ADDIS ABABA UNIVERSITY

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCES

SCHOOL OF INFORMATION SCIENCE

ADOPTION OF E-COMMERCE FRAMEWORK FOR ETHIOPIAN BANKS

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ADOPTION OF E-COMMERCE FRAMEWORK FOR ETHIOPIAN BANKS

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By Emishaw Tefera Tekle

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Declaration

This thesis has not previously been accepted for any degree and is not being concurrently submitted in candidature for any degree in any university.

I declare that the thesis is a result of my own investigation, except where otherwise stated. I have undertaken the study independently with the guidance and support of my research advisor. Other sources are acknowledged by citations giving explicit references. A list of references is appended.

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

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Abstract

E-commerce, a relatively new concept for Ethiopian market, is giving competitive advantages across the globe in both developed and developing countries. This study is about adopting e-commerce framework for Ethiopian banks.

The study has used technology organization environment (TOE) technology adoption model to identify the factors for e-commerce framework adoption for Ethiopian banks. It has also contextualized a questionnaire developed by Elizabeth and J. Michael (2004), in their research done for developing an e-commerce adoption model for developed countries Small and Medium Businesses. Following the survey results additional factors of e-commerce adoption are included on the TOE framework. Compatibility of the tailored e-commerce framework and external pressure are included as external factor of adoption to the existing TOE framework. Organizational support, organizational readiness, ease of use, usefulness, entrepreneurial orientation and perception of decision makers are also included as internal/organizational factors for e-commerce adoption. The survey responses are also used to perform strength, weakness, opportunity and threat (SWOT) analysis on each of the factors of e-commerce adoption. Based on the results a tailored e-commerce framework is proposed to suite the Ethiopian banks working environment by amending the national interoperability infrastructure–EthSwitch to interoperate among the member banks and the e-commerce application, 3-Domian secure (issuer, acquirer and interoperability), is interfaced with the merchant plug in at the merchant web site and rearranging the existing modules of the framework.

As a result, the tailored e-commerce framework that is “close-controlled and close-boundary” will resolve the issues of e-commerce fraud, security related issues, settlement related issues, legislation and policy related issues. Other researchers will use the proposed framework as a startup to further study cross boarder e-commerce implementation in Ethiopia by widening the operating environment to accept major international standard cards such as the Visa and MasterCard.

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Acronyms

ACS	Access Control Server
CVV	Card Verification Value
DOI	Diffusion of Innovation
EICTDA	Ethiopian ICT Development Agency
EthSwitch	Ethiopian National Switch
EFT	Electronic Fund Transfer
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
MCIT	Ministry of Communication and Information Technology
MICR	Magnetic Ink Character Reader
MPI	Merchant Plug In
PA DSS	Payment Application Data Security Standard
PAN	Primary Account Number
PCI DSS	Payment Card Industry Data Security Standard
PSS	Premier Switch Solutions S.C.
SADC	Southern African Development Community
SSL	Secure Socket layer
TAM	Technology Acceptance Model
TLS	Transport Layer Security
TOE	Technology, Organization, Environment
TPB	Theory of Planned Behavior
UNCITRAL	United Nations Commission on International Trade Law
USAID	United States Agency for International Development
UTAUT	Unified Theory of Acceptance and Use of Technology
VRML	Virtual Reality Modeling Language

CHAPTER ONE

1. Introduction

1.1. Background

Evolution of Information Technology has enhanced the society life from time to time in every direction. Almost all human activities are made easier with the help of information technology. The Internet is growing faster than all communication technologies that preceded it. In the world today almost all businesses have internet component unless they are either very small or locally focused. The Internet provides an environment in which automated functions can undertake significant business with little or no physical activity (Wondwossen and Tsegai, 2005).

In Ethiopia modern banking started in 1905 with the establishment of Abyssinian Bank, in 1908, three additional foreign owned banks were established. After being in the market for 26 years Abyssinian Bank was liquidated in 1931 and replaced by Bank of Ethiopia, which was the issuing bank until the Italian invasion of 1936. During the Italian occupation legal tender has been formed by bank of Italy bank notes. In 1943, the State Bank of Ethiopia was established. In 1963, these functions were formally separated and the National Bank of Ethiopia (the central and issuing bank) and the Bank of Ethiopia were formed (Bhaskar and Tewodros, 2011).

In 1974 the nationalized banks were reorganized and one commercial bank (CBE), a national Bank and two specialized banks namely the Development Bank of Ethiopia (DBE) and a Housing and Saving Bank, later renamed as Construction and Business Bank (CBB) which recently merged with commercial bank of Ethiopia were formed (Amdemikael 2012).

The Ethiopian People's Revolutionary Democratic Front declared a liberal economy system following the downfall of the Dergue regime in 1991. Following this monetary and banking proclamation of 1994 established the National Bank of Ethiopia as a judicial entity, separated from the government and outlined its main functions. Monetary and Banking proclamation No. 83/1994 and the Licensing and Supervision of Banking Business No. 84/1994 laid down the legal basis for investment in the banking sector (NBE, Habtamu, 2012).

Currently there are 16 private and Three government banks in the Ethiopian banking industry that are serving the around one hundred million population of Ethiopia with local and international banking services and products. There are no foreign banks in the country, and the system remains isolated from the effects of globalization. It seems that policy-makers fear that inviting foreign banks to invest might lead to loss of control over the economy (NBE, Bhaskar and Tewodros, 2011).

The development of Ethiopian banking system has largely been affected by the dominance of cash. In Ethiopia, cash is "king" since the bulk of personal consumption is done through the medium of cash. For big companies in particular, this has resulted in the problems of cost and delay, arising from the counting, bundling, transporting and depositing of large volumes of cash, as well as the risk and inconvenience of dealing with counterfeiting and the treatment of damaged notes (Ethiopian Bankers Association, 2009).

Electronic commerce (e-commerce) refers to using the Internet and intranets to purchase, sell, transport, or trade data, goods, or services. It is one of the facilities Information technology provided to make consumers and organizations able to handle business along with purchasing/selling goods and services online (Zhanwei, 2015).

'E-commerce' is a term used to describe the wide array of commercial activities carried out by electronic means that enable trade without the confines of geographical boundaries. It enables the transmission of voice, data, images and video information to take place in cyberspace by the use of the Internet. The internet is described as 'the world-wide networks of networks that are connecting each other into one single logical network all sharing a common addressing scheme (Annet,2008).

E-commerce can ensure fast, efficient and relatively cheap distribution of resources. The nearly instantaneous transmission of information, the speed at which transactions are concluded and the increase in the bulk of transactions completed can encourage even the smallest e-commerce enterprise owned by an individual to sell not only in national but also in international markets. The Internet has created a new route for the exchange of goods and services, the accessing of offshore facilities that have not been fully regulated. Global computer-based communications cut across territorial borders, creating a new realm of human activity and undermining the feasibility

and legitimacy of laws based on geographic boundaries. As the Internet ignores international boundaries, 'place' has little meaning in the networked world (Annet, 2008).

The Internet is the major factor in the approach of e-commerce which created a wide gap in every aspect of life among nations. In developing countries, many of the challenges to e-commerce implementations are the same challenges to the use of information and communication technologies in general. E-commerce has changed the way the world has been handling business and enforces technologists, economists, politicians, lawyers, bankers and others to rethink and reengineer work methods, policies, laws, and standards.

1.2. Statement of the problem

According to Japhet and Usman (2010) there are four major factors that hinder the adoption of e-commerce in developing countries. Infrastructure barriers such as Technology, Telecommunication, High access cost (connectivity) and Access to equipment; Lack of government policy & support barriers such as, Socio-cultural barriers such as Transactional trust, shopping as a social place, Limitation on personal contact, Language/content; and Socio-economic barriers such as Economic conditions, Educational system, Payment system and Logistics.

In their study to identify the factors for lack of e-commerce in developing countries, Sushil and Jatinder (2009) has listed the different factors such as the telecommunication infrastructure that includes the digital divide, opportunity of wireless technology, lack of electricity; user infrastructures that include internet access infrastructure, computer accessory and equipments; Business and service infrastructure that includes business infrastructure, distribution and delivery systems; regulatory issues, Absence of cyber law, security problems associated with online transactions, Intellectual property right issues.

Ethiopia as a developing country shares the hindering challenges of e-commerce adoption as evidenced by zero level implementation unlike the growth of internet and other Information technology related implementations.

Below are some of the factors that are challenging the implementation of e-commerce in Ethiopian banks according to different literatures:

- Lack of awareness and education;
- Non fitting e-commerce framework for Ethiopian Market;
- Security of the telecommunications infrastructure;
- Highly censored internet connection;
- Availability of financial infrastructure;
- Legal system;
- Government issues;
- Pricing structure;
- Social and psychological factors ;
- Language barrier (English is becoming the dominant language of the internet).

As can be seen in different literatures and the pre-study assessment, the difficulty and challenges to implement e-commerce in developing countries are not similar in nature. However, if the existing e-commerce framework depicted under Figure 2.2 is modified to fit the Ethiopian way of doing business and optimize it to fit the national policies and proclamations of the different government bodies, the country may benefit out of the implementation.
The research problem addressed in this study is:

- What appropriate e-commerce implementation framework could be developed to suit Ethiopian banks by modifying the existing framework?

1.3. Objective of the study

The main objective of the research is to adopt e-commerce framework for Ethiopian Banks and evaluate if e-commerce could act as one channel to be integrated to other e-banking menses to avail banking products and services to customers.

The specific objectives of this study are:

- Assess the potentials and risks of implementing e-commerce as one means of availing banking services and products;

- Assess the existing e-commerce practice in the Banking and related market sector;
- Assess the important factors on the decision to accept and use e-commerce applications as a customer, bank and merchant;
- Tailor the existing e-commerce framework to suite Ethiopian Banks.

1.4. Operational Definition

E-commerce - E-commerce in this study is considered as a means of buying or selling goods and services on the online environment through the use of internet as connectivity means. The transactions could have financial and/or non-financial nature.

Adoption - Adoption in this study is used as a mechanism to choose and use existing means of handling things by modifying or adjusting to fit the intended purpose. It includes theories, frameworks, ideas, policies, strategies or plans.

Framework–Framework in this study is used as a structure or arrangement that includes the concepts, assumptions and building blocks of the idea to reflect.

1.5. Significance of the study

The research focuses on how to tailor existing e-commerce framework depicted under Figure 2.2 for Ethiopian banks and gives direction and resolution to issues raised in the research objective. Below are significant of the research.

- The research will tailor the existing e-commerce framework depicted under Figure 2.2 to suit Ethiopian banks;
- The research will direct how banks could avail banking services and products through e-commerce that adds up to the current banking delivery channels;
- The research will be used as an input to the National Bank of Ethiopia in relation to promoting cashless society and will also help in reducing bank note printing cost;
- The research will help policy makers and legislators to include e-commerce related items in the list of their policy and legislation;
- The research will address different issues raised such as security, legal, fitness, language and others in relation to e-commerce implementation;

- The research will be used as a starting point for other scholars who would like to study further about e-commerce implementation challenges and related issues in Ethiopia.

1.6. Scope of the study

This study will focus only on tailoring the existing e-commerce framework depicted under figure 2.2 for Ethiopian banks. Different merchant outlets, Small and medium size enterprises, micro finances and item delivery companies like the Ethiopian Postal Services that could have direct or indirect effect on the existing e-commerce framework adoption are not in the scope of this research.

1.7. Organization of the research

The research is organized in to six chapters. The first chapter deals with the introductory and research problem part of the research in which back ground of the research, statement of the problem, research problem, objectives of the study, significance, limitation of the study , and organization of the study are incorporated.

The second chapter deals with the literature review in which variety of published and unpublished sources are summarized and discussed. Modern banking in Ethiopia, Technology adoption models for e-commerce, Technology adoption in Ethiopian Banks, the readiness in e-commerce adoption in Ethiopia, E-commerce adoption in developing countries, the legal framework for e-commerce adoption and other related topics are discussed.

Chapter three incorporate research design and methodology, which describes the methodology undertaken, research approach, the research strategy, data collection, pilot on questionnaire, sampling technique and questionnaire administration for the intended analysis strategy.

Chapter four discusses survey results presentation, analysis and interpretation.

Chapter Five will focus on discussing the proposed e-commerce framework that could suit Ethiopian banks.

Conclusion, recommendation, implication, limitation and future research guidance are discussed and presented in the Sixth chapter.

CHAPTER TWO

2. Literature Review

2.1. Introduction

Information and Communication Technology (ICT) adoption has a proven record of obtaining significant economic, social and environmental benefits at local, national and global levels. In the developed world, ICT is the pivot of every walk of life. With the help of ICT, developed countries have successfully transformed their economy to become highly successful.

Technology adoption happens around us all the time and is important because it is the vehicle that allows most people to participate in a rapidly changing world where technology has become central to our lives. Understanding the factors influencing technology adoption could help predict and manage who adopts, when, and under what conditions. If we are able to answer these questions it will be possible to assess where we are in the technology adoption process.

As stated in bridges-to-technology[1], technology adoption can be defined as a process that begins with awareness of the technology and progresses through assessment, Acceptance and learning steps and end in appropriate and effective usage of the technology for the intended purposes. Every technology goes through an adoption cycle ranging from early adopters to people who never adopt. Each technology has a maximum market potential based on the total number of people who are willing and able to adopt.

2.2. Definition of e-commerce

According to Turban et al (2008) electronic Commerce (e-commerce) is the process of buying, selling, transferring, or exchanging products, services, and/or information through the use of internet and the World Wide Web (in short, the web) to enhance business activity. E-commerce can also be defined from the following perspectives.

[1] http://www.bridges-to-technology.com, accessed on June 23, 2017

- Business process: from a business process perspective e-commerce is doing business electronically by completing business process over electronic networks, thereby substituting information for physical business process;
- Services: from this perspective e-commerce is a tool that addresses the desires of governments, firms, consumers, and management to cut service cost while improving the quality of customer service and increasing the speed of service delivery;
- Learning: e-commerce is an enabler of online training and education in schools, universities, and other organizations including businesses;
- Collaborative: e-commerce is a framework for inter and intra-organizational collaboration;
- Community: e-commerce provides a gathering place for community members to learn, transact, and collaborate;

Another definition for e-commerce could be the use of Internet and intranets to purchase, sell, transport, or trade data, goods, or services (Efraim et al, 2015).

2.3. Types of e-commerce

A common classification of e-commerce, based on Rania (2011), is by the type of the transactions and the transacting members. The major types of e-commerce transactions are listed below.

- **Business-to-Business (B2B):** Business-to-business (B2B) e-commerce refers to transactions between and among organizations which covers majority of e-commerce volume.
- **Business-to-Consumer (B2C):** Business-to-consumer (B2C) e-commerce includes retail transactions of products or services from businesses to individual shoppers. The typical shopper at Amazon.com is of this type. Since the sellers are usually retailers, we also call this type e-tailing.
- **Business-to-Business-to-Consumer (B2B2C):** In business-to-business-to-consumer (B2B2C) e-commerce, a business (B1) sells a product to another business (B2). B2 then sells, or gives away, the product to individuals who may be B2's own customers or employees.

- **Consumer-to-Business (C2B):** In consumer-to-business (C2B), people use the Internet to sell products or services to individuals and organizations. Alternatively, individuals use C2B to bid on products or services.
- **Intra-business e-commerce:** The intra-business e-commerce category refers to e-commerce transactions among various organizational departments and individuals.
- **Business-to-Employees (B2E):** The business-to-employees (B2E) category refers to the delivery of services, information, or products from organizations to their employees. A major category of employees is mobile employees such as field representatives or repair services that go to customers. E-commerce support to such employees is also called business-to-mobile employees (B2ME).
- **Consumer-to-Consumer (C2C):** In the consumer-to-consumer (C2C) e-commerce category individual consumers sell to or buy from other consumers. Examples of C2C include individuals selling computers, musical instruments, or personal services online.
- **Collaborative Commerce:** Collaborative commerce (c-commerce) refers to online activities and communications done by parties working to attain the same goal. For example, business partners may design a new product together.
- **E-Government:** In e-government e-commerce, a government agency buys or provides goods, services, or information from or to businesses (G2B) or from or to individual citizens (G2C). Governments can deal also with other governments (G2G).

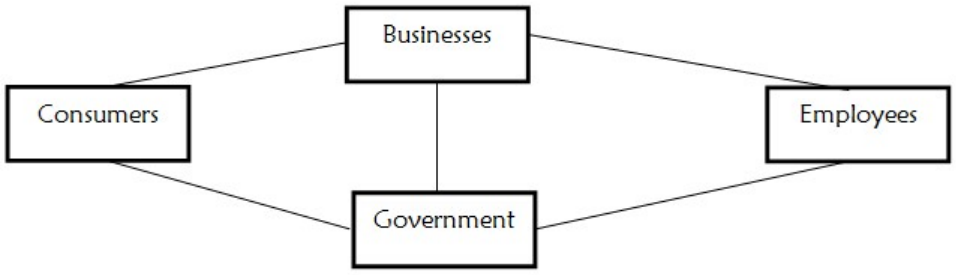

Figure 2.1 – Types of e-commerce transaction flows (source – electronic commerce a managerial and social networks perspective, 8th edition)

According to Efraim et al, (2015) E-commerce can also be divided in to two; either pure or partial e-commerce depending on the nature of its three major activities; ordering and payments, order fulfillment, and delivery to customers. Each activity can be of physical or digital. Thus, organizations that handle the three activities digitally are considered to be pure e-commerce

organizations and those that handle any of the three activities physically are considered to be partial e-commerce organizations. If any organization handles the three basic activities physically then the organization is referred as brick and mortar. For example, purchasing a computer from Dell's website or a book from Amazon.com is partial e-commerce, because the merchandise is physically delivered. However, buying an e-book from Amazon.com is pure e-commerce, because ordering, processing, and delivery to the buyer are all digital.

According to Efraim et al (2015) a standard e-commerce framework should contain the e-commerce application, people, public policy, marketing & advertisement, support service, business partnership, infrastructure and management at the different level of the framework. The below figure depicts the framework used by Efraim et al (2015) for a standard e-commerce implementation.

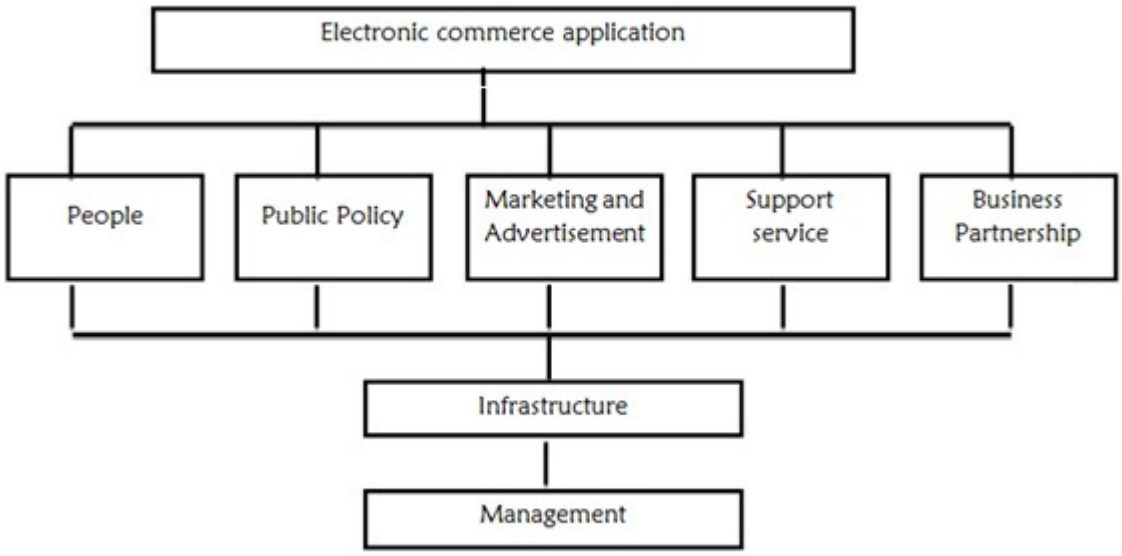

Figure 2.2- Standard e-commerce framework (source: electronic commerce a managerial and social Network perspective, 8th edition)

- The e-commerce application includes direct marketing, could be used to search jobs, could be used to handle online banking, e-government, e-purchasing, B2B exchange, C-

commerce, social commerce, e-learning, m-commerce, auctions, travel, online publishing, consumer services, collaboration 2.0.

- Support area that includes people, public policy, marketing and advertisement, support service and business partnership.
    i. People includes buyers, sellers, intermediaries, service, IS people and management
    ii. Public policy includes taxes, legal , privacy issue, regulations, compliances, and technical standards
    iii. Marketing and Advertisement includes market research, promotions, web content and targeted marketing
    iv. Support service include order fulfillment, logistics, payments, content and security systems development
    v. Business partnership includes affiliate programs, joint venture, exchanges, e-marketplace and consortia.
- Support services:
    i. Common business service infrastructure (security, smart cards/authentication, electronic payments, directories/catalogs, hardware peripherals
    ii. Messaging and information distribution infrastructure (e-mail, HTTP, chat rooms), web 2.0 tools
    iii. Multimedia content and network publishing infrastructure (HTML, JAVA, XML, VRML)
    iv. Network infrastructure (telecom, cable TV, wireless internet, WAN, LAN, intranet, extranet) wifi, wimax, cell phones
    v. Interfacing infrastructure (with database, business partners application, web services)
- All of these components require good management practices. This means that organizations need to plan, organize, motivate, devise strategy, and restructure processes, as needed, to optimize the business use of e-commerce models and strategies.

According to Dessalegn and Dagmawi (2014), The Ethiopian government has given recognition for ICTs as a major enabler of social and economic changes which has been demonstrated in the

five years general transformation plan of the country. The attention given to the telecom sector in the five years plan is quite promising in that it could be seen as a new dawn that can put the country in good stead in the global arena. The achievements of the major milestones set out in the five years plan would herald large scale improvements as well as expansions in telecommunication services in the country's history which would also in the global arena help the country improve its ranking in the digital economy.

In Ethiopia e-commerce implementation is dependent on the efficiency of the single state owned telecommunication facility and ICT infrastructure, expansion of ICT's use and diffusion, quality of service, cost of infrastructure usage, secure electronic payment system, efficient regulatory framework, widespread awareness and literacy among the public. Due to these issues only few organizations have tried to implement e-commerce through different mechanisms; among them are ethiogift, ebirana and Kaymu Ethiopia.

Ethiogift is a USA based company that works in collaboration with Ethiopian dealers to deliver gift items ordered from around the world. All payments and commissions are paid through credit cards as the company is United States based[2] and the gift items are bought from the local market and delivered to customers.

Ebrana.com is focused on selling e-books by working with Dashen Bank modbirr payment facility, where at the end of the transaction the customer will get an email containing the download link of the book ordered[3].

Kaymu is Pakistani based company with largest online shopping community around Middle East. At Kaymu, nearly all items are sold ranging from fashion cloths and electronics to jewelry and books. Kaymu Ethiopia is established with cash on delivery payment method of e-commerce strategy. After an order is placed on the e-commerce site of Kaymu, customer will receive a confirmation email. The buying and delivery price, fixed and non-negotiable, will be displayed at the time of purchase for decisions of delivery means[4].

[2] www.ethiogiftshop.com, accessed on June 23, 2017
[3] www.ebrana.com, accessed on June 23, 2017
[4] www.kaymu.com, accessed on June 23, 2017

2.4. Technology adoption models – e-commerce adoption

According to Tiago and Maria (2012) there are many theories used in IS research. The most commonly used ones are the technology acceptance model (TAM), theory of planned behavior (TPB), unified theory of acceptance and use of technology (UTAUT), Diffusion of Innovation (DOI), and the Technology-Organization-Environment (TOE) framework. TOE framework is one of the models that focus on technology adoption frameworks that are at the firm level whereas the others are considered at the Individual level.

The scope of this study, adopting e-commerce framework for Ethiopian banks is a study that focuses on organizational level of the respective banks. Tornatzky & Fleischer (1990) has developed the Technology-Organization-Environment (TOE) framework, which identifies three basic Factors for the adoption of new technological innovation i.e, technological factors, organizational factors and environmental factors. Technological context describes both the internal and external technologies relevant to the firm. This includes current practices and equipment internal to the firm as well as the set of available technologies external to the firm. Organizational context refers to descriptive measures about the organization such as scope, size, and managerial structure. Environmental context is the arena in which a firm conducts its business; its industry, competitors, and dealings with the government (Tornatzky and Fleischer, 1990).

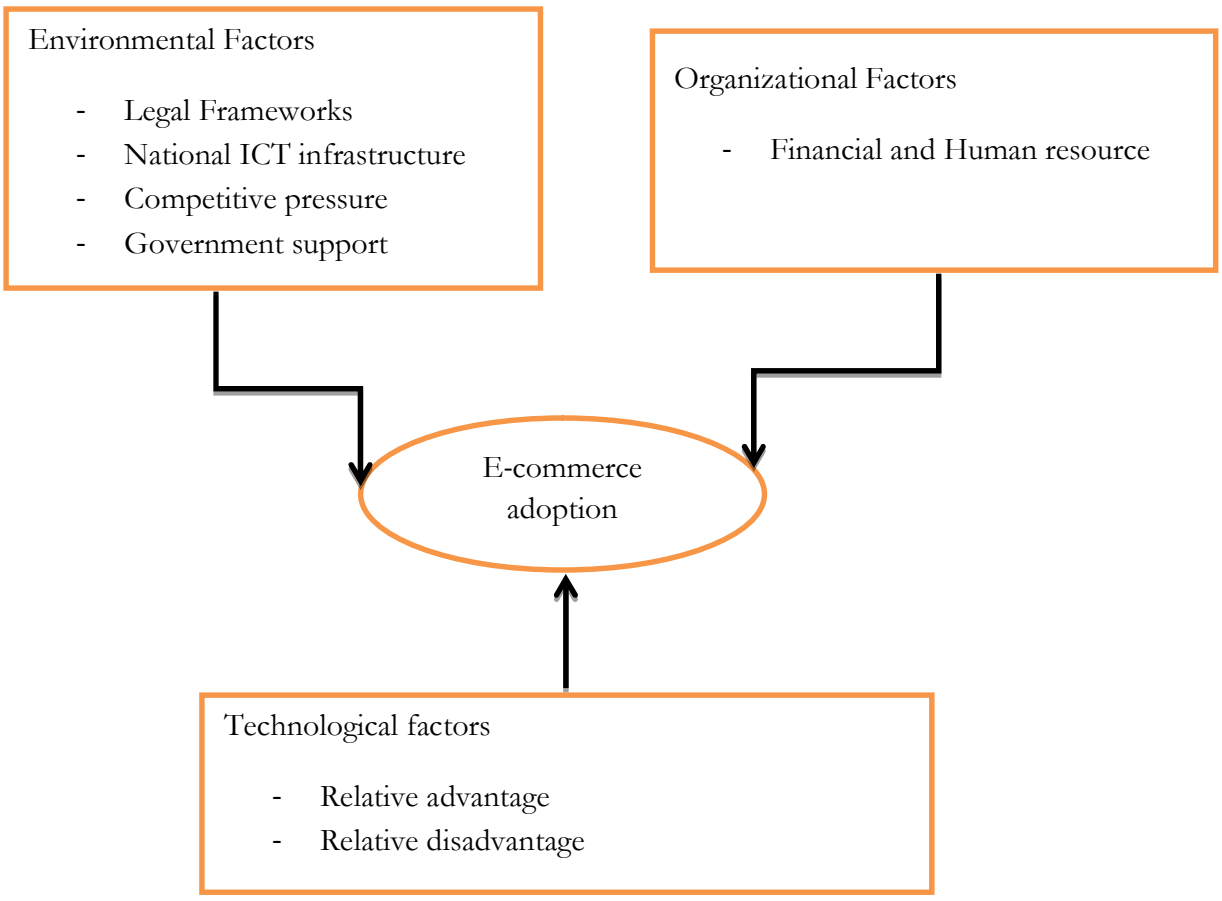

Figure 2.3- TOE framework (Tornatzky and Fleischer, 1990)

2.5. Technology Adaption in Developing Country Banks

A study in Nigeria by Agboola (2005) on how banks and their ever changing business environment have been benefited from wide varieties of industry specific or standard technologies available: the use of centralized core banking system, centralized WAN and LAN networks, the use of Mobile banking, the use of Internet banking, wide distribution of Automatic teller machine (ATM) Terminals, wide distribution of Point of Sales (POS) terminals, the use of magnetic ink character reader (MICR) in cheque, the use of electronic fund transfer switches, electronic data interchange and computerized credit rating.

A case study in Kampala by Namirembe (2007) has investigated the influence of ICT on banking industry specifically three major e-banking technologies namely the Mobile banking, the Internet banking, and the use of electronic funds transfer. ICT has become part of everything, banks are trying to achieve and striving to provide productivity, improved efficiency, customer relation

services, quality of service, cost effective transaction, better competitiveness, positive return on investment, and effective marketing function.

A research to study the relationship between ICT adoption and efficiency in banks is done in thirteen commercial banks of Nigeria (Stella, 2010).It was discovered that information technology improved the efficiency of such banks after their technology adoption and more would be achieved if changes around ICT could be facilitated. The suggested improvements are increased investment in information communication technology by banks, diversification of software packages for greater operational efficiency and strengthening of an enabling environment with respect to improved electricity supply, more favorable ICT gadgets importation policies and encouragement of local industries that are into information technology acquisition, production and assembly by the government to achieve optimal performance and greater utilization of information communication technology devices.

In Ethiopia e-banking adoption started with the commercial bank of Ethiopia (CBE) in 2001 by introducing ATM operations through local debit cards to local customers. CBE had introduced Visa card acceptance since November 2005. However the visa membership had not been successful for the first few years. Despite being the first to introduce e-banking through ATM by acquiring local and Visa branded international cards, CBE had lagged behind Dashen bank, which worked aggressively to maintain a lead in E-payment system (Ayana**,** 2014).

Following CBE and Dashen, Wegagen and Zemen bank has joined the e-banking industry by introducing the similar functioned local debit card services through ATM and POS terminals located at different locations of the country where CBE and Dashen has the lion share in the number of ATM and POS terminals deployed and distributed all over the country (Ayana**,** 2014).

Premier Switch Solutions S.C. (PSS) has established as a consortium in February 2009 by three private banks; Awash International Bank, Nib International Bank and United Bank. The goal has been to start a comprehensive and equipped payments and cards processing center in Ethiopia, to manage and operate the functions of Cards issuing, merchants acquiring through POS terminals and ATM driving. In addition to the above providing third party processing services to other banks and financial institutions in Ethiopia has been the goal. The company's adoption of state of the art centralized electronic fund transfer switch technology and joining the e-banking market

has enhanced the availability of acquiring terminals and add more to the customers' experience of debit card usage (Premier Switch Solutions and S2M, 2012).

Later in 2012 and 2013 Addis International Bank, Berhan Bank and Cooperative Bank of Oromia has joined the PSS consortium as a shareholder and member to the earliest group has shifted the way the e-banking industry has been operating by increasing the number of Acquiring terminals and customers experience.

Zemen Bank, the only Ethiopian bank with the idea of single branch banking had launched its internet banking, a service that has been new to the Ethiopian banking industry in the year 2010. 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 was 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 (NBE, Zemen Bank website).

Below is a table that summarizes the numbers of ATM terminals, POS terminals, debit cardholders, and Mobile Banking users in Ethiopia for the last five years. (Source – CBE e-payment directorate feasibility study, ND)

Channels	2011/12	2012/13	2013/14	2014/15	2015/16
Number of ATM Terminals	100	459	851	1,220	1,810
Number of POS Terminals	771	1,094	1,282	3,332	11,169
Number of Debit Cardholders	75,404	617,143	1,404,362	2,282,747	3,878,009
Number of Mobile Banking users	-	9,236	119,912	604,246	1,447,653

Table 2.1- The different e-payment related infrastructures in Ethiopia as of 2016 fiscal year

The implementation of the Ethiopian National Switch (EthSwitch) by a shared investment from all the banks in the nation has changed the way e-payment has been done from independent banks way to sharing a national e-payment infrastructure by all banks in the nation. The National Switch (EthSwitch) has interfaced all the banks in Ethiopia for national interoperability and national clearing and settlement. In addition to the national interoperability and clearing settlement, EthSwitch has also interfaced five of the private banks, namely Bunna International

Bank, Enat Bank, Oromia International Bank, Lion International Bank and Debub Global Bank, for card banking and the related card personalization service provision. Due to the national interoperability any customer of any Bank can do ATM and POS related card banking transactions in any other bank acquiring terminal (ATM and POS) throughout the nation (Ethiopian Bankers Association, 2009).

According to Ethiopian Bankers Association (2009) EthSwitch's payment system is implemented in such a way that it would be possible to interface different e-payment solutions to further support the national interoperability. For instance any of the member banks mobile banking solution could be interfaced with the national switch to interoperate with any other bank mobile banking solution so that customers of one bank could transfer money to account of another customer on the other bank. Hence, the same infrastructure is readily available to implement a shared e-commerce framework to reach every bank customer and the respective merchants linked to the e-commerce application.

2.6. Readiness on e-commerce implementation in Ethiopia

According to Oxley and Young (2001) in order for a country to start the business of e-commerce, the availability of physical infrastructure is a must to have. Availability and access to personal computer and internet at a reasonable cost are minimum requirements. However adequate confidence on the integrity of the online payments is assumed to bring more people to actively participate in the online payment system.

E-commerce readiness is defined as the measure of the availability of necessary preconditions to adopt e-commerce. Technological, Political, Social and Legal factors are some of the precondition factors that will inhibit or allow the adoption of e-commerce (Elizabeth et al, 2010).

According to Choucri et al (2003) e-readiness is defined as the ability to pursue value creation opportunities facilitated by the use of the Internet and represents different thing to different people in different context for different purposes. Following the robust foundations of e-readiness of a country successful e-business and e-commerce could take place.

On their study in e-commerce readiness in Ethiopia: A macro level assessment, Elizabeth et al (2010) states that various models to measure the readiness of e-commerce have been used by different nations and regions. A frame work developed by the Asia Pacific Economic Cooperation (APEC) in 2001 has stated three main issues such as the readiness in terms of potential usage and access of technological infrastructure; the Intensity in terms of transaction and business size; and the impact in terms efficiency gain and employment/skill composition.

According to the Information economy report by UNCTDA (2015) four factors are used to measure readiness of countries on e-commerce implementation. Internet use, secure services, credit card penetration and postal delivery are used as B2C e-commerce readiness indicator to index developing countries. The Index allows countries to compare their readiness with others and also indicates their relative strengths and weaknesses in different elements of the e-commerce process, such as the quality of Internet infrastructure and the availability of payment and delivery solutions. On the same report Ethiopia is listed as a country with increasing B2C e-commerce from 20 million USD in 2009 to 60 million USD in 2012. The same report has also indicated that Ethiopia uses buy only B2C sites that operate in personal account payment method. Regarding the availability of legislation, Ethiopia is found to be working on drafting the different legislations such as e-transaction legislation, consumer protection legislation, consumer privacy and data protection legislation and cybercrime legislation.

Elizabeth et al, (2010) has discussed the different models to measure e-commerce readiness. Some of the models focus on discussing on the general e-readiness that cover a wider perspective than measuring e-commerce readiness, some other focus on the narrower perspectives focusing on infrastructure and manpower while others are focusing on a wider perspectives focusing on e-commerce readiness. Some of the models discussed in the same study are Networked readiness index, The Brazilian e-commerce readiness and diffusion model and the Asia-Pacific economic cooperation e-readiness. Generally Elizabeth et al, (2010) has indicated that there is no single standard to measure e-commerce readiness of a country and concluded that Ethiopia should develop a new model based on the existing ones that will suit current conditions.

2.7. E-commerce Adaption in Developing Countries

According to Majed (2015) Industry environment, location, and the state of the infrastructure are influences for the intention of firms to adopt new technologies. E-commerce is a technology that was launched in industrialized countries, therefore, many theories and frameworks have been developed for e-commerce adoption in these countries in order to increase the rate and success of adoption. However, these studies cannot be applied in developing countries because these countries are different in their cultures, business conduct and regulatory environments.

E-commerce adoption in Ghana has been virtually non-existent due to a lack of legislation, telecommunications infrastructure and competencies, high costs, and a lack of consumer demand (Majed, 2015). In Egypt global operators, suppliers, and consumers for small tourism operators has pressured to improve their Internet presence, as 59% did not even have a website. The barriers included poor infrastructure and a lack of computer literacy (Abou-Shouk and Megicks, 2013).

According to Sherah (2016) to explore the relevance of e-commerce and the opportunity of its growth in developing countries, it is important to understand national factors that affect e-commerce adoption. Different literatures suggested a number of such factors as summarized in Figure 6 below. The factors are also linked to one another to show the influence of each factor on other factors.

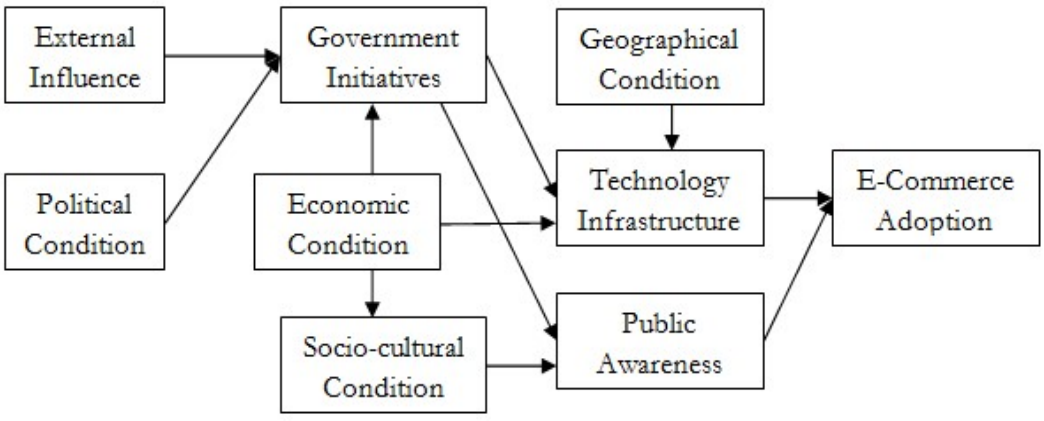

Figure 2.4 - Factors Affecting e-commerce Adaption (Sherah, 2016)

While describing Figure 2.2, Sherah (2016) states that one of the major factors that affect e-commerce adoption are government initiatives of a country. The effects could be in terms of ICT usage, education and establishment of the required frameworks. The initiatives could be affected by the country's political condition, economic condition, and external influence from other countries. Political situation is also a key factor for e-commerce growth in a country. Countries with unstable political condition are less likely to give attention enough attention for e-commerce development.

The same study by Sherah (2016) has considered economic condition of a country as one of the major driver for e-commerce adoption. The technology on which e-commerce relies on is relatively expensive that directly affect the implementation of e-commerce. Technology Infrastructure is also found to be one of the factors that affect e-commerce implementation as e-commerce depends entirely on telecommunication infrastructures, efficient logistic infrastructures, reliable and secure payment infrastructures.

Geographical condition of a country is also considered as a major factor in Sherah (2016) study. The adoption of e-commerce also depends on the cultural and social environment. In some countries, people consider shopping as a recreation. The level of education, the availability of IT skills, the level of penetration of personal computers and telephone within the society also affect the growth of e-commerce. The lack of awareness of the use of ICT can also hinder the growth of e-commerce. In some developing countries, many people are only aware of limited e-commerce applications such as chat, email and browsing websites. As a result, many organizations have not considered exploiting the potential of e-commerce to improve their business operations.

External Influence is also found to be one of the major factors that affect the implementation of e-commerce in a country. The reputation of credit card frauds in some countries caused blockages of several IP addresses by a number of commercial sites from other countries. This situation can cause those countries to be expelled from global business transactions and hence, limit the usefulness of e-commerce (Sherah, 2016).

Abou-Shouk and Megicks (2013) study in Egypt for the tourism industry has concluded that resources limitation, funding problem, the lack of governmental support, a lack regulatory system & consumer culture and the lack of public infrastructure readiness were the common

barriers for e-commerce implementation. Another study done in Malaysia for different industries by Alam et al (2011) has concluded Relative advantage, compatibility; organizational readiness, manager's characteristics, and security have significant impact on e-commerce adoption.

Moayyad (2014) have done an assessment on the relationship between e-commerce adoption and business strategy on Jordan telecommunication companies and found out that lack of efficient and developed telecommunication infrastructure was the main factor for e-commerce adoption at organization level in communication industry. Lloyd and Jan (2011) has also investigated the role of ICT with in SME in South Africa and found out weakness of telecommunications and legislation, and high levels of perceived fraud are some of the major challenges that hinder the diffusion of e-commerce adoption in the country.

Based on the different researches summarized in the above paragraphs, different factors are the obstacles to e-commerce adoption in developing countries. Therefore, developing countries are considered to be very 'heterogeneous' in terms of political systems, economies, ideologies, demography, cultures, race, and so on; thus, such factors which might contribute or impede the adoption of e-commerce in one country may not be applicable in another (Abou-Shouk and Megicks, 2013).

2.8. Legal framework for e-commerce

Wondwossen and Tsegai (2005) have discussed the United Nations and SADC model laws for e-commerce that formulate the legal framework for e-commerce. The United Nations Commission on International Trade Law (UNCITRAL) created by the United Nations General Assembly on December 1966. The mandate of the commission was to further the progressive harmonization and unification of the law of international trade and in that respect to bear in mind the interests of all peoples, in particular those of the developing nations, in the extensive development of international trade.

The UNCITRAL formulated a model law on e-commerce in 1996. The need to formulate model legislation arose in response to the fact that in a number of countries the existing legislation governing communication and storage of information is inadequate or outdated because it does not contemplate the use of electronic commerce. In some cases, existing legislation imposes or

implies restrictions on the use of modern means of communication, for example by prescribing the use of 'written', 'signed' or 'original documents'. Moreover, the model law is envisaged to help remedy the problems that stem from the fact that inadequate legislation at national level may create obstacles to international trade (Wondwossen and Tsegai, 2005).

The SADC Model Law on Electronic Transactions and Data Protection was another initiative sponsored by the United States Agency for International Development (USAID) to develop common legal and regulatory framework to assist the Southern African Development Community (SADC) member countries interested in adopting or enacting legislation, regulation and policies related to electronic commerce. This is an integral part of the need to start building an appropriate legal framework to facilitate ICT development expressed in the SADC policy guidelines of 2000. In August 2001, the Heads of State of all the 14 SADC states declared to develop a model law for e-commerce in the region. The draft version was tabled and discussed at the SADC Workshop on Harmonization of E-commerce laws held in Johannesburg, South Africa November 2003 (Wondwossen and Tsegai, 2005).

The need to harmonize e-commerce laws in the SADC member countries arises from the following reasons according to the report on the workshop.

- It is critical that e-commerce laws be introduced to enable SADC Member Countries to globalize and leapfrog into the Cyber Age.
- Borderless e-commerce is a reality and it would be better for legal certainty and facilitation of international trade if the laws of different countries were similar as possible so that they present few surprises to those who embark on e-commerce in any part of the world.
- Uniform laws throughout the SADC Member countries would allow them to learn from each other's experiences in the implementation and enforcement of such laws.

The SADC Model Law is not intended for adoption in whole or in part by SADC countries; instead, it presents a range of policy options that a country must consider as it contemplates legal reform in the information technology sector. It is also claimed this range of options are exhaustive depending on the needs of the particular jurisdiction.

A comprehensive legal framework aimed at 'facilitating' instead of 'strictly regulating' e-commerce is a crucial prerequisite for its growth. Growth of e-commerce and ICT play a key role in leveling the field for the developed and developing countries. Hence, efforts are under way to create a favorable and facilitatory legal regime as well as technological infrastructure for e-commerce in different countries (Wondwossen and Tsegai, 2005).

Ethiopia has not yet set a comprehensive legal framework for e-commerce in general. According to Wondwossen and Tsegai (2005) the reason for the not yet established legal framework is mainly the inexistence of large pool of e-commerce activities. However Ethiopia is now drafting different legislations that are focused on implementation of e-commerce as online purchasing activities are now increasing from time to time (UNCTDA, 2015). Some African countries such as Tunisia and Egypt have developed a comprehensive legal and regulatory framework for e-commerce. Tunisia has already passed detailed and progressive Internet legislation (Wondwossen and Tsegai, 2005).

With regard to the legal framework for e-commerce in Ethiopia, the National bank of Ethiopia does not clearly state its role to oversight and regulate the payment system in Ethiopia in its governing legislation. Due to this the legal framework governing e-commerce related payments in Ethiopia has some major shortcomings such as lack of significant penalties for frauds and other abuses (Wondwossen and Tsegai, 2005).

According to Adam (2010) as e-commerce involve transactions over the cyberspace or Internet which is boundary-less, contractual disputes and other related conflicts cannot be avoided. The problem is how to answer some legal and other uncertainty issues that are likely to face e-commerce environment. For instance where the dispute arises between two contracting parties from different countries it might be difficult to determine which law to apply and which country will have jurisdiction. Apart from legal uncertainties, it might also be hard to determine the law enforcement agencies that can have power to exercise their jurisdiction on these cases.

The Ethiopian ICT Development Agency (EICTDA) had arranged various consultative meetings with key stakeholders on developing e-commerce law for Ethiopia. One of the consultative meetings had been on January 2010. The Agenda had been to gather views and more information from the stakeholders to make the development of e-commerce law project more participatory.

Stakeholders consulted had been the Ministry of Justice, the National bank of Ethiopia, Ministry of Trade and Industry, the Revenue & Customs Authority, Ethiopian Commodity Exchange, Ethiopian ICT Development Agency (EICTDA), Ministry of Revenue and Ministry of Finance. From the consultative meeting it was revealed that some of the Government agencies and departments had started implementing e-government and e-commerce like services (Adam, 2010).

The National Bank of Ethiopia had been undertaking the e-payment system project which was completed by the end of March 2010. The second stage of the project had been the preparation of the draft law on e-payment system. The Ministry of Trade and industry had also been implementing e-Government through e-services project. The e-services allow people to apply, file and register their business, trade and companies online; also apply for the business licenses electronically. Furthermore, the Revenue and Customs Authority had a project on e-taxation as part of the implementation of e-government. Tax payers could have an opportunity to file their returns and make payments electronically (Adam, 2010).

According to Adam (2010) the consultative meeting by the Ethiopian ICT Development Agency had observed that the lack of legal and regulatory framework to support the initiatives on e-commerce and e-Government at various levels. There had also been the need of technical support and capacity building in effectively implementing these initiatives and projects. The consultative meeting participants, at the end of the meeting, had decided to have a project in developing e-commerce low in Ethiopia with two phases; phase one on developing the legislation in line with e-payment system law and phase two on developing cyber security law (Cybercrime), Data Protection and Privacy Law.

Socio cultural attitude had been one of the problems in e-commerce related activities. According to (Wondwossen and Tsegai, 2005), in their attempts to introduce and adopt new technologies such as electronic payment systems, the Dashen Bank, Total Ethiopia, and the Ethiopian bank, have faced some problems. The society as well as the staffs had resisted the technological changes which had been attributed to lack of awareness on the benefits of the new technologies, fear of risk, lack of training, and tendency to be content with the existing structure instead of looking for better opportunities (conservatism).

The current international e-commerce framework works fine for countries that has the e-commerce policy in place (Social security number usage policy, sending a broadcast email message policy, sanitization and disposal of information resource policy, registration and protection of system policy, registration and protection of end points policy, network protection policy, Information security risk management policy, information security charter, information resource aces control and log management policy and email usage policy) (Paulos, 2015), for countries that issue international standard payment cards (debit, credit and charge) that could be settled and reconciled with any international currency with the card issuer banks. However the frameworks will not suite Ethiopian banks as:

- Ethiopia has National ICT policy, in which there is no single policy that specifically concern e-commerce in any of its form. Without such policies the development of e-commerce will take very slow progress (Paulos, 2015).
- It could be seen that due to single state owned internet service provider the e-commerce infrastructure will get inefficient, if e-commerce is implemented.
- The different legislations (such as the National Payment system proclamation, telecom fraud offence proclamation, and the consolidated foreign exchange directives of National Bank of Ethiopia) didn't talk about e-commerce as an object of regulation (Paulos, 2015).
- The government bodies (such as Information Network Security Agency/INSA, Ministry of communication and Information technology/MCIT and the National Bank of Ethiopia) that should have institutional control of the e-commerce infrastructure like technological setup, e-payment system and e-shipment mechanism lack the effort for such control. (Paulos, 2015)
- The preferred payment mechanism for e-commerce transactions has to be done in Ethiopian currency and the transaction has to be within the Ethiopian boundaries (Art. 4.2 of Directive number FIS/01.2012).
- The payment mechanism on the current e-commerce systems is mainly through credit cards, which is not yet allowed for the general public by the National Bank of Ethiopia.
- In almost all e-commerce sites the setup is in such a way that merchant- issuer bank transactions are settled and reconciled with foreign currency mainly USD.
- Almost all e-commerce sites are not customized to entertain Ethiopian customers as they are developed with foreign language, mainly English language.

- Lack of awareness on customers and merchants – large volume of mobile customers' of Ethio Telecom (mobile and internet service provider in Ethiopia) use internet data for accessing social Medias, however the tendency to access e-commerce sites on the same device to do shopping is not advanced. Majority of merchants are also comfortable to do business on physical existence of the customer with physical cash exchange rather than settling through banks.

Currently the Ethiopian Government is working on drafting different legislations and policies among which the e-signature low, computer misuse act, data protection act and electronic transactions act are the ones related to the development of the e-commerce framework.

According to Ministry of communication and Information Technology (MCIT) e-government strategy and implementation plan(2011), the growth of the local ICT Sector cannot be promoted through addressing the local market alone. E-commerce is proposed as solution to tap potential markets across the world in a very cost effective manner. Ethiopia with its diverse cultural backgrounds of its people and varieties of natural resources has a rich heritage of crafts skills. Handicraft, Leather and textiles are some of the important and widely spread occupations of most Ethiopians next to agriculture. Thus it would be important to design appropriate mechanisms that will help such small and middle level enterprises to participate in product modernization and export market development especially in leather and leather products, textiles, horticulture, etc., in which the country has comparative advantages.

2.9. Pre-assessment study

A pre-study assessment interview has been done to three banks e-banking managers (namely Bunna International Bank S.C., United Bank S.C. and Enat Bank S.C), marketing manager of Shoa hypermarket market, sales representatives of four shopping centers in Zefmesh grand mall and five randomly selected walking customers of Shoa hypermarket and Zefmesh grand mall on benefits of implementing e-commerce application that is interfaced with Ethiopian banks (the interview guide is attached as Annex I).

As a result of the pre-study assessment study, The Banks has a strategic plan to implement e-commerce as one means of availing banking products and services as it will help them get more deposit, transaction commission fees, help them reduce operational costs of their branches and technology driven services and products availability to their esteemed customers, However they have issues on the existing framework as it might not fit Ethiopian way of doing business, the current ICT infrastructure security, internet service availability, the national ICT policy and e-commerce related regulation on the National Bank of Ethiopia might not allow the implementation of e-commerce as it is.

The merchants, one branch of Shoa hypermarket market and the selected Zefmesh grand mall shopping centers, the two largest merchant outlets in Ethiopia, had showed interest in having an e-commerce implemented that could operate in local currency as it will create them National reach, 24/7open business opportunity from anywhere, lower communication cost, and getting competitive advantage due to innovative business approach.

Majority of consumers of the two merchants, Shoa hypermarket and Zefmesh shopping centers, also respond positive in doing their procurement online through e-commerce sites. Especially for those items they procure regularly e-commerce gives them flexibility in choosing from multiple vendor and style, do shopping any time from their location and can download digital products easily. However the consumers has also major concern on the security of the ICT infrastructure, the single internet service provider, the national ICT policy and procedure on customer data protection.

As can be seen from the different literatures and the pre-study assessment study in few merchant outlets and banks, it becomes very difficult to implement e-commerce in developing nations, same in Ethiopian Banks in local currency, However if the e-commerce framework is adopted to fit the Ethiopian way of doing business and optimize it to fit the national policies and proclamations of the different government bodies, the country may benefit out of the e-commerce implementation. That is tailoring the e-commerce implementation framework to suite local currency for Ethiopian banks could enhance the way we are doing business.

2.10. Summary

As can be seen from the different literatures, the factors that affect e-commerce adoption in one country are totally different from the factor in another country. The below table summarizes some of the main contents of the literature review.

Author	Discussed idea	Result found
Stella, 2010	The relationship between ICT adoption and efficiency in banks of Nigeria	IT improved the efficiency of such banks after their technology adoption and more would be achieved if changes around ICT are facilitated.
Oxley and Yeung, 2001	Fundamental factors in e-commerce adoption readiness in developing countries	Technological, political, social and legal factors. The pace of technological change, acceptance by consumers andbusinesses, and the response of governments are also other factors.
Abou-Shouk and Megicks, 2013	Common barriers for e-commerce implementation in Egypt	resources limitation, funding problem, the lack of governmental support, a lack regulatory system & consumer culture and the lack of public infrastructure readiness
Alam et al, 2011	Factors that have significant impact on e-commerce adoption in Malaysia	Relative advantage, compatibility, organizational readiness, manager's characteristics, and security
Moayyad, 2014	The relationship between e-commerce adoption and business strategy on Jordan	Lack of efficient and developed telecommunication infrastructure

Lloyd and Jan, 2011	Role of e-commerce adoption with in SME in South Africa	weakness of telecommunications and legislation, and high levels of perceived fraud

Table 2.2 – Summary of the literature review

CHAPTER THREE

3. Research Methods

3.1. Research approach

Any research project will involve the use of theory and analysis of the result found. This research is about adopting the existing e-commerce implementation framework for Ethiopian banks and hence needs the strength, weakness, opportunity and threat (SWOT) of adopting the framework.

According to Team FME (2013) SWOT analysis is a business analysis technique that an organization can perform for each of its products, services, and markets when deciding on the best way to achieve future growth. The process involves identifying the strengths and weaknesses of the organization in implementing the new business model, and opportunities and threats present in the market that it operates in. It also involves a lot of subjective decision making at each stage. It should always be used as a guide rather than as a prescription and it is an iterative process.

There is no such thing as a definitive SWOT for any particular organization because the strengths, weaknesses, opportunities, and threats depend to a large extent on the business objective of each organization under consideration. However the industry under study, banking, focuses on similar service in different way or mechanism (Team FME, 2013).

SWOT analysis involves two types of analysis, the organizations internal situational analysis and the organizations external environment situational analysis. The internal situational analysis involves analysis on the organizations strength which is favorable for achieving the organizations goal and objective; and weakness which is unfavorable for achieving the organizations objective and implement the new model business. The external situational analysis focuses on opportunities and threats on implementing the new business (Team FME, 2013)

- Internal Analysis: The internal analysis of an organization should include its culture, expertise, resources, and unique qualities within the market place. The extent to which

the organization could adopt to changing circumstances is also a factor that needs to be considered.

i. Strengths -'strength' is something that has a positive implication. It adds value, or offers an organization a competitive advantage. Strengths include tangible assets such as available capital, equipment, credit, established and loyal customers, existing channels of distribution, copyrighted materials, patents, information and processing systems, and other valuable resources. Strengths might also be evaluated by function, for example marketing, finance, production, and support of the current business on hand (Team FME, 2013).

ii. Weaknesses - Weaknesses are those things that detract from the value of the organization's offering or place the organization at a disadvantage when compared with other competitors.

- External Analysis: External factors include the environment an organization operates in, its market, eco-system, and all of the third parties involved.

i. Opportunities –Opportunities can occur for a variety of reasons and may result from changes within the market, customer lifestyle changes, advances in technology, new marketing methods, a change in business strategy etc. Successful organizations are constantly reviewing their products and services to see how they can increase their market share.

ii. Threats –these are factors that organizations have little or no control over them. Organizations should consider making contingency plans, no matter how small the threat is. This will ensure that the organization is not taken by surprise.

3.2. Research Strategy

According to Sunders (2000) research strategy is a general plan of how a researcher will go about answering the research questions he has set. Survey, one of the research strategies, is described as a system for collecting information to describe, compare, or explain knowledge, attitude and behavior. It has considerable ability to generate answers to the question 'what?' as well as 'how?' questions. Based most often on a questionnaire, these data are standardized allowing easy comparison (Sunders, 2000).

Since this thesis aims to analyze the factors that hinder the adoption of e-commerce in the Ethiopian Banks, survey is the appropriate research strategy. According to management study guide[5],due to the fact that in survey respondents may be asked a variety of questions regarding their behavior, intention, attitudes, awareness, motivation, demographic and lifestyle characteristics. Survey will also allow reviewing the same concept in multiple organizations so that generalizations could be drawn. As compared to other methods (direct observation, experimentation) survey yield a broader range of information. Surveys are effective to produce information on socio-economic characteristics, attitudes, opinions, motives etc and to gather information for planning product features, new service setup, advertising media, sales promotion, channels of distribution and other marketing variables. With survey questioning is usually faster and cheaper than observation, questions are simple to administer, data is reliable, the variability of results is reduced, it is relatively simple to analyze, quote and interrelate the data obtained by survey method. Therefore by using this strategy it is expected to receive suitable answers from the industry representatives in order to analyze the factors for the adoption.

Survey responses are then grouped based on major factors of e-commerce adoption and median of each response are analyzed. The responses for all questions, except the open ended ones, are any one of the seven likert responses.

According to Elaine and Christopher (ND) as a general rule, mean and standard deviation are considered to be invalid parameters for descriptive statistics whenever data are on ordinal scales, as are any parametric analyses based on the normal distribution. It would be difficult to measure

[5]www.managementstudyguide.com, accessed on June 22, 2017

the distance between agree and strongly agree, possible responses of a likert scale. Nonparametric procedures based on the rank, median or range are appropriate for analyzing likert type data, as are distribution free methods such as tabulations, frequencies, contingency tables and chi-squared statistics. In this research the median is used as it draws the line right in the middle of the data set. Median provides a better measure of centrality for likert type data as 50% of the data is above the median value (Gail and Anthony, 2013).

3.3. Data Collection

Data collection method is highly influenced by the methodology chosen (Sunders, 2000). After a strategic document of an organization is approved by the senior management team and the board of directors it is usually distributed to the different units of the organization so that every activity and planning is according to the strategic document. In this study the survey participants are the banking industry respective IT departments and e-payment department representatives or managers, with whom interview might be difficult. Due to the information requirements, time constraints and respondent characteristics questionnaire is used as data collection devices. In this study structured data collection is emphasized.

In structured data collection, formal questionnaires prepared and the questions are asked in a pre-arranged order; thus, the process is direct (Uma, 2003). Also the questions in this research are fixed-response alternative questions, which requires the respondent to select from a predetermined set of responses from highly disagree to highly agree. In other words the response method used in this research is in form of likert scale by which the respondents show their level of agreement to the statements with a numerical score. The respondents choose one to seven levels of agreement, 1 to highly disagree and 7 to highly agree.

3.4. Pilot Test

We have used a questionnaire prepared by Elizabeth and J. Michael (2004), in their research done for developing an e-commerce adoption model for developed countries Small and Medium Businesses with some contextualization, was replicated with changes to some of the parts. Some

questions that are directly applied for developed countries small and medium enterprises (SME) are removed, and some questions that seems non relevant to this study are removed/modified.

In their model development, Elizabeth and J. Michael (2004) have asked respondent's years of work in present position, years of work in present firm, the industry type, the number of employees in the industry, the number of computers in the organization, presence of website, and how the organization under study is utilizing e-commerce if it already adopt one. However in this study, adoption of e-commerce for Ethiopian Banks, the banks under scope didn't yet commence e-commerce related services and also the banks will only involve in the transaction authorization of the e-commerce initiated transactions. Due to this, questionnaire items related to the above concepts has been excluded for this study.

In order to make the questionnaire suitable for this study more than 20 questions that are related to the different government regulatory bodies that involve in ICT related policy development and approvals, the infrastructure at the banks premise, the telecom operator, and perception of the industry decision makers are included in the adopted questionnaire. The pre-assessment study interview question responses that are related to organizations strategy, organizations readiness, the different products and services that could be offered through the adoption of e-commerce, financial inclusion strategy of NBE, competing strategy of merchants, the national policy and legislation, the merits and demerits of e-commerce adoption are used to derive the added survey questionnaire items.

The questionnaire then has been piloted with five technological professionals. After the pilot misunderstanding of some questions, some questions modifications and changes in vocabularies are handled. The revised questionnaire was once more tested with two bank IT managers and are checked if the added and removed parts has been okay; which indicates the questionnaires could be spread among the industry representatives, bank IT managers and e-banking representatives.

The questionnaire has also been commented and approved by the research advisor after a consultation with the domain experts and a pilot with the banking industry e-banking representatives; following the advisor comments and consultations with the industry representatives' grammatical errors and questionnaire structure are corrected and also three open ended questions are included.

3.5. Sampling

The basic idea of sampling is that by selecting some of the elements in a population, we may draw conclusion about the entire population. In this research the population of interest is the banking industry, specifically the Information technology and e-banking unit. The sampling method which was used in this research is probability sampling. In this research, simple random sampling which is the simplest form of probability techniques was used. Simple random sample is considered a special case in which each population element has a known and equal chance of selection (Uma, 2003).

According to National Bank of Ethiopia, there are nineteen banks in Ethiopia[6]of which Development Bank of Ethiopia is not focusing on retail banking and Construction and Business Bank has merged with Commercial Bank of Ethiopia, hence the research will consider seventeen of the banks who are actively involved in retail banking.

The seventeen banks are organizationally structured with director or vice president level of their IT and e-banking units with a five year strategy that is aligned with the second strategy period of Ethiopia (the second growth and transformation plan – GTP II)on achieving market dynamicity with technological enhancements to the banking industry by giving emphasis to innovations that could give their respective banks a competitive advantage, reduced operational cost and financial inclusion.

To participate in the survey eight banks are selected out of the seventeen banks, this is achieved by considering 95% Confidence interval, 25 confidence levels with a population size of 17.

Below is the formula used to calculate the sample size:

$$SS = \frac{Z^2 * (P) * (1 - P)}{C^2}$$

$$\text{Sample Size} = \frac{(1.96)^2 * (0.5) * (1 - 0.5)}{(0.25)^2} = 15.36$$

[6]http://www.nbe.gov.et

Where:

Z = Z value (e.g. 1.96 for 95% confidence level)

P = percentage picking a choice, expressed as decimal (.5 used for sample size needed)

C = confidence interval, expressed as decimal, 0.25 for +/-25.

Correction for Finite population size

$$\text{Sample size} = \frac{\text{SS}}{1 + \frac{\text{SS}-1}{\text{POP}}}$$

$$\text{Sample size} = \frac{15.36}{1 + \frac{15.36-1}{17}} = 8.32 \approx 8$$

Where: pop = population

Simple random sampling is applied to select the eight banks out of the seventeen banks. The use of Microsoft excel RAND() function helped to randomly select the eight banks out of the seventeen.

s.no	Random numbers	Banks	Establishment Year (G.C)
1	0.093609644	Nib International Bank S.C.	1999
2	0.171493524	Oromia International Bank S.C.	2004
3	0.193995015	Awash International Bank S.C.	2009
4	0.209368969	Bank of Abyssinia	1996
5	0.254642056	Commercial Bank of Ethiopia	1963
6	0.274610177	Bunna International Bank S.C.	2009
7	0.282533442	Lion International Bank S.C.	2006
8	0.304635901	United Bank S.C.	1998
9	0.402577152	Cooperative Bank of Oromia	2008
10	0.520584777	Wegagen Bank S.C.	1997
11	0.645099518	Debub Global Bank S.C.	2012
12	0.646456068	Enat Bank S.C	2012
13	0.715187664	Zemen Bank	2008
14	0.786525392	Berhan International Bank S.C.	1994
15	0.795330151	Addis International Bank S.C.	2011

16	0.810322495	Dashen Bank S.C.	1995
17	0.934928712	Abay Bank S.C	2010

Table 3.1 - List of banks ordered based on a random number generated

Within the selected banks, using simple random sampling method, purposive sampling is done to select the survey respondents. According to Palys (2008) the main goal of purposive sampling is to focus on particular characteristics of a population that are of interest, which will best enable to answer the research questions. Purposive sampling relies on the judgment of the researcher when it comes to selecting the survey units (e.g., people, cases/organizations, events, pieces of data) that are to be studied. Usually, the sample being investigated is quite small, especially when compared with probability sampling techniques.

The aim of the study, adopting e-commerce framework for Ethiopian Banks, is better understood by IT and e-banking unit representatives of the respective banks. Using purposive sampling each e-banking and IT representatives (the Vice president or the Director who are officially assigned by the bank) and their deputy or assistant managers are selected to participate in the survey. That is, from each Banks selected for the survey four respondents are selected which will make the total survey respondents thirty-two.

3.6. Questionnaire

According to Thomas (2001) questionnaire can be self-administrated or interview administrated. Self-administrated questionnaires are usually completed by the respondents. Such questionnaire can be On-line questionnaire (delivering and returning the questionnaire electronically using Internet), Postal questionnaire (sending and receiving the questionnaire by post) and Delivery and Collection questionnaire (delivering and collecting the questionnaire to respondent by hand).

In this research, self-administrated questionnaire are used. The questionnaires are delivered and collected by hand. It asks respondents how they feel about the implementation of e-commerce with the adoption of the international standard framework to make it fit Ethiopian way of doing business and the factors that hinder the adoption by designing the questionnaire ina form of as seven scale likert from highly disagree to highly agree. The questionnaire prepared by Elizabeth

and J. Michael (2004), in their research done for developing an e-commerce adoption model for developed countries Small and Medium Businesses with some contextualization, was replicated.

The first section of the questionnaire gathers demographic information. The second section collects information about respondents' to the strategic value of e-commerce through 15 questions. The third part asks respondents about the factors which influence e-commerce adoption by 56 questions, the fourth part asks respondents' about their general understanding of their respective bank's on e-commerce adoption related activities by 16 questions, the fifth section is composed of three open ended questions about the respective banks readiness, the future of e-commerce in Ethiopian banking industry and the respondents experience regarding e-commerce usage.

3.7. Summary

In this research a SWOT analysis research approach is followed. Survey research strategy has been applied by calculating the median of each response and analyzes the result accordingly. Contextualization of Elizabeth and J. Michael (2004) questionnaire is handled by amending more than 20 questions after analyzing the pre-assessment result. The questionnaires then have been piloted and corrections on vocabulary, grammar and structure are done in consultation with the domain experts, the research advisor and the industry representatives. Out of the seventeen banks in Ethiopia, eight banks are randomly selected and four participants from each banks are selected that will make the total survey participants thirty-two. The questionnaire is prepared with a seven scale likert response and open ended questions that are of totally ninety in number.

CHAPTER FOUR

4. Data Analysis and Result

4.1. Data Analysis

The questionnaire has been distributed to eight randomly selected banks, four participants from each of the eight banks with a total of 32 respondents. The selected survey respondents are vice president or the director of the IT and e-banking units and their official deputies/assistants. 29 of the respondents have filled and returned the questionnaire and 3 of the respondents refused to respond to the questionnaires. This makes 90.625% of the questionnaires are returned. The below table depicts the frequency and percentage of the survey demographic characteristics.

s.no	Attribute	Possible values of attributes	Frequency	Percentage
1	Gender	Male	23	79.31
		Female	6	20.69
2	Age	20-30	6	20.69
		31-40	16	55.17
		41-50	7	24.14
		51-60	0	0
		Over 60	0	0
3	Education Level	Diploma	0	0
		Bachelor Degree	19	65.52
		Master	10	34.48
		PhD	0	0
		Other	0	0

Table 4.1 - Demographic data analysis

4.2. Data analysis

The questionnaire has 87 questions with seven scale likert type response and three open ended questions with a total of 90 items. The likert scale type responses used in this research has seven categories or responses as strongly disagree, disagree, somewhat disagree, neutral, somewhat agree, agree and strongly agree. Median of each questioner response is calculated to check the distribution of responses. Median is especially useful with skewed distributions as it draws the line right in the middle of the data set. Median provides a better measure of centrality as 50% of the data is above the median value (Gail and Anthony, 2013).

A sample response data set is used to show how the median of the survey results is calculated.

Category	Number of respondents	Cumulative no of respondents
1-strongly disagree	0	0
2-disagree	0	0
3-somewhat disagree	1	1
4- neutral	3	4
5-somewhat agree	4	8
6-agree	10	18
7-strongly agree	11	29

Table 4.2 – Sample data for median calculation

- Step 1: The middle point is calculated by dividing the total number of responses by 2. So 29/2 = 14.5
- Step 2: The category in which this middle point falls is identified. In this case 14.5 falls in the '6- Agree' category as there are 8respondents up to category 5. (See the Cumulative no. of respondent's column).
- Step 3: As there are 8 respondents up to category 5, the difference between the middle point (i.e. 14.5) and 8 is calculated. So 14.5-8 = 6.5. This tells us how many 'places' away from the bottom of category 6 is the median.

- Step 4: The 10 respondents who answered with a '6 – Agree' are then assumed to be evenly distributed between 5.5 and 6.49. We need to identify where '6.5 places' into that range sits. As there are 18 respondents the fraction 6.5/18 is calculated (0.36). This is then added to 5.5 (the bottom of the range) to give a median of 5.86.

As per the data collected from the survey respondents the responses are grouped in to the different factors that are of relevant to e-commerce adoption in respect to the Ethiopian business environment and median of each response is calculated. Below are the summary of the responses from the three factors of adoptions perspectives.

4.2.1. The strategic value of e-commerce to Ethiopian Banks

Factor	Questionnaire item	Response Median
Organizational Support	OS1	6
	OS2	6
	OS3	7
	OS4	7
	OS5	6
	OS6	6
	OS7	7
Managerial Productivity	MP1	6
	MP2	6
	MP3	6
	MP4	6
Decision Aids	DA1	6
	DA2	6
	DA3	6
	DA4	6

Table 4.3–Factors that indicate strategic value of e-commerce for Ethiopian Banks

4.2.1.1. Organizational support

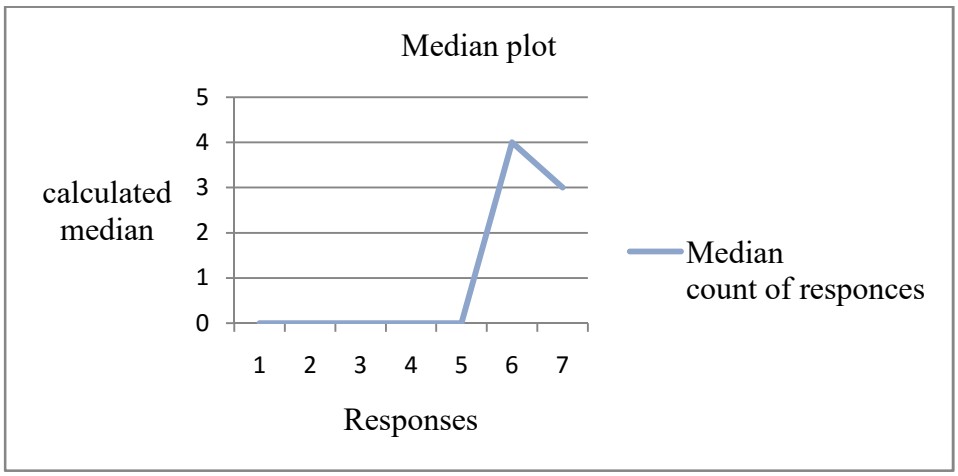

Figure 4.1 –Median plot of Organizational support

Under this factor of e-commerce framework adoption seven questions have been asked for the survey participants. The questions elaborate how the adoption of e-commerce framework could support organizations. As shown above the median of all responses lie in between Agree and strongly agree, indicating e-commerce adoption will help organizations to reduce cost of business operation, increase operational benefits, increase the accessibility of products/ services to customers, improve financial accessibility to more customers, increase the ability to compete (enhance competitiveness), provide customers more satisfying shopping experience and improving customer service.

4.2.1.2. Managerial Productivity

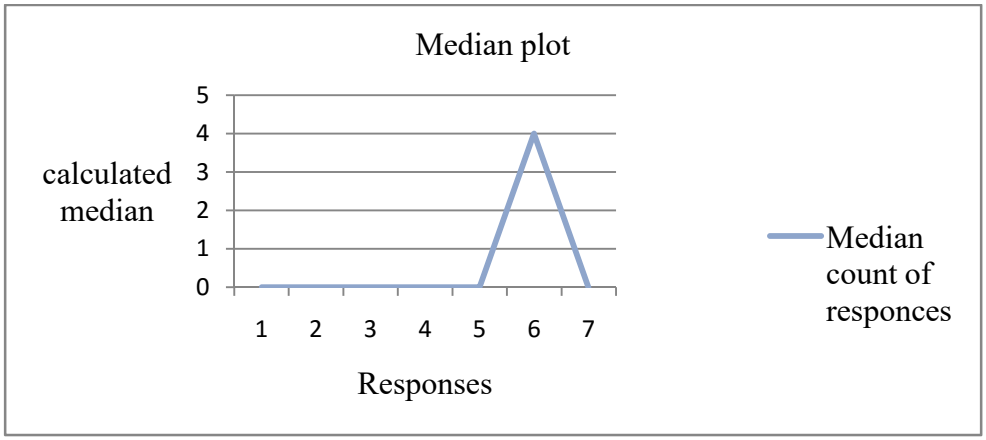

Figure 4.2 – Median Plot of managerial productivity

With e-commerce adoption managerial productivity will be enhanced as the median of all respondents out of 29 responds agree saying e-commerce adoption will provide managers better access to information, providing mangers access to method and models in making functional area decision, Improve communication in the bank and Improve productivity of managers.

4.2.1.3. Decision Aids

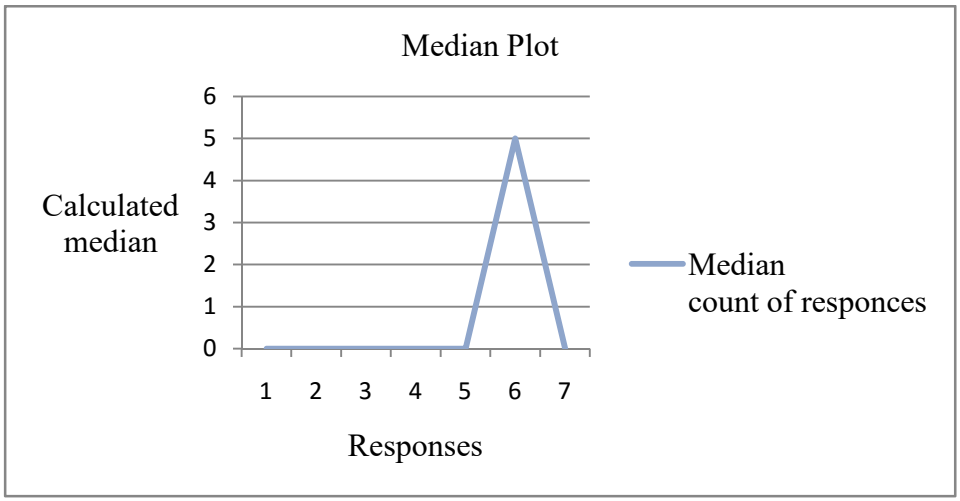

Figure 4.3 - Median Plot of Decision aids

E-commerce adoption will aid banks in making decisions, support strategic decisions for managers and could support cooperative partnership in the industry and provide information for strategic decision making as those questions response median indicates agree by all respondents.

4.2.2. The factors that inhibit the adoption of e-commerce for Ethiopian Banks

Factor	Questionnaire item	Response Median
Organizational Readiness	OR1	5
	OR2	6
	OR3	6
	OR4	5
	OR5	5
	OR6	5
	OR7	4
	OR8	5
Compatibility	C1	5
	C2	5
	C3	5
	C4	5
	C5	5

	C6	5
	C7	6
External pressure	EP1	6
	EP2	6
	EP3	5
	EP4	6
	EP5	5
	EP6	5
	EP7	5
	EP8	4
	EP9	6
	EP10	5
	EP11	5
	EP12	5
	EP13	5
	EP14	5
	EP15	4
	EP16	5
	EP17	4
	EP18	5
	EP19	5
	EP20	6

Ease of use	EU1	5
	EU2	6
	EU3	5
	EU4	5
	EU5	5
Usefulness	U1	5
	U2	6
	U3	6
	U4	6
	U5	6
Entrepreneurial orientation	EO1	5
	EO2	5
	EO3	6
	EO4	5
	EO5	6
	EO6	6
	EO7	6
	EO8	5
	EO9	6
	EO10	6
	EO11	6

Table 4.4 - Factors that inhibit the adoption of e-commerce for Ethiopian Banks

4.2.2.1. Organizational Readiness

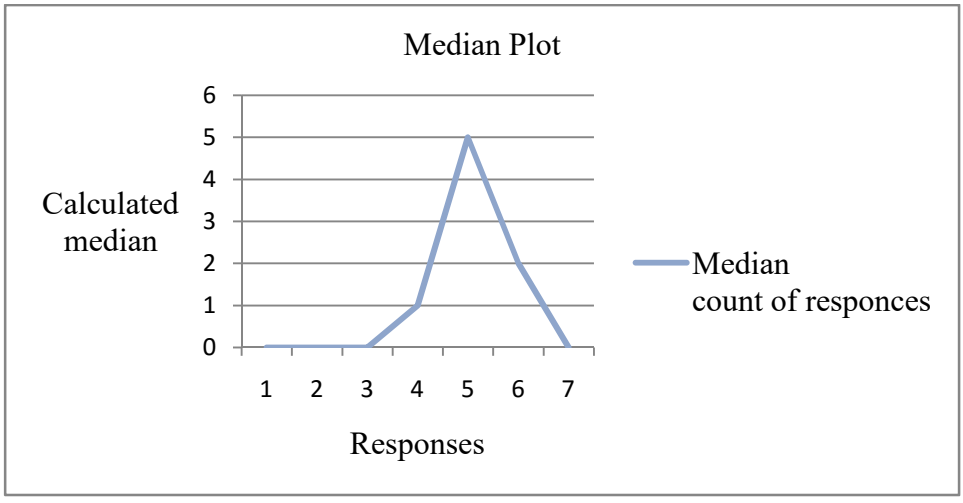

Figure 4.4 –Median Plot of Organizational readiness

From the study it is found that majority of the respondents median lied on somewhat agree responses with the organizational readiness as one of the major factors that inhibit the adoption of e-commerce by indicating banks have the financial, technological, technical experts and merchants need to have sufficient logistics and inventory. Few respondents have disagreed with the organizational readiness factor of adoption as there is very high employee resistance and the government is not totally supporting e-commerce adoption.

4.2.2.2. Compatibility

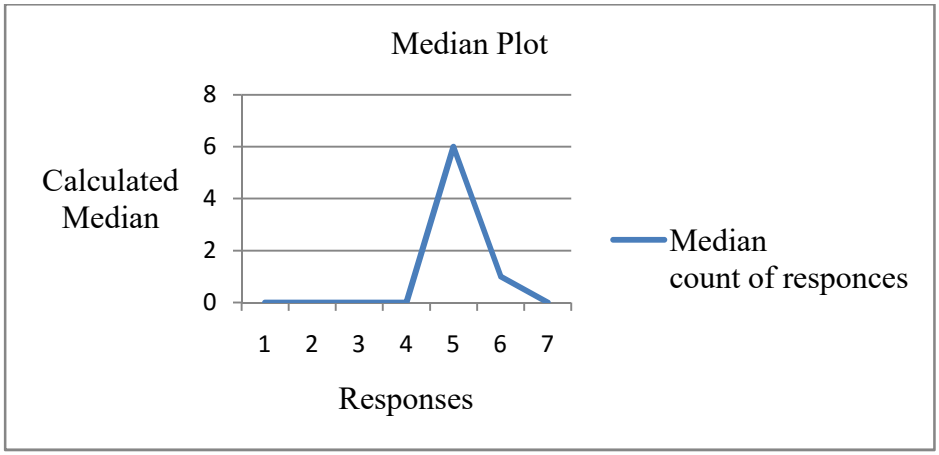

Figure 4.5 - Median Plot of compatibility

With this factor of e-commerce adoption the median of the responses lie on above somewhat agree indicating consistency of e-commerce with organizational culture, organizational value, preferred work practice, organizational business requirement, management enthusiasm and management awareness on strategic importance of e-commerce as a major factor that inhibit e-commerce adoption.

4.2.2.3. External pressure

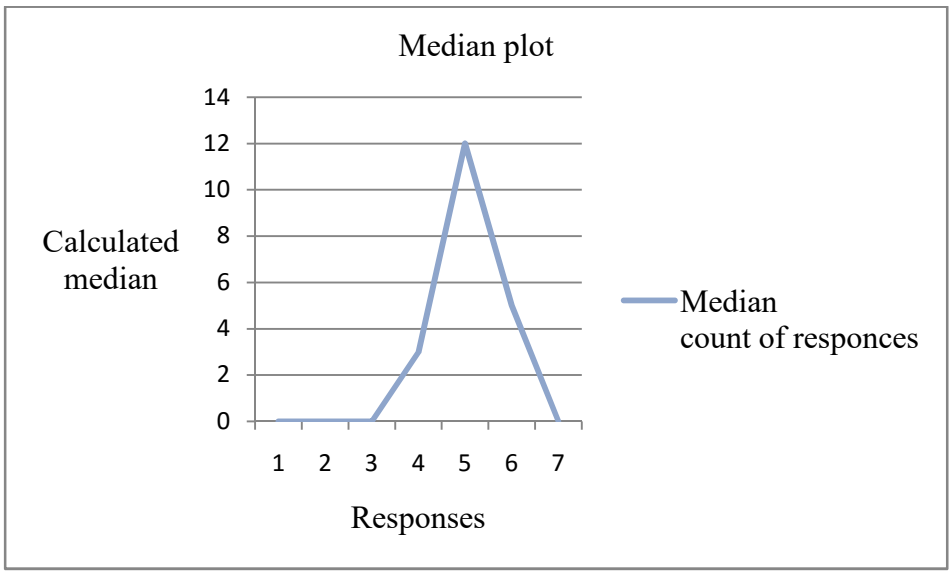

Figure 4.6 - Median Plot of external pressure

The median to majority of responses fail on somewhat agree and agree categories that competition, level of change resistance of Ethiopian buyers, computer skill of the general population, level of income, technological and secured infrastructure, national ICT policy, Ethiopia's direction to join world trade organization, the single state owned internet service provider, and absence of legislation for e-commerce, absence of pressure from the banking industry, the people trust in using e-commerce and cross country e-commerce settlement issues are the factors that inhibit e-commerce adoption on Ethiopian banks. However few respondents median lied on the neutral category for questionnaires such as ethical/religious beliefs, credit card acceptance and lack of institutional control of e-commerce infrastructure by Government bodies like the INSA, MCIT and NBE.

4.2.2.4. Ease of use

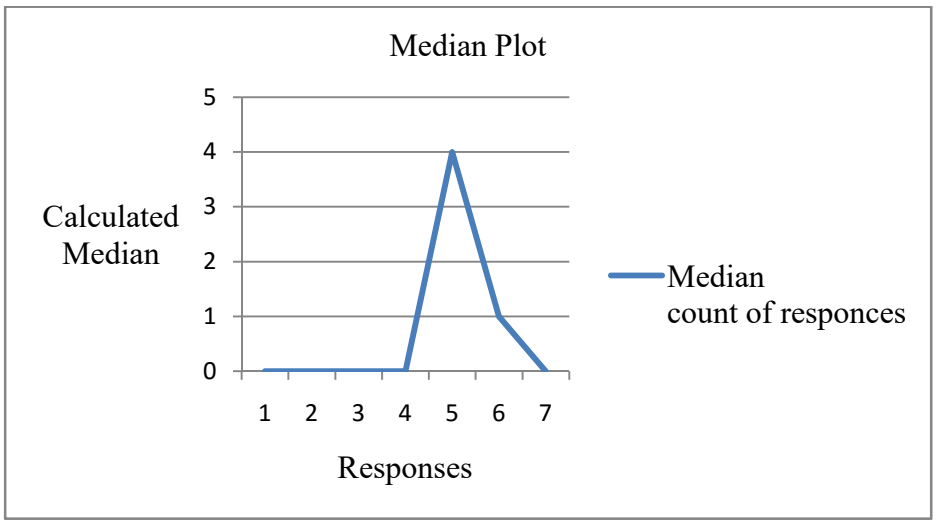

Figure 4.7 - Median Plot of ease of use

In relation to ease of use as one factor that inhibit e-commerce adoption the median is found to be on the somewhat agree and agree response categories that learning to operate e-commerce, non-flexibility of e-commerce access and e-commerce usage are factors that hinder the adoption of e-commerce for Ethiopian banks.

4.2.2.5. Usefulness

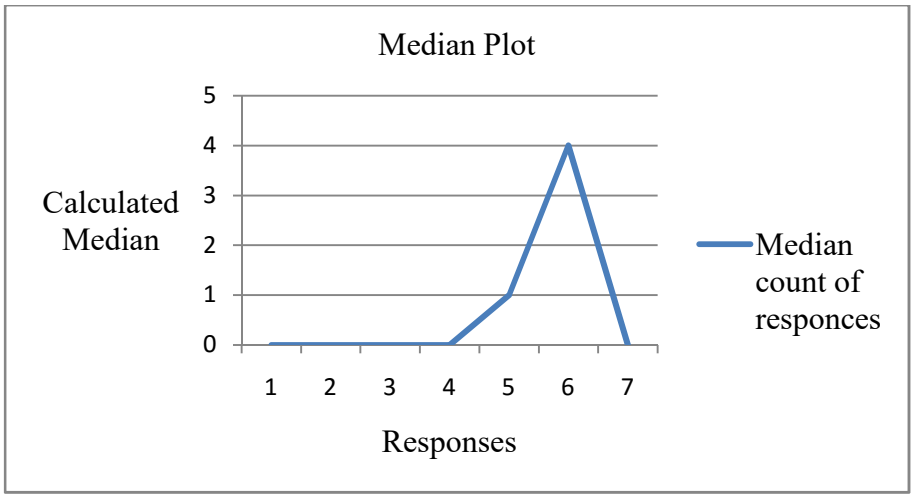

Figure 4.8 - Median Plot of usefulness

Job performance could be improved by using e-commerce and increase in productivity could be affected by adopting e-commerce as the respondents median showed that all responses lied on the agree category.

4.2.2.6. Entrepreneurial orientation

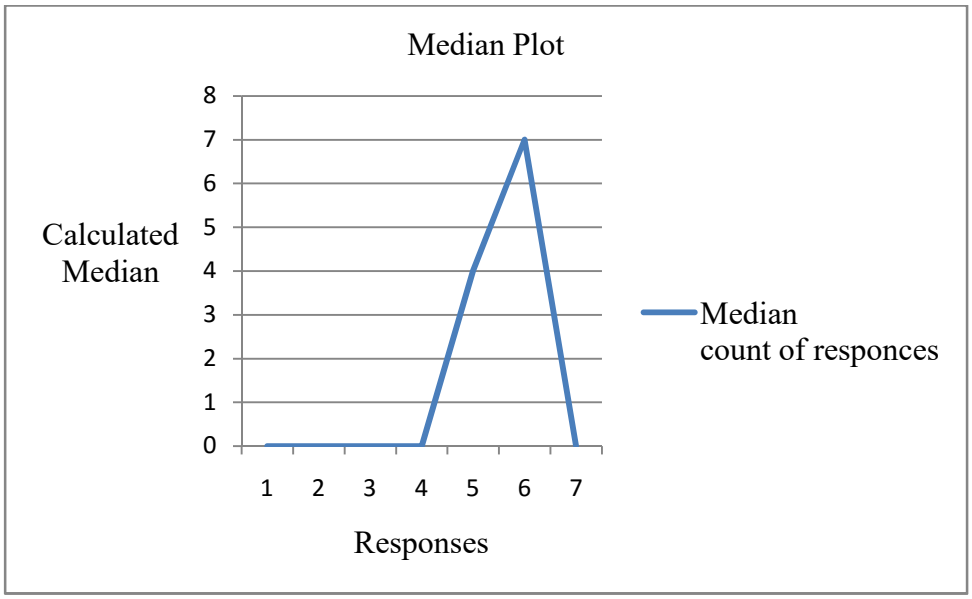

Figure 4.9 - Median Plot of Entrepreneurial orientation

Being entrepreneurial on the industry that provide similar product and services is important as majority of responses median lies in the somewhat agree and agree response categories. Improving service/product quality, new business target, re-engineer service/products, improve customer value, price aggressiveness, being partner with others are factors that hinder the adoption of e-commerce are also responded somewhat agree and agree by the respondents.

4.2.3. The banking industry decision makers' perception on the adoption of e-commerce

Factor	Questionnaire item	Response Median
General perception of decision makers	PDM1	5
	PDM2	6
	PDM3	5
	PDM4	6
	PDM5	6
	PDM6	6
	PDM7	3
	PDM8	5
	PDM9	5
	PDM10	4
	PDM11	4
	PDM12	4
	PDM13	4
	PDM14	4
	PDM15	6
	PDM16	6

Table 4.5 – The banking industry decision makers' perception on the adoption of e-commerce

4.2.3.1. General perception of decision makers

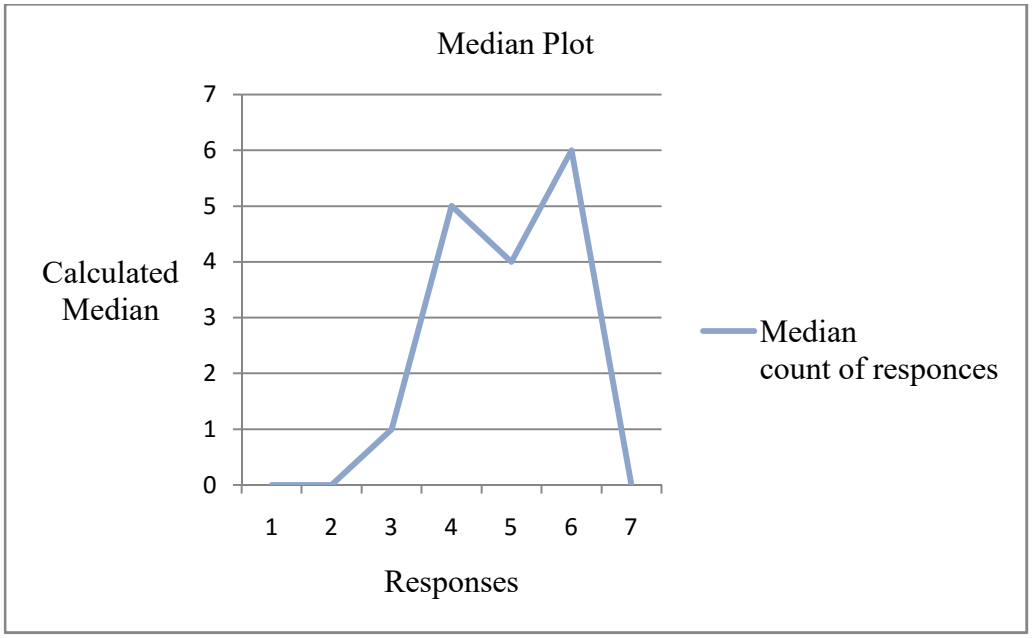

Figure 4.10 - Median Plot of general perception of decision makers

With this factor of adoption the median is distributed from somewhat disagree to agree categories of the responses. Majority of the responses are somewhat agree and agree that their respective bank has enough bandwidth, sufficient experience with network based applications, capable technological infrastructure to handle e-commerce applications and are with clear vision on e-commerce adoption. However five median values fail on neutral category to this factor of adoption on effective laws to combat cybercrime, settlement of electronic commerce transactions, government didn't show strong commitment to promote e-commerce; there is no effective low to protect consumer privacy and low on cybercrime.

4.3. SWOT analysis

Based on the data summary above the strengths, weaknesses, opportunity and threat of e-commerce framework adoption in respect to the Ethiopian business environment will bean alyzed.

Figure 4.11 - Median Plot of overall survey responses

The above chart represents the overall survey responses median distribution towards how adopting an e-commerce framework could support organizations, a change on the managerial productivity due to the adopted framework, how the adopted framework could assist as a decision aid, organizational readiness to adopt the framework, compatibility of adopted framework, external pressure on the organizations to adopt the framework, usefulness of the framework, ease of use of the technology to be adopted, entrepreneurial orientation of the adopters and decision makers perception to adopt the framework. As can be seen on the chart 88.51% of the respondents median fails between somewhat agree and strongly agree to the questionnaire responses.

Regarding the open ended questions, only 14 respondents have answered the questions and 15 respondents leave the questions blank. From the responses it is found that three of the banks are found to be ready with infrastructure and the required human resource to acquire e-commerce application, however regulatory issues are found to be still the concern. One bank has floated an RFP to procure e-commerce solution, four banks are on the process of doing analysis on how they could implement the solution, and this research could help them achieve their strategy. Nine of the responses related to the future of e-commerce for Ethiopian banking industry are found to be good. The respondents has listed the indicators for the response good as the Ethiopian government initiatives on drafting e-commerce laws, the increasing number of internet users and the implementation of interoperability environment. None of the respondents have experience on shopping through e-commerce, but five of the respondents have experience of using e-commerce sites to check for cost and quality of items online before they go to merchant locations for physical shopping.

4.3.1. Internal Analysis

4.3.1.1. Strengths of e-commerce adoption

From the survey analysis it is found that e-commerce framework adoption will help organizations to get more profits and get advantage on their operational activities by improving the day to day customer banking experience. The biggest strength of e-commerce adoption is also the boundary less access of products and services. In other words banks don’t need brick and mortar structure to avail their banking service or do business or no specific boundary is required for a bank customer to do business with its bank. It also enables all the banking industry

to expand the business operation to global level. The widening of geographic retail markets may facilitate the development of global retailers.

The study also depicts that the banking industry is ready to adopt e-commerce with human resource, financial capability, and technological resources. Some banks in Ethiopia have already started the adoption of e-commerce with limited boundary; Ebrana.com is an e-commerce facility that is focused on selling electronic books by working with Dashen Bank's modbirr payment facility, where at the end of the transaction the customer will get an email containing the download link of the book ordered[7].

Entrepreneurial orientation of the banks in Ethiopia is also another internal strength of organizations to adopt e-commerce. The banks in Ethiopia are working to improve their product or service quality in order to be competent in the industry. The banks are also working towards innovating new business/market other than the usual retail banking, the current card banking experience could be considered as an example to this point. Every bank in the nation has card banking facility as a minimum standard and one channel of banking. E-commerce is the next line of channel banking the banks would start to become competent and add value to their esteemed customer's way of banking. Increasing managerial productivity is also found to be additional strength of e-commerce adoption for Ethiopian banks. Managers will get more information access on the market which will help them decide on the method and model they follow in making financial decisions.

E-commerce adoption could make banks help small businesses to stand at the same level with giants by eliminating the long chain of middle-men, decreasing need of having brick infrastructure and outsource logistic. Other strengths of e-commerce adoption are also its time saving nature by reducing physical movement to look for the product or service we would like to obtain and also the concept of 24x7 on which the transactions can be made from any time anywhere. Banks are also facilitating faster exchange of information as the electronic nature of the commerce will always guarantee fast and accurate sharing of information among merchants and bank customers and also enables prompt quick just in time reply.

[7]www.ebrana.com,accessed on June 23, 2017.

The concept of Niche Market, availability of rare species products/services without putting some special efforts by consumer, could be considered as strength to the banking industry through the adoption of e-commerce.

4.3.1.2. Weaknesses of e-commerce adoption

The survey has indicated that Ethiopian banks have to work hard on their ICT infrastructure and operational security as security currently is the biggest challenge specifically on the integrity of the online payment process. The level of employee resistance within the bank is another major weakness found from the survey responses.

4.3.2. External Analysis

4.3.2.1. Opportunities of e-commerce adoption

E-commerce adoption could make the banking industry achieve the new dimensional business opportunity due to the changing trends in the society's day to day shopping experience. E-commerce is fast and effective even the transactions can be made from any part of the world. Another opportunity of adopting e-commerce for the banking industry is the increasing number of internet users[8]who will be bank cardholders in order to use merchant sites linked to e-commerce application to handle online businesses.

E-commerce adoption will give Ethiopian banks regular global expansion easily. E-commerce can be operated anywhere any time without any interruption. It always has a scope of expansion. All newly joining cardholders and existing bank cardholders who are not the user of e-commerce could be considered as the target expansion.

International trends are showing that currently banks are responding to the opportunities created by the rise of on-line commerce. All banks in Ethiopia have already put in place a cost-efficient electronic access channel for traditional banking products through the integration of their

[8]www.InternetLiveStats.com/internet-users/Ethiopia/, accessed on May 07, 2017.

respective Electronic Funds transfer Switch or Core banking system to the national interoperability switch-EthSwitch for the provision of ATM and POS banking services[9].

In addition, the implementation of the national interoperability switch is an opportunity for the local banks to adopt e-commerce for acquiring of transactions of their esteemed cardholders which will create an opportunity of being competent and a choice by the newly bank industry joining population. Such a change would probably prompt banks to reduce their branch expansion cost by scale back the size or alter the scope of their branch networks and to devote more resources to the development and maintenance of computer networks and software, which is the future of banking industry.

4.3.2.2. Threats of e-commerce adoption

The survey result indicates that the change resistant nature of Ethiopian buyers against electronic shopping, the general population computer related skill and knowledge, the public trust in doing online transactions, the level of income, the single state owned internet service provider are mentioned as threats to e-commerce adoption by the banks in Ethiopia.

Availability of fake merchant websites are also another concern the banks will face on adopting e-commerce framework as the use of these websites could not only disgrace e-commerce but also bring bad name to the bank that issue the card. Fraud is also mentioned as another threat to the banks as they could not avoid even after the adoption of e-commerce as personal and financial details could be misused by internal staffers or system hackers.

In this research the banks are only to authorize the payment for items purchased on the merchant website linked to the e-commerce application. With this scope the survey respondents has also indicated that long delivery of purchased items by the delivery agents, the impossibility of physical examination of ordered items, the limited exposure of the general public to e-commerce, and impossibility of avoiding the long-lived Ethiopian way of doing business that is full of bargaining should be considered as a threat to adopt e-commerce framework.

[9]www.ethswitch.com, accessed on June 23, 2017

Another list of threats for e-commerce adoption mentioned are the not yet approved Ethiopian national ICT policy to include e-commerce related transaction protection and also there is no legislation for e-commerce on the National Payment system proclamation, telecom fraud offence proclamation, and the consolidated foreign exchange directives of National Bank of Ethiopia. Lack of institutional control of e-commerce infrastructure by Government bodies like the INSA, MCIT and NBE is also considered as a major threat for e-commerce adoption. The non-reliable Ethiopian telecom infrastructure, lack of efficient and affordable support from local IT industry to support the move to internet, non-conducive legal environment to do business online are also considered as a major threat for e-commerce adoption.

The Fears that information can be misused lead to spam e-mail or identity fraud, no-direct interaction on the online purchasing process, in e-commerce there is no direct interaction between customer and the seller, lack of scope of bargaining, the general public's preference to buy physically as compare to online to experience personal feel, are also some major threats for e-commerce adoption. Unfair means of operating e-commerce that could damage the confidence and faith of people on the banking industry are also considered as a threat for e-commerce adoption.

CHAPTER FIVE

5. Tailored e-commerce framework

5.1. Why do we need to tailor the e-commerce framework?

As discussed in the previous chapters and the literature review part of this study the existing e-commerce framework applies only for countries that has the required e-commerce policy and legislation in place, for countries that issue international standard payment cards (debit, credit and charge) that could be settled and reconciled with any international currency with the card issuer banks. However from the survey responses and the pre-assessment study the framework will not suite Ethiopian banks due to many reasons of which some are: the National ICT policy of Ethiopia didn't include e-commerce related activities, the single state owned ISP, non-existence of national legislation that discuss e-commerce as an object, non-existence of institutional control on e-commerce related activities by the different government bodies such as the INSA and MCIT, lack of awareness of merchants and customers.

The implementation of the national switch- EthSwitch is found to be a driver to the adoption of e-commerce framework. The Ethiopian National Switch- EthSwitch has currently interfaced all the banks in Ethiopia for national interoperability and national clearing and settlement. Any customer of any Bank can do ATM and POS banking related transactions in any other bank acquiring terminal throughout the nation. EthSwitch's payment system is implemented in such a way that it would be possible to interface different e-payment solutions to further support the national interoperability on mobile banking, Internet banking and e-commerce. The EFT switch of the national interoperability environment is of industry standard certified such as Payment Application Data Security Standard PA DSS, Payment Card Industry Data Security Standard – PCI DSS, ISO8583, Euro, MasterCard and Visa (EMV). Hence, the same infrastructure can be used to implement the adopted e-commerce framework to reach every bank customer and the respective merchants whose websites are interfaced to the e-commerce application (SmartVista national electronic funds transfer (EFT) switch functional specifications document, 2014).

As observed in the pre-assessment study, the responses obtained from the banking industry representatives, the banks have a strategic plan to implement e-commerce even though the existing framework did not direct-fit the current ICT infrastructures, issue of internet service availability, non e-commerce supportive government policy and legislations. The merchants had also showed interest in having an e-commerce implemented. National reach, round the clock open business from any part of the country and competitive advantage due to innovative business approach are some of the advantages they think will get out of the adoption. The consumers as well had positive perspective in doing their day to day procurement online through e-commerce sites. Flexibility of choosing from multiple vendor and style and handling shopping at any time of the day from their location will give consumers a better lifestyle and way of doing business. The assessed consumers had of course shared the issues raised by the bank managers on the adoption of e-commerce.

5.2. The Modified TOE model

Based on the Technology-Organization-Environment (TOE) technology adoption model, the e-commerce adoption model for Ethiopian banks needs additional factors of adoption. TOE proposes technology factor as advantage and disadvantage of the adopted technology, Environmental factor as legal framework, National ICT infrastructure, Competitive pressure and Government support for the adopted technology; and Organizational factor as the required financial and human resource to adopt the technology. However based on the survey done using the contextualized Elizabeth and J. Michael (2004) questionnaire the TOE model is modified by adding factors on the organizational and environmental blocks of the model as below.

As can be seen in figure 5.1 below the modified model includes compatibility of the e-commerce model to be adopted with the existing organizational culture, organizational value, existing technology in the organization and the current work practice as an external factor. The other newly included factor, External pressure, in the modified model includes competition among the banks, level of resistance of Ethiopian buyers against e-commerce, the general population computer related skill and knowledge, non-existence of technological and security related infrastructure, the countries readiness to join the world trade organization, national ICT policy, the state owned single ISP, non-existence of the legislation for e-commerce on National Payment

system proclamation, telecom fraud offence proclamation, and the consolidated foreign exchange directives of National Bank of Ethiopia, Lack of institutional control of e-commerce infrastructure by Government bodies like the INSA, MCIT and NBE.

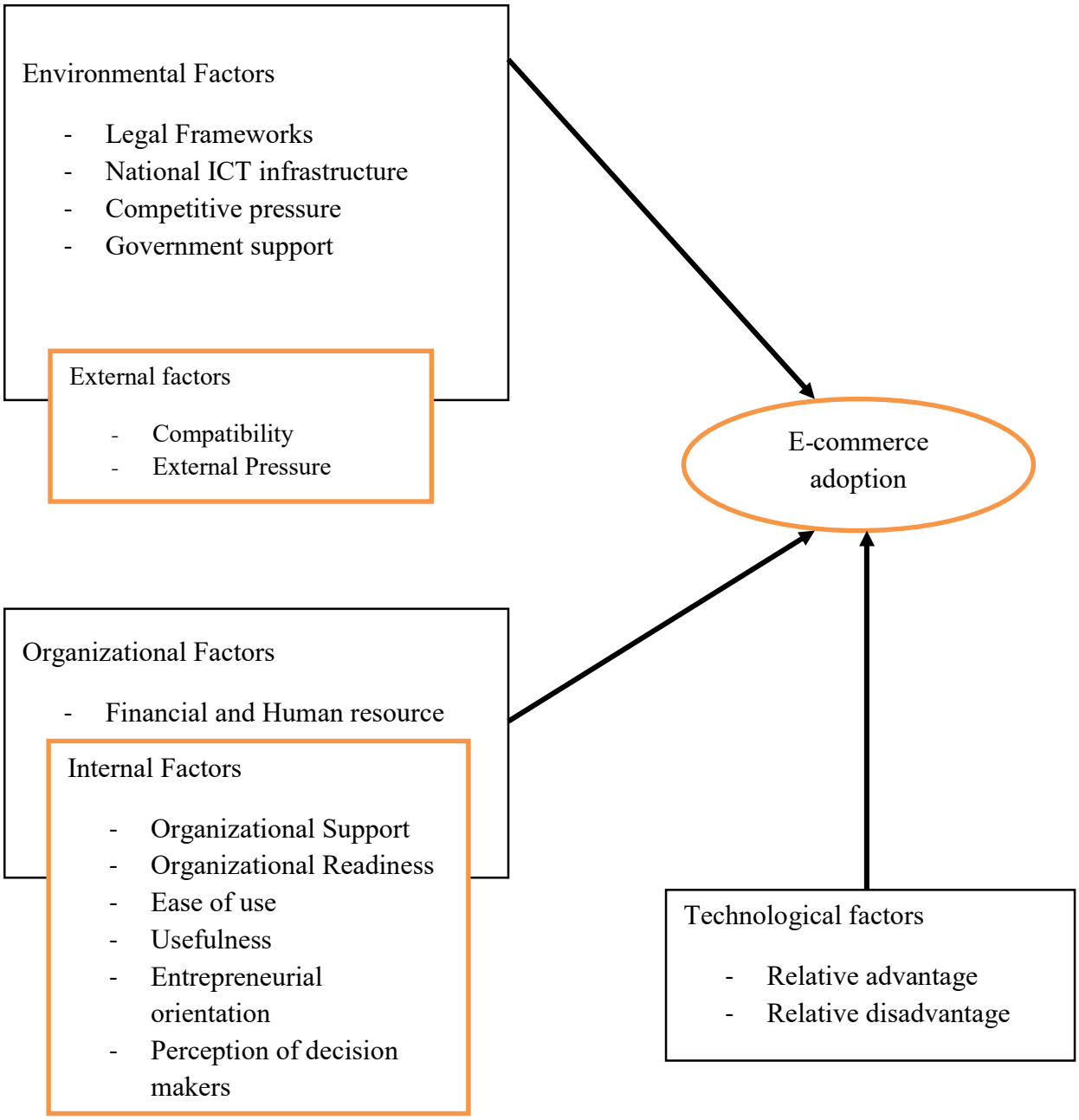

Figure 5.1 - Modified TOE e-commerce adoption model

In the modified model organizational factor or internal factor has included additional adoption factors such as the organizational readiness, the support organizations will get from the adoption

of e-commerce, entrepreneurial orientation of organizations, perception of the industry decision makers and ease of use and usefulness of e-commerce adoption.

Even though the objective of the research we not to modify the TOE e-commerce adoption model, the survey response to the questionnaire items has indicated an addition of the above listed factors will make the TOE model workable to adopt the framework successfully.

5.3. The Proposed e-commerce framework

The e-commerce framework considered on this study, Efraim et al (2015), contains the e-commerce application, support area, people, public policy, marketing & advertisement, support service, business partnership, infrastructure and management as building blocks. The below figure depicts the proposed e-commerce framework with the addition of some building blocks and rearrangement of the existing building blocks to make it suitable for Ethiopian banks based on the SWOT analysis of the survey results.

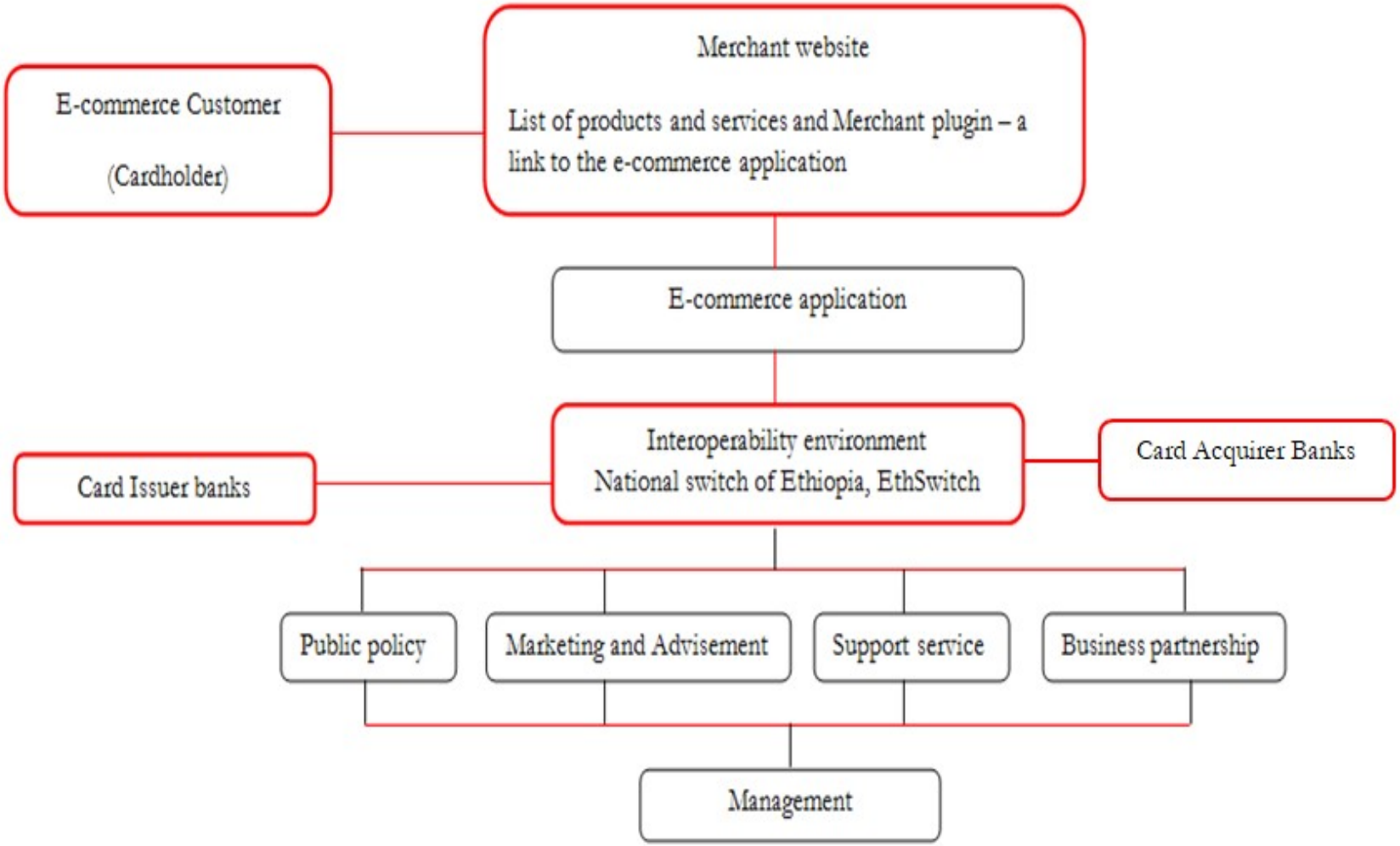

Figure 5.2 - The tailored e-commerce framework based on Efraim et al (2015)

The modified TOE framework to include additional factors of e-commerce adoption is used to amend the interoperability environment and rearrange other blocks of the existing e-commerce framework represented by figure 2.2.

Based on the SWOT analysis, the existing e-commerce framework depicted under figure 2.2 will not resolve the issues of security to ensure the integrity of the online payment for the local cards, availability of fake merchant websites, the not yet approved ICT policy to protect customers from e-commerce transaction related frauds are also found to be threats to the e-commerce framework adoption. To resolve the above adoption issues the National switch of Ethiopia, EthSwitch, is amended to the existing e-commerce framework to intermediate among the banks and the e-commerce application to resolve the weakness and threats of the adoption.

The national switch of Ethiopia, EthSwitch, is included as an intermediary infrastructure to resolve the security issues as the infrastructure is already interfaced with the bank's core banking system or EFT switch for card banking operations and also the government bodies such as the NBE are overseeing the day to day activities of the company that will resolve the issues related to the different legislations and policies. The interoperability environment is currently getting trusted by cardholders of the different banks in the nation, which is justified by the increasing number of card transactions achieved on the interoperability environment. This will at least minimize the cardholder awareness issues even though it needs awareness creation campaign and training to use the infrastructure.

The proposed e-commerce adoption framework, with the amendment of the national interoperability environment and re-arrangement of existing blocks, is in a position to resolve the issues that has been identified as threats to the implantation of the standard e-commerce framework as:

- Cardholder-Issuer Payment is online and real time however merchant-acquirer bank settlement could be handled either online or offline. Currently POS card banking for purchase transactions are done online with offline merchant-acquirer settlement on T+1 day (with in 24 hour time after the transaction is done).
- The e-commerce environment proposed is close-controlled, only pre-registered Ethiopian bank's cardholder cards will be eligible to transact on the proposed e-commerce model.

- With the current framework, e-commerce transactions are not cross border. The transactions are allowed only for local cardholders. This will resolve the issue of settling the transactions among member banks.
- Delivery of purchased items could be outsourced to the different services providers like the Ethiopian postal service, not in the scope of this study.
- One of the factors that hinder the adoption of e-commerce has been absence of public policy and legislation that supports the adoption of e-commerce. Ethiopia is developing e-commerce law which is started by drafting different policies and legislations that targeted the implementation of e-commerce. The e-signature law, computer misuse act, data protection act, and electronic transactions act are some of the legislations and policies.
- The e-commerce application proposed is 3-D secure (Three domain – issuer, acquirer and interoperability), discussed in detail on the next sections. The interoperability environment- EthSwitch infrastructure is Payment Application Data Security Standard (PA DSS) and Payment Card Industry Data Security Standard (PCI DSS) certified. This will enhance the resolution of security related problems of online payment processing.

The points below elaborate the functions of each building blocks of the proposed e-commerce framework.

5.3.1. E-commerce customer(cardholder)

On the proposed e-commerce framework e-commerce customer or cardholder is assumed to be any Ethiopian banks cardholder, whose card details such as the primary account number (PAN), card expiry date, Cardholder name and Card verification value (CVV) are registered on the e-commerce platform to use e-commerce related transactions from merchants that are linked to the e-commerce platform. This will enable a transaction on a controlled environment with a controlled cardholder details to minimize fraudulent transactions.

In the existing e-commerce framework cardholders should keep their card from being stolen, as the use of the PAN and CVV could make e-commerce transactions authorized. However in the proposed model the use of PAN and CVV only will not be enough to authorize e-commerce

transactions. Cardholders are also required to enter authentication mechanisms such as private password.

5.3.2. Merchant website

Any national merchant that would like to sell its product and service online through the e-commerce application proposed shall have merchant account in one of the banks. The account will be used to settle transaction amounts with the card issuer banks through the national settlement system on T+1 day settlement rule either online or offline.

The merchant website is the place that contains list of products and services provided by the merchant. The website design shall allow display of the web content on different platforms that are convenient to the cardholder such as PC, tablet, mobile and on different language choices. The merchant website will also include a merchant plug-in application that is used to route customer purchase request to the e-commerce application for further processing.

5.3.3. The e-commerce application

E-commerce refers to using the internet and intranets to purchase, sell, transport, or trade data, goods, or services (Efraim et al,2015).The e-commerce application includes direct marketing, could be used to search jobs, could be used to handle online banking, e-government, e-purchasing, B2B exchange, e-learning, auctions, travel, online publishing and consumer services.

In e-commerce 3-D Secure (3- Domain Secure) Payment authentication is the process of verifying cardholder account ownership during a purchase transaction in an online environment. Three-Domain Secure (3-D Secure) protocol has been developed to improve online transaction performance and to accelerate the growth of electronic commerce. The objective is to benefit all participants of the e-commerce activity by providing Issuers with the ability to authenticate cardholders during an online purchase, thus reducing the likelihood of fraudulent usage of cards and improving transaction performance (Visa Public, 2011).

In the proposed e-commerce framework all debit cardholders card details will be enrolled to the e-commerce platform using an enrollment web service. bank's system administrator will have a web access to send the first name of the cardholder, last name, login, password, secret question, response, primary account number (PAN) and the expiry date using the web service client. Another web service will be used to verify if the PAN and the expiry date are correct and enrolled in e-commerce application data base. After validation, the card is enrolled 3-D Secure and the cardholder can do his purchase securely.

The systems and functions necessary to implement 3-D Secure are divided according to domain:

- Issuer Domain : Systems and functions of the issuer and its customers (cardholders)
- Acquirer Domain : Systems and functions of the acquirer and its customers (merchants)
- Interoperability Domain: Systems, functions, and messages that allow Issuer Domain systems and Acquirer Domain systems to interoperate.

5.3.3.1. Issuer Domain

- **Cardholder**: The cardholder shops online, providing the account holder name, card number, expiration date, and CVV, then indicates readiness to finalize the transaction. In response to the Authentication Request Page, the cardholder provides information needed for authentication, such as a password.
- **Cardholder browser**: The cardholder browser acts as a conduit to transport messages between the Merchant Server Plug-in (in the Acquirer Domain) and the Access Control Server (in the Issuer Domain).
- **Issuer**: A Member bank to the interoperability environment – EthSwitch that:
    - Enters into a contractual relationship with the cardholder for issuance of one or more payment cards.
    - Determines the cardholder's eligibility to participate in the 3-D secure service.
    - Defines card number ranges eligible to participate in the 3-D secure service.
    - Performs enrollment of the cardholder for each payment card account

5.3.3.2. Acquirer Domain

- **Merchant:** Existing merchant software handles the shopping experience, obtains the card number, and then invokes the Merchant Server Plug-in to conduct payment authentication. After payment authentication, the merchant software may submit an authorization request to the acquirer, if appropriate.
- **Merchant Server Plug-in:** The Merchant Server Plug-in (MPI) creates and processes payment authentication messages, then returns control to the merchant software. As part of processing the authentication response message from the issuer, the MPI may validate the digital signature in the message.
- **Validation Process:** This function validates the signature received in the message from the Access Control Server to the merchant.
- **Acquirer:** A Member bank to the interoperability environment – EthSwitch that:
    - Enters into a contractual relationship with a merchant for purposes of accepting payment cards
    - Determines the merchant's eligibility to participate in the 3-D Secure service
    - Following payment authentication, the acquirer performs its traditional role:
        - Receives authorization requests from the merchant
        - Forwards them to the authorization system
        - Provides authorization responses to the merchant

5.3.3.3. Interoperability Domain

- **Functions and messages:** Functions and messages that allow Issuer Domain systems and Acquirer Domain systems to interoperate
- **Commercial Certificate Authority:** Generates selected certificates for the use of 3-D secure entities, including Transport layer Security-TLS/Secure Socket layer - SSL client and server certificates.

5.3.4. Support area

According to Efraim et al (2015)in their e-commerce framework support area includes but not limited to people, public policy, marketing and advertisement, support service and business

partnership. An estimate done as of July 2016 by Internet Live Stats[10]the number of internet users in Ethiopia is 4,288,023. The number shows an increase of 13.4% from the same time in 2015.which indicates the general public awareness in using internet based systems, one could be e-commerce, to facilitate the day to day experience is enhancing.

5.3.5. Interoperability Environment

According to Zhanwei (2015)Electronic commerce platform is a platform that can provide online trading opportunities or trading opportunities to enterprises or individuals, use the Internet technology in virtual network space to create a possible guarantee business for the smooth operation of the environmental management, integrate the information flow, capital flow and commodity flow of network transaction, promote enterprises and businesses to make full use of its network infrastructure, payment platform, security management and other resources, carry out efficient and low into the local e-commerce activities.

According to EthioPay Statistical bulletins, the monthly bulletin published by the Ethiopian National Switch - EthSwitch, which has enabled all banks in the nation to get ATM and POS banking services interoperable among the members and facilitate settlement and reconciliation of the same on T+1 day principle. The infrastructure is now able to process millions of debit card transactions initiated from ATM terminals of the member banks (EthioPay Statistical bulletin, issue No.008, 009 and 010, 2017).

The interoperability environment is established with the national bank of Ethiopia as an overseeing body and all the banks in the nation being a shareholder. The infrastructure is acquired to enable all Ethiopian banks, existing and new entrants, interoperable on card banking related activities, card less transactions such as money transfer from one bank to another, to handle bill/utility payments from any ATM/POS/Mobile banking/Internet banking facility. The infrastructure is also capable of interfacing e-commerce applications to make it interoperable among the member banks. On the project scope of the national switch implementation, the Functional Specification Document - FSD states that EthSwitch is able to manage authorization messages routing between member bank's Core Banking System and EFT Switches for transactions originated from ATM, POS and e-commerce(SmartVista national electronic funds transfer (EFT) switch functional specifications document, 2014).

[10]www.InternetLiveStats.com/internet-users/Ethiopia/, accessed on May 07, 2017.

CHAPTER SIX

6. Conclusion and Recommendation

6.1. Summary

A developing country can be rationalized and mechanized if it introduces e-commerce effectively and efficiently. Information Technology (IT) growth and the related innovations has boosted the implementation of e-commerce worldwide. E-commerce has enhanced any organization's output and gives competitive advantage. For a country that implemented e-commerce, it has become easier to enter to a new market and product/service quality of a company can easily be evaluated. Different literatures and publications on e-commerce related topics have witnessed a major business opportunity and profit out of e-commerce adoption and the implementation of e-commerce has also shown a reduction on business overhead and an enhance on business management.

The defined aims of this research was adopting an e-commerce framework for Ethiopian Banks and evaluate if e-commerce could act as one channel to be integrated to other e-banking menses to avail banking products and services to customers. The specific objectives of the study have been:

- Assess the potentials and risks of implementing e-commerce as one means of availing banking services and products.
- Assess the existing e-commerce practice in the Banking and related market sector.
- Assess the important factors on the decision to accept and use e-commerce applications as a customer, Bank and Merchant.
- Tailor e-commerce framework for Ethiopian Banks that works with local currency.

To achieve those objectives, the TOE technology adoption model was modified to include additional factors that hinder the adoption of e-commerce. Elizabeth and J. Michael questionnaire is used with some contextualization. The questionnaire has been developed using IT adoption factors from different researches (Elizabeth and J. Michael, 2004). The questionnaire has been modified with the addition of more than 20 questions to fit the research objectives and

also have been pre-checked/piloted for vocabulary, clarification, and general structure with the domain experts, the research advisor and the industry representatives before distribution.

Based on the results from 29 respondents the strategic values of e-commerce adoption, the factors that affect e-commerce adoption and perception of the banking industry decision makers are recognized. A SWOT analysis on the survey results to adopt the existing-commerce framework of Efraim et al (2015) for Ethiopian banks is done. The existing e-commerce framework is tailored by amending the national switch of Ethiopia- EthSwitch as a mid-player between the banks in Ethiopia and the merchants in the nation and also by rearranging the existing blocks of the framework. The proposed framework will resolve the different issues raised and discussed in the adoption of the existing framework as it is.

The aforementioned parts discuss the conclusion of the research findings, the contributions, recommendations, limitations of this research and proposal to future researches.

6.2. Conclusions

The research has targeted to achieve a response for the research problems that asks the challenges that affect e-commerce implementation and to propose an e-commerce framework that could be applicable to the Ethiopian banking industry to settle in local currency. An adopted and contextualized research questionnaire has been used to cover three major factors of e-commerce adoption to achieve the research objective; strategic value of e-commerce, factors that inhibit the adoption of e-commerce, and general perception of the industry decision makers about the adoption of e-commerce for Ethiopian banks. The questioner items further have been sub categorized in to major factors of e-commerce adoption such as organizational support, managerial productivity, decision aids, organizational readiness, compatibility, external pressure, ease of use, usefulness, entrepreneurial orientation and perception of decision makers.

The survey result shows that e-commerce adoption is the next business line the banking industry in Ethiopia is going to achieve as more than 88% of the respondents median shows an agreement to the raised questionnaire items on the adoption of e-commerce. A SWOT analysis on the internal and external factors of adoption has been done following the survey results. A change on the TOE technology adoption model has been proposed to enable the banking industry consider

some additional factors of adoption such as compatibility of the adopted framework with the existing organizational setup and external pressure of the competitors on the organization as external factors of adoption on the environment factor; Organizational readiness, organizational support, ease of use of the technology, usefulness of the technology, entrepreneurial orientation of the organizations under scope and perception of decision makers as internal factor on organization factor of TOE and the technology factor as it is without change.

From the pre-assessment study and the survey responses I am able to determine the different challenges and factors that contribute to the adoption of e-commerce. Based on the SWOT analysis a new e-commerce adoption framework has been proposed by amending additional blocks to make the framework workable for the Ethiopian banking industry. The newly included blocks of the framework, the interoperability environment, will reduce capital expenditures of the different banks in the nation to adopt e-commerce, as banks are only needed to interface their existing IT infrastructure to the e-commerce application availed by the national switch which enables every bank to have access to the same system. The proposed system is also close-controlled to have secure e-commerce transactions and protect cardholder, merchant and issuer banks against fraud.

The Ethiopian government initiatives on drafting different legislations and policy items that targeted e-commerce transactions are also a plus for the proposed framework.

6.3. Contribution

The theoretical contribution as of this research is, the adoption of e-commerce for the banking industry will enhance the country's economic growth in particular of the financial industry to become technology driven and achieve financial inclusion strategy of the National Bank of Ethiopia by being one means of banking channel. The financial industry is important in reallocating capital and thus providing the basis for the continuous restructuring of the economy that is needed to support national growth of a country.

The practical contribution on the other hand is that the research has proposed a tailored e-commerce framework that has identified and resolved the challenges that hinder the

implementation of e-commerce in Ethiopian banks, which in turn will increase in revenues and profits by reducing operational costs and enhanced customer experience.

6.4. Recommendation

The pre-assessment and survey questionnaire responses to the study has indicated the different parties interest (cardholders, merchants and issuer banks) in adopting e-commerce that could resolve the issue they have today and gave them flexibility in diversified business opportunities. Following a SWOT analysis this study has proposed an e-commerce adoption framework that could resolve the different issues that has been raised by cardholders, merchants and issuer banks. The proposed framework, a close-controlled mechanism of transaction management, if once tested with the current scope of implementation (for national/local cardholders), could be enhanced to accept international card as well. This is hence a recommendation for the Ethiopian banks to implement e-commerce based on the proposed adoption framework.

The government should also encourage Ethiopian banks to adopt such technology for the betterment of financial inclusion and achieving the goal of creating cashless society. Such technology adoption could also help the National bank of Ethiopia to reduce note printing cost. Hence, should work on e-commerce related directives to enable banks adopt the technology easily.

The future of e-commerce is uncertain, but due to technological innovations and globalization the processes involved in e-commerce transaction completion such as delivery times will improve, customer service will get increasingly better, and product selection will become ever greater. This is an opportunity for the local banks to get better profit out of the e-commerce adoption to entertain the ever changing financial industry, and hence adoption of the proposed frame work is recommended.

6.5. Limitation

- Due to the fact that e-commerce is a new phenomenon in Ethiopian Banks, its related concepts and usage could be somehow unfamiliar to the survey respondents thus they may have found certain questions irrelevant or difficult to understand.
- Elizabeth and J. Michael (2004) questionnaire model was applied in diversified industry (Education, Finance, Wholesale, Retail, Healthcare, Construction and Insurance) but in this research the model is adopted only to the Banking industry.
- Some of the survey questions focus on the strategy of the respective banks under study, which the respondents think is confidential information to share with, and some of the responses might not be correct to represent the ideas behind.
- Unit of analysis were focused on the selected bank managers and senior staffs of the IT and e-banking departments with them getting an appointment, convincing them to fill out the questionnaire was a very difficult task to do. This could have affected the responses to the questionnaire items.
- The sample size of this research, eight banks and 32 respondents, could be a limitation. A larger sample size may provide more diverse or convincing results.
- The use of purposive sampling, to select survey respondents, due to subjectivity and non-probability nature of sample selection, representativeness could be difficult to defend.
- The large number of questions in the questionnaire were also caused problem for respondents, although there wasn't any other way to reduce the number of questions since they are all related to the different items of e-commerce adoption factors.

6.6. Further Research

- Conducting sampling with large sample size in different organizations including but not limited to micro finance institutions, merchant outlets, organizations involved in items delivery and different business organizations is suggested to gather more representative information about e-commerce adoption for Ethiopian Banks.

- As e-commerce is new to Ethiopia, future studies should incorporate this measure as after some time the banking industry will be familiar to e-commerce adoption which might change the result found in this study.
- Since this study is focused only on the banking industry, future research on other industries is also suggested, that could present more valid model of e-commerce adoption. Also a replication of this research on different industries would provide data for comparison.
- The research has proposed a framework that is workable only for local bank cards; however with the current globalization effect of business, cross country commerce is a mandatory way forward for developing countries like Ethiopia. This hence needs further study to extend the proposed framework to fit international business sectors to enable Ethiopian public enjoy the benefits of cross bordere-commerce and settlement of transactions with international payment networks such as the Visa, MasterCard and China Union Pay that are the major international card clubs operate in Ethiopia.
- Though this study includes important adoption factors and variables, future studies could include additional adoption variables such as cultural implications and government's role in e-commerce implementation support.
- Further studies can be focused on the perceptions of customers towards the e-commerce services offered by the banks. It will also determine the benefits derived and challenges faced by customers who use such services.

REFERENCES

1. Abou-Shouk M. and Megicks P. (2013). E-commerce and small tourism businesses in developing countries: drivers versus boundaries of adoption, Tourism Planning & Development.
2. Adam Mambi (2010).An Assessment Report on developing e-commerce law for Ethiopia, The Ethiopian ICT Development Agency and The United Economic commission for Africa.
3. Agboola A., (2005).Information and Communication Technology (ICT) in Banking Operations in Nigeria: An Evaluation of Recent Experiences. http://www.informaworld.com/smpp/title~content=UNPANO26533.pdf
4. Ajzen I., (1991).The Theory of Planned Behavior, Organizational Behavior and Human Decision Processes
5. Amdemikael Abera (2012). Factors Affecting profitability: An Empirical study on Ethiopian Banking Industry, AAU.
6. Annet Wanyana Oguttu (2008).The Challenges that E-commerce Poses to International Tax Laws: 'Controlled Foreign Company Legislation' from a South African Perspective, University of South Africa, South Africa.
7. AyanaGemechuBultum (2014). Factors Affecting Adaption of Electronic Banking System in Ethiopian Banking Industry.
8. Belaynew AsrieMola (2012).Electronic Commerce: Opportunities and Challenges of general importers in Addis Ababa, Addis Ababa.
9. Bhaskar Reddy Muvva Vijay and Tewodros Sisay Asefa (2011).Application of Software and Technology in Selected Ethiopian Banks, International Journal of Computer Science
10. BPC Banking Technologies (2014).SmartVista national electronic funds transfer (EFT) switch functional specifications document.
11. Commercial Bank of Ethiopia (ND). E-payment directorate national feasibility study on e-payment infrastructure acquiring.
12. Dessalegn Mequanint and Dagmawi Lemma (2014). The Promises and Challenges of ICT-Pedagogy Integration in Developing Countries: the Case of Ethiopia. *Revue internationaled'éducation de Sèvres* 67, 75-84.

13. Elizabeth Ayalew, Lemma Lessa and Mariye Yigzaw (2010). E-commerce Readiness in Ethiopia: A Macro-level Assessment. Proceedings of the Sixteenth Americas Conference on Information Systems, Lima, Peru, August 12-15, 2010. Accessed on May 14, 2017 from https://link.springer.com/chapter/10.1007/978-3-642-15141-5_7.
14. Elizabeth E. Grandon and J. Michael Pearson (2004).Electronic commerce adoption: an empirical study of small and medium US businesses, USA.
15. Efraim, David, Jae, Ting-peng, Deborrah (2015).Electronic Commerce A Managerial and Social Networks Perspective, Switzerland.
16. EthSwitch (2017).EthioPay Statistical Bulletin issue number 008 January 2017, issue number 009 February 2017 and issue number 010 March 2017. Ethiopia.
17. Ethiopian Bankers Association (2009).Study Report to Establishing National Switch in Ethiopia, Addis Ababa.
18. EFDRE (2016). Ethiopian ICT policy and strategy.
19. Gail M. Sullivan MPH and Anthony R. Artino, Jr PhD (2013). Analyzing and interpreting likert scale data.www.ncbi.nlm.nih.gov, accessed May 6, 2017.
20. Habtamu Negussie Ayele (2012). Determinant of Banks Profitability: An Empirical Study on Ethiopia Private Commercial Banks, Msc Thesis, AAU
21. International Telecommunication Union (ITU) (2013). Electronic Transactions & Electronic Commerce: SADC Model Law.
22. I. Elaine Allen and Christopher A. Seaman (ND). Likert Scales and Data Analyses; www.asq.com, accessed on May 02, 2017.
23. Japhet E. Lawrence and Usman A. Tar (2010). Barriers to ecommerce in developing countries. Information, Society and Justice, Volume 3 No. 1, January 2010: pp 23-35
24. J. Oxley and B. Yeung (2001). E-commerce readiness institutional environment and international competitiveness, New York.
25. Les Labuschagne and Jan Eloff (2008)E-commerce strategy formulation, Rand Afrikaans University, South Africa.
26. Lloyd Modimogale, Jan H Kroeze (2011). The Role of ICT within Small and Medium Enterprises in Gauteng, South Africa. Accessed on February 15, 2017 from https://scholar.google.com/citation

27. Mahmoud M. Yasin, Andrew J. Czuchry, Maria Gonzales, Paul E. Bayes (2006). E-commerce implementation challenges: Small to medium-sized versus large Organizations, East Tennessee State University, USA.
28. Majed Ahmad Aljowaidi (2015). Study of E-commerce Adaption Using the TOE Framework in Saudi Retailers: Firm Motivations, Implementation and Benefits. PHDDissertation, School of Business Information Technology and Logistics RMIT University, Melbourne Australia.
29. Mohamed A. El-Nawawy, Magda M. Ismail (2012). Overcoming Deterrents and Impediments to Electronic Commerce in Light of Globalization: The Case of Egypt, Egypt.
30. Meseret Yohannes (2010).ICT Adaption Model for Ethiopian Banking Industry, Addis Ababa University.
31. Ministry of Communications & Information Technology (2011). E-Government Strategy and Implementation Plan – Report, Addis Ababa.
32. Moayyad AL-Fawaeer, Dr. (2014). Exploring the Relationship between E-Commerce Adaption and Business Strategy: An Applied Study on the Jordanian Telecommunication Companies. Jordan.
33. Namirembe E. (2007).Influence of ICT on the Banking Industry: The Case of Kampala.
34. Nagarit Gazeta of the Empire of Ethiopia. The Ethiopian Civil Code, Proclamation no.165 of the 1960. Addis Ababa
35. NBE (2012). Regulation of Mobile and Agent Banking Services, Directives No. FIS /01/2012.
36. N. Choucri, V. Maugis, S. Madnick, M. Siegel, S. Gillet, S. O'Donnel, M. Best, H. Zhu, F. Haghseta, (2003). Global e-readiness – for what? Massachusetts Institute of Technology Cambridge.
37. OluwaseunIbikunle (2003). E-Commerce in Developing Nations: Issues and Challenges. Consumer Attitude in the Nigerian Market, Nigeria.
38. Paulos Biruk (2015).The legal architecture for E-commerce in Ethiopia. Lessons from the EU experience, Hamburg, Germany, https://books.google.com.et
39. Palys, T. (2008). Purposive sampling. The Sage Encyclopedia of Qualitative Research Methods. (Vol.2). Sage: Los Angeles.

40. Premier Switch Solutions and S2M (2012). Five years Comprehensive Business plan of premier switch solutions, Addis Ababa.
41. Rania Nemat (2011). Taking a look at different types of e-commerce, Department of IT, Al-Azhar University, Cairo, Egypt. World Applied Programming, Vol (1), No (2), June 2011. 100-104.
42. Stella, M.I. (2010). Evaluation of the Impact of Information Communication Technology on Banking Efficiency Using the Transcendental Logarithmic Production Function and Camel Rating, International Journal of Engineering Science and Technology.
43. Scott W. Ambler (1999).An Object-Oriented Architecture for Business-To-Consumer Electronic Commerce on the Internet.
44. SADC Model Law on Electronic Transactions and Data Protection, SADC Workshop on the harmonization of e- commerce laws. Nov 24th-25th (2003). Johannesburg, South Africa.
45. Salwani (2009). E-commerce usage and business performance in the Malaysian tourism sector: empirical analysis, Information Management & Computer Security.
46. Sherah Kurnia (2016). E-Commerce Adaption in Developing Countries: an Indonesian Study, the University of Melbourne, Australia. San Diego international systems conference, 14-16
47. Sunders (2000). Research methods for business students, Edinburgh Gate, Prentice Hall
48. Survey Methods; http://www.managementstudyguide.com, accessed May 12, 2017.
49. Sushil K. Sharma and Jatinder N. D. Gupta (2009). Identifying Factors for Lack of E-Commerce in Developing Countries.
50. Syed Shah Alam, Md. Yunus Ali, Mohd. Fauzi Mohd. Jani (2011). An empirical study of factors affecting electronic commerce adoption among SMEs in Malaysia, Malaysia. https://www.scribd.com/document/261996438/Alam-Ali-and-Jani-2011-JBEM-Paper
51. Team FME (2013). SWOT analysis strategy skills, www.free-management-ebooks.
52. Tornatzky, G & Fleischer, M (1990). The Process of Technology Innovation, Lexington, MA, Lexington book. https://www.nap.edu/read/2070
53. Thomas F Burgess (2001). A general introduction to the design of questionnaires for survey research, University of Leeds, UK.

54. Tiago Oliveira and Maria Fraga Martins (2012). Literature Review of Information Technology Adaption Models at Firm Level. Universidade Nova de Lisboa, Lisbon, Portugal.
55. Turban, King, McKay, Marshall, Lee and Viehland (2008). Introduction to Electronic commerce and e-Market places.
56. Uma Sekaran (2003). Business Research Methods for Business, Fourth Edition, Southern Illinois University at Carbondale, USA.
57. United Nations (1999).UNCITRAL Model Law on E-Commerce with guide to enactment 1996. New York.
58. United Nations (2015). Information Economy Report 2015 – unlocking the potential of e-commerce for developing countries, Switzerland.
59. Venkatesh, V. and F.D.Davis (2000).A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, Management Science.
60. Visa Public (2011).Verified by Visa Acquirer and Merchant Implementation Guide, US region.
61. Wondwossen Tadesse and Tsegai G. Kidan, (2005).e-Payment: Challenges and Opportunities in Ethiopia. United Nations, Economic Commission for Africa.
62. Wade, M., (2009). Resource-based view of Information system. http://www.fsc.yorku.ca/york/istheory/wiki/index.php/Resource- ased_view_of_the_firm
63. Zhu. K & Kraemer. K (2005). Post-adoption variations in usage and value of e-business by organizations: Cross-country evidence from the retail industry, Information Systems Research.
64. Zhanwei Chen (2015). Research on Network Architecture of the E-commerce Platform and Optimization of the System Performance, china.
65. Zhao Duan (ND). Analysis of E-Commerce Model in Transaction Cost Economics Framework, HuaZhong Normal University, china.

Annex I: Pre-assessment Study Interview Guide

Title – Adaption of e-commerce framework for Ethiopian banks

Details of Interviewee

Sex: M/F

Age: 20 – 30/31-40/41-50/50-60/above 60

Education: Diploma/Bachelor Degree/Master/PhD/Other

Date of Interview:_____

Interview Questions for e-banking managers

1. What is your organization's strategy in implementing e-commerce?
2. How is your organizations readiness in implementing e-commerce?
3. Any reason why your organization didn't yet start e-commerce related service and products for the general public.
4. How do you think e-commerce could assist in achieving the digital financial services and financial inclusion strategy of the National Bank of Ethiopia?
5. What could be the merits and demerits of e-commerce implementation for Ethiopian commercial banks in general?

Interview Questions for shop/merchant representatives

1. How long do you stay open in 24 hours?
2. Does your organization have a web site to promote your services/products online?
3. What are some of the strategies your organization is currently following to be competent in the current globalized marketing system?
4. Do you/your organization ever think of using e-commerce as a means of selling your services/products online?
5. How many branches do you have with in Ethiopia?

Interview Questions for the walking customers

1. How frequently you do shopping?
2. Do you use internet for social media access and other activities online?
3. Have you ever use e-commerce to purchase physical or digital items online?
4. How do you compare product/service price and quality before you do final purchase?
5. How do you think e-commerce would help to ease the way we do shopping?

Annex II: Survey Questionnaire

Research Title - Adaption of e-commerce framework for Ethiopian Banks.

Dear Participant,

My name is Emishaw Tefera, a postgraduate student at Addis Ababa University, School of Information Science. As part of the program requirement, I am doing my thesis research paper on the adoption of international e-commerce framework for Ethiopian Banks. Because you are working in the banking industry and play a part in the information and communications technology industry, I am inviting you to participate in this research by completing the attached survey questions.

The questionnaire will require approximately 15 minutes of your valuable time. There is no compensation for responding nor is there any known risk. In order to ensure that all information will remain confidential, please do not include your name or credentials. Copies of the research report will be provided to my research advisor, to Addis Ababa University main library and to the library of the School of Information Science. If you choose to participate in this research, please answer all questions as honestly as possible and return the completed questionnaires promptly. Participation is strictly voluntary and you may refuse to participate at any time. If you require additional information or have questions, please contact me at the number listed below.

If you are not satisfied with the manner in which this study is being conducted, you may report (anonymously if you so choose) any complaints to my research advisor Dr. Wondwossen Mulugeta through an e-mail - wondwossen.mulugeta@aau.edu.et.

Sincerely,
Emishaw Tefera
Mobile Number – 0911-160344
Email – emi.tefera@gmail.com

Instruction:

This questionnaire has five sections. In the first section you are requested to tick the choice that best describes you. For the next three sections please use the below rating scale to indicate your agreement with the listed set of questions. Section Five contains three open ended questions, for which you could write your response using maximum of 150 words.

1	2	3	4	5	6	7
Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree

Section 1: General Information

Gender

- ☐ Male
- ☐ Female

Age

- ☐ 20-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51-60
- ☐ Over 60

Education

- ☐ Diploma
- ☐ Bachelor Degree
- ☐ Master
- ☐ PhD
- ☐ Other

Section 2: The following questions are about your perceptions of strategic value of e-commerce for your Bank.

In order to provide strategic value to your bank, e-commerce will help:

s.no	Question code	Questions	Responses						
			1	2	3	4	5	6	7
1	OS1	Reduce cost of business operation							
2	OS2	Reap operational benefit							
3	OS3	Improve customer service							
4	OS4	Providing customer more satisfying shopping							

s.no	Question code	Questions	Responses						
			1	2	3	4	5	6	7
		experience							
5	OS5	Increase the accessibility of products/services to customers							
6	OS6	Improve financial accessibility to more customers							
7	OS7	Increase ability to compete (Enhances competitiveness)							
8	MP1	Providing mangers, consumers, merchants, business owners and producers better access to information							
9	MP2	Providing mangers access to method and models in making functional area decision							
10	MP3	Improve communication in the bank							
11	MP4	Help make decisions for managers							
12	DA1	Support strategic decisions of managers							
13	DA2	Provide information for strategic decision							
14	DA3	Support cooperative partnership in the industry							
15	DA4	Improve productivity of managers							

Section 3: The following questions are about adopting e-commerce.

What are the factors that hinder e-commerce adoption to Ethiopian Banks?

s.no	Question code	Question	Responses						
			1	2	3	4	5	6	7
1	OR1	Having financial resources for adopting, implementing and supporting e-commerce							
2	OR2	Having technological resources for adopting, implementing and supporting e-commerce							

s.no	Question code	Question	Responses						
			1	2	3	4	5	6	7
3	OR3	Having technical expertise for adopting, implementing and supporting e-commerce							
4	OR4	Having logistical capability for adopting e-commerce							
5	OR5	Having sufficient inventory of products in order to give better services to the customers							
6	OR6	Level of risk tendency of the organization							
7	OR7	Level of employee resistance against e-commerce adoption							
8	OR8	Governmental support for adopting e-commerce							
9	C1	Consistency of e-commerce with culture of organization							
10	C2	Consistency of e-commerce with value of organization							
11	C3	Consistency of e-commerce with preferred work practices							
12	C4	Consistency of e-commerce with existing technology infrastructure in the organization							
13	C5	Consistency of e-commerce with business requirements in the organization							
14	C6	Management's awareness about strategic importance of e-commerce							
15	C7	Management's enthusiasms about e-commerce adoption							
16	EP1	Competition is a factor in organizations' decision to adopt e-commerce							
17	EP2	Level of change resistance of Ethiopian buyers against electronic shopping							

s.no	Question code	Question	Responses						
			1	2	3	4	5	6	7
18	EP3	People computer-related skills and knowledge							
19	EP4	People trust in using e-commerce							
20	EP5	Increasing percentage of young generation in Ethiopia							
21	EP6	People level of income							
22	EP7	Existence of technological and security-related infrastructures in the country							
23	EP8	Ethical/religious beliefs of the people							
24	EP9	Government pressure on banks to adopt e-commerce							
25	EP10	Government support of banks to adopt e-commerce							
26	EP11	Joining to world trade organization - WTO							
27	EP12	National ICT Policy							
28	EP13	Single state owned internet service provider							
29	EP14	No legislation for e-commerce on National Payment system proclamation, telecom fraud offence proclamation, and the consolidated foreign exchange directives of National Bank of Ethiopia							
30	EP15	Lack of institutional control of e-commerce infrastructure by Government bodies like the INSA, MCIT and NBE							
31	EP16	Mechanism of payment for purchased goods and services is in Ethiopian Birr							
32	EP17	NBE didn't allow credit cards							
33	EP18	Cross country e-commerce payments settlement is done in foreign currency mainly in USD							

s.no	Question code	Question	Responses						
			1	2	3	4	5	6	7
34	EP19	Pressure from banking industry to adopt e-commerce							
35	EP20	In order to be a leader in the banking industry there is a need to adopt e-commerce							
36	EU1	Learning to operate e-commerce would be easy							
37	EU2	e-Commerce is flexible to interact with customers							
38	EU3	Interaction with e-commerce is clear and understandable							
39	EU4	It is easy to become skillful at using e-commerce							
40	EU5	e-Commerce is easy to use							
41	U1	Using e-commerce enable the organization to accomplish specific task more quickly							
42	U2	Using e-commerce improve job performance							
43	U3	Using e-commerce increase productivity							
44	U4	Using e-commerce enhance effectiveness on the job							
45	U5	Using e-commerce make it easier to do the job							
46	EO1	Improving product/services quality before competitors is important in our decision to adopt e-commerce							
47	EO2	Finding new business or markets target is important in our decision to adopt e-commerce							
48	EO3	Creating new products to provide value for customers affects e-commerce adoption							
49	EO4	Re-engineering the process to make them more efficient than competitors' Processes affects e-commerce adoption							

s.no	Question code	Question	Responses						
			1	2	3	4	5	6	7
50	EO5	Improving value to customers through non-product means is important in our decision to adopt e-commerce							
51	EO6	Creating value for customers through partnership with vendors is important in our decision to adopt e-commerce							
52	EO7	Introducing new products/services before competitors is important in adopting e-commerce							
53	EO8	Price aggressively to increase market share is important in adopting e-commerce							
54	EO9	Creating partnership with the best partner in the industry is important in adopting e-commerce							
55	EO10	Being successful in the market the bank need to be entrepreneurial is important in adopting e-commerce							
56	EO11	Being more entrepreneurial than competitors is important in adopting e-commerce							

Section 4: The following questions are about your general understanding of your bank on e-commerce adoption related activities.

What is your general perception about yourself and your bank regarding e-commerce adoption?

s.no	Question code	Question	Responses						
			1	2	3	4	5	6	7
1	PDM1	The bank has a clear vision on electronic commerce							
2	PDM2	The bank has high bandwidth connectivity to the Internet							

s.no	Question code	Question	Responses						
			1	2	3	4	5	6	7
3	PDM3	The bank has sufficient experience with network based applications							
4	PDM4	e-commerce fits well your bank beliefs and practices							
5	PDM5	e-commerce fits well your bank as it has a strong relationship with suppliers and customers							
6	PDM6	The bank business partners are ready to conduct business on the Internet							
7	PDM7	The telecommunication infrastructure is reliable and efficient							
8	PDM8	The technology infrastructure of and financial institutions is capable of supporting e-commerce transactions							
9	PDM9	There is efficient and affordable support from the local IT industry to support our move to the Internet							
10	PDM10	There are effective laws to protect consumer privacy							
11	PDM11	There are effective laws to combat cyber crime							
12	PDM12	The legal environment is conducive to conduct business on the Internet							
13	PDM13	The government demonstrates strong commitment to promote electronic commerce							
14	PDM14	Government regulations allow electronic settlement of electronic commerce							

s.no	Question code	Question	Responses						
			1	2	3	4	5	6	7
		transactions							
15	PDM15	Learning to operate electronic commerce would be easy							
16	PDM16	Interacting with electronic commerce would be flexible							

Note:

- OS – Organizational Support
- MP – Managerial Productivity
- DA – Decision Aids
- OR- Organizations readiness
- C – Compatibility
- EP- External Pressure
- EU – Ease of Use
- U – Usefulness
- EO - Entrepreneurial orientation
- PDM – Perception of decision makers.

Section 5: Open ended questions

1. How is your bank's readiness in acquiring e-commerce platform? Please elaborate your response by indicating some of the indicators.

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   ……
   ……
   ……
   ……

2. How will you describe the future of e-commerce for the Ethiopian banking industry? Good/Bad/Unknown? If Good or bad, please provide reasons.

   ……
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   ……
   ……
   ……
   ……

3. Do you ever use e-commerce as a means to purchase any item online? Yes/No. If yes, Please provide your experience of the purchasing process.

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