"A SURVEY OF E-COMMERCE SERVICES IN COMMERCIAL BANKS IN KENYA"

By

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DECLARATION

This Management Research Project is my original work and has not been presented for a degree in any other university.

Signed.....Date 2.11.2005

This Management Research Project has been submitted for examination with my approval as a University Supervisor.

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DEDICATION

I dedicate this project to my beloved wife Rachel and son Gian for being so understanding and supportive.

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LIST OF ABBREVIATIONS

1.	A2A	:Account –to-account
2.	ACH	:Automated Clearing House
3.	ATMs	:Automated Teller Machines
4.	Bk2B	:Bank -to- Bank
5.	Bk2C	:Bank -to- Customer
6.	C2C	:Customer -to- customer
7.	CBK	:Central Bank of Kenya
8.	CDS	:Central Depository System
9.	CHIPS	:Clearing House Inter-banks Payment System
10.	CA	:Certification Authority
11.	DDA	:Direct Debit Authority
12.	EFT	:Electronic Funds Transfer
13.	EFT POS	:Electronic Funds Transfer Point of Sale
14.	GOK	:Government of Kenya
15.	ICT	:Information and Communication Technology
16.	IT	:Information Technology
17.	ISPS	:Internet Service Providers
18.	KBA	:Kenya Bankers Association
19.	KEPSS	:Kenya Electronic Payment System
20.	Me2Me	:Me -to- me
21.	MICR	:Magnetic Ink Character Recognition
22.	NSE	:Nairobi Stock Exchange
23.	PCs	:Personal Computers
25.	POS	:Point of Sale
26.	PDAs	:Personal Digital Assistant
27.	RTGS	:Real Time Gross Settlement System
28.	SWIFT	:Society for Worldwide Inter-bank Financial Telecommunication
29.	SWOT	:Strength, Weakness, Opportunities and Threats
30.	UCC	:Uniform Commercial Code
31.	UETA	:Uniform Electronic Transaction Act
32.	WAN	:Wide Area Network

TABLE OF CONTENTS PAGE

LIST OF TABLES

ABSTRACT

Due to competition, banks in Kenya have generally adopted Internet technology in their service delivery. This study investigated the range of E-commerce services offered by commercial banks in Kenya. Other objectives of the study were to establish the benefits and challenges faced by banks in implementing E-commerce products and services. These objectives were achieved through a survey of commercial banks in Kenya. A total of 40 questionnaires were distributed however only 35 banks responded representing 87% response.

The outcome of the study shows that overall 94% of banks use automated clearing through EFT, 80% electronic transfer payment facility and 66% use settlement of payments real time. Settlement of government securities electronically is used by 43% whereas 17% of banks use truncation and cheque imaging facility.

Overall 54% of banks use ATMs services with 80% of banks with government participation and 59% of wholly locally owned banks using it. However credit cards and debit cards are used by 14% of banks overall.

The E-commerce services by commercial banks in Kenya has been influenced by the need to increase customer base, expand geographical reach, meet customer demands and keep pace with rapid technological changes.

The impact of use of technology has been improved customer service, reduction of customers from the banking halls, increased revenue, reduction of operation cost and increased market share.

However the use of E-commerce services has brought a number of challenges. These include, ensuring desired levels of security and privacy, dealing with security breaches, Integration with banks' other back office systems, Unreliable telecommunication as well as lack of legislation governing E-commerce transactions.

CHAPTER ONE: INTRODUCTION

1.1 Background

Development of Information and communication technology (ICT) coupled with increased globalization and liberalization has resulted in emergency of various ICT technologies. Internet being one of these ICT technologies has brought about various revolutions on how business is carried out (Kiyeng', 2003). E-commerce is changing the shape of competition, the speed of action and the nature of leadership. Bowden et al (2001) noted that, streamlining of interactions, products and payments from customers to companies and from companies to suppliers is bringing new challenges on the management of organizations. Electronic business is now a major force in global economy. With this in mind, many banks in the world have realized that only those that overhaul their payment service delivery and operations are likely to survive in this new millennium. This is due to pressure of globalization, consolidation, privatization, deregulation and rapidly changing technology. Banks are making use of Internet technology to place themselves in favorable positions for competitions

As the world becomes more and more connected with each new technology (Gonzalez, 2001), devices such as smart cards, extended networks (WAN etc), biometric devices and wireless devices, which can process, store or transfer a large amount of data and information at a surprising speed, coupled with systems such as automatic teller machines (ATMs), voice mails and the Internet are, for many customers, their primary method of transacting banking services. In time, a customer (client) will be able to complete any and all transactions through a communication network devices such as the Internet. Thus, banks will be able to mediate all the financial transactions of their clients through Internet (Gonzalez, 2001).

As new devices emerge, increase in the capacities of communication networks and banks restructure their business, diverse types of interrelations will arise in the banking and/or financial environment. These will include Bank-to-Customer (Bk2C), involving transactions between banks with customers, Bank-to-Bank (Bk2Bk), involving trading

between banks and business, Customer-to-Customer (C2C) where customers trade with customers, Business-to-Customer (B2C) where business trade with customers and Business-to-business (B2B) involving trading between business.

Banks in Kenya are embracing E-commerce to reduce costs, increase efficiency, ensure better service to customer, create new potential market and realize both opportunities and revenue from new and current products and services. The effective use of E-commerce can assist the banks to offer niche products and services to global market. For banks that thoroughly exploit their potential, E-commerce and Internet banking offer the possibility of major changes that would radically change customer expectations and redefine the market, or create completely new markets. As a result, the bank's possibilities will be expanded and the geographical and time restrictions eliminated. E-commerce is inspiring and forcing businesses to take a new look at how they do business, to reassess their competition, to collaborate in new ways, and to identify new Customers (O'Brien 2002).

E-commerce is making banks incorporate a diverse spectrum of new commercial relations. Banks are evaluating new strategic avenue for business through the emerging technologies to gain full benefit of changes that E-commerce brings. The value of the customer relationships remains the primary gauge for success in E-commerce business, and it can increase substantially with addition of E-commerce strategies involving outside segments of the population, such as customer to business segment. Banks moving into E-commerce should not abandon traditional practices. They should strive to bridge the gap between old and new business models instead.

At the same time, E-commerce and Internet banking also represents substantial new risks. These risks include; strategic risk, legal risk, operational risk, reputation risk, regulatory risk and credit, market, and liquidity risks (Hawke, 2001).

Many banks in Kenya have installed modern computer inter-connectivity backbone that will enable them achieve communication of data and multimedia over Internets, Intranets and Extranets. With these gradual adoption of Information Technology, most banks have

put up a web-site that provides general information on the bank, its location, services available e.g loan and deposits products, application forms for downloading and e-mail option for enquiries and feedback.

The banks also realize that they have to achieve not only management/staff wide computer literacy but what could be called information literacy. All staff and managers in modern bank need to be able to search and gather data from several types of sources, analyze them, select relevant ones and organize them in such a manner to allow them make decisions based on the organized data.

Kenyan banks have realized that the banking of tomorrow requires more electronic manipulations and shuffling of bit- based money and other banking transactions, instead of paper. Paper based transactions are now being replaced by electronic based transactions. All banks in Kenya are therefore connected through a virtual private network (VPN) to facilitate inter bank electronic transactions.

1.2 Statement of the Problem

The Kenya Banking and Financial Services sector plays a leading role in the development of the country's economy. According to the Central Bank of Kenya (CBK) Bank supervision annual report 2003, the banking sector recorded a relatively stable growth in 2003. It recorded increased profitability and improved asset quality. Net profits increased by 134% from Ksh 6 billion in 2002 to Ksh 14.1 billion in 2003. Similarly, asset quality of the banking system improved during the year with non-performing loans ratio declining to 11.2% from 14% in 2002.

The phenomenal growth has partly been because of general improved economic environment and development of ICT in the banking sector. The bank annual supervision report has noted that, the advancement in ICT has enhanced efficiency and improved customer service. This is reflected particularly in the increased use of ATM machines which have been installed by banks in Kenya..

Although a lot of research work has been done on the prospects and challenges of information Technology in firms in Kenya, most of them are broad based and only a few are on E-commerce services in banking industry. Muganda (2001) investigated business value of E-commerce amongst selected firms in Kenya, Kiyeng' (2003) reviewed broadly the business effects and challenges faced by companies which have adopted E-commerce in Kenya and Muyoyo (2004) investigated factors influencing the adoption and implementation of E-business technologies in companies quoted at NSE.

In view of this, a study on E-commerce, E-banking or Internet banking needs and challenges in Kenya is needed. This study was, therefore, designed to fill this gap, by emphasizing on E-commerce and E-banking or Internet in Kenyan banking sector. The research aimed at addressing the following questions. What are the range of E-commerce, E-banking or Internet banking products offerings adopted by banks for the market? What are the drivers for embracing E-commerce, E-banking or Internet banking? Finally, what are the challenges/constrains and the impact of implementing E-commerce services by Kenyan banks?

1.3 Objective of the study

This project specifically addresses the adoption of E-commerce concept in Kenya by banks. The objectives of the study are:

i) To establish the extent to which E-commerce services have been utilized in Kenyan banking sector; and

ii) To establish the benefits and challenges faced by banks in implementing E-commerce products and services.

1.4 Importance of the study

i) Banks and financial institutions can use the technology and business practices of E-commerce to market their products to customers;

ii) E-commerce provides business opportunity for banks to offer new products and services to serve the customer needs of E-commerce; and

iii) The new business environment associated with E-commerce provides opportunity for institutional innovations in banking and finance which can lay a sounder foundation for the international financial systems.

CHAPTER TWO: LITERATURE REVIEW

2.1 History of Banking in Kenya

The history of banking in Kenya dates back to 1896 when National bank of India opened a small branch in the coastal town, Mombasa. In January 1911, Standard Chartered Bank opened its first branches in East Africa at Treasury Square in Mombasa and Kenyatta Avenue in Nairobi. In 1958, Grindlays Bank of Britain merged with the National Bank of India to form National and Grindlay Bank. In 1970, the government of Kenya acquired 60% shareholding in National and Grindlays Bank and renamed it the Kenya Commercial Bank.

The Cooperative Bank of Kenya was established in 1965 for the express purpose of providing financial services to co-operative societies. National Bank of Kenya (NBK) was incorporated on 19th June 1968 and officially opened on Thursday November 14th, 1968 with an objective of helping Kenyans get credit and control their economy after independence)

The development of E-banking in Kenya started in the early 1990s with the installation of first ATMs machines. By the end of 2004, cards were widespread payment method used by most bank account holders in Kenya. Similar things are likely to happen to on-line banking and other instruments of E-banking.

2.2 Definition

Electronic commerce (E-commerce) is a term popularized by advent of commercial services on the Internet (David, 2004). Many definitions of electronic commerce prevail in the literature, ranging from a tight description relating solely to "commercialization of the Internet" to broad, inclusive definitions embracing all private, internal and external networks which form part of inter-organizational electronic information system (0'Daniel 1999).

i. E-commerce can be defined in general terms as '....the seamless application of information and communication technology from its point of origin to its

endpoint along an entire value chain of business processes conducted electronically and designed to enable the accomplishment of a business goal. These processes may be partial or complete and may encompass business to business as well as business to consumer and consumer to business transactions...' (Wigand, 1997);

ii. The Internet includes all web-enabled technologies and open telecommunication networks ranging from direct dial-up, the public World Wide Web, cable, and virtual private networks. (BIS-EBG, 2003);

iii. Internet banking (E-banking) is defined to include the provision of retail and small value banking products and services through electronic channels as well as large value electronic payments and other wholesale banking services delivered electronically. (BIS-EBG, 2003).

There exists a number of E-commerce business models adopted by Kenyan banks. These include business to business (B2B) where customers are other banks or companies, business to customers (B2C) where customers are individuals and customer to customer (C2C) where the transaction are between individual customers of the bank.

2.3 Business Models for E-commerce

A business model is a unique configuration of elements comprising the organizations goals, strategies, processes, technologies and structure, conceived to create value for the customers and thus compete successfully in a particular market. It describes how a business position itself within the value chain of its industry and how it plans to sustain itself.

Banks involved in E-commerce rely on Internet based technologies and E-commerce applications and services to accomplish marketing, transaction processing and product and customer service processes. Many banks are participating in or sponsoring four basic categories of electronic commerce business models. These are classified according to transaction partners such as B2B, B2C and C2C. Within these broad categories, there is a number of variations in the way the models are implemented.

2.3.1 Business to Business (B2B)

A variety of definitions of B2B E-commerce have been employed by researchers and policy makers (OECD, 2000; Wigand, 1997; World trade Organization, 1998). In its broadest conception, B2B is that model of E-commerce whereby a company conducts its trading and other commercial activity through the net and the customer is another business itself (Joseph, 2004).

2.3.2 Business to Consumer (B2C) E-commerce

While the term E-commerce refers to all online transactions, B2C stands for "business-to-customer" and applies to any business or organization that sells its products or services to customers over the Internet for their own use. When most people think of B2C E-commerce they think of amazon.com the online bookseller that launched its site in 1995 and quickly took on the major retailers in the US. However, in addition to online retailers, B2C E-commerce has grown to include services such as online banking, travel services, online auctions, health information and real estate sites.

2.3.3 Customer to Customer (C2C) E-commerce

In C2C E-commerce, online transaction occur between two consumers. In banking, this is referred to as Account-to-Account (A2A) transfers also called interbank fund transfers. A2A transfers allow customers to move money from their bank accounts to their accounts at other banks (Me2Me) and to other individuals or business bank accounts (C2C, C2B). A2A transactions have the advantage of reducing the volume of cheques in the banking system and better leverage investment in online banking platform.

2.4 Common banking products

2.4.1 Tele-Banking products

This is a facility that enables customers, via telephone calls, find out about their position with their bankers by merely dialing the telephone numbers given to them by the banks. In addition, the computers on the phone would require special codes given to the

customers as a means of identification of authentic users before they can receive any information requested.

This is a service introduced into the banking business as a result of computer telephony technology being made available. The technology of telephone banking has a diverse possible applications limited only by imagination. These areas include:

i. Account balance enquiry;
ii. Account statement printing; and
iii. Download account transactions etc.

On the other hand, banks could process customer instruction such as payment instruction initiated from a computer located at home or office of a customer. Some of the feature of telephone and PC banking include:

i. They bring the bank to the doorstep of the customer. It does not require the customer to leave his premises;
ii. Interactive Voice Responses becomes a regular features of operations;
iii. Text-to-speed capability becomes reality; and
iv. A uniformed messaging capability becomes permanent feature of the bank.

2.4.2 The Card System

The card System is a unique electronic payment type. The smart cards are plastic devices with embedded integrated circuit being used for settlement of financial obligations. The power of cards lies in their sophistication and acceptability to store and manipulate data, and handles multiple applications on one card securely. Depending on the sophistication, it can be used as credit card, Debit card and ATMs (Automatic Teller Machine).

The smart cards were introduced into the Kenyan market to reduce or eliminate problems of carrying cash about. It is electronically loaded with cash value and carry about like credit card and stores information on a microchip. The microchip contains a 'purse' in which value is held electronically. In addition it contains security programs which protect transactions between one card user and the other.

It can also be transferred directly to a retailer, merchant or other outlet to pay for goods and services, and like cash, transaction between individual without the needs for banks or other third parties.

2.4.3 The Automated Teller Machine (ATM)

Worldwide, the use of paper cash still remains the most widely used and acceptable means of settling transactions and obligations. However, the proportion of cash transaction is increasingly on the decline, especially in advanced economies. In USA, where the use of cash is still prominent, compared with European countries, it represents 50 percent or more of the total transactions. However, the physical carriage of cash as well as the visit to the bank branches is being reduced by the introduction of the electronic device, ATM.

An ATM mechanism allows a bank customer to withdraw cash from his account via a cash dispenser (Machine), and the account is debited immediately. A fundamental advantage is that it needs not to be located within the banking premises. It is usually in convenient places such as stores, shopping malls, fuel stations.

In Kenya there are over 230 ATMs belonging to five (5) big banks and a few medium size banks. Major banks in Kenya now issue ATM cards to holders of both current and savings accounts in order to ease long queues in banking halls and enable the withdrawal of cash.

Kenswitch, an on-line ATM network set up by a consortium of 18 small and medium banks provides a shared network for switching ATM transactions among the small and medium banks that opt to become members.

2.4.4 Chequeing

A cheque is a paper based payment instrument whose use is still gaining ascendancy. The Automation focus on this instrument is to reduce the number of clearing days and improve on security arrangement in the course of settlement and collection.

For example, in Kenya the Central Bank of Kenya has implemented an online clearing system. The Central Bank facilitates the ACH operations through the Kenya Bankers' Association (KBA) which owns, operates, and administers the clearing of cheques and EFTs that are used by 38 clearing banks, including the CBK and 5 other non-clearing banks.

Magnetic Ink Character Recognition (MICR) system was adopted during 1998 as a basis for the automation of clearing effects in the whole country. For security purposes all files to and from the clearing House are signed by a system which generates signature files for the exchanged files. The data files are transmitted through dial up telephone lines to the ACH where they are processed to produce settlement figures by 10.00am. Cheques are then taken to clearing house by a bank representative where they are physically exchanged. The ACH is able to manage the settlement risk by way of ACH rules allowing for unwinding of a bank's position when in an overdrawn position.

2.4.5 Electronic Funds Transfer (EFT) System.

EFTs are used for transferring value between banks on behalf of customers. Within Kenya's inter bank exchange arrangements, EFT system is used as a facility for processing payments electronically via Automated Nairobi Clearing House between the Kenya Bankers Association member banks. Value is given on the same day basis while finality and irrevocability of the payment is guaranteed.

2.4.6 Direct Debits

Direct debits are in use in countries all around the world and are fast becoming the preferred way of paying regular bills and making utility service related payments globally. They are pre-authorized by the paying customer who gives permission for his/her bank to debit his/her account upon receipt of instructions initiated by the receiving customer e.g. insurance or mortgage companies.

The Kenya Bankers Association introduced the Direct Debit Scheme, effective from 1st June 2003. Direct Debits provide a simple, safe and convenient banking service that

enables one ("the debtor") to settle his or her bills as and when they fall due. This is typically done by the service provider ("the creditor"), who initiates the transfer of the funds due from the debtor's account in settlement of goods sold, or services rendered to him or her. The transfer is based on the Direct Debit Authority (DDA) signed by the debtor and the service provider, provided his or her account has adequate funds to pay.

Types of payments that can be made using Direct Debits, include: Insurance premium payments, Hire purchase repayments, Public utility e.g. power, water, telephone payments, mortgage repayments.

2.4.7 Swift

Society For Worldwide Inter-bank Financial Telecommunication (SWIFT) is a cooperative owned by members banks in 199 countries worldwide. In Kenya, all the 43 commercial banks are members of SWIFT. The central bank is encouraging banks to join SWIFT because of its robust and secure network, which has been chosen as a platform for delivering National Real time Gross Settlement System (RTGS).

2.4. 8 Changes Envisaged in the banking sector

(a) Cheque Truncation.

The volume of cheques presented to banks have increased with cheques being increasingly used as a payment instrument. The physical movement of a large volume of cheques from the collecting Bank branch to the paying bank branch delay the realization of funds to the recipient when payments are made in cheques. In some countries, banks have been able to short-circuit the whole cheque clearing and movement process by resorting to truncation and cheque imaging.

Cheque truncation is one of the ways to compress the clearing cycle to provide faster clearances of local cheques. Cheque truncation, very loosely defined, is the process in which the physical movement of cheque within a bank, between banks or between banks and clearing house is curtailed or eliminated, being replaced in whole or in part, by

electronic records of their content (with or without the images) for further processing and transmission.

The use of cheque imaging technology helps to reduce the duration of the cheque clearing process, enabling faster availability of funds in countries where this technology is applied. The KBA is in the process of constituting a committee to spearhead the Cheque Truncation implementation process in Kenya.

(b) Real Time Gross Settlement and Central Depository Systems

In Kenya, B2B E-commerce has witnessed a steady growth in banking sector. B2B strategy is unfolding on two fronts. Firstly, the government of Kenya (GoK) through the Central Bank Of Kenya (CBK) and the Nairobi Stock Exchange (NSE) have come up with major B2B initiatives that will have a great impact on the efficiency of payment systems in the country and by extension improve the performance of the economy. CBK is currently spearheading the implementation of a Real Time Gross Settlement system (RTGS), the Kenya Electronic Payment system (KEPSS). KEPSS will provide the final settlement of systematically important payments in the country. Systematically important payments are:

i) Payments between settlement participants (bank-to-bank payments) including payments to and from the CBK;
ii) Payments on government securities transactions;
iii) Net transfers of funds requiring the designated time settlement; and
iv) Large-value customer payments.

The concept of KEPSS is to enforce, through the system, the processing and settlement of payments on a gross basis in real-time. This eliminates the settlement and systematic risks associated with pre-existing arrangement where settlement was deferred and conducted on a net basis. KEPSS will ensure irrevocable receiver finality – a potential significant consumer advantage. Each KEPSS Participant (CBK and Commercial Banks) interface supports access to non-value functions including:

i) On –line access to account balance and activity information;

ii) On –line access to queued payment information;

iii) On –line information for the total sum of queued inward payment;

iv) On –line access to perform reprioritization or cancellation of queued payment; and

v) Monitoring of KEPSS central System operational status.

KEPSS will also provide a secure communications facility for exchange of electronic mail between participants.

Secondly, the Nairobi Stock Exchange (NSE) through the Central depository corporation have implemented a central depository system (CDS). The CDS is a computer based data recording system which records the holdings of government securities and other investment instruments. This are customer based depository. At any given point in time, the holders of securities in the CDS will be able to obtain confirmation for their holdings. The transfer of holdings of securities is recorded electronically in the CDS according to instructions received from the participants of the system i.e primary dealers and licenced commercial banks. The CDS will be linked to participating institutions which trade in government securities. The CDS will issue monthly statements confirming the balances held by investors in the government securities. The CDS will also advice the parties involved in a transaction whenever a transaction is carried out within the system.

The CDS when interfaced with the KEPSS will enable the settlement of government securities transactions electronically, online in a computer based system. Whenever, a transaction takes place, securities will be transferred from one account to another. In an outright buying and selling transaction, for instance, there will be a buyer who will receive securities and his account will be credited securities and the seller's securities account will be debited. The buyer of the securities will pay money through the KEPSS which is instantaneous. Given this electronic and efficient systems, it is expected that there will be a large number of transactions taking place in any business day in the government debt securities market. The settlement of securities on account of all these

transactions is recorded through the CDS. Commercial banks together with primary dealers will be participants in the CDS in a B2B E-commerce model.

(c) Other Electronic Banking Services

Commercial banks in Kenya also provide other electronic banking services such as office-banking, home-banking, Internet-banking, tele-banking or m-banking etc. These are electronic services where the customer can instantly access their account balance and other information on an on-line basis using a telephone and a personal computer.

2.5 E-banking Experience in other countries

2.5.1 Developing countries

Developing countries are catching up in E-banking. The average E-banking penetration was close to 5% (World Bank Survey, 2001). In Brazil, the number of E-banking users reached 8million in 2000, in Mexico it reached 1.25 million in 2000 and in India, over 50 banks are offering online banking services. E-banking in Korea, Thailand, Malaysia and Singapore, Hong Kong and Taiwan (China) is thriving. In Ghana and some other African countries, smart cards based on VISA Horizon proximately technologies are getting started (MU Yibin, 2003).

Banks in developing countries can be said to be on the threshold of a major banking revolution with net banking having already been unveiled. Internet banking provides the facility of accessing customers accounts from anywhere in the world by using a home computer with Internet connection is particularly fascinating to high net worth individuals having multiple bank accounts. The growth potential is, therefore, immerse. Further incentives provided by banks would dissuade customers from visiting physical branches, and thus get "hooked" to the convenience of arm-chair banking.

2.5.2 Developed countries – USA

In the USA, the number of thrift institutions and commercial banks with transactional web sites is 1275 or 12% of all banks and thrifts. Approximately 78% of all commercial banks with more than $5 billion in assets, 43% of banks with $500 million to $5 billion in

assets, and 10% of banks under $ 500 million in assets have transactional web-sites. Of the 1275-thrifts/commercial banks offering transactional Internet banking, 7 could be considered 'virtual banks'. 10 traditional banks have established Internet branches or divisions that operate under a unique brand name.

Several new business process and technological advances such as Electronic Bill Presentment and Payment (EBPP), handheld access devices such as Personal Digital Assistants (PDAs), Internet Telephone and Wireless Communication channels and phones are emerging in the US market. A few banks have become Internet Service Providers (ISPs), and banks may become Internet portal sites and online service providers in the near future. Reliance on third party vendors is a common feature of electronic banking ventures of all sizes and degrees of sophistication in the US.

Currently, payments made over the Internet are almost exclusively conducted through existing payment instruments and networks. For retail E-commerce in the US, most payments made over the Internet are currently completed with credit cards and are cleared and settled through existing credit card clearing and settlement systems. Efforts are under way to make it easier to use debit cards, cheques and the Automated Clearing House (ACH) to make payments over the Internet. Versions of e-money, smart cards, e-cheques and other innovations are being experimented to support retail payments over the Internet.

There is legislation and regulations within the US that specifically codifies the use of and rights associated with the Internet and E-commerce in general, and electronic banking and Internet banking activities in particular. Federal and state laws, regulations, and court decisions, and self-regulation among industries groups provide the legal and operational framework for Internet commerce and banking in the USA. The international model laws promulgated by the United Nations Commission on International Trade Law (UNCITRAL) provide the guidance to the member nations on the necessity for revising existing legal structures to accommodate electronic transactions.

Some important laws of general application to commercial activity over the Internet within the US are the Uniform Commercial Code (UCC), the Uniform Electronic

Transaction Act (UETA) (which provides that electronic documents and contracts should not be disqualified as legal documents particularly because of their electronic form), various state laws and regulations on digital signatures and national encryption standards and export regulations.

Many states already have digital signature and other legislation to enable E-commerce. State laws in this area differ but the trend is towards creating legislation, which is technology neutral. The E-sign Act, a new US law that took effect on October 1, 2000, validates contracts concluded by electronic signatures and equates them to those signed with ink on paper. Under the Act, electronic signatures using touch-tones (on a telephone), retinal scans and voice recognition are also acceptable ways of entering into agreements. The E-sign Act takes a technological neutral approach and does not favor the use of any particular technology to validate an electronic document. The Act however does not address issues relating to which US state's laws would govern an online transaction and which state's code would have jurisdiction over a dispute.

Some characteristics of e-money products such as their relative lack of physical bulk, their potential anonymity and the possibility of effecting fast and remote transfers make them more susceptible than traditional systems to money laundering activities. The UCC guidelines lay down an effective 'know your customer' policy. Federal financial institutions, regulators, Society for Worldwide Inter-bank Financial Telecommunications (SWIFT) and Clearing House Inter-bank Payment System (CHIPS) have issued statements encouraging participants to include information on originators and beneficiaries.

2.6 E-Commerce Strategy

E-commerce is now seen as a reality for many businesses and normal part of business strategic plan. Formulating an E-commerce strategy needs strategic thinkers focusing on customers, markets, and competitive position, as well as on internal operations. Several authors on E-commerce strategy development suggests different approaches to E-commerce strategy formulation. Dawn (2001) point out that, the determination of a

suitable E-commerce strategy begins with identification of the opportunities and risks. The task of tracking the changing environments, understanding customer groups requires formulating strategies and planning their implementation. They view E-commerce strategy development as a systematic process captured in six steps model.

2.6.1 Step 1: Making the Initial Decision to offer E-commerce.

Any company planning to offer E-commerce should have a long-term vision and an objective of transforming itself into an e-business to provide business value to the corporation and its shareholders. The first step to becoming an E-commerce business is to define a dynamic business strategy based on opportunities to provide value. Developing that strategy requires a revaluation of the existing model and identifying internal issues.

2.6.2 Step 2: Identifying the business aims of E-commerce

The company needs to define the aims behind an E-commerce strategy which could include some of the following:

i) To improve customer service and interactions;
ii) To increase brand awareness and awareness of the company;
iii) To expand geographical reach;
iv) To expand into new markets;
v) To increase revenue and market share;
vi) To reduce operational costs;
vii) To be seen as an innovative and progressive company through being a E-commerce leader; and
viii) To compete with bigger rivals on more even terms.

The company should focus its reengineering into areas where it gives more return on investment . This requires clear well defined objectives (Bricknell,2000) as well as considerations of external viewpoint such as:

i) Are customers happy with existing services or do they require more?
ii) Are customers interested in transacting online?
iii) Will supplier companies be willing to interact on-line?

When considering to what extend you wish to utilize the Internet it is necessary to understand how it matches the existing company business. It is important to establish how the web can be incorporated into the existing lines of business, supply and channel distribution? In addition it is necessary to determine targets for the use of the new web facility. Targets need to be determined for the number of visitors to the web site and the transactions that result in order to make the move into E-commerce worthwhile. For this feasibility analysis must be carried out.

2.6.3 Analyzing the feasibility of the E-commerce initiative

Once the business aims and objectives for E-commerce are clear, the company needs to carry out a feasibility study and analyze whether it is possible for organization to offer online services with the resources available. A detailed feasibility study should be carried out to identify critical success factors. This involve examining human as well as technology aspects, looking at the benefits of E-commerce and analyzing the risks and pitfalls. In addition it is necessary to determine the E-commerce activities of competitors. Ghosh (1998) advices that, you should ask yourself whether you will be at a significant disadvantage if your competitors provide these capabilities to customers before you do.

An important aspect of E-commerce introduction is the transformation required of core business processes. This requires a thorough understanding of the existing business. The company needs to carry out a full SWOT (Strengths, Weakness, Opportunities and Threats) analysis. By giving executives a tool that is familiar, such as SWOT, and yet targeted to the fast changing environment, companies can quickly react to changes in own environment (Hackbarth and Kettinger, 2000).

Industry and competitive analysis for E-commerce involves monitoring, evaluating and disseminating information from external and internal environments. The goal is to identify the critical factors that will determine the success of the E-commerce project in the competitive marketplace.

In a world which is increasingly competitive and where organizations are required to undertake greater levels of risk in order to compete, those companies that fail to act now may find they have left it too late if E-commerce becomes a dominant way of doing business in their sector. By contrast, companies that have vision, a strategy, and a long term outlook will find that by embracing E-commerce now, they will reinforce their market position.

After identifying the opportunities the next objective is identifying the costs of introducing and operating an E-commerce project. This will involve reviewing what is present at the moment in terms of skilled staff, technology and resources, and estimating costs of building, implementing, and supporting the hardware, software and human resources needed. In many E-commerce projects costs have been underestimated and benefits overestimated so companies entering this field should exercise caution.

Care must be taken, however, not to view everything in simple financial terms. Other measures in terms of metrics most indicative of the companies market leadership, customer and revenue growth, the degree to which customers continue to purchase from a company on a repeat basis, and the strength of the companies brand should also be considered.

2.6.4 Step 4: Planning and Design of E-commerce.

Strategy formulation should depend on the development of strength and opportunities. It includes examining the corporate or project mission by specifying achievable objectives. An organization mission states the purpose for its existence. Based on its E-commerce mission a company can formulate the objective of E-commerce. An E-commerce objective is the measurable goal that the company wants to achieve with E-commerce.

2.6.5 Step 5: Implementation

Ideas, plans, and strategies are one thing – implementation is entirely something different. Jeff Bezos, of Amazon.com, claims that nothing Amazon.com does is very

original – it just executes better than anyone else. In other words strategy is nothing without implementation.

Many E-commerce implementation fail because they promise long term gain but no immediate benefits. Whenever possible, e-business projects should be divided into three to six month modules so that immediate benefits can be delivered with flexibility in overall plan. E-commerce is not an end state. It is a new business platform that will grow and evolve. To sustainable E-commerce success is to think and plan not just in terms of overall architecture, but act in incremental steps.

In order to have a successful E-commerce development it is necessary to have board level commitment, and support from all departments, people involved and stakeholders. Projects have been known to fail without such commitment (Malcom, 1999). To put this "E-commerce culture" in place some education and training will need to be implemented before any further development is attempted.

Once staff are trained or hired the technical staff and operational managers can be involved in the decision process. To maintain E-commerce culture this should continue throughout the development and operational life cycle. Many of the advantages of E-commerce will be lost if it is implemented in isolation. It is important to involve suppliers and distributors. This involves spreading the E-commerce culture beyond the company's boundary. The relationship with partner companies will need to be continually reviewed as other companies make and follow their own initiatives.

It is necessary to identify and understand what your customers and partners expect from the Internet and from E-commerce. It is necessary to know how many customers are able and willing to interface over electronic networks and conduct electronic transactions. This may require surveys and interviews to learn of customer attitudes. Once this customer base is identified the company can build a close- knit community with customers, encouraging customers to find out more about their products and services through message boards and emails.

The technical issues of E-commerce implementation will also need to be continually reviewed throughout the system life cycle. The technology is moving at such a pace that it is likely that advantage can be taken of developments worldwide of technology and standards that were not available at the start of the project. It is advisable to built scalability and flexibility into the solution and to standardize wherever possible.

2.6.6 Step 6: Strategy Assessment

Like any other project, E-commerce projects need to be assessed during and after implementation. The objectives of strategic reassessment are:-

i) To find out if the E-commerce system is delivering what it was supposed to deliver;

ii) To learn from both the successes and failures of the system reviewed. Whether the system is living up the expectations or not, it should be possible to learn from mistakes and improve future planning. E-commerce is a continually changing environment so initiatives that work in the first instance may cease to be cost effective at a later stage; and

iii) To identify failing projects as soon as possible and determine the reason for failure. There may be fundamental flaws in the original assumptions or outside changes may have completely altered the online market. There is need of continuing with the project if it can't be saved. It is better to learn from mistakes to avoid the same problems on subsequent systems.

Strategic planning clarifies what an E-commerce project should do or focus on, with respect to the company's mission and given business environment. It is essential to have a well thought out strategy for E-commerce. It is important to carry out a pilot study in order to get feedback.

Daniel et al (2000) in the final project report on E-commerce strategy development process forecast that E-commerce will have a broad impact affecting relations with customers and suppliers and even causing restructuring in the whole industry. They found out that it seems unlikely that one single model or framework could be sufficient to

explain what organizations should do in this domain. They identified a number of inter-related models, from strategy, marketing and IS fields, as well as from more relevant E-commerce literature, that can be used together to formulate an E-commerce strategy.

The suggested process consists of six stages that cover the entire strategy development process, from analysis, through change management issues to measurement review. The six stages are:

i) Context and Positioning- To set the scene for the role of E-commerce, the process begins with high-level examination of the industry and the organization's positioning within it;

ii) Market Value analysis:- An understanding of the organization's place within the current industry structure is gained, including understanding of the value provided to customers;

iii) Market Vision- Potential modifications to the current route to market are explored and evaluated in terms of their impact on customer value, in order to predict how the industry will change as a result of E-commerce;

iv) Prioritization and selection – The transition to a future vision cannot be accomplished at once, and the organization may be able to take advantage of all the potential opportunities in the industry. In this stage, options are prioritized and selected;

v) Change management- Chosen projects now need to be planned and implemented, including necessary changes to the way the organization conducts business as well as IT developments; and

vi) Measurement and review- Finally, there is a need for the efficacy of the E-commerce initiatives to be evaluated in order to inform future work.

A set of tools or framework are suggested for each stage of the process discussions of which are beyond the scope of this paper.

2.7 The Drivers of E-commerce.

At the onset of 21st Century, when time is one of the most sought after commodities, E-banking may become an answer to the needs of bank customers. Its Core advantage is quick and comfortable conclusion of operations without leaving one's home or office. Currently, it is mostly embraced by young and educated people, open to novelties. However, as time passes, it stands a chance of becoming a widespread method of providing banking services.

2.7.1 Advantages and Disadvantages of E-commerce

Advantages

i) Reduce costs in the phase of global competition;
ii) Reduce delivery costs, for goods which can be transported electronically;
iii) Reduce advertising costs;
iv) Creates new potential market;
v) Allows equal access to existing market; and
vi) Internationalization.

Disadvantages

i) Connecting to the Internet is risky;
ii) Loss of privacy;
iii) Payment security; and
iv) Vendor reliability.

2.7.2 Benefits to commercial banks that provide E-Internet banking

The Internet is now considered to be "strategic weapon" (Seitz & Stickel, 1998).
The following positive results could be realized by commercial banks who adopt Internet banking.

(a) Cost savings

Cost savings can be measured in a number of ways. The following examples depict how commercial banks can be able to reduce costs using Internet banking

i) The start up cost of Internet banking is less when compared to establishment of a traditional branch bank because:

a) Overhead, such as wages and rent is at minimum, given that the consumer has direct access to accomplish their transactions on-line;

b) A reduction in bank personnel has occurred as a result of Internet banking. To illustrate bank tellers are not required with Internet banking, as they would be in traditional brick–and-mortar environment; and

c) Internet banking offers a tall free customer service call center in place of tellers that is available to consumers who experience issues, have account related questions or need additional information pertaining to other products and services.

ii) Postage is also kept at minimum. Since bills as well as other products and services can be sent electronically, the need to send hard copy bills and promotional collaterals are eliminated.

(b) Customer Loyalty

As banks become more of a convenient one-stop shopping environment, consumers will more than likely convert to transacting all personal finances on-line. For instance, once a customer has gone through all of the trouble of setting up electronic bill payments, he or she is less likely to switch (Higgins, 2002).

By offering a wide array of products and services from Internet integration banks can benefit by retaining customers by offering services that are important and add value.

(c) Profit Generation

Internet banking can lead to substantial cost savings when properly integrated into existing banking operations. Internet banking also provide a high level of productivity due to automation of transactions such as fund transfers, bill payments, and account balance inquiries. Strategic alliances can lead to additional business opportunities that would otherwise go unrealized (Nath et al, p.25). As enhancement are made to provide

customers with all their needs in one place, customers usage is likely to soar. It is this prediction that banks are betting on.

(d) Advertising

Advertising is one strategy of marketing and it plays a necessary role in every business. That is because it is the way to attract and convince the customers. However advertising should be done in the right way to attract as much people. Banks can advertise using pop up messages windows in others' websites, search engines websites and putting advertising banners in others' websites.

(e) Promotion

In addition to advertising, promotion is one way of marketing. It's what attracts customers more, and convince them to deal with advertiser. Likewise it shows the customers the advantages he/she will get or benefit. The main role of promotion is to attract customers and inform them about products and services. For instance, as online banks offer many services on Internet it considers as promotion. Since they provide variety services on-line, where people can use them anywhere, and anytime. Therefore, it saves them time and money instead of going to the bank and spending one or two hour to use the service. In other words, transferring funds between accounts, checking credit card balance, bill payments, checking accounts, opening new accounts, applying for a loan, etc believed to be promotional to people.

2.7.3 Benefits of utilization of Internet banking to customers

When traditional bank customers consider banking on-line there are many advantages. There are cost savings since operating in cyberspace is cheaper. Customers would not have to waste time driving to their local branch and waiting in line. Costs associated with postage for mailing monthly bills or statements are eliminated. Frustration that occur with Postal service misdirecting the mail are also eliminated.

Another advantage of banking on-line is convenience. On-line banks are open 24 hours a day, 7 days a week. Transactions are processed real time. Customers do not have to worry

about banking on the next day's business or arriving at a branch before or after hours of operation. Internet banking also provides "one-stop shopping" (Nath et al, p. 26). Banks allow customers to apply for loans on-line, and also verify items that have been presented for payment against their account.

Yet, another advantage of Internet banking is earning a higher rate of interest on deposits as well as better rates on for loans and credit cards. Consumers are also able to contact bank personnel to ask questions via the Internet site or, in some cases, by contacting the bank directly, in person or by phone. Also, banks can make customer's web experience personal. By allowing its customers to customize features on their web site, banks are more efficient at meeting their customer's needs.

Finally, Internet banking allows consumers complete freedom and full control in taking charge of their personal finances. Banking customers now have the convenience that they want and a plethora of web institutions to choose from. Now that we have examined advantages to consumers, we will now look at disadvantages.

Customers have found several disadvantages with Internet banking. Many customers feel that Internet banking is too impersonal. Internet banking customers who have contacted customer service, claim that they have experienced poor response time (Orr, 2001). They feel that there is no human factor involved when using Internet banking and that it is unfriendly and untrusting (Tan et al, 2000). Customer service software does exist and provides web-based interactive tools and live customer service chat. This would alleviate some of these issues, but they will mostly never disappear completely.

A second disadvantage is techno-phobia. Techno-phobia is a fear that is generated by new technology, such as computers and Internet. Many people do not feel comfortable using a computer or the Internet and refrain from doing so. The percentage of Internet users in urban towns is increasing quickly and techno-phobia are becoming few. Hence, this phenomenon will gradually fade.

The ability to access paper money is also a disadvantage. ATM machines are currently the easiest way to acquire paper money. Many ATM transactions usually have a fee that is charged to the customer which is a burden to the customer. ATM cards have of let become a target for violent robbers who force the cards holders to give them his/her pin number and in the process are able to withdraw the cards holders funds. Electronic or digital cash is existent, but can only be used to make purchase online.

Another disadvantage is ability to deposit paper checks. You can deposit a check through mail or through ATM machine, but customers find this a burden or dislike (Nath et al, 2001). Many customers have concerns about Internet banking and this are discussed next.

2.7.4 Concerns of Internet banking customers.

(a) Availability

In order for web banking to become successful service, it must be available and easily accessible by all consumers. One of the major concerns for banks should be whether or not all web browsers or Internet devices are supported by the bank's web site. If customers are using Netscape, Internet Explorer, or other hand held devices will they be able to access their account information? Availability of the web browser application creates a competitive advantage to the financial provider that is able to compete on all platforms

Of greater concern is availability for disabled users If persons with disabilities want to bank on-line, is there help available? Some old bank technologies like ATMs are still inaccessible to the disabled. Although audio enabled ATMs are available, most banks do not own them because of costs associated with it. This trend seems to carried over into on-line banking. Most do not offer any special services to the disabled. Implementing talking browsers, with customer service support, would enhance on-line banking and this service would be helpful to on-line customers without disabilities.

Most banks are currently focusing on simpler services like account inquiries or investment services. Most are not focused on the availability issues presented. While this is true, banks must recognize that there is an entire consumer population that is not being serviced. These consumers want the same opportunities to be available to them. The next concern to be addressed is the speed.

(b) Speed

Data that is transferred over the Internet does not flow directly from the web site to the customer. The data must pass through several handlers before reaching them. If one of the handlers is slow, then the transfer speed will be slow. The speed of your Internet connection depends on the total response time of everything in the path. Current and progressive liberalization of Internet backbone providers will help mitigate the speed. Unfortunately the banks have no direct control over this. As time goes, this will become less of an issue because of the liberalization of telecommunication sector that is going on.

Another aspect of speed is the slow server response time. Many banks are increasing their resources to make their Internet banking system more efficient and robust. Many are adding information technology departments to help them concentrate on keeping up with the rapidly growing technologies. Some are outsourcing their technology which is very costly. Once a customer has decided not to use the Internet banking service, due to a bad experience, it is very difficult to get them try again. Banks need to invest in best technology up front to help them capture and sustain the Internet banking market. The cost savings that will incur later will exceed the initial start up and maintenance costs (Orr, 2001). Next will be addressed, appearance and attractiveness.

(c) Appearance/Attractiveness.

A web site's appearance is important. Appearance will determine whether someone will return to your web site.

(d) Reliability

Many customers become frustrated and turn away from Internet banking because they have had one or two bad experiences with web site reliability. When a customer waits five minutes for a web site to download, and when it finally downloads, they receive an error page, they become very frustrated. They decide that maybe online banking should not be depended upon. The customer begins to wonder how their bank is going to keep their information accurate and up to date via on-line when they cannot keep their web site working properly.

Many web site errors that users encounter are performance related, and are attributable to a stressed Web server, database server or to links in the chain between the users and the server (Ellis, 2001). Server reliability is the most understood performance issue and can be corrected and monitored. Unfortunately, your server is not the only link in performance chain (Ellis, 2001). User reliability is the other that deals with the end user, and this still remains a problem (Ellis, 2001). It is still a problem because it is impossible to predict the quality of the Internet connection between your server and the user.

Another common web site error happens when the customer clicks on an object or link and a runtime script error occurs. This happens because the object it is referencing is an object that has not been created. This can happen in a number of ways and can be prevented by verifying the objects and their properties. Proper testing is important and should be done routinely under conditions that simulate those that are expected (Ellis, 2001). Accurately predicting web site traffic and being prepared can help to avoid many reliability issues.

Some errors occur because the customer entered the wrong type of data in an entry field. Data validation can and should be applied. Data validation refers to the process of double checking the validity of data input by the user before it is posted to the server or used in a database query. Users are notified that they entered the incorrect data. This does not always eliminate returning the an error to the user, but it will help. The user will at least

know that it is an error caused from their incorrect entry and not by the Internet banking web site. Ease of use and navigational ease is another main concern.

(e) Ease of use/Navigational Ease

Web sites can provide useful sources of information. However, if it is difficult to navigate, it's contribution and usefulness will be a waste. A web site should be:

i) Easy to read and navigate;

ii) Help screens should be available to the user; and

iii) Search features should be accessible

Keeping web sites simple and easy to use is extremely important to customers. It is important that banks do not sacrifice content for simplicity. Instead, they should ensure that the sites are intuitive enough so that user can easily navigate from point A to B. Banks need to keep their sites very simple and essentially a click away from what the customer is looking for. This does not mean that sites should be too simple. If the web sites have nothing of value, there is no reason for the consumer to return.

Another frequent complaint about web sites is too much form and not enough functionality. For instance, dancing kangaroos are not as important as "humanizing" your web site. Users want to know that there are real people serving them in cyberspace. Hence, short biographies of friendly staff people or key personnel are more effective than animation overkill (Schaffer, p.50)

Consistency is also a key factor that makes a web site easy to navigate. Users need to feel comfortable. The more components behave the same, the more users will feel in control of the system (Schaffer, p.50). Formatting such a text, front size, lay out and colors should be consistent throughout the wed site. Consistency facilitates navigation, which allows the consumer to fulfill their reason for visiting the web site in the first place.

Security and Privacy is another area of great concern

(f) Security/Privacy

Using Internet to increase profits while decreasing coasts does not come without some risks associated with it. The threats to information systems security are many and varied (Ogeto, 2004). They come from many fronts. In many different forms, and will change as new safeguards are developed. In general, there are four kinds of information security threats: interruption, interception, modification and fabrication (Maiwald, 2002).

Many customers are weary of Internet banking due to security and privacy issues. Because of the sensitivity of financial information, banks need to focus on overall security and privacy of their activities and operations to gain customers trust (Gupta et al, 2000). There are two types of perpetrators, external and internal agents (Gupta et al, 2000). "External agents exploit internal ubiquity and anonymity as an advantageous features to accomplish their objectives" (Gupta at el, p.669). These could include hackers, terrorist organizations, business competitors, organized criminals and foreign intelligence (Gupta at el, 2000). " internal agents are authorized users who exploit their system access to achieve specific objectives" (Gupta at el, p 669). These include employees, contractors, teleworkers (Gupta at el, 2000).

Banks in Kenya have deployed some of the following security systems to secure their systems and boost consumer confidence.

(i) Firewalls

A firewall is an Internet host that has been designed intruders out of sensitive information on a private local area network. Firewalls block unwanted IP packets to and from protected hosts, while allowing specific information to pass through. These will often prevent security protocols from operating ' end to end' between bank's system and the PC on the customer's desk. Firewalls are an important first line of defence against crackers (Microsoft Bookshelf Internet Dictionary). It works as a defence mechanism permitting access to the system to some users and denying access to others : Firewall are now a standard installation in every bank's network.

(ii) Digital Signatures

Utilizing public key cryptography, a digital signature is created when a message digest- or a unique "fingerprint" of the message is created – is encrypted with this private key. Thereby ensuring the messages integrity is maintained. This message is decoded by the receiver using the senders public key.

(iii) Digital Certificates

Digital Certificates are employed to ensure that the public key you posses is actually the one belonging to the sender of the message. A digital certificate is added to a message to authenticate its contents. The digital certificate which is built with the help of a certification authorities (CA) private key, is added to a public key to authenticate its owner. The CA guarantees the authenticity of the digital signatures.

(iv) Cryptography and Information Transfer

There are three vital area which have to be addressed when attempting to provide a secure transmission of information, they include;

i) Confidentiality;

ii) Integrity; and

iii) Authentication.

Confidentiality implies that, whatever is sent is received and read by the intended recipient and only this recipient. It must ensure that the information is not viewed by any other person or persons during its transportation.

Guaranteed Integrity will ensure that the information is received in exactly the same condition as when the sender send it, that is to say that the information has been at no way changed or interfered with.

Finally Authentication is provided to the receiver that this information was actually send by the receiver and not by somebody else claiming to be the sender. This authentication normally takes the form of encrypted signatures that can only be decoded by the receiver.

(v) Cryptography

Cryptography is used to protect information from authorized modification or disclosure. Cryptography is used widely by banks, in particular in protecting information exchanged during an ATM transaction. Cryptography is used to:

i) Protect a message from unauthorized disclosure in transit (encryption);

ii) Decipher a message that has been encrypted (decryption);

iii) Secure a message from unauthorized modification in transit (authentication). an integrity check is an example of this; and

iv) Verify a message to prove that only the originator could have send the message (digital signature).

This requires that two parties who wish to communicate to share a common secret or password, usually referred to as a Key.

There are two popular methods used in cryptography:

i) Private Key Cryptography; and

ii) Public Key Cryptography

(vi) Private Key Cryptography

This requires the two parties who wish to communicate to share a common secret password, usually referred to as a key. One party uses the encryption key to encrypt and the receiving uses the decryption key to decrypt. This requires one party to have securely communicated the Key, e.g., by telephone, to the other in advance of this happening. This Key can be reused many times after the initial exchange.

(vii) Public Key Cryptography

Public Key Cryptography (also known as Asymmetric Cryptography), works on a different principal. Here both parties generate two related Keys (Key Pair) using a mathematical function. The Key pair consists of a Public Key which can be made known to any party that wishes to communicate with you and a secret Key which is stored securely and only ever known to yourself. When someone wishes to communicate with you they encrypt the data with your public Key and only you can decrypt the encrypted

data. If others want to digitally sign a message proving that only they could have sent it then they sign the message with their secret Key and you can verify the signature with their public Key (Banking Ireland 2000).

Finally for full implementation of E-commerce in banking sector to be successful legislative issues have to be addressed.

2.7.5 Legislation

Worldwide, regulators have tended to issue E-commerce guidelines, rather than regulations, in order not to stifle innovation in a dynamic field. There are increasing signs, however, that the time may have come to formulate and expound a policy position and to research and develop a comprehensive regulatory approach Internet and related technologies raise many issues that have to be resolved before the business environment will be orderly. Issues requiring resolution include, amongst others, legal jurisdiction, cross-border solicitation, cross-sector demarcations, service fees and codes of conduct

To safe guard the banking and financial systems, a set of legislation and by laws need to be develop to ensure that only the authorized organizations are allowed to be involved in the countries payment systems.

In Kenya, CBK is already working on an explicit legal framework an National Payment System Act (NPS Act), while the Government is working on the Information Communication and Technology Law to support the payment system modernization process. The draft EFT Act; with the primary objective of the provision of individual customer rights is already documented a waiting presentation to parliament for debate

If passed in law, the EFT act will authorize the use of electronic and digital signatures, and electronic records. It will provide for legal validity of digital signatures and electronic records, as well as for the retention of electronic records and their admissibility in any legal proceedings. The Electronic act will:

i) remove any legal impediments to the conduct of electronic transactions;

ii) provide certainty and security in the conduct of electronic transactions and thereby enhance the confidence and trust of the public in carrying out such transactions; and

iii) Adopt a technology neutral approach to cope with rapid technological changes.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section discuses the methodology used in this research project. This includes the research strategy or approach, the population of study, type of data to collected, method of collection and analysis procedures applied.

3.2 Research Design

The research design took a survey approach. The purpose of the study was to establish the extent to which E-commerce, E-banking or Internet banking products and services have been utilized in Kenyan banking sector. It also sought to establish the benefits and challenges faced by banks in implementing E-commerce products and services.

A survey approach was chosen based on the nature of the problem being researched and given that no documented studies have been conducted in relation to E-commerce, E-banking or Internet banking development in Kenyan banking sector. A survey was sufficient for this study since the researcher intended to gain a broader overview of the extent of application of E-commerce in Kenyan banks.

3.3 The study population

Given the number of banks and the fact that their Head Offices are based in Nairobi the researcher conducted a census of 40 banks operating in Kenya who are members Bankers Association (KBA). See appendix 1.

3.4 Data Collection Techniques

The structured questionnaires was used to gather primary data required for the study. The questionnaire targeted the managers in charge of E-commerce services, marketing product development and I.T as the case maybe. The questionnaire was administered through e-mail or "drop and pick later" method.

The questionnaire comprised of closed and open-ended questions and was divided into three sections. Part A of the questionnaire was used to collect data on the profile of the organization. Part B was used to collect data on the extent of use of various E-commerce products in banks. Part C was used to collect data on the benefits and challenges of implementing E-commerce services. Respondents used five point Likert scale to indicate the extent to which each product or factor is applicable to them.

3.5 Data Analysis and Presentation.

The data collected was analyzed through the use of descriptive statistics such as frequency tables, proportions and percentages. The data is presented using tables and charts. Cross tabulation was undertaken to identify trends such as ownership versus adoption. Factor analysis was also used to group benefits and challenges.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

Out of 40 Questionnaires distributed, 35 banks responded, of which 62% were wholly locally owned, 14% with government participation, 12% Foreign owned but locally incorporated and 11% Foreign owned and not locally incorporated.

Table 1.0 Number of banks surveyed

Category	No. of Banks	No of banks Respondede	Percentage of response
Foreign Owned not locally incorporated	5	4	12%
Foreign Owned but locally incorporated	6	4	12%
With government participation	5	5	14%
Wholly locally Incorporated	24	22	62%
Total	40	35	100%

Source: Research data

4.1.1 Extent of use of bank to bank E-commerce services.

Table 2.0 shows that, the majority of banks (66%) use settlement of payments real time, Whilst the vast majority (97%) use Electronic funds transfer through swift, Automated clearing house through EFT (94%) and electronic funds transfer payments (89%), Settlement of government securities electronically and Truncation and cheque imaging transmission are used by fewer banks at 43% and 17% usage respectively.

Table 2.0 Extent of usage of bank –to-bank E-commerce Services

E-Commerce service	Not applicable	Least applicable	Moderately applicable	Largely applied	Applied greatly
Settlement of payments real time	2.9%	5.7%	25.7%	31.4%	34.3%
Settlement of government Securities electronically	17.1%	5.7%	28.6%	22.9%	20.0%
EFT electronic payment	2.9%	2.9%	5.7%	31.4%	57.1%
Automated Clearing through EFT	0%	0%	5.9%	35.3%	58.8
Truncation and cheque imaging transmission	68.6%	5.7%	8.6%	11.4%	5.7%
EFT via EDI system -swift	0%	0%	2.9%	29.4%	67.6%

Source: Research Data

Table 3.0 cross tabulation reveals that, 100% of foreign owned banks use settlement of payments real time, settlement of government securities electronically, automated clearing and electronic payments through swift, whilst 80% use electronic funds transfer payments.

100% of wholly locally owned banks that responded use Electronic funds transfer via swift, (95%) use electronic funds transfer payments and automated clearing and 72% use settlement of payments real time.

100% of banks with government participation use electronic funds payments, 80% use electronic payments via swift and automated clearing house. However, only a small number (25%) of partly locally owned banks that responded use the E-commerce services with a moderate number (50%) using automated clearing and electronic funds transfer through swift.

Table 3.0 Cross tabulation of Bank –to- bank E-commerce Services usage by ownership categories

E-Commerce service	Foreign owned	Partly locally owned	Government participation	Locally owned
Settlement of payments real time	100%	25%	20%	72%
Settlement of government Securities electronically	100%	25%	20%	41%
EFT electronic payment	80%	25%	100%	95%
Automated Clearing through EFT	100%	50%	80%	95%
Truncation and cheque imaging transmission	50%	0%	0%	14%
EFT through swift	100%	50%	80%	100%

Source: Research Data

4.1.2 Extent of usage of bank –to- customer E-commerce services.

Table 4.0 shows that, the majority (76%) of banks use electronic funds transfer, whilst few (23%) of banks use Internet banking, office banking (46%), home banking (20%), tele-banking (23%), mobile banking (23%) and electronic funds transfer point of sale (31%).

Table 4.0 Extent of usage of bank to customer E-commerce services

E-Commerce service	Not applicable	Least applicable	Moderately applicable	Largely applied	Applied greatly
Internet banking	48.6%	11.4%	17.1%	20.0%	2.9%
Office Banking	25.7%	11.4%	17.1%	31.4%	14.3%
Home banking	29.4%	35.3%	14.7%	14.7%	5.9%
Tele- banking	48.6%	14.3%	14.3%	20.0%	2.9%
Mobile baking	28.6%	14.3%	34.3%	11.4%	11.4%
EFT point sale Services	48.6%	14.3%	5.7%	22.9%	8.6%
Electronic Funds transfer	0%	5.9%	17.6%	38.2%	38.2%

Source: Research Data

Table 5.0 cross tabulation reveals that, 100% of foreign owned banks use electronic funds transfer, a majority (75%) use office banking, whilst a modest (50%) use electronic funds transfer point of sale services.

Majority of banks with government participation (80%) and wholly locally owned banks (77%) use electronic funds transfer with a modest (55%) of locally owned banks using office banking. The high percentage of foreign banks using electronic funds is due to the need to transact with their branches abroad.

Table 5.0 Cross tabulation of bank –to- customer E-commerce Services usage by ownership categories

E-Commerce service	**Foreign owned**	**Partly locally owned**	**Government participation**	**Locally owned**
Internet banking	25%	0%	40%	23%
Office Banking	75%	0%	20%	55%
Home banking	25%	0%	0%	27%
Tele- banking	25%	0%	40%	23%
Mobile baking	25%	0%	40%	23%
EFT point sale Services	50%	0%	40%	23%
Electronic Funds transfer	100%	25%	80%	77%

Source: Research Data

4.1.3 Electronic payment methods applied by banks

54% overall of the banks that, responded use ATM services. However, cross tabulation Table 7.0 reveals that, 80% of banks with government participation and 59% of wholly locally owned banks use this facility whilst only 25% of foreign owned banks use it. The rest of payment methods recorded a low usage with 40% of banks with government

participation using credit cards and debit cards whilst 25% of foreign owned banks using credit cards.

Table 6.0 Electronic payment methods applied by banks

E-Commerce Payment services	Not applicable	Least applicable	Moderately applicable	Largely applied	Applied greatly
Credit Cards(VISA, MASTER)	74.3%	5.7%	5.7%	2.9%	11.4%
Prepaid Cards/Smart Cards	88.6%	8.6%	2.9%	0%	0%
Debit Crads	62.9%	14.3%	8.6%	2.9%	11.4%
ATM services	40.0%	2.9%	2.9%	14%	40%

Source: Research Data

Table 7.0 Cross tabulation E-commerce payment methods usage by ownership categories

E-Commerce service	Foreign owned	Partly locally owned	Govern. participation	Locally owned
Credit Cards(VISA, MASTER	25%	0%	40%	18%
Prepaid Cards/Smart Cards	0%	0%	0%	0%
Debit Crads	0%	0%	40%	14%
ATM services	25%	0%	80%	59%

Source: Research Data

4.1.4 Factors influencing the adoption of E-commerce services in banks

From table 8.0, all the eleven factors seem to influence the banks adoption of E-commerce services with improving customer being the highest at 94.3% followed by response to customer demand at 85.7%. The lowest rated factor as a great influencer to adoption of E-commerce services is compliance with regulation at 40%

Table 8.0 Percentages of factors influencing usage of E-commerce services in banks

Factor/variables	Not applicable	Least Extent	Moderate Extent	Great extent	Very great extent
To improve Customer Service	0%	0%	5.7%	34.3%	60.0%
To reduce customer queuing	0%	14.3%	20.0%	42.9%	22.9%
To cut down operational costs	0%	5.9%	14.7%	50.0%	29.4%
Increase customer awareness	0%	20%	17.1%	37.1%	25.7%
Expand banks geographical reach	0%	8.6%	22.9%	37.1%	31.3%
Expand banks' market share	0%	5.7%	34.3%	25.7%	34.3%
Increase banks profitability	0%	22.9%	17.1%	31.4%	28.6%
To Keep with industry trend	0%	11.4%	11.4%	45.7%	31.4%
Compliance with regulation	14.3%	34.3%	11.4%	14.3%	25.7%
Response to customer' demand	0%	0%	14.3%	51.4%	34.3%
Response to customer awareness of E-commerce services	0%	28.6%	22.9%	25.7%	22.9%

Source: Research Data

Factor analysis was also used to assess the reasons for adopting E-commerce services by banks. A total of 11 factors were used to determine those influencing adoption of E-commerce services.

Table 9.0 E-commerce services Communalities

Factors/variables	Initial	Extraction
To improve Customer Service	1.000	.539
To reduce customer queuing	1.000	.870
To cut down operational costs	1.000	.727
Increase customer awareness	1.000	.776
Expand banks geographical reach	1.000	.644
Expand banks' market share	1.000	.747
Increase banks profitability	1.000	.813
To Keep with industry trend	1.000	.624
Compliance with regulation	1.000	.713
Response to customer' demand	1.000	.660
Response to customer awareness of E-commerce services	1.000	.569

Extraction method: Principal Component Analysis

Principal Component Analysis was performed on the respondents' scores. Commonality refers to the portion of variance of a particular item that is due to common factors or shared with other items. It expresses the proportion of variance that is extracted or accounted for by the factors. From Table 9.0 most of the variations in the variables were captured by factors with the lowest variation being 54% for factor 1.

Table 10.0 Total Variance of factors influencing adoption *Explained.*

	Initial Eigenvalues			Extraction Sums of Squared loadings		
Factors/variables	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
To improve Customer Service	4.983	45.296	45.296	4.983	45.296	45.296
To reduce customer queuing	1.656	15.052	60.349	1.656	15.052	60.349
To cut down operational costs	1.043	9.486	69.834	1.043	9.486	69.834
Increase customer awareness	.797	7.241	77.076			
Expand banks geographical reach	.699	6.356	83.432			
Expand banks' market share	.627	5.699	89.131			
Increase banks profitability	.458	4.166	93.297			
To Keep with industry trend	.320	2.908	96.205			
Compliance with regulation	.183	1.667	97.872			
Response to customer' demand	.169	1.536	99.408			
Response to customer awareness	.065	.592	100.00			

Table 10.0 shows the total variance for explained for each of the extracted factor. Each factor accounts for decreasing proportion of variance subject to the condition that is

uncorrelated to all previous factors. For a factor to account for at least one variable, it should have an Eigen value of at least 1. This serves as a cut off point for determining the number of factors to be extracted.

From the figures in Table 10.0, factor 1 accounts for 45.3% of the total observed variations, factor 2 explains 15. 1% of total variation and factor 3 explains 9.5% of total observed variation. The third factor explained 70% of the total observed variation.

Table 11.0 Adoption factors Rotated Component Matrix

		Component		
	Factors/Variables	**1**	**2**	**3**
1	To improve Customer Service	.300	.649	-.165
2	To reduce customer queuing	-.0680	1.026	-.930
3	To cut down operational costs	.571	.468	-.428
4	Increase customer awareness	.805	.295	.202
5	Expand banks geographical reach	.802	-.030	.024
6	Expand banks' market share	.789	.354	.004
7	Increase banks profitability	.274	.827	.234
8	To Keep with industry trend	.037	.774	.152
9	Compliance with regulation	.175	.474	.676
10	Response to customer' demand	.578	.518	.241
11	Response to customer awareness of E-commerce services	.490	.531	.218

Extraction method: principal component analysis. Rotation method: Varimax with Kaiser Normalization.

Table 12.0 shows the results of orthogonal varimax rotation with Kaiser Normalization done on the initial factor matrix. A summary of factor loading is shown below

Table 12 Summary of loading of adoption factors

Factor	**Variable(s)**
1	4,5,6
2	1,7,8,11
3	9

Theses factors are shown in Table 13.0

Table 13 Banks Statements of adoption factors

Factor	**Statement**
1.	4. To increase customer awareness of bank products 5. To expand banks geographical reach 6. To expand banks market share
2.	1. Improve customer service 7. Increase banks profitability 8. To keep up with industry trend 11. Response to customer awareness of E-commerce products
3.	9. Compliance with regulations

Analysis of statements under each category show that banks are influenced to adopt E-commerce services by the need to increase their customer base by creating awareness of their products and retaining the existing customers through offering improved customer service.

4.1.5.Benefits of E-commerce services to banks

Factor analysis was used to evaluate the benefits derived by banks from adopting E-commerce services. A total of 8 factors were defined and used in the analysis.

Table 14 Banks Benefits Communalities

Factor/variables	Initial	Extraction
To improve Customer Service	1.000	.735
To reduce customer queuing	1.000	.637
To cut down operational costs	1.000	.734
Increase customer awareness	1.000	.593
Expand banks geographical reach	1.000	.876
Expand banks' market share	1.000	.830
Increase banks revenue	1.000	.667
Seen as innovative & progressive	1.000	.618

Extraction method: Principal component Analysis

Table 15.0 Total Variance .of benefits *Explained*

	Initial Eigenvalues			Extraction Sums of Squared loadings		
Factor/variables	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
To improve Customer Service	4.606	57.581	57.581	4.606	57.581	57.581
To reduce customer queuing	1.088	13.549	71.131	1.084	13.549	71.131
To cut down operational costs	.794	9.930	81.060			
Increase customer awareness	.561	7.017	88.078			
Expand banks geographical reach	.327	4.083	92.161			
Expand banks' market share	.307	3.831	95.992			
Increase banks revenue	.22	2.772	98.764			
Seen as innovative & progressive	.099	1.236	100.00			

Extraction method: Principal component Analysis

From Table 15.0, factor 1 accounts for 57.6% of total observed variation, factor 2 explains 15.5% of the total variation. The two-factor solution explained 71.1% of the total observed variation.

Table 16.0 Benefits Rotated Component Matrix

component

	Factor	1	2
1	To improve Customer Service	.849	.116
2	To reduce customer queuing	.567	.562
3	To cut down operational costs	.766	.383
4	Increase customer awareness	..608	.472
5	Expand banks geographical reach	.062	.934
6	Expand banks' market share	.331	.849
7	Increase banks revenue	.796	.184
8	Seen as innovative & progressive	.414	.669

Extraction method: principal component analysis. Rotation method: Varimax with Kaiser Normalization.

Table 16.0 shows the results of orthogonal varimax rotation with Kaiser Normalization done on the initial factor matrix. A summary of factor loading is shown below

Table 17.0 Summary of loading of benefits

Factor	Variable(s)
1	1,2,3,4,7
2	5,6,8

Theses factors are shown in Table 18.0

Table 18.0 Banks Statements on benefits

Factor	Statement
1.	1. Improved customer service 2. Reduced number of customers from banking hall 3. Reduced operational costs 4. Increased customer' awareness of banks products and services 7. Increased banks revenue
2.	5. Expanded banks geographical reach 6. Expanded banks market share 8. Bank seen as innovative and progressive

From factor analysis it can be concluded that, banks improved their customer service by adopting E-commerce thereby cutting down on operational costs and creating customers awareness of their products resulting in increased revenue. Banks are also able to increase their geographical reach thereby increasing their market share.

4.1.6 Challenges of E-commerce services in banks.

Factor analysis was used to evaluate challenges encountered by banks in implanting E-commerce services. A total of 13 factors were defined and used in this analysis.

Table 4.7.1 Factors explaining the challenges of E-commerce services by ownership

Table 19.0 Challenges Communalities for banks

Factor/Variables	Initial	Extraction
Unreliable telecommunication	1.000	.909
Slow speed of connection	1.000	.903
Unavailable Internet infrastructure	1.000	.786
Cost acquiring E-commerce	1.000	.637
Integration with back office system	1.000	.810
Ensure desired levels of security	1.000	.835
Ensure levels of privacy	1.000	.799
Lack of legislation	1.000	.709
Cost of maintaining services	1.000	.765
integration with other systems	1.000	.868
Dealing with security breaches	1.000	.789
Reluctance to change by users	1.000	.706
Frequent power interruptions	1.000	.924

Extraction method: Principal component Analysis

Table 20.0 Total Variance of challenges Explained.

	Initial Eigenvalues			Extraction Sums of Squared loadings		
Factor/Variables	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Unreliable telecommunication	7.600	58.460	58.460	7.600	58.460	58.460
Slow speed of connection	1.694	13.029	71.489	1.694	13.029	71.489
Unavailable Internet infrastructure	1.146	8.818	80.307	1.146	8.818	80.307
Cost acquiring E-commerce	.677	5.209	85.516			
Integration with back office system	.553	4.255	89.771			
Ensure desired levels of security	441	3.393	93.164			
Ensure levels of privacy	250	1.920	95.084			
Lack of legislation	217	1.666	96.750			
Cost of maintaining services	.167	1.282	98.032			
integration with other systems	.098	.753	98.785			
Dealing with security breaches	.066	.505	99.290			
Reluctance to change by users	.050	.383	99.673			
Frequent power interruptions	.043	.327	100.00			

Extraction method: Principal component Analysis

From Table 20.0 factor 1 accounts for 58.5% of total observed variation, factor 2 expalins 13.0% and factor 3 explains 8.8% of the total variation. The three-factor solution explained 80.3% of the total observed variation.

Table 21.0 Challenges Rotated Component Matrix

		component		
	Factor/Variable	**1**	**2**	**3**
1	Unreliable telecommunication	.290	.899	.128
2	Slow speed of connection	.141	.939	.040
3	Unavailable Internet infrastructure	.316	.776	.290
4	Cost acquiring E-commerce	.433	.147	.654
5	Integration with back office system	.833	.337	.047
6	Ensure desired levels of security	.809	.384	.181
7	Ensure levels of privacy	.746	.395	.294
8	Lack of legislation	.639	.409	.365
9	Cost of maintaining services	.631	.053	.603
10	integration with other systems	.868	.264	.212
11	Dealing with security breaches	.855	.118	.209
12	Reluctance to change by users	.636	-.019	.549
13	Frequent power interruptions	.038	.242	.930

Extraction method: principal component analysis. Rotation method: Varimax with Kaiser Normalization.

Table 21.0 shows the results of orthogonal varimax rotation with Kaiser Normalization done on the initial factor matrix.

A summary of factor loading is shown in Table 22.0

Table 22.0 Summary of loading of challenges

Factor	**Variable(s)**
1	5,6,7,8,9,10,11
2	1,2,3
3	4,13

These factors are shown in Table 23.0

Table 23.0 Banks Statements on challenges

Factor	**Statement**
1.	5. Integration with other back office systems 6. Ensuring desired levels of security 7. Ensuring desired levels of privacy 8. Lack of legislation covering electronic transactions 9. Cost of maintaining E-commerce services 10. Integration with other systems in industry 11. Dealing with security breaches
2.	1. Unreliable telecommunication infrastructure 2. Slow speed of connection 3. Unavailability of Internet infrastructure to most customers.
3	4. Cost of acquiring E-commerce services. 13. Frequent power interruptions

Factor analysis reveals that, the major challenge facing banks in implementation of E-commerce services is in dealing with security and systems integration. Poor or lack of telecommunication infrastructure needs to be addressed whereas cost of acquiring E-commerce services and frequent power interruptions are not considered a challenge.

CHAPTER FIVE: SUMMARY AND FINDINGS

The objective of the study was to establish the extent to which E-commerce services have been utilized in Kenyan banking sector and to establish the benefits and challenges of implementing E-commerce services by banks. This chapter covers the key findings, limitations and suggestions for further study.

5.1 Key Findings

Extent of bank to bank E-commerce service utilization:

i. The majority of banks that responded (66%) use settlement of payment real time facility. However, cross tabulation revealed that, 100% of foreign banks, 72% of wholly locally owned, 25% of partly locally owned and 20% of banks with government participation use this facility;

ii. Vast majority of banks that responded (97%) use electronic funds transfer through swift facility. However, 100% of foreign owned, 100% of wholly locally owned, 80% of banks with government participation and 50% of partly locally owned banks use this facility;

iii. 94% of banks that responded use automated clearing house through EFT with 100% of foreign banks, 95% of locally owned banks, 80% of banks with government participation and 50% of partly locally owned banks using this facility;

iv. 89% of banks that responded use electronic funds transfer payment facility with 100% of banks with government participation, 95% of wholly locally owned, 80% of foreign and 25% of partly locally owned using this facility;

v. Settlement of government securities electronically is utilized overall by 43% of banks that responded. However, 100% of foreign banks, 41% of locally owned, 25% of partly locally owned and 20% of banks with government participation using this facility; and

vi. Only a small number of banks that responded (17%) use Truncation and cheque imaging system with 50% of foreign and 14% of wholly locally owned banks using it.

Extent of usage of bank to customer Electronic payment Methods

i. The majority of banks (76%) that responded use electronic funds transfer facility with 100% of foreign banks, 80% of banks with government participation, 77% of wholly locally owned and 25% of partly locally owned banks using it;

ii. Office banking facility is used overall by 46% of banks that responded. However sector wise, 75% of foreign owned, 55% of wholly locally owned and 20% of banks with government participation use this facility. None of partly locally owned banks use this facility;

iii. 31% of banks that responded use electronic funds transfer point of sale services, whilst 50% foreign owned banks, 40% of banks with government participation and 23% of wholly locally owned banks use this service. None of the of the partly locally owned banks that responded use it;

iv. 23% of banks that responded use Internet banking, tele-banking and mobile banking. The average usage across the categories is 25%; and

v. 29% of banks that responded indicated they will be adopting an electronic service in the next one year.

Extent of usage electronic payment methods

i. ATMs payment method is the most utilized with 54% overall of banks that responded using it. 80% of banks with government participation, 59% of wholly locally owned and 25% of foreign banks use ATM service. However, 44% of banks that do not have ATM service have plans to implement it in the next one year;

ii. Credit cards and debit card payment methods recorded usage of 14% each with 40% of banks with government participation using credit cards and debits whilst 25% of foreign owned banks using credit cards; and

iii. 50% of banks that responded indicated that they have plans to implement an electronic payment method in the next one year.

Factors influencing adoption of E-commerce services.

From the factor analysis carried on the factors for adoption of E-commerce services by banks the following deductions can be drawn.

i. Banks are influenced to adopt E-commerce services by the need to increase their customer base (market share) through expanding their geographical reach, creating awareness of their products (marketing), and retaining existing customer by offering better service through E-commerce;

ii. Banks use E-commerce services to keep with rapid development in technology and meet customers demands; and

iii. Banks use E-commerce service to comply with the industry regulator requirements such as making electronic returns and adoption of real time gross settlement services.

Benefits of E-commerce services.

From the factor analysis carried on factors of E-commerce benefits to banks the following deduction can be drawn from the banks perspectives:

i. Customer service has improved with reduction of number of customers in the banking halls and most customers have become aware of banks products and services through E-commerce marketing;

ii. There has been increased revenue through reduction of operational cost, increased market share and income from commission charged for usage of E-commerce services; and

iii. Banks have been able to retain existing customers and attracted new ones due to expanded geographical reach by E-commerce and being innovative and progressive.

5.1.6 Challenges of E-commerce services.

From the factor analysis carried on factors of challenges of E-commerce to banks the following deduction can be drawn.

i. Ensuring desired levels of security, privacy and dealing with security breaches of E-commerce services is a major concern to banks;

ii. Integrating E-commerce systems with the current banks' back office systems to achieve straight through processing has not been achieved by most banks;

iii. Lack of legislation covering electronic transaction in the country makes adoption of E-commerce services risky to banks when it comes to litigations;

iv. Unreliable telecommunication and unavailable Internet infrastructure to most bank customers makes it difficult for banks to spread E-commerce to most parts of the country; and

v. Whereas the cost of acquiring E-commerce services does not pose a major challenge to banks, banks are more concerned with the high costs of maintaining this services.

5.2 Limitation of the study

Limitation to this research include:

i. Some respondents refused to respond to questionnaires sent to them;

ii. There was also self assessment bias by some respondents who wanted to protect self image through providing inaccurate information; and

iii. Time and resources available was also limited especially for collecting and analyzing data.

5.3 Suggestions for further study.

This study focused on the E-commerce services adopted by banks and the benefits and challenges faced by banks in adopting these services. Further studies can be focused on the perspectives of bank customers towards the E-commerce services offered by banks. Such a study would seek to determine the level of awareness by customers of the E-commerce services being offered by banks. It will also determine the benefits and challenges derived by customers who use such services.

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APPENDIX 1.

LIST OF BANKS BY CATEGORY

Banks Shareholding Information

Foreign Owned banks

Foreign owned and not Locally incorporated

1. Citibank N.A
2. Bank of Africa
3. Habib Bank A.G Zurich
4. Bank Of India
5. Habib Bank

Foreign owned but locally incorporated banks (Partly owned by locals)

1. Barclays Bank Of Kenya Ltd.
2. Standard Chartered bank Ltd.
3. Stanbic Bank Ltd
4. Bank Of Baroda Ltd
5. Diamond Trust Bank Kenya Ltd.
6. K-Rep Bank Ltd.

Banks with Government Participation

1. Kenya Commercial Bank
2. Stanbic Bank Ltd
3. Industrial Development Bank Ltd.
4. National Bank Of Kenya Ltd
5. Consolidated Bank Of Kenya Ltd
6. Development Bank Of Kenya

Banks Locally Owned

1. CFC Bank Ltd
2. Commercial Bank Of Africa Ltd
3. Transnational Bank Ltd.
4. Credit Bank Ltd
5. Guardian Bank Ltd.
6. Investment & Mortgages Bank Ltd.
7. Middle East Bank (K) Ltd.
8. Akiba Bank Ltd.

9. FINA Bank Ltd
10. Imperial Commercial Bank
11. Victoria Commercial Bank
12. Prime Bank Ltd
13. Equatorial Commercial Bank Ltd.
14. Giro Commercial Bank
15. Biashara Bank Ltd
16. Africa Banking Corporation Ltd
17. Chase Bank Ltd
18. City Finance Bank Ltd
19. Paramount Universal Bank Ltd
20. Southern Credit Banking Corp. Ltd
21. Fidelity Commercial Bank Ltd
22. Co-operative Bank of Kenya Ltd
23. National Industrial Credit Bank Ltd
24. Equity Bank

APPENDIX II

Research Questionnaire

QUESTIONNAIRE NO. ----------

PART A: DEMOGRAPHIC DATA

PERSONAL DETAILS OF RESPONDENT.

1. Name **(Optional)** ----------
2. Position in the Organization ----------

COMPANY INFORMATION.

3. Name of the Bank----------
4. Year of incorporation **(Optional)**----------
5. Please tick the category that best describes your bank

   Foreign owned and not locally incorporated [ ]

   Foreign owned but locally incorporated [ ]

   With government participation [ ]

   Wholly locally owned [ ]

6. How many employees does your bank currently have?

   Less than 50 [ ]

   50-100 [ ]

   More than 100 [ ]

7. How many branches does your bank have?

   Less than 5 [ ]

   5-10 [ ]

   More than 10 [ ]

PART B:

8. For each of the following **bank-to-bank** e-commerce services indicate the extent to which it is applicable to your bank.

   Use a five-point measurement scale as follows:

   1= Not applicable at all, 2= Least applicable, 3=moderately applicable, 4= Largely applied, 5= Applied to a great extend.

	1	2	3	4	5
a. Settlement of payments on a gross basis in real-time	[ ]	[ ]	[ ]	[ ]	[ ]
b. Settlement of government securities electronically	[ ]	[ ]	[ ]	[ ]	[ ]
c. EFT electronic payment bank –to- bank	[ ]	[ ]	[ ]	[ ]	[ ]
d. Automated Clearing through EFT	[ ]	[ ]	[ ]	[ ]	[ ]
e. Truncation and cheque imaging transmission	[ ]	[ ]	[ ]	[ ]	[ ]
f. Electronic funds transfer via EDI system **(swift)**	[ ]	[ ]	[ ]	[ ]	[ ]

   g. Others please specify----------

9. Which other bank-to-bank e-commerce services does your bank intends to introduce in the next one year.
   - ----------
   - ----------

10. For each of the following **bank-to-customer** e-commerce services, indicate the extent to which it is applicable to your bank.

    Use a five-point measurement scale as follows:
    1= Not applicable at all, 2= Least applicable, 3=moderately applicable, 4= Largely applied, 5= Applied to a great extend.

	1	2	3	4	5
a) Internet Banking- direct access to account	[ ]	[ ]	[ ]	[ ]	[ ]
b) Office banking- access to acct from convenience of office	[ ]	[ ]	[ ]	[ ]	[ ]
c) Home banking- access to cust. Account from home	[ ]	[ ]	[ ]	[ ]	[ ]
d) Tele-banking- automated telephone banking Services	[ ]	[ ]	[ ]	[ ]	[ ]
e) Mobile banking- access to cust. Acct. on mobile phone	[ ]	[ ]	[ ]	[ ]	[ ]
f) EFT Point of sale services	[ ]	[ ]	[ ]	[ ]	[ ]
g) Electronic funds transfer (EFT)	[ ]	[ ]	[ ]	[ ]	[ ]

    h) Others please specify----------

11. Which other bank-to-customer e-commerce services does your bank intends to introduce in the next one year.
    - ----------
    - ----------

12. Rate the extent to which the bank uses the following electronic payment methods.

    Use a five-point measurement scale as follows:

    1= Not applicable at all, 2= To less extent, 3= To moderate extent 4= To great extent, 5= To a very great extent.

	1	2	3	4	5
a) Credit Cards (VISA, MASTER etc)	[ ]	[ ]	[ ]	[ ]	[ ]
b) Prepaid Cards/Smart Cards services	[ ]	[ ]	[ ]	[ ]	[ ]
c) Debit Cards services	[ ]	[ ]	[ ]	[ ]	[ ]
d) ATM services	[ ]	[ ]	[ ]	[ ]	[ ]

    e) Others please specify ----------

13. Which other electronic payment services does your bank intends to introduce in the next one year.

    - ----------

PART C:

14. To what extent did the following factors influence the adoption of e-commerce services in your bank? Use a five-point measurement scale as follows:

    1= Not applicable at all, 2= To less extent, 3= To moderate extent 4= To great extent, 5= To a very great extent.

	1	2	3	4	5
a) To improve customer service	[ ]	[ ]	[ ]	[ ]	[ ]
b) To reduce number of customers in banking hall	[ ]	[ ]	[ ]	[ ]	[ ]
c) To cut down on operational costs	[ ]	[ ]	[ ]	[ ]	[ ]
d) To increase customer awareness of bank products	[ ]	[ ]	[ ]	[ ]	[ ]
e) To expand banks' geographical reach	[ ]	[ ]	[ ]	[ ]	[ ]

f) To expand banks' market share	[ ]	[ ]	[ ]	[ ]	[ ]
g) Increased banks' profitability	[ ]	[ ]	[ ]	[ ]	[ ]
h) To keep up with industry trend	[ ]	[ ]	[ ]	[ ]	[ ]
i) Compliance with regulations	[ ]	[ ]	[ ]	[ ]	[ ]
j) Response to customers' demands	[ ]	[ ]	[ ]	[ ]	[ ]
k) Response to customers awareness of e-commerce services	[ ]	[ ]	[ ]	[ ]	[ ]

l) Other please specify ----------

15. Please indicate which of the following factors best explains the benefits derived by your bank from adopting e-commerce services.

Use a five-point measurement scale as follows:

1= Strongly disagree, 2= somewhat disagree, 3= Neither agree nor disagree, 4= Somewhat agree, 5= Strongly agree.

	1	2	3	4	5
h) Improved customer service	[ ]	[ ]	[ ]	[ ]	[ ]
i) Reduced number of customers in banking hall	[ ]	[ ]	[ ]	[ ]	[ ]
j) Reduced operational Costs	[ ]	[ ]	[ ]	[ ]	[ ]
k) Increased customer awareness of bank products	[ ]	[ ]	[ ]	[ ]	[ ]
l) Expanded banks' geographical reach	[ ]	[ ]	[ ]	[ ]	[ ]
m) Expanded banks' market share	[ ]	[ ]	[ ]	[ ]	[ ]
n) Increased banks' revenue	[ ]	[ ]	[ ]	[ ]	[ ]
h) Bank seen as innovative and progressive	[ ]	[ ]	[ ]	[ ]	[ ]

16. Rate the extent to which the following factors are a challenge to your bank in the implementation of e-commerce.

Use a five-point measurement scale as follows:

1= Strongly disagree, 2= somewhat disagree, 3= Neither agree nor disagree, 4= Somewhat agree, 5= Strongly agree.

	1	2	3	4	5
a) Unreliable telecommunication infrastructure	[ ]	[ ]	[ ]	[ ]	[ ]
b) Slow Speed of connection	[ ]	[ ]	[ ]	[ ]	[ ]
c) Unavailability of internet infrastructure to most customers	[ ]	[ ]	[ ]	[ ]	[ ]
d) Cost of acquiring e-commerce services	[ ]	[ ]	[ ]	[ ]	[ ]
e) Integration with other back office systems	[ ]	[ ]	[ ]	[ ]	[ ]
f) Ensuring desired levels of Security	[ ]	[ ]	[ ]	[ ]	[ ]
g) Ensuring desired levels of Privacy	[ ]	[ ]	[ ]	[ ]	[ ]
h) Lack of legislation covering electronic transactions	[ ]	[ ]	[ ]	[ ]	[ ]
i) Cost of maintaining e-commerce services	[ ]	[ ]	[ ]	[ ]	[ ]
j) Integration with other systems in the industry	[ ]	[ ]	[ ]	[ ]	[ ]
k) Dealing with security breaches	[ ]	[ ]	[ ]	[ ]	[ ]
l) Reluctance to change by users	[ ]	[ ]	[ ]	[ ]	[ ]
m) Frequent power interruptions	[ ]	[ ]	[ ]	[ ]	[ ]

n) Other please specify ----------

17. What other factors do you consider are challenge to implementation of e-commerce in your bank?

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18. What additional views would you like to give that may contribute to the development of e-commerce in the banking sector in Kenya

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19. Please give any other comment that you may deem useful for this exercise.

I thank you very much for your co-operation and the time spared to complete this Questionnaire.

APPENDIX III

LETTER OF INTRODUCTION

SAMUEL ALWENYA OJUNG'A,

UNIVERSITY OF NAIROBI,

FACULTY OF COMMERCE,

DEPARTMENT OF MANAGEMENT SCIENCE,

P.O BOX 30197,

NAIROBI.

To Whom It May Concern:

I am a postgraduate student in the faculty of commerce, University of Nairobi, pursuing an MBA degree program. I am undertaking a Survey of e-commerce services offered by Kenyan banks. The survey is aimed at establishing the extend at which banks have adopted e-commerce services and the benefits and challenges encountered by banks in adopting e-commerce practices.

You have been selected as one of the respondent. I therefore kindly request you to fill in the attached questionnaire. The information from the questionnaire is needed purely for academic research purposes and will therefore be treated with utmost confidentiality. In no way will your name or the name of your firm appear in the final report. A copy of the final report can be made available to you upon request.

If you require any further information please do not hesitate to contact me by email alwenyas@devbank.com or tel. 251082, 0722 944401.

Thank you in advance for your cooperation.

Yours Faithfully,

Samuel Alwenya
MBA STUDENT