs taking up some activities that were previously done by the bank staff
- **Security:** Enhance payment security by minimizing theft or loss and Prevent fraud through automated controls.

- **Create paper light environment:** reduce paper work, printing, mailing, and financial handling costs associated with processing transaction, thus helping them to move the paper less environment.(Donald Mushabati 2008)

2.8 Possible Challenges come upon ATM performance

- Poorly developed telecommunication infrastructure
- Frequent power interruption: Lack of reliable power supply is a key challenge for smoothly running e-banking in Ethiopia. Gardachew (2010)
- High rates of illiteracy: Low literacy rate is a serious impediment for the adoption of E-Banking in Ethiopia as it hinders the accessibility of banking services.
- Resistance to changes in technology among customers and staff due to:
 - Lack of awareness on the benefits of new technologies,
 - Fear of risk
- Tendency to be content with the existing structures,
- People may be resistant to technology and new payment mechanisms
 - Consumer's confidence and trust in the traditional payment system has made customers less likely to adopt new technologies. New technologies will not dominate the market until customers are confident that their privacy will be protected and adequate assurance of security is guaranteed. New technology also requires the test of time in order earn the confidence of the people, even if it is easier to use and cheaper than older methods.
 - Quality of Notes: This is the physical state of the notes that are put in the ATM for dispensing purposes. The quality of notes that are put in the ATM have direct bearing on how well or how badly the ATM will operate as bad notes are usually the source of note jams in the ATMs which results in poor service.
 - No Cash in the Vault Syndrome: This is a situation where ATM runs out of cash and not replaced immediately.

- Wrong Debiting: There are cases of ATM machine debiting the account of a customer without releasing the money to him. It takes time to rectify this problem
- Card Trapping: At times the ATM card is trapped inside the machine, thereby frustrating the owner.
- There have been cases of ATM giving out money without debiting the account, or giving a higher value notes as a result of incorrect denomination loaded in the money cassettes.
- Illiteracy/Lack of Skill: Some account holder cannot read and write. These people find it difficult to use ATM card. Others lack the basic skill on how to use ATM card. The result is that they seek for assistance. A dubious assistant can steal vital information from the card such as the cardholder's PIN and use it to defraud the person being assisted.(Odachi, Gebriel Nwabounu, 2011)
- Cyber security issues: Cyber security is a global challenge that requires global and multi-dimensional response with respect to policy, socio-economic, legal and technological aspects. E-banking applications represent a security challenge as they highly depend on critical ICT systems that create vulnerabilities in financial institutions, businesses and potentially harm banking customers. It is imperative for banks to understand and address security concerns in order to leverage the potentials of ICTs in delivering E-banking applications. In the deployment of E-banking application, attention should be drawn to the prevention of cyber-crime.(Yalew Nigussie,2015).

Empirical Review

ATM services offered by NMB Ifakara branch are effective except that ATMs are located only in the bank premises. It could have been better if the bank considered of locating the ATMs to different locations especially in places where there are other services like hospital, bus stand, train stations and local market for more convenience.

On the other hand, customers do face problems when accessing ATM service. Such problems include network/machine breakdown, card retention, limited amount of money to be withdrawn per day and other complications. (Joseph Jackson Tillya 2013)

ATM technologies installed by the banks are user friendly, have good operational speed and almost no waiting times at ATMs. This demonstrate that banks in Ethiopia have invested in effective ATM technologies that enhance the performance of ATM but the downside is the supporting services and management decisions in the delivery of ATM services. The result has further found that service quality performance under responsiveness dimension performing the least among the other service quality dimension. ATM banking performed the lowest in ATMs not out of order, employee effectiveness in solving ATM problem, employee speed in responding to ATM problems, returning fast swallowed cards, quick replacement of lost cards, accessibility of employee to solve ATM problems, easy access to ATMs, accessibility of wide range of service and number of ATMs per station. (Gezahegn Bacha 2015)

Examined the factors that influence customers satisfaction on ATM services includes costs involved, and the efficient functioning of ATM. (Davies et al., (1996)

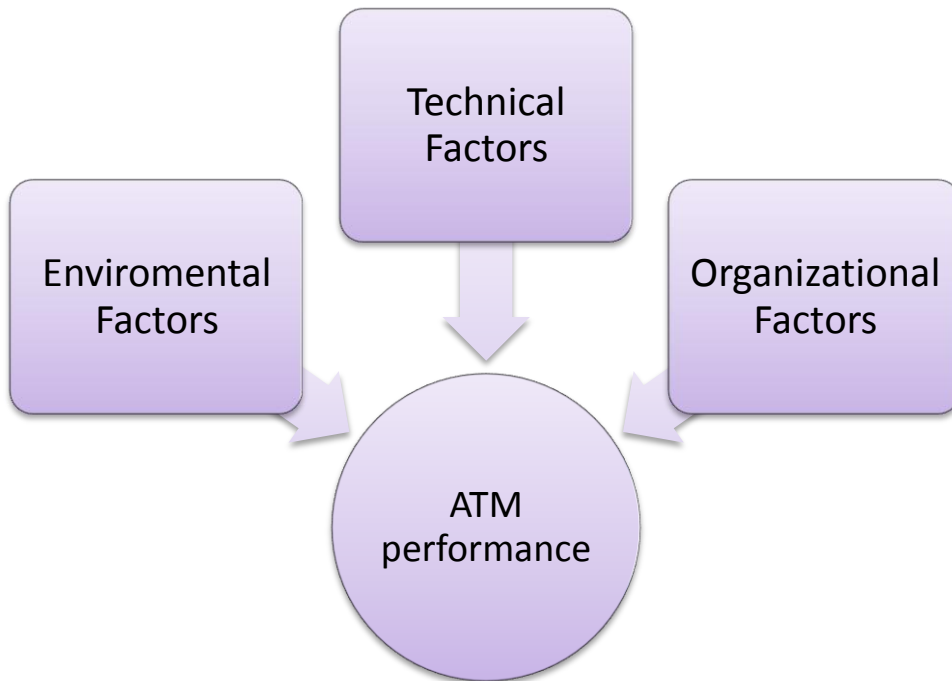
Telecommunication link is impacting very unstable and creates intermittent breaks in the service.

Quality of Notes is impacting negatively on the quality of service that the banks' ATM are providing and this is one area of great concern as it contributes to ATM failures. (Donald Mushabati 2008).

2.9 Conceptual Frame work for ATM performance

ATM performance (dependent variable) depends on independent variables (Environmental Technical, and Organizational Factors). Therefore, ATM performance is dependent on Environmental, Technical and Organizational factors as shown below in the figure.

Fig.2.1 Conceptual frame work for ATM performance



Source: Own conceptualization

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Research Design and Approach

In order to realize the research objective and answer the research questions an institution based cross-sectional study design was adopted. The study was conducted on CBE head office E-payment department, purposely selected on account of the specific area of service this team is responsible for. There are E-payment teams in all 14 districts the bank administrates, at head office there are currently four teams working exclusively in E payment sub process under four managers and 8 team leaders. However, the researcher purposively selected the E payment department at head office as it is accountable for managing all other districts and where most experts relevant to the study are situated. Both qualitative and quantitative data will be used for analysis and the finding will be clearly described.

3.2 Sampling Procedure

Due to the area of research and the nature of the research question; purposeful sampling was employed to include all employees from head office E-payment sub process who are responsible for the recruitment, approval, deployment, monitoring and support (hardware and software maintenance) of CBE's ATM's. Currently there are over 200 employees in four teams working at head office level exclusively in E payment sub process under four managers and 8 team leaders.

Contribution of each team under E-payment Sub-process for the performance of ATM

- The technical team is responsible for ensuring stable, secured, 24/7 card payment service (system monitoring) ATM monitoring, ATM maintenance.
- Operation team is responsible to guarantee operational transactions are performed in accordance with the banks e-payment and accounting procedures including orderly settlement of transactional items.

- The Business team is in charge of ensuring the development and proper implementation of e-payment products and services. Selection and approval of ATM site & Branding tasks are done by this team.
- Mobile and internet banking team ensure stable, secured and 24/7 Mobile and Internet Banking services. No particular role in the performance of ATM.

3.3. Source of Data & Data Collection Technique

3.3.1. Source of Data

In order to carry out any research activity information should be gathered from proper sources. Therefore, the achievement of the objective of this study was using both primary and secondary sources of data. The primary source of the data was collected from the staffs of the concerned department. This is because the study shall depend mainly on the opinion of staff that has direct work relation on the performance of ATM.

In addition, secondary data was also obtained from different sources like, the central data base of the bank, annual and quarter reports, research paper, articles, magazines, published and unpublished materials, books, internet, and web sites.

3.3.2 Data Collection Techniques

The primary data for this study was collected in the form of self-administered questionnaires provided for employees, which comprises both open and close-ended questions that were clear, to the point and easy to understand for the respondents.

The respondents of this study were from commercial bank of Ethiopia. Questionnaires were distributed for 200 respondents of E-payment process staffs. Questions present in the form of affirmative statements, relating to the concepts on performance of ATM, to enable measurement of the respondent's opinions. The respondents were asked to indicate their level of agreement on a five point Likert scale with the following rating. '5' 'Strongly agree,' '4' 'agree,' '3' 'moderate or neutral,' '2' 'disagree, and '1' 'strongly disagree. The questionnaire included both close ended and open ended questions to get guided responses and for easy analysis and to obtain information, the respondents were also requested to forward any suggestion that would help the bank to enhance the performance of its ATMs, if there are any factors not mentioned that will affect the performance of CBE's ATMs and their personal opinion if the ATMs are performing as expected including serving its customers off working hours and holidays. On so as to provide open ended responses if they have opinions which they feel the researcher would find useful. Bearing in mind the sensitivity of the questions that ask,

the questionnaire was simple and clear to ease the participant into the data gathering process. This would be done by asking the basic questions about the participants' demographic profiles at the beginning of questionnaire and more intrusive questions about the participants' activity at the end. The questionnaire was prepared in English language.

3.4 Method of Data Analysis

A descriptive statistical summary using statistical instrument like measures of central tendency and measure of variability will be the preliminary step to be conducted for understanding the collected data. To facilitate interpretation process of the research data, the researcher will employ frequency tables, graphs, and pie charts. Moreover, detail analysis will be made on the qualitative data to be collected from the respondents.

In this research, both qualitative and quantitative methods of data analysis were used. The first stage of data analysis comprises the preparation of codebooks for the questionnaires. The questionnaires edited, coded, and analyzed using Statistical Package for Social Science (SPSS) relevant data analysis need to answer the research questions were carried out. The quantitative techniques utilized in this study were descriptive statics like percentage, frequency and Tables were used to show the results of the analysis and to facilitate the interpretation of the data. In addition, the qualitative analysis describe in narrative way.

3.5. Ethical Consideration

Confidentiality and privacy are some of the most corner stone of field research activities in order to get relevant and appropriate data. Sometimes researchers undertake research without telling the truth about the purpose and nature of the research. This leads respondents mislead about the reality of the study because of fear and lack of confidentiality. To avoid this problem the researcher was care for ethical aspects. The researcher assured the purpose of the research paper and confidentiality of any information gathered through questionnaire on the introductory part of the paper. Also the participants in the study were briefed about the purpose and nature of the research study by the researcher. The data was collected from willing sample respondents without showing any unethical behavior or forceful action. The results or a report of the study was use for academic purpose only and response of the participants kept confidential and analyze in aggregate without any change by the researcher. In addition, the researcher respects the work of previous investigations or study and cites appropriately those works that used as a source.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1. Introduction

The analysis was conducted in order to assess performance of CBE's ATM service and to identify factors that lead to ATM performance gap. The ultimate aim of the study was to gain a better understanding of factors that influence ATM service performance from service provider's aspect. The analysis begins with assessment of CBE's ATM performance followed by a description of the demographic profile of the respondents and factors associated with ATM performance. The data collected on various factors affecting performance of ATM service will be presented using frequency tables, graphs along with mean and percentages. This study analyzed 191 responses.

4.2. Performance of CBE's ATMs (Past 9 months)

Currently CBE has a total of 1042 ATM machines throughout the country. There are 86, 76, 74, and 74 ATM machines in East, West, North and West districts of Addis Ababa respectively, which makes up 29% of the total number of ATM's. The least amount of ATM machines (4%) is found in Shashemene. As of June 2016 the number of ATM deployed was 899. Thus CBE has increased the number of ATM machines by 22% when compare to the year before and by 38% correlated with the year 2014/15 which was 644.

Table 4.1 list of ATMs with their respective districts share percentage

No	Districts	No of ATMs	Percentage
1	E-payment	97	9.3
2	East Addis	86	8.2
3	North Addis	76	7.3
4	South Addis	74	7.1
5	West Addis	74	7.1
6	BahirDar	69	6.6
7	Hawassa	66	6.3
8	DireDawa	64	6.1
9	Gondar	64	6.1
10	Dessie	60	5.8
11	Nekemt	57	5.5
12	Adama	57	5.5
13	Wolayta	56	5.4
14	Jimma	51	4.9
15	Mekelle	50	4.8
16	Shashemene	41	4
	TOTAL	1042	100

Source: Gasper report, September 2015- March 2016

Table4.2 key Performance Indicators

KPI	Expected percentage
Up time	> 90%
Cash Out	< 1%
Supervisor mode	< 0.75%
Hard fault	< 2.75%
Communication	< 5%
Host Down	< 0.75%

Source: Commercial Bank of Ethiopia, E-payment

4.2.1. Uptime and Downtime percentage

Up time /In Service is the amount of available time that the ATM was giving service without significant problem. This is calculated by subtracting the time the ATM was out of service from the available time. Whereas down time/out of service is the amount of available time that the ATM was not giving service because of different reasons.

The past 9 months the average percentage of ATM uptime for all districts was 79.88%. The highest average percentage of uptime (87.84), was recorded under E-payment, while the least percentage (69.10%) was documented in Jimma district.

A well performing ATM service is expected to have an Uptime percentage greater than 90% while Downtime percentage shouldn't exceed 10%. Thus all CBE's ATM has been underperforming regarding uptime in the past 9 months.

Table 4.3 uptime and downtime percentage of ATMs with their respective districts

Rank	District's Name	Uptime percentage	Downtime Percentage
1	E-payment	87.84%	12.16%
2	South Addis	85.27%	14.73%
3	Dire Dawa District	84.15%	15.85%
4	North Addis	84.09%	15.91%
5	East Addis	83.40%	16.60%
6	West Addis	83.07%	16.93%
7	Gondar District	81.39%	18.61%
8	Dessie District	80.78%	19.22%
9	BahirDar District	79.05%	20.95%
10	Hawassa District	76.77%	23.23%
11	Wolayta District	76.07%	23.93%
12	Shashemene Dist.	76.01%	23.99%
13	Mekelle District	75.00%	25.00%
14	Adama District	74.51%	25.49%
15	Nekemt District	71.77%	28.23%
16	Jimma District	69.10%	30.90%
ALL DISTRICTS		79.88%	20.12%

Source: Gasper report, September 2015- March 2016

4.2.2. Supervisor percentage

Is the amount of available time that the ATM was out of service because of balancing i.e. because of tasks performed while the ATM is opened like replenishing cash, fixing the ATM. Supervisor mode percentage is expected to be less than 0.75%. Only ATM's at E-payment

district (0.63%) managed to attain the standard, whereas the least acceptable percentage was recorded in Jimma district (2.72%).

Table 4.4 supervisor mode percentage of ATMs with their respective districts

Rank	District's Name	Supervisor Percentage
1	E-payment	0.63%
2	South Addis	1.12%
3	Dire Dawa District	1.12%
4	North Addis	1.19%
5	East Addis	1.19%
6	West Addis	1.27%
7	Gonder District	1.33%
8	Dessie District	1.39%
9	Bahirdar District	1.45%
10	Hawassa District	1.45%
11	Wolayta District	1.60%
12	Shashemane District	1.69%
13	Mekelle District	1.70%
14	Adama District	1.75%
15	Nekemt District	1.97%
16	Jimma District	2.72%
ALL DISTRICTS		1.47%

Source: Gasper report, September 2015- March 2016

4.2.3. Cash out percentage

The amount of available time that the ATM was out of service as the number of notes in all cassettes is below 100 notes or empty. Standard cash out percentage is expected to be less than 1%. Thus ATM at Dire Dawa district (0.96%) and E-payment (0.33%) are the ones that attained the level desired, the worst cash out percentage was recorded in Wolayta district (2.75%).

Table 4.5 cash out percentage of ATMs with their respective districts

Rank	District's Name	Cash out Percentage
1	E-payment	0.33%
2	Dire Dawa District	0.96%
3	Gonder District	1.15%
4	Bahirdar District	1.18%
5	South Addis	1.34%
6	Dessie District	1.48%
7	Mekelle District	1.58%
8	Shashemane District	1.63%
9	Hawassa District	1.74%
10	West Addis	1.89%
11	Adama District	1.94%
12	East Addis	2.04%
13	Nekemt District	2.05%
14	North Addis	2.29%
15	Jimma District	2.48%
16	Wolayta District	2.75%
All DISTRICTS		1.67%

Source: Gasper report, September 2015- March 2016

4.2.4. Hardware fault percentage

This presents the amount of available time that the ATM was out of service due to a hardware fault. For example: some problems of parts of the ATM like Card reader, Monitor and EPP failures. Hard fault Percentage is expected to be less than 2.75%. Yet again, E-payment is the only district who attained the expected percentage. The average value for all districts was 5.31% which is twice the target value.

Table 4.6 Hard fault of ATMs with their respective districts

Rank	District's Name	Hard fault Percentage
1	E-payment	1.89%
2	Gonder District	3.71%
3	South Addis	4.38%
4	Bahirdar District	4.61%
5	Hawassa District	4.63%
6	Jimma District	4.68%
7	Dire Dawa District	5.09%
8	East Addis	5.30%
9	North Addis	5.57%
10	West Addis	5.83%
11	Nekemt District	5.83%
12	Shashemane District	5.95%
13	Mekelle District	6.18%
14	Dessie District	6.40%
15	Wolayta District	6.50%
16	Adama District	8.44%
All DISTRICTS		5.31%

Source: Gasper report, September 2015- March 2016

4.2.5 Communication percentage

Communication percentage is the percentage that the ATM was out of service because of network problem or power/Battery interruption. Since there is no other option of reporting separately the power interruption, it is included on the communication/network issues. The standard percentage for this issue is expected to be less than 5%. As can be seen on table 4.7 none of the districts has met the criteria, the average value for all districts was 10.03% which is twice the value expected from a well performing ATM.

It can be deduced from the above tables that communication/network issues and hardware faults are the major factors affecting performance.

Table 4.7 communication percentage of ATMs with their respective districts

Rank	District's Name	Communication Percentage
1	North Addis	5.20%
2	South Addis	5.54%
3	East Addis	5.75%
4	West Addis	6.03%
5	Dire Dawa District	6.50%
6	E-payment	7.36%
7	Dessie District	8.04%
8	Gondar District	9.75%
9	Wolayta District	10.92%
10	Adama District	10.95%
11	BahirDar District	11.46%
12	Mekelle District	12.21%
13	Hawassa District	12.66%
14	Shashemene District	13.18%
15	Nekemt District	16.15%
16	Jimma District	18.85%
All DISTRICTS		10.03%

Source: Gasper report, September 2015- March 2016

2.4.6 Host down percentage

The amount of available time that the ATM was out of service as it is deliberately switch off from central switch for system maintenance, configuration or definition of new ATM into a group. Host down percentage is not supposed to exceed 0.75%, but the minimum value recorded the past nine months was 1.73% at North Addis Ababa district, which is 2.3 times higher than the target value.

Table 4.8 Host down percentage of ATMs with their respective districts

Rank	District's Name	Host down Percentage
1	E-payment	1.95%
2	Dire Dawa District	2.18%
3	Gonder District	2.32%
4	BahirDar District	2.31%
5	South Addis	1.87%
6	Dessie District	1.84%
7	Mekelle District	2.31%
8	Shashemene District	2.04%
9	Hawassa District	2.88%
10	West Addis	1.99%
11	Adama District	2.18%
12	East Addis	1.76%
13	Nekemt District	2.94%
14	North Addis	1.73%
15	Jimma District	3.18%
16	Wolayta District	2.31%
All DISTRICTS		2.23%

Source: Gasper report, September 2015- March 2016

In general commercial bank of Ethiopia has been consistent in increasing the number of ATM's deployed the past 6 years, yet issues regarding performance remain at large. In the following sections analysis of factors affecting ATM performance is going to be presented

4.3. Demographic Variables

In this section of the paper the demographic profile of the study participants' are presented.

4.9 Demographic factors

No.	Variables	Frequency	Percentage	
1	Gender	Male	138	72.2
		Female	53	27.8
		Total	191	100
2	Age	< 25	28	14.7
		25-35	94	49.3
		36-45	53	27.7
		46-55	13	6.8
		≥56	3	1.5
		Total	191	100
3	Year of experience	<1 year	28	14.7
		>5 years	88	46.1
		<10 years	53	27.7
		>10 years	22	11.5
		Total	191	100
4	Educational Level	Diploma	2	1.1
		Degree	181	94.8
		Post Grad.	8	4.1
		PHD	0	0
		Total	191	100
5	Place of Assignment	Technical	60	31.5
		Operation	100	52.4
		Business	21	10.4
		M&IB	10	5.7
		Total	191	100

Source: primary data (2017)

As we can learn from the above table Seventy two percent (72.2%) of the study participants were Male and the remaining twenty seven percent (27.8%) were Females. This implies that females are disproportionately represented in the sample. Number of respondent participated on the paper based on age break down of respondents. (14.7%) of the personnel are below age 25,

94 (49.3%) are between 25 and 35, and 53 staff (27.7%) are between 36 and 45, 6.8% are between 46 and 55 while only 1.5% were above 56 years of age.

Most of the respondents (85.3%) have worked in their respective field for five years or more. Hence the employees who participate in the study are more experienced and the data these personnel gave has better credibility, so with this respect the data collected has good quality and reliable for analyses.

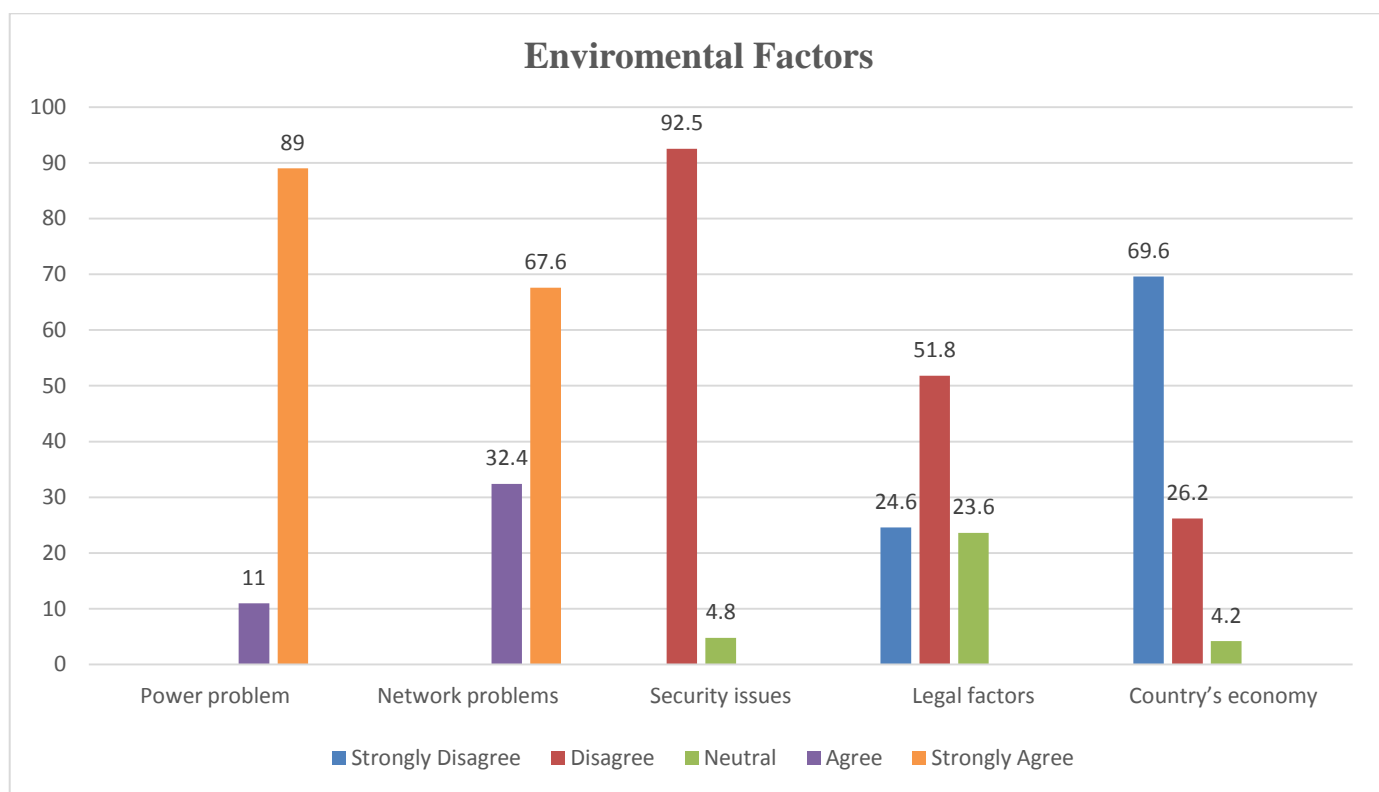
Concerning educational level, majority of the employees has degree (94.8%) while there were fewer of those with diploma (1.1%), regarding place of assignment, 31.5% of the personnel are assigned to the Technical team, 52.4% to the Operation team, 10.4% Business team while the remaining 5.7% belong to Mobile and internet banking team.

4.4. Factors associated with ATM performance

4.4.1. Environmental factors

Most employees strongly agree that power and network problems (89% and 67.6% respectively) play a vital role in ATM performance. Regarding security concerns 95.2 agree that it doesn't significantly affect performance. Respondents tend to strongly disagree on the relationship between state of county's economy and performance of ATM.

Figure 4.1 Environmental factors affecting performance of ATM



Source: primary data (2017)

As can be observed from the figure above, power and network issues are among the environmental factors that significantly affect ATM service performance of CBE, while security issues are of least concern regarding performance.

4.4.2. Technical Factors

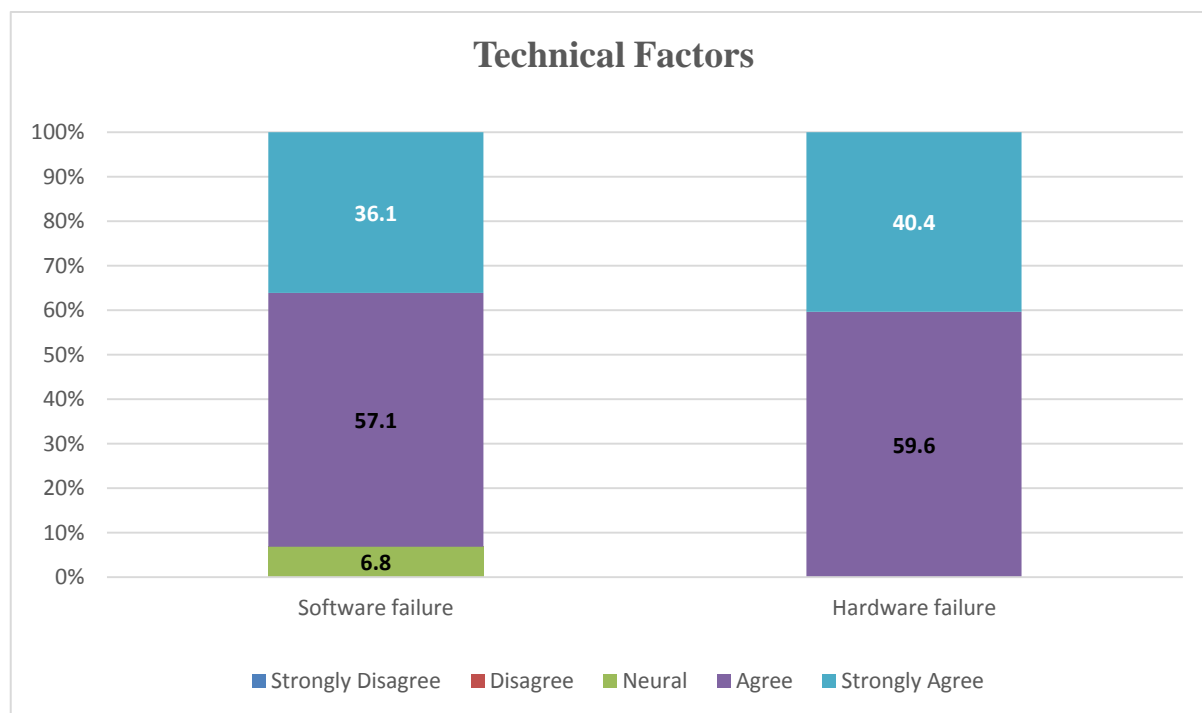
Most disagree that ATM complexity affects performance, while those who strongly agree on the matter make up 9.5% of the respondents.

Regarding software and hardware failures a significantly higher portion of the respondents, 57.1% and 50.6% of the respondents respectively agree that it significantly affects ATM performance. 45.6% of the personnel disagree cost of ATM maintenance being an issue while most (47.2%) strongly agree that shortage of spare parts affect ATM performance.

Overall those who believe that ATM is complex or not user friendly make up less than 10% of the respondents; hence we can say that it is not an imperative technical factor affecting the current ATM service performance gap.

Figure 4.2 Technical factors affecting performance of ATM

Source: primary data (2017)



4.4.3. Organizational Factors

Half the respondents (50.2%) agree that CBE’s ATM location affect performance. 126 respondents which make up 65.9% strongly disagree on cash withdrawal limit affecting performance similarly 60 (31.4%). 2 (1.2%) share contrary idea agree that it affects performance.

Meanwhile more than three fourth of the staff (76.5%) strongly agrees that the amount of charge per transaction does not affect ATM performance.

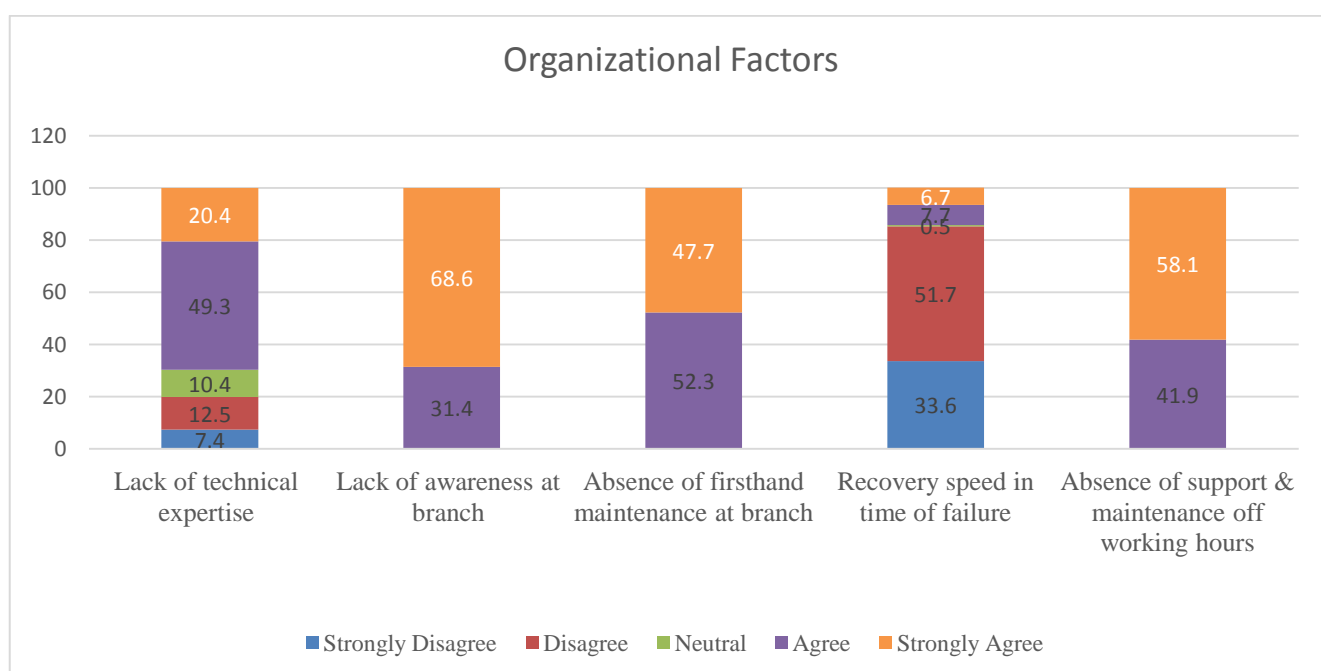
Hardware failure could result from poor quality cash notes as it could get jammed in the dispensing mechanism making it impossible to dispense cash. All of the respondents have confidence in the quality notes used in the ATM, thus hardware issues that arise couldn’t be attributed to this factor.

Whereas quality of notes was a non-issue, unavailability of cash in the ATM machine was considered by all employees involved in the study as a chief issue causing inconvenience.

E-banking section, which is responsible for maintenance and configuration, among other duties is found at district level. Respondents inarguably believe that lack of awareness and absence of firsthand maintenance at branch is a significant factor affecting ATM performance.

Figure 4.3 Organizational factors and their effect on performance of ATM

Source: primary data (2017)



Similarly the participants unanimously agree that absence of support & maintenance off working hours and lack of continuous follow-up from responsible organ affects ATM service performance.

Those who disagree with association between recovery speed time of failure and availability of ATM service makes up majority of the employees 85.3%, while 14.4% believed otherwise Concerning lack of technical expertise 133 employees representing 69.7% of the total population agreed that it affects performance. However, 38 employees disagreed with the statement while 20 employees representing 10.4% were neutral.

All employees mentioned lack of standard system and continuous follow-up from responsible organ as a contributing factor for underperformance, whereas lack of monitoring system was not an issue.

When asked about whether or not they believe that CBE's ATM are performing as expected and if they feel that client could get the service at their own convenient time, 80.6% and 94.2% of the study participants replied No to the questions respectively.

Suggestions given by the respondents to improve ATM performance

- Branch measurement should not be limited to cash out
- Training to branch and district
- Generator installation
- Provide quality notes to the ATM
- Change the system

Table4.10 Maximum, Minimum, Mean and Mode value for factors affecting ATM performance.

No	Factors	N	Min	Max	Mode	Mean
	Environmental Factors					
1	Power problem	191	4	5	5	4.8
2	Network problems	191	4	5	5	4.67
	Technical factors					
3	Software failure	191	3	5	4	4.3
4	Hardware failure	191	4	5	4	4.4
	Organizational Factors					
5	Lack of awareness at branch	191	4	5	5	4.68
6	Absence of firsthand maintenance at branch	191	4	5	4	4.47
7	Lack of standard System	191	4	5	4	4.2
	Unavailability of cash in the ATM machine	191	4	5	4	4.8
8	Absence of support & maintenance off working hours	191	4	5	5	4.6
9	Lack of continuous follow-up from responsible organ for the ATM	191	4	5	5	4.9

Note: N-Number of responses; Response measurements, 1-strongly disagree, 2- Disagree, 3- Neutral, 4-Agree and 5-Strongly agree.

By observing the mean value of factors it can be well understood from the above table that Environmental factors like: Power (μ : 4.8) and Network (μ : 4.67) problems, Technical factors like: Software (μ : 4.3) and Hardware (μ : 4.4) failure, and Shortage of spare parts (μ : 4.36), and Organizational Factors like: ATM location (μ : 4.1), Lack of awareness at branch (μ : 4.68), Lack of technical expertise (μ : 3.63), Absence of firsthand maintenance at branch (μ : 4.47), Unavailability of cash in the ATM machine (μ : 4.8), Absence of support & maintenance off working hours (4.6) and Lack of continuous follow-up from responsible organ for the ATM (μ : 4.9) are major factors acknowledged by the study participants that affect ATM performance significantly thus the bank should focus on these areas in order to bridge the performance gap and improve customer satisfaction regarding ATM service

CHAPTER FIVE

FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Summary of major findings

Based on the analysis and interpretation made in the previous chapters, the major findings of the study are summarized as follows:

- CBE was the first bank in Ethiopia to introduce ATM service for local users. According to latest reports CBE alone is administering >60% of the country's ATMs. Currently not all ATMs the bank has deployed are performing to the standard the bank expects and requires from them.
- In fact most of the ATMs face multiple service interruptions causing great customer dissatisfaction and complaints and loss of revenue for the bank. This customer dissatisfaction will in time lead to customer disloyalty there by driving customers away from the bank and in to the arms of competitors.
- The core objective of the study is to assess the performance of Commercial bank of Ethiopia's ATMs and forward workable recommendations for a better performance.
- In order to realize the research objective and answer the research questions an institution based cross-sectional study design was adopted. Purposeful sampling was employed to include all 200 employees from head office E-payment sub process.
- Both primary and secondary sources of data were used. The primary sources of the data serves as main sources of the study; it was collected from the employees at head office E-payment using questionnaire.
- A descriptive statistical summary using statistical instrument like measures of central tendency and measure of variability was used.
- Among the 200 questionnaires distributed 191 of them were answered completely.
- The demographic backgrounds of the sample respondents are presented in five parameters to get a clear profile of our respondent: Gender, age, educational background, year of experience and place of assignment.
- The specific question has both open and close ended questions, the open ended questions has three categories, environmental, technical and organizational.
- The secondary data obtained from the central data base of the bank has shown the following result:

- As uptime, Communication, and Host down of ATM was supposed to be >90%, <5% and <0.75% respectively the average actual performance of each ATM was 79.88%, 10.03% and 2.23% respectively.
- As Supervisor mode, cash out and hard fault were expected to be <0.75%, <1% and <2.75% respectively the average actual performance of each was 1.47%, 1.67% and 5.31% respectively which is all below the floor limit set by the bank.

Table 5.1 Average Expected and Actual performance of CBE ATMs

KPI	Expected percentage	Actual total percentage
Uptime	> 90%	79.88%
Supervisor mode	< 0.75%	1.47%
Cash out	<1%	1.67%
Hard fault	<2.75%	5.31%
Communication	< 5%	10.03%
Host down	<0.75%	2.23%

Source: Gasper report, September 2015- March 2016

Even though the total average performance of CBE ATMs is below expected, E-payment has managed to achieve on three among the six Key performance indicators, cash out, supervisor mode and Hard fault. While Jimma and Wolaieta districts happen to be the least performers.

- Analysis of response from 191 employees indicates that:
 - Seventy two percent (72.2%) of the study participants were Male and the remaining twenty seven percent (27.8%) were Females.
 - 14.7% of the personnel are below age 25, 49.3% are between 25 and 35, and 27.7% of the staffs are between 36 and 45. Only 6.8% are between 46 and 55 the rest 1.5% were above 56 years of age.
 - Most of the respondents (85.3%) have worked in their respective field for five years or more.

- Among the 191 respondents 31.5% of the personnel are assigned to the Technical team, 52.4% to the Operation team, 10.4% Business team while the remaining 5.7% belong to Mobile and internet banking team.
- 89% and 67.6% of the respondents strongly agreed power and network problems, affect the performance of CBE ATMs. While nearly 100% of the respondents agree and strongly agree that software and hardware failure affect the performance of CBE's ATMs. Legal factor and security issues have no effect on the performance of ATMs.

5.2 Conclusions

The introduction of Automated Teller Machine (ATM) that intends to reduce the number of customers in the banking halls as customers now can go to the closest ATM for withdrawals. Customers can access to withdraw their money 24-hours and reduce queues in front of the banks. Today, the ATM is an intelligent self-service device. Financial institutions across the world use them to promote sales of new services, enhance customer experience; improve efficiency and increase profitability.

The state owned Commercial Bank of Ethiopia is the first bank to introduce electronic payment system by installing ATM in 2009/10. Since then the bank has deployed 1042 ATM machines throughout the country and the use of Automated Teller Machines (ATM) has increased over the years and ATMs have become one of the important banking service channels. Based on the main findings, the researcher has concluded that CBE's ATMs actual performance is below what is expected due to The highest number of ATMs are under the administration of E-payment head office and the lowest is under the district of shashemene. The causes that lead for the current performance gap are classified in to environmental, technical and organizational factors. couple of environmental and technical factors affect the performance of CBE's ATMs, most organizational factors has contributed for the current undesired performance.

Power and network problems, software and hardware failure, shortage of spare parts, lack of awareness and firsthand technical expertise at branch, unavailability of cash in the ATM machine, absence of support & maintenance off working hours and lack of continuous follow-up from responsible organ for the ATM to be major factors that affect the performance of CBE's ATMs significantly thus the bank leaders should focus on these areas in order to bridge the performance gap and improve customer satisfaction regarding ATM services.

Based on the main findings above, the researcher has concluded that CBE's ATMs actual performance is below what is expected. Even though it is below the banks' expected percentage for up time, which is 90% E-payment is performing better than the other 14 districts by 87.84%

followed by south district by 85.27%. Regarding supervisor mode, hard fault, and cash out e-payment had performed, on cash out Dire Dawa district had accompanied e-payment in performing up to standard. Given the above detail the researcher has conclude that E-payment is performing better than the 14 districts.

Among the 16 districts within the bank Best practice of ATM goes to E-payment and the least performers are Jimma and Wolaieta districts.

Research made in Ethiopia banks by Gezahegn Bacha has concluded that supporting services and Management decision has high effect on the performance of ATM while Davies stated cost related issues has a upper effect. Unlike other researches the researcher of this study found that most organizational factors like, lack of expertise, Lack of awareness at branch, Absence of firsthand maintenance at branch, Lack of Standard system and unavailability of cash in the ATM highly affect the performance of the ATM.

Alike the research made in Zambia by Donald Mushabati this reasearchhas also found that Telecommunication link and quality of notes affect the performance of ATM.

5.3 Recommendations

In order to enhance performance of CBE's ATMs and their contributions to improve the service excellence, boost customer's satisfaction and to achieve desired level of improvement the study proposed the following recommendations.

For a better performance of an ATM telecommunication infrastructure and power supply are major prerequisite. Therefore,

- a. The government should support the banking sector by investing on telecommunication and power supply infrastructure development, and not only CBE but all banks should demand for a better supply of power and telecom services.
- b. The bank should get in to a special agreement with Ethio Telecom.
- c. The bank should start using alternative power supplies in addition to installing generators, especially for outline district ATMs.

The bank in collaboration with national bank should strive to provide quality notes for its' ATM. Poor quality notes doesn't only increase down time but also affect hardware if happened frequently. To minimize hard ware faults, it is highly recommended to refresh hardware by professionals and/or by those who took training.

For durable solution to minimize the percentage of host down problem the bank should install a standardized system.

The bank should have frequent contact and discussion with vendors to get technical assistant, it is necessary for upgrading service time of ATM since all the machines are the same and imported from similar sources and regarding shortage of spare parts E-payment should establish chain with suppliers to get all necessary spare parts easily and timely.

Concerning deployment strategy, size of population and convenience of place (location) for maintenance are important for efficiency and to minimize down time with the intention that the bank should give a special attention for placement of ATMs.

The bank should minimize the status of ATM cash out level by assigning staffs, off working hours and days. ATM First Line Maintenance training should be delivered to all districts and ATM administering branches.

The bank needs to arrange continuous training to create awareness and concern among the staffs at branches and districts that are responsible for ATMs. Furthermore Branches Measurement and responsibility should not be limited to cash out, but;; other out of service elements too.

Commitment is important from districts and branches to continuously focus on performance improvement and to work closely with E-payment technical staffs. Branch Managers, District IT Managers and District Managers awareness should be hammered again by higher officials.

Annex

Questionnaire for CBE E-payment employees

St. Mary`s University

Department of General MBA

Dear respondents my name is Yamlaksira Belete the following questionnaire is designed to gather information for my Master`s thesis with the title “performance assessment on ATM in the case of CBE”. The information you provide will only be used for the purpose of the study and will be kept strictly confidential. Thanks in advance for your cooperation and valuable time you are dedicating to fill out this questionnaire.

Part 1 Demographic questions

1. Gender

Male Female

2. Age

Below 25 years old 25-35 years old

36-45 years old over 45 years old

3. Year of experience in the bank

Less than one year

Greater than five years

Less than ten years

Greater than ten years

4. Education back ground:

Diploma

Degree

Postgraduate

PHD

5. Place of assignment in E-payment technical team

Technicalteam

Operation team

Business team

Mobile &Internet Banking team

Part 2 specific questions

Please indicate your level of agreement for the following questions

No	Factors	Strongly Disagree	Disagree	Neural	Agree	Strongly Agree
	Environmental Factors					
1	power problem					
2	Tele communication link/Network problems					
3	security issues					
4	legal factors					
5	State of country's economy					
	Technical factors					
6	ATM complexity					
7	software failure					
8	Hardware failure					
9	Cost of ATM maintenance					
10	Shortage of spare parts					
	Organizational Factors					
11	ATM location					
12	Cash withdrawal limit					
13	Amount of charge per transaction					
14	Quality of notes used in ATM					
15	Lack of technical expertise					
16	Lack of awareness at branch					
17	Absence of firsthand maintenance at branch					
18	Recovery speed in time of failure					
19	Lack of standard System					
20	Lack of ATM monitoring system					
21	unavailability of cash in the ATM machine					
22	Absence of support & maintenance off working hours					
23	Lack of continuous follow-up from responsible organ for the ATM					

24. other factors that affect the performance of CBE's ATM

25. Given the above factors do you think CBE's ATMs are performing as expected?

26. Do you think CBE's ATMs are providing customers with a service at their own convenient time (after bank hours, weekends and public holidays)?

27. What do you suggest should be done to improve current CBE's ATM performance?

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