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Research Project Report

PROJECT TITLE: Towards the Development of a Framework for improving Internet banking in Kenya.

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Presented in partial fulfilment for the award of a Master of Science in Information Systems of the University of Nairobi.

DECLARATION OF AUTHENTICITY

I Julius Mboya, hereby declare that this project work entitled "Towards the Development of a Framework for improving Internet banking in Kenya" submitted to the University of Nairobi, School of Computing and Informatics, is an original work undertaken by me and has not been submitted for the award of a degree in any other university.

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

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DEDICATION

Dedicated to my dear wife Florence and progenies Collins, Warren and Gentrix.

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ABSTRACT

Internet banking is a primarily a recent technology that enables customers access banking services and transact remotely through the Internet (WWW) using computers or other hand-held devices. The concept has gained popularity in developed countries and to a lesser extent in developing countries. Internet banking has the potential of time and cost savings to banks and customers hence our interest in the subject.

The ultimate goal of our study was to develop a framework for improving Internet banking business in Kenya. Towards achieving this goal, the research set to examine the value of Internet banking in bank-customer relationship as well as appreciate the issues customers faced in their use of the service. Using these key customer issues, suitable technology considerations were proposed to mitigate for increased customer satisfaction. The research therefore took a customer-facing approach in proposing the framework. Literature review identified key models notably UTAUT, forces responsible for increasing and competitive change in the banking industry and Internet portal quality that formed the basis of our proposed framework. A survey was planned involving commercial banks and their customers. Data was collected using questionnaires followed by interviews for additional information. 1,013 questionnaires were distributed of which 615 useful responses received (60.7% response rate). The data was analyzed using frequency, percentage, means as well as regression and correlation analysis.

Analysis of the results established that 70% of banks that participated confirmed that Internet banking was of strategic value in their bank-customer relationship and 12 of them were actually offering the service. Furthermore, only 28% of the identified Internet banking products had been implemented. Customers used Internet banking more for obtaining financial information and less for transactional needs. Favourable economic climate and increasing customer demands for better, cheaper and convenient services served to push banks towards rolling out Internet banking. Support for Internet banking transactions was the biggest challenge consumers of the service faced followed by slow systems and issues of security and trust. A generic framework for improving Internet banking was eventually proposed based on identified technology considerations to address these service gaps.

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LIST OF ABBREVIATIONS

BFI	Banking and Finance Industry
ICT	Information and Communication Technology
ACH	Automated Clearing House
ATM	Automated Teller Machine
BPA	Business Process Automation
BPR	Business Process Re-engineering
CA	Certification Authority
CBK	Central Bank of Kenya
CCK	Communications Commission of Kenya
CIA	Confidentiality, Integrity and Availability
COTS	Commercial Off The Shelf
CVI	Content Validity Index
DMZ	Demilitarized Zone
EFT	Electronic Funds Transfers
FAQ	Frequently Asked Questions
GDP	Gross Domestic Product
GDP	Gross Domestic Product
IB	Internet Banking
ISP	Internet Service Provider
ITU	International Telecommunications Union
IVR	Interactive Voice Responses
KBA	Kenya Bankers Association
MFI	Micro Finance Institutions
MICR	Magnetic Ink Character Recognition
NBFI	Non-Bank Financial Institutions
P2P	Peer to Peer
PC	Personal Computer
PCA	Principal Component Analysis
PIN	Personal Identification Number
PKE	Public Key Encryption
POS	Point of Sale

RTGS	Real Time Gross Settlement
SACCO	Savings and Credit Co-operative Societies
SME	Small and Medium-sized Enterprises
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
SSL	Secure Socket Layer
SWIFT	Societies World Interbank Financial Telecommunication
TAN	Transaction Authorisation Number
TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
TKL	Telkom Kenya Limited
UTAUT	Unified Theory of Acceptance and Use of Technology
WWW	World Wide Web

CHAPTER 1: INTRODUCTION

1.0   Chapter overview

In this chapter, we introduce electronic banking concept and zero in on Internet banking. Subsequently, we take a global survey of Internet banking growth and finally, we look at the developments in Internet banking service in Kenya, hence our research problem.

1.1   Introduction

The proliferation of, and rapid advances in, computer-based systems, especially those related to the Internet, have led to rapid changes in how companies interact with customers (Ibrahim et al, 2006; Bauer et al., 2005). Internet banking has become the self-service delivery channel that allows banks to provide information and offer services to their customers with speed and convenience through web services technology. This new world of electronic banking is changing day by day.

1.2   Electronic Banking: a new distribution channel

Eelectronic banking is an umbrella term for the process by which a customer may perform banking transactions electronically without visiting a brick-and-mortar institution (FinCen, 2000) or a form of banking where funds are transferred through an exchange of electronic signals between financial institutions, rather than an exchange of cash, checks, or other negotiable instruments. The ownership of funds and transfers of funds between financial institutions are recorded on computer systems connected by telephone lines. Customer identification is by access code, such as a password, Personal Identification Number (PIN) and/or Transaction Authorization Number (TAN) instead of a signature on a check or other physical document (allbusiness.com). Since its inception, e-banking has availed unprecedented opportunities for businesses globally, banks inclusive. Electronic banking is a construct that consists of several distribution channels, summarized in the table 1.1 below:

Channel	Description
Personal Computer (PC) banking	The customer installs banking software on his or her personal computer at home or in the office. The customer has access to his or her account with that specific software.
GSM or mobile phone banking	This second innovation enabled customers' to access financial services through their mobile phones. Subscribers could send SMS messages, call the telephone banker or automated telephone systems as well as fixed line in order to perform banking tasks.
Web-based banking	Customers use the web browsers to access the bank's portal in order to get financial information as well as originate transactions sending them directly to the bank for processing. This uses PCs, mobile phones or other web-enabled hand-held devices.

Table 1.1: Electronic Banking Distribution Channels

It should be noted that electronic banking is a larger concept than banking via the Internet (Karjaluoto, 2002). It embodies the following services:

- Mobile/SMS Banking
- Telephone Banking
- Electronic funds transfers
- Self Service (PC) Banking
- POS Banking (Credit and Debit cards)
- ATMs
- Interactive TV
- Automated Clearing House (ACH)
- Intranet banking
- E-mail banking
- Internet banking

The Internet is a main delivery channel for electronic banking and its value to customers and banks is continuously increasing.

1.2.1 Internet Banking

With connectivity improving at 10% per month, Internet proves to offer commercial businesses with more opportunities. The Internet can no longer be considered a "fad" or the preserve of "techies" and "computer nerds". Commercial uses of the Net have become the fastest growing part of the World Wide Web (Rizal et. al, 2007).

Often, online banking, Internet banking as well as PC banking are taken to be synonymous. Online banking is another term for Internet banking (IBanking or simply IB) and will be used interchangeably in the course of this research. Many researchers have attempted to define Internet banking (Liao and Cheung, 2003; Bradley et al., 2003; Nath et al., 2007). Their definitions coalesce into one fact; *"Internet banking is a technology initiated banking service channel that uses computers or other intelligent devices to deliver banking services remotely through the World Wide Web by availing a platform on the bank's web site that bank customers can interact with to access product information as well as originate both financial and non-financial transactions, sending them directly to the back-office for processing. It uses appropriate authentication to identify the customer prior to granting access and use, which can be by means of User ID and Password combined with other features like TAN, biometric etc".*

1.2.2 Functional Levels of Internet banking portals

This definition brings out three distinct levels of Internet banking. Thulani (2009) and the Comptroller's Handbook on Internet Banking identifies these levels as:

i.   Informational Level

This is the basic (first) level of Internet banking. Typically, the bank has marketing information about the bank's products and services on a stand-alone server. The risk is relatively low, as informational systems typically have no path between the server and the bank's internal network.

ii.   Communicative/simple transactional sites

This type of Internet banking system allows some interaction between the bank's systems and the customer. The interaction may be limited to electronic mail, account inquiry, loan applications, or static file updates (name and address changes) and does not allow funds transfers.

iii.   Advanced Transactional Sites

This level of Internet banking allows customers to execute transactions i.e transfer funds, pay for utilities and conduct other banking transactions online.

On the other hand, PC banking is defined as a home or office banking whereby consumers are supplied with a financial software package on disks, allowing consumers to fill in details offline and then to send them into the bank over the bank's private network. Unlike PC banking, Internet banking or online

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banking does not require proprietary software or access to a private network (Rizal et. al, 2007). It is worth noting that banks' internal networks (intranets) are a buzz with online connectivity especially to the central processing centres but these are 'closed' networks operated mostly by bank staff to serve customers who visit branches. Those customers wishing to sever ties with branch visits have to hook up to the Internet and other online banking alternatives.

The Internet has opened numerous capabilities for banks to exploit for competitive advantage. A firm's competitive advantage depends on its superior deployment of capabilities (Christensen and Overdrof, 2000). In the Internet age, the extension of commercial banking to the cyberspace is an inevitable development (Liao and Cheung, 2003). Both researchers and practitioners in the BFI have highlighted the need for banks to broaden their branch-based delivery channels by embracing electronic forms of banking (Wu Jen-Her, et al, 2006), notably Internet banking.

1.2.3   Internet Banking Products.

From the three functional levels of Internet banking exposed above, a cohort of services have and continue to be added at each level, making Internet banking a sort of replica to branch based banking save for the need for physical cash which it does not facilitate. Booz et al., (2003) indicated that ample evidence exist to suggest that Internet banking has been highly accepted in only specific line of services and yet global bankers have to fight a fierce battle when Internet Banking will be a truly serious and parallel banking channel, complementing offline banking in a big way.

Ongkasuwan et al., 2002 identified these capabilities of Internet banking. The following list of features originally adapted from Ongkasuwan et al., (2002) and enriched from heuristic experience and past studies portrays the capabilities available to Internet banking customers in the 21st century, as outlined in the table 1.2 below:

Level	Services Offered
INFORMATIONAL	o View Product Information on the bank's website
	o Check foreign exchange rates
COMMUNICATIVE (Includes Informational +)	o Language Option
	o Online banking demo
	o Comprehensive FAQ
	o Online transaction hours
	o E-mail support
	o Online business
	o Online investment
	o Online insurance
	o Online application forms
	o Request for bank statement
	o Change user id and password (Account Management)
TRANSACTIONAL (Includes Informational and communicative +)	**Financial Transactions:**
	o Transfer funds between own accounts at same or different branch(es)
	o International funds transfer
	o Transfer funds to third party account
	o Bill payment
	o Repay loans and mortgages
	o Bulk payment processing
	o Fixed deposit placement
	o Standing order or direct debit request
	o Credit and debit card payment
	o E-phone banking on the Internet
	o Web shopping on the Internet
	o Online flight ticket payment
	Non-Financial Transactions:
	o Request to order cheque book
	o Apply for loans and mortgages
	o View statement and account balances
	o Downloading bank statement
	o Stop cheque
	o Apply for credit and debit card

	o Online loan repayment calculation
	o Historical records (Transaction History Enquiry)
	o Tracking loan/mortgage applications

Table 1.2: Capabilities of Internet Banking

The above services were further classified by Centeno, (2004) as in Table 1.3 below:

Type of Product	Examples
Convenience	Mobile Banking, Mobile Payment, SMS alerts, Secure e-mail
3rd Party	Commerce Payment (shopping), Tax payment on-line, Utilities Bill & account management, e-Billing
Other Financial Services	Life Insurance Contract, Traffic Insurance Contract.
Investment	Deposit Account Opening & Management, Domestic/foreign equity investment, Mutual funds/bonds investment, insurance investment
Credit	Loan application, credit card application
Basic banking	Account opening / closing / management, Domestic / foreign money transfer, Standing orders, Direct debit, Debit Card Application etc.

Table 1.3: Categorization of Internet Banking Services adapted from Centeno, 2004.

A close competitor to Internet banking is cellular phone SMS banking service whose penetration in Kenya stands at 63.2% (KNBS, 2009), see Figure. 1.0: below from (Blycroft, 2011):
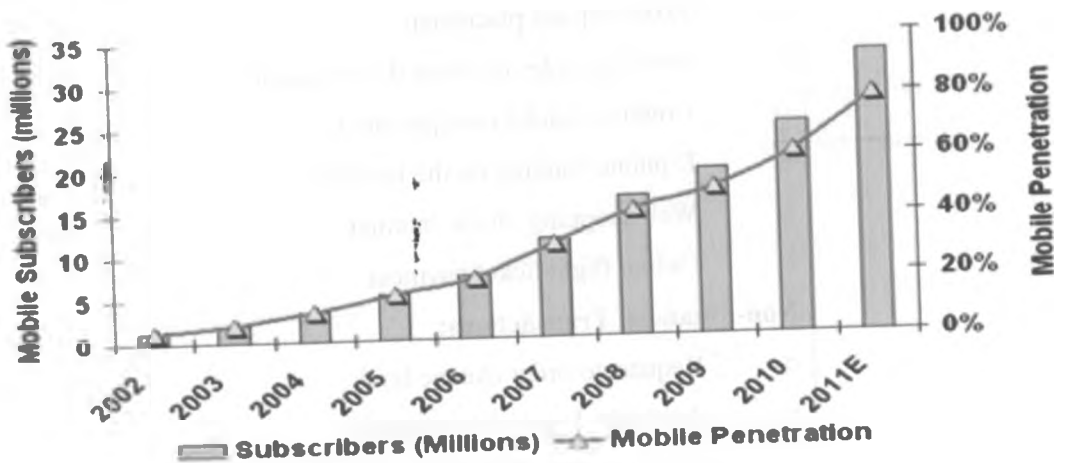
Fig. 1.0: Kenya Mobile Subscribers and Penetration 2002-2011

On Internet use, the digital divide report (www.rich.co.ke) outlines key trends in Internet use in Kenya thus:

- Kenya now has over 2 million registered users on Facebook
- Email is being discarded in favour of social networks like Facebook and Twitter by new Internet users in Kenya. One quarter of Kenyans who are online do not have email addresses
- 79% of Kenya's Internet users are members of Facebook.
- Daily and weekly Internet usage in Kenya have both doubled in the last two years whereas monthly usage grew by over 80% in the same period.
- Kenyan Internet users spend approximately 70 minutes online during each visit. This utilization is comparable to the average amount of time spent on television.

This parallel competitor has been identified to offer the range of products adapted from (bankislam.com) as captured in the table 1.4 below:

SMS Banking Products
Alert services
Bill payment
Balance enquiry
Transfers (own/other accounts)
Credit card payments
Cheque book request
Stop cheque request
Release stop cheque requests
Cheque status enquiry
Last 5 transaction history
SMS PIN change
Prepaid reload purchase
Account deposit functionality

Table 1.4: SMS banking products adapted frombankislam.com

This outlines the enormous potential of Internet banking to accommodate not less than 25 different types of banking services (financial and non-financial) on the same channel, making it the one-stop online banking delivery alternative with the widest reach on a global platform. This makes it a suitable complement of branch banking.

1.3   Global Internet Banking Penetration Survey

There is sufficient evidence of Internet Banking gaining considerable prominence in developed, and to a lesser extent developing world. However ample evidence exists to suggest that Internet banking has been highly accepted only in specific line of services. Global bankers will have to fight a fierce battle when Internet Banking will be a truly serious and parallel banking channel, complementing offline banking in a big way (Booz et al., 2003).

Developed nations have registered a higher usage of Internet banking compared to their developing counterparts. A survey of online banking usage is as summarised in table 1.5:

REGION	% ONLINE BANKING USERS	RESEARCH FIRM	TIME RESEARCH FINDINGS WERE REPORTED
Australia	16%	Nielsen Survey	April 2007
America	25%	ABA	September 2009
Europe	30%	Gartner Group	January 2009
Middle East	14%	The Banker	May, 2008

Table 1.5: Global Internet Banking penetration survey

Online Internet banking excels in a technically sound communications infrastructure with a good risk management framework and a vibrant legal and regulatory framework. Infrastructure facilitates information exchange with speed whereas risk management framework addresses operational lapses while legal and regulatory framework clarifies liabilities of the online banking participants (gtnews.com). Higher online banking usage in any region/country is a reflection of the superior deployment of these three capabilities.

Africa, though largely developing, portends great potential for online banking, having made significant milestones in communication, risk and regulation. South Africa, Egypt and Nigeria have relatively superior infrastructure in these three key areas compared to other African countries. Kenya is fast becoming increasingly attractive following various efforts by the government, CBK and various stakeholders to promote diffusion of technology within the banking sector.

1.4   Financial Services Industry in Kenya

Kenya is one of Sub- Saharan Africa's most diverse economies, and the most developed in East and Central Africa. Its strategic location and well developed business infrastructure make Kenya a natural choice for investors, and many international firms have made it their regional hub. With a nominal 2008 gross domestic product (GDP) of $ 29.3 billion, it is also the economic, commercial, and logistical hub for the entire region. The economy is forecast to grow at a 10 per cent rate from 2012 and thus creating investment opportunities in the financial sector including infrastructure bonds and corporate bonds within the capital markets, forex bureaus, and ICT-supportive financial infrastructure (internationalbusinessstrategies.com).

According to FinAccess (2009), Kenya has a youthful, largely educated population totalling to approximately 39 million of which 22.6% are adults and 50% are children under the age of 15 years. The financial services industry in Kenya can be described as growing and has recorded improved performance in the last 5 years. It comprises of banks and non-bank financial institutions (NBFIs). In terms of composition, there are 43 commercial banks and NBFI category comprises 2 mortgage finance companies, 2 building societies, 15 Micro Finance Institutions (MFIs), 123 forex bureaus, 22,000 Small and Micro Enterprises (SMEs), and 5,122 SACCOs; all of which were intimated to hold over 10 million accounts (CBK, 2009). Of the 43 commercial banks, 11 are foreign owned whereas the rest are locally owned. All banks, MFIs and building societies are regulated and supervised by the Central Bank of Kenya (CBK) while SACCOs are regulated by the Commissioner for Co-operatives.

The Kenyan populace have a strong entrepreneurial tradition according to US Commercial Service hence their need for financial services has led to a vibrant banking sector where each institution strives to customize products that appeal to business clients while reaching the unbanked. FinAccess (2009) further qualifies this by revealing that 67.3% of the adult population operate an account of some sort with one or more institutions mentioned above. This is further stratified as below:

i.   22.6% hold accounts with commercial banks.

ii.   17.9% bank with SACCOs and MFIs.

iii. 26.8% with Informal Financial Service Providers, and

iv.   32.7% are unbanked.

There is intense competition in the Kenyan banking sector, powered in a special way by a growing economy, stable currency and improved remittances from Kenyans in the Diaspora and a largely educated and unbanked population. This has made banks re-brand, merge, expand branch network, extend banking hours and create target loan products as they shift focus to small savers. Reorganizations are shaping the financial services landscape characterized by either mergers or acquisitions.

Appendix 1.0 outlines such activities in Kenya since 1994. The bank branch network is expanding in a bid to bring services closer to the consumers, reaching 948 branches by June 2009 (CBK, 2009).

Technology is proving to be an alternative bounty by which banks can extend their services closer to customers at the most reasonable cost. This has resulted in non-cash instruments notably an expansive multifunctional ATM network numbering 1,510 ATMs (CBK, 2009). These are often located outside bank branches as well as strategic off site locations including supermarkets, shopping malls, open air markets, filling stations and business premises especially large firms for ease of customer access. In tandem to the growth of ATMs is the increasing use of chip cards numbering 2,541,827 according to CBK (2009). Use of ICT has created efficiencies and increased delivery channels with such products as e-banking, P2P banking, POS terminals, Direct Debit requests, Electronic Funds Transfers (EFT), SWIFT, automated Clearing House (ACH), Value Capping, Real Time Gross Settlement (RTGS) and SMS banking added to supplement branch network as banks strive to achieve branchless banking status (Manjau, 2005). The Micro Finance Bill 2008 which allows SMEs to accept deposits is set to stiffen competition even further as banks seek to consolidate their market share in this largely SME dominated segment. This is pegged on the realization that small savers have proved to be an attractive source of cheap and stable deposits for banks.

Large banks are able to marshal their resources and invest in these emerging technologies. Small banks are facing expansion challenges owing to inadequate resource capacity. However, they have an option of partnering with larger banks as well as alternative financial service providers in order to offer these services to their customers. Such strategic alliances continue to witness partnerships with alternate ATM service providers such as Pesa Point and Kenswitch who use their networks to hook smaller banks and NBFIs in offering card-based services to their customers. SACCOs are further partnering with large banks to avail card based services to their

customers. A case in point is the Co-opSwitch project of Co-operative Bank where SACCO customers are issued with Visa branded debit cards for use either at ATMs or at POSes. Kenya has the highest mobile footprint in Africa (allAfrica.com) and this gadget has found favour with consumers especially in funds transfer services. Prior to this, courier services were the main channels used in money transfers especially to upcountry stations. Banks lost a sizeable portion of revenue from funds transfers as customers shifted to use the mobile phones for this service. However, they are reclaiming this revenue through SMS banking which integrate clients' bank accounts and their cellular accounts for transfer services as witnessed in many initiatives by banks i.e Equity Bank's M-Kesho etc. Most banks are however integrating their mobile banking with cellular banking especially M-Pesa which has found favour with most customers.

All these realignments could not have been possible without the government's regulatory role. Legislations have been passed by the government, recognizing electronic transactions in Kenya. Furthermore, the government has encouraged diffusion of ICT within its operations through e-government as well as grass root level by introducing computer education at primary and secondary school levels as well as digital village project. Other notable investments by the government include zero-rating ICT equipment and the under-sea fibre optic cable project as well as upgrading the national back-haul interconnecting the major towns on fibre optic link. This has increased Internet speeds considerably, thereby encouraging use of Internet enabled businesses in the country.

Central Bank has also promoted the use of technology amongst banks through:

   i.   Inspecting new bank branches for compliance to requirements before licensing.
   ii. Setting up automated clearing house (Bank Connect)
   iii. Adopting RTGS for effecting payments of Kshs. 1 million and above.
   iv. Mandating bank's external auditors to audit the banks' ICT systems etc.

These developments in ICT, risk management and regulatory framework together with the demographic aspects of the Kenyan population explained in earlier sections serve to back the milestones the country has made in technological progress in the financial services sector.

As revolutions take place in the BFI in Kenya, mobile banking seem to gain greater prominence compared to Internet banking in handling financial services. In the wake

of these developments, Internet banking poses to be the next generation banking channel but is still at the nascent stages in Kenya hence our research problem.

1.5   General statement of the problem

In the wake of emerging superior Internet payment systems, ICT infrastructure, risk management, legal and regulatory frameworks as well as greater demands by customers for electronic means of accessing banking services signalled by an increasingly knowledgeable workforce (KNBS, 2009), the response from Kenyan Banks is still forthcoming. Out of 43 commercial banks, only 12 banks representing 27.9% offer basic Internet banking services (CBK Annual Reports, 2009). Furthermore, the types of services deployed are typical of those offered in alternate channels like cellular phone SMS banking and ATM networks (refer to table 1.4 above).

We undertook a survey amongst the banks that had implemented Internet banking in order to appreciate this penetration level. To conduct the survey, we surfed through banks websites and identified those banks that had indicated they were offering Internet banking as per table 1.6 below. Based on the enriched list of Internet banking products originally adapted from Ongkasuwan et., al (2002) in table 1.2 above, we prepared a spread sheet listing these services (see appendix 7) and contacted the banks to confirm by ticking against the products their customers were accessing through their Internet banking system. The survey was conducted between February and May 2010.

Table 1.6 below enlists the banks with Internet banking point of presence in Kenya:

Commercial Banks offering Internet banking in Kenya
Barclays Bank of Kenya Limited
CFC Stanbic Bank
Kenya Commercial Bank Ltd
Ecobank Kenya Ltd
Co-operative Bank of Kenya Ltd
Equity Bank Ltd
National Bank of Kenya Ltd
Standard Chartered Bank Kenya Ltd
NIC Bank Ltd
Commercial Bank of Africa Ltd
Dyer & Blair Investment Bank Ltd
Citibank Pty Ltd

Table 1.6: Commercial Banks offering Internet Banking in Kenya.

Of the 25 identified possible Internet banking services (see Table 1.2 above), the commercial bank that ranks first has successfully rolled out 10 Internet banking services representing 40% deployment whilst that with the least has rolled out 3 services or 12% deployment. The average number of services deployed by the 12 banks identified is 6, representing 24%. Table 1.7 below outlines the actual numbers and percentages of services deployed by the identified banks.

The ordering of the banks has been altered (from that in table 1.6 above) to uphold their privacy.

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NUMBER OF INTERNET BANKING SERVICES DEPLOYED		
BANK	NO. OF IB SERVICES OFFERED	DEPLOYMENT %
1	3	12%
2	5	20%
3	6	24%
4	6	24%
5	6	24%
6	6	24%
7	7	24%
8	7	28%
9	7	28%
10	8	32%
11	10	40%
12	14	56%
AVERAGE	7	**28%**

Table 1.7: Products offered through Internet banking in Kenya

According to our survey results, Internet banking service diffusion in Kenya stands at an average 28% leaving 72% in various stages of realization as summarised in the chart 1.1 below:
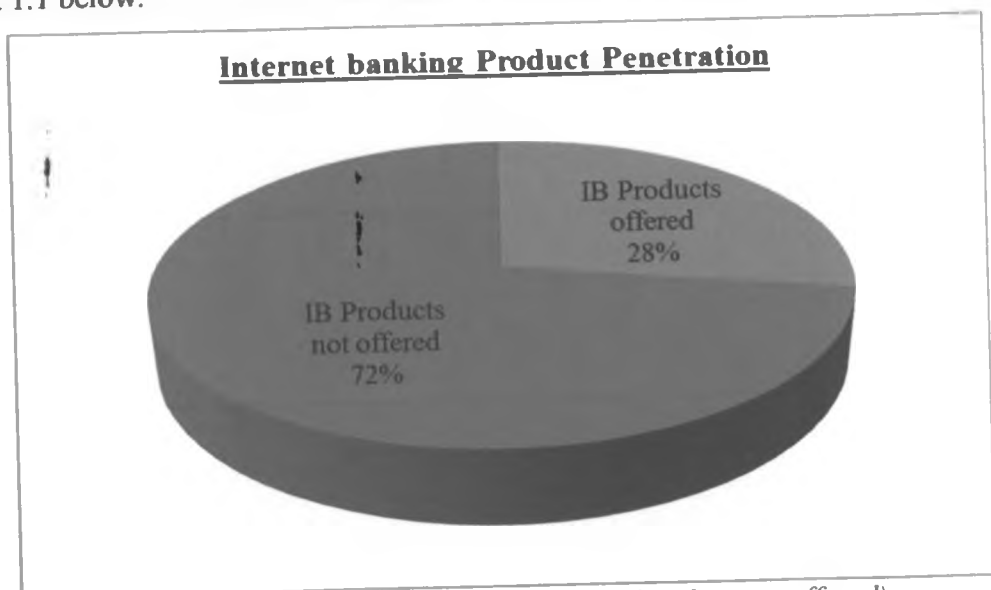
Fig. 1.1: Summary of Internet banking products (offered vs not offered)

These results confirm that Internet banking is present in Kenya with minimal features. The 76% gap in unrealized products elicited our interest, hence our focus on this research area. These preliminary results also confirm the opinion of a number of IS researchers in the field of Internet banking that this technology it is still at its blossoming stages especially in developing countries (Nyangosi, 2003, Nath et al., 2007).

1.6   Problem formulation and solution to the study.

1.6.1   Problem statement.

Since 2000, technology has presented a wide range of products that continue to revolutionize business landscape worldwide. Banks have not been spared from this transformation. A cohort of technology initiated products have found their way into the banking industry, the latest being Internet banking.

Developed nations have registered higher usage patterns of Internet banking compared to their developing counterparts (see table 1.5: Global Internet Banking Penetration). Developing countries have made efforts to promote diffusion of Internet banking in their BFI and Kenya is one such country.

Our study therefore seeks to understand why only a few banks in Kenya offer Internet banking with minimal products and hopes to propose solutions on how to increase usage of this product.

1.6.2   Objectives of the study.

The purpose of this research is to understand Internet banking in Kenya using exploratory study method. The research involves identifying suitable theoretical models that have been used by IS researchers in the field of Internet banking around the globe with a view to applying them in the Kenyan context in order to propose a framework for increasing Internet banking business. The objectives of our study are:

- *Establish the banks' perception of the strategic value of Internet banking in their relationship with customers.*
- *Establish the key technology considerations in offering Internet banking.*
- *Establish the hindrances to customers' adoption of Internet banking in Kenya.*
- *Propose a framework for increasing Internet banking diffusion in Kenya.*

1.6.3 General scope and application of study

The scope of our research is limited to Internet banking i.e using the World Wide Web technology to access banking services remotely (web-based banking). All other forms of electronic banking i.e as outlined in section 1.21 – page 16 above, fall outside the scope of this research.

1.6.4 Significance of study

i. Banking Industry

Our study findings would benefit the target industry, i.e *banking industry,* especially the decision makers involved in implementation of electronic banking service delivery strategies. The study aims to establish improvements necessary to deliver quality Internet banking system by highlighting gaps that the affected banks need to close on to realise this level of quality . Further, commercial banks that are considering or are in the various stages of implementing the technology can use the findings of this research to clarify issues of relevance and get greater insights into their implementation of the technology.

ii. The Government

Implementation of the much talk about e-governance in Kenya would definitely get a lift from the findings of this study. The *government* can use this research for comparative purposes. Internet banking adoption and network in Kenya could be compared to other economies to gauge the level of technological advancement. The study would be of importance to the policy makers in government, since an understanding of the environment of Internet banking technology adoption will enable them come up with appropriate policies that promote level playing field for all players.

iii. Academia

Internet banking is a research area in Kenya with spurious literature. Our study contributes in terms of literature and proposes areas for further research which can be used to expand knowledge on this subject. Finally, the purposed framework can be tested and validated in other fields in order to test its applicability especially in developing countries.

iv.   The private Sector

Since the government cannot on its own achieve meaningful financial inclusion especially to the private sector, partnering with the private sector is key to delivering this initiative. The private sector is one of the biggest consumers of financial services and the report aims to expose critical success factors that will enable this sector to reap maximum benefits from Internet banking products.

v.   The un-banked.

This group is the target in financial inclusion programmes in many developing countries like Kenya. The research aims at giving them relevant information on aspects they need to consider while making decisions to subscribe to any Internet banking service. This will see them have a smooth and informed entry into the technology-enabled banking services and help allay many fears and uncertainties about their decision to consume such services.

1.6.5   Basic assumptions and limitations of study

The following assumptions are considered necessary for success of this research study.

I.   Stability in the legislative landscape with no major legislations likely to deter outcome of research envisioned. If any, policies passed during the currency of this research are deemed to be enablers rather that deterrent.

II.   Customer trends with regard to banking services subscriptions shall prevail and economic conditions facilitating the same shall prevail for the duration of research.

III.   Financial information is often treated with secrecy. The study therefore assumes respondents will open up in volunteering information since it does not touch on the nature of financial information they deal in. This has been validated by the preliminary findings above on the number of Internet banking services deployed.

CHAPTER 2: LITERATURE REVIEW

2.0   Chapter Overview

In this chapter, we outline the technological developments in Kenya that serve to set the stage for Internet banking followed by some facts about Internet banking from past IS literature. We examine the fundamental changes reshaping the banking industry in Kenya which map out the trajectory of growth to non-cash forms of banking and follow closely by examining the benefits that accrue to both banks and customers as a result of adopting Internet banking. We conclude with the customer perceptions on Internet banking mainly from international studies which provide hindsight to help banks formulate or rethink their approaches to Internet banking implementation.

2.1   The Growth of Internet in Kenya

Studies have been done by researchers on the subject of Internet in order to appreciate its evolution and trajectory of growth as a foundation upon which new technologies emerge and grow. Having been in Kenya for the last two decades, reports on Internet in Kenya has not been adequately documented. A recent study by Communications Commission of Kenya (CCK) captured these developments in Internet technology in Kenya whose results are worth mentioning in this study. The forces of supply and demand affect technology as well though the study focussed mainly on the supply side of Internet (CCK, 2006).

The study traced the entry of Internet in Kenya to 1990, being an initiative of Kenyans returning home from abroad. Early pioneers were FormNet and Africa Online which offered dial-up and content services primarily to import/export firms and academic institutions. Increasing ISPs mandated the need for an Internet backbone which was delivered by Jambonet 8 years later. The key challenges in the 90s were limited and high cost international Internet bandwidth, high cost of both dial-up and domestic leased lines, limited penetration of PCs, limited capacity and poor quality fixed infrastructure, lack of an Internet policy and regulatory environment and the lack of appropriate IT skills.

Until 2005, Telkom Kenya Limited (TKL) monopolised provision of telecommunications services and this monopoly was characterized by high Internet bandwidth and high leased line tariffs.

CCK licensed more players in 2004 leading to exclusivity of TKL, driving down costs while simultaneously increasing international Internet bandwidth. Challenges at the time were high costs of Internet services in comparison with Kenyans' income levels, poor availability and reliability of local access network, little local content to invoke demand, ISPs focused on Internet access rather than Internet services and applications and mediocre licensing framework leading to longer interconnection processes. The study intimated Internet users in Kenya to be 2.8 million at the time.

Key determinants to Internet growth in Kenya according to the study were:

i.   Regulatory and licensing framework

ii. Affordability of Internet services

iii. Limited access to locally relevant content

iv. Limited ICT penetration in academic, commercial, health, government and other sectors.

The study projected an exponential growth in users and bandwidth to 7 million and 10 Gbps respectively in five years as well as investment by the licensee to the tune of $700 million in the areas of national fibre backbone, undersea sub-marine cable and deployment of strategic applications i.e e-learning, e-government and e-commerce in order to sustain the expected high usage patterns. The usage statistics conducted by ITU in Table 2.1 below outlines the growth prospects according to ITU:

Year	Users	Population	% Pen.	Usage Source
2000	200,000	30,339,770	0.7 %	ITU
2008	3,000,000	37,953,838	7.9 %	ITU
2009	3,359,600	39,002,772	8.6 %	ITU

Table 2.1: ITU Internet growth projections adapted from ITU.

Further to this penetration, the costs of getting online have substantially reduced especially wireless connectivity where modems go for as little as Kshs. 3,000.00 and cyber cafes mushrooming in urban as well as rural areas. The population is largely educated and their ability to adapt to new technology has been demonstrated by the fast diffusion of cellular phone that has made Kenya the country with the highest mobile coverage footprint in Africa (itnewsAfrica.com). Prospects are positive for banks that are able to securely deliver their services on the Internet in Kenya.

2.2   Online Banking in Kenya

The idea of paying for goods electronically is not new (Mahony, et al., 2001). We find evidence of transactions around us which have been wholly or partly done electronically since late 1970s. The Internet spurred the exponential growth of these transactions owing to the World Wide Web (WWW) technology which enabled information to be kept in many computers around the world and be accessed as a single multi-media linked document with simple point-and-click interactions (Raja and Velmurgan, 2008).

Commercial banks of all types and sizes have intensified the use of online (Internet/web-based) banking in their operations (Mols, 1999) since 1990s.

There are various forms of online banking in Kenya. In one form, there is increased online activity within the banks' intranets with most services deployed from a central processing centre (Data Centres) with online connectivity to branch outlets using client-server architecture. This is *online intranet banking*, a closed, web-based platform used primarily by bank staff to serve their customers. On the other hand, we have *anywhere anytime banking* where customers have around-the-clock access to their financial information wherever they are and at whatever time they prefer. This can only be achieved by taking banking activities to cyber space i.e the bank is only a click away from the customer. There are vivid attempts by banks to exploit this channel as highlighted in the problem formulation but statistics do not support increased usage of the service compared to alternative means like cellular phone SMS banking that has gained greater prominence.

2.3   Developments in the Banking Finance Industry in Kenya.

Central Bank of Kenya (CBK) in conjunction with the Kenya Bankers Association (KBA) have been spearheading various IT related projects since 1993 aimed at promoting the use of technology in banking industry operations. The cheque clearing system was the first to be automated using Magnetic Ink Character Recognition (MICR) technology which reduced clearing period for cheques and other instruments from initially 3-4 weeks to 3 days (T+3) and 2 days (T+2) for small and high value cheques (10 million and above) respectively. This was known as the Automated Clearing House (ACH) system and has been in use since then. Appendix 2.0 outlines the achievements of this system.

The payment system in Kenya was primarily dominated by cash payments which provided instant value. Bulkiness, insecurity and high production costs associated with cash payments served as drivers for the shift to non-cash payment alternatives. This shift radically re-shaped the payment systems leading to a cohort of alternatives starting with the cheque, payment cards/plastic money, paperless payment/EFT, Direct Debits, SWIFT and other electronic banking services such as office banking, home-banking, Internet-banking, tele-banking etc (CBK, 2003). Other notable developments included the foreign cheque clearing system, the Real Time Gross Settlement (RTGS) which enabled same day clearing of cheques above 1 million and Value Capping which facilitates exchange of cheque images as opposed to physical cheques. These changes serve to enhance electronic banking by making non-cash alternatives the preferred means of accessing banking services.

As Seipp (2000) clearly points out, the basic trends affecting the financial markets are globalization, deregulation, liberalization, technology, and new demographic trends. Globalization *"reflects the progressive interaction of the world economics"* (World Bank 2000). In other words, technology has enabled the world to be viewed as one platform (market) where each trading partner is just a click away. Liberalization and deregulation in the banking sector implies increasing competition among banks and other financial institutions. As a result, banks are no longer the only players in the financial service sector. It is expected that telecommunication companies will soon offer similar transaction services, selling financial products / services via the Internet, a concept that has had strong roots in Kenya where mobile phone money transfer is active, moving Kshs. 350 billion in 2009 alone (CBK, 2009) and the passing of Microfinance Bill that enables micro finance institutions take deposits is set to provide serious competition to commercial banks. Technology, specifically the Internet, has had a profound impact on the financial markets.

New demographic trends point to changes in the customer base whereby the population comprises up to 50% youth who are increasingly knowledgeable and cost conscious with regard to access and use of services.

2.4 Forces shaping the banking sector operations globally.

Both internal as well as external forces interplay to shape the banking sector globally. Jayawardhena and Foley (2000) identify these forces in the figure 2.0 below:
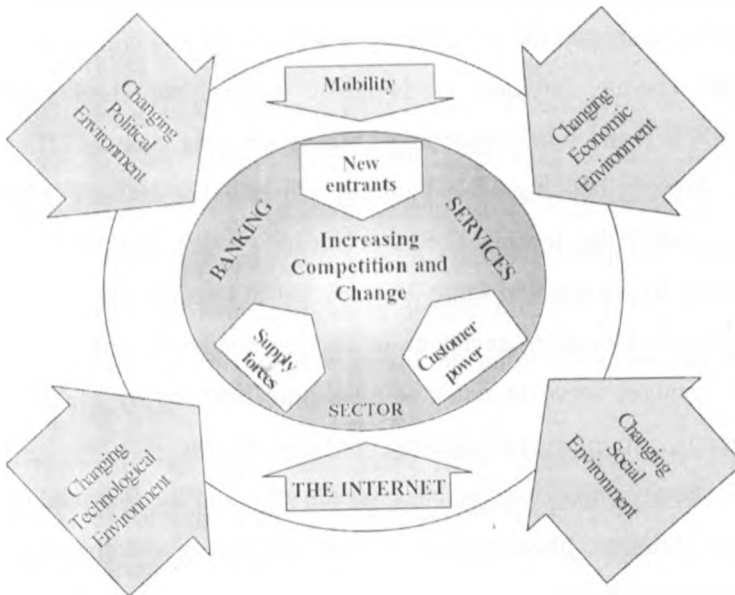
Fig. 2.0: Banking services sector and interaction with forces adapted from Jayawardhena and Foley (2000)

2.4.1 External Forces affecting Banking Industry

Four main external forces in the banking industry according to the researchers can be summarised by the acronym PEST i.e Political, Economic, Social and Technological forces. According to the researcher, these external forces have the greatest impact in business of any economy.

a. Changing Technological Environment

Technology was preceded by liberalization which changed the banking industry primarily from deposit and withdrawals to bottomry or lending and the list of services grew exponentially as competition intensified. Information technology developments enhanced how information was collected, stored, processed, transmitted and distributed and continue to influence banking activity in the following ways:

i. It contributes to banking information management cost reduction by replacing paper based and labour intensive methods with automated processes, passing the cost-saving benefits to stakeholders in form of attractive benefits and to customers in form of higher returns on savings and investments. This has seen intensive automation of banks' processes with new departments being set up internally to oversee these changes i.e Business Change Management headed

by process analysts who spearhead and co-ordinate these automation activities. Thus, technological landscape has given forth to new careers in banks along the lines of Business Process Automation (BPA) and Business Process Re-engineering (BPR) activities.

ii.   It modifies the way customers' access banks products and services i.e remote banking and here is where Internet banking finds its roots. Majority of banks do not have direct influence on technological developments. Rather, they just adapt to the use of new technologies in their production and distribution processes. This adaptation has impacted on the banks' strategies in three main ways:

- It resulted into integration of the latest generation of technology into the banks' internal processes, products and distribution methods in order to gain competitive advantage and increase market share as well as improve efficiency and risk management.

- It resulted in new business alliances and strategic partnerships with technology partners and telecommunications operators in order to create common platforms which allow further developments in the effective application of the most up-to-date technologies and to optimise research and development and implementation costs.

- It resulted in diversification into other business areas such as e-commerce, e-money, Internet banking, ATM, PC banking etc.

b. Changing Political Environment

Politics operates at the core of any country's economy and determines the trajectory of growth in a country. At the most general level, political stability in any economy affects attractiveness of any market to investors. Hence Internet banking will generally grow in a politically stable economy.

More so, the legislations passed by government directly or indirectly affect electronic banking. For instance, the e-transactions bill passed by the Kenya government served to spur usage of the Internet within government operations as well as private sectors. The government is better placed to encourage diffusion of this technology through inclusion in its operations i.e using EFT to make government payments.

The overseeing function of the political system serves to strengthen the use of electronic banking. This is possible through passing legislation aimed at protecting consumers from losses resulting from I-Banking activities. Finally, passing favourable bills and policies by the political system will determine the rate of growth of the economy. As the economy grows, individuals' purchasing power increase which in turn reflects in demand for electronic payment hence encouraging use of electronic means of payments.

c. Changing Economic Environment

Few business people can afford to ignore the state of the economy, because it affects the willingness and ability of customers to buy their products. Decision makers in financial institutions must keep their eyes on numerous aggregate indicators of the economy, such as Gross Domestic Product (GDP), inflation rates, and savings ratios. However, while aggregate changes in spending power may indicate a likely increase for goods and services in general, the actual distribution of spending power among the population will influence the pattern of demand for specific products i.e I-Banking.

In addition to measurable economic prosperity, the level of perceived wealth and confidence in the future can be an important determinant of demand for some high-value services. If consumers' confidence is low, a high pro-portion of income tends to be saved. If confidence is high, consumers are more likely to borrow, so that their expenditure is greater than their income.

Both political and economic forces increase rights to the consumer in using certain services and have to be favourable for meaningful realization of the targets set by product owners.

d. Changing Social Environment

It is crucial for banks to fully appreciate the cultural values of a society and device strategies alongside these values. The values operate at the core of communities and groups and unless the products that banks develop appear to support these values, they are doomed to fail. Some social concerns that are pertinent to I-Banking include:

i. Leisure which has become a bigger part of people's lives, and banks have responded with a wide range of leisure related services including I-Banking that delivers banking services to where the customers spend a good proportion of their time.

ii.   Level of education impacts directly on the usage of I-Banking services. As more and more people get educated, there is a gradual shift from traditional modes of banking to modern ones hence bankers should design services that retain the elite members of the society whilst at the same time reaching out to the less elite members.

iii.   Consumer experiences with the product impacts directly on the opinion so formed, which underpins his/her decision to continue using the product, switch to competition or drop the product altogether. The customer experience is a powerful marketing tool as satisfied consumers are more likely to talk of the benefits of the service to their friends and families hence widening the niche for the concerned banks. Banks therefore need to roll out thoroughly tested products and have a responsive customer service that is able to provide instant solutions to customer queries so as to increase customer confidence for increased subscriptions.

Two factors interplay between the external and internal environments with regards to Internet banking technology implementation. These are:

- **Mobility**

As trading activities intensify and as infrastructure advances, people have found themselves moving from one point to the other with ease. This has served to strengthen the need for electronic forms of banking that delivers banking services to them wherever they are, whenever they need access. This has served to spur the impetus for I-Banking services especially through the ubiquitous Internet and the prolific hand-held devices.

- **The Internet**

This is the medium upon which globalization find its roots and many businesses in the 21st century find Internet a critical component to their operations. Many employees spend a good proportion of their time on the Internet for specific reasons.

2.4.2   Internal Forces affecting Banking Industry

Jayawardhena and Foley (2000) identified three categories of internal forces as being, threat of new entrants, increasing customer power and volatile supply forces.

i.   Threat of New Entrants

As liberalization and deregulation activities intensify, many new entrants have found their way into the financial services industry and competition has stiffened. Each of the 43 commercial banks in Kenya now seek new and improved ways of delivering value-added financial services to their customers and as the search for options intensify, a lot of attention has been shifted to technology-initiated choices mainly the Internet. Internet banking has removed many barriers to entry and has created stiff competition with the banks success remaining hinged on ability to consolidate their numbers of loyal customers. Karjaluoto (2002) points out that an answer to this lies in good online-services through the Internet. Internet has become a major threat to traditional banks as it has the potential of reaching many customers globally and lowering considerably the transaction costs of services. It has therefore been a great attraction to customers lately and these traditional banks have little options other than embracing it to supplement their branch-based delivery channels.

ii.   Increasing Customer Power

Karjaluoto., (2002) acknowledges that increasing customer power implies shifting financial control from banks to their customers, i.e. customers are able to control almost all of their financial transactions and even apply for loans via the Internet. With the help of the Internet, switching barriers from one bank or financial institution to another will disappear, as customers will be able to change banks at the press of a button in the comfort of their homes or offices. Banks therefore are faced with the daunting task of retaining these customers and the single most powerful way to achieve this is through offering superior Internet based services.

iii.   Volatile Supply Forces

Volatile supply forces are also changing the way banks package and deliver their services. Many banks in Kenya have adopted *channel-based pricing strategies* with low price offers on technology based delivery channels and higher prices on branch-based channels for the same services. For example, it costs a customer as high as

Kshs. 100.00 to withdraw cash over the counter in some bank branches whilst the same over ATMs is as low as Kshs. 30.00. Similarly, transferring money from one account to another within the same bank or to another bank costs a customer up to Kshs. 250.00 over the counter and as low as Kshs. 30.00 over Internet banking channels for some banks. Also, banks are heavily investing in online customer service so as to provide fast and easy to use electronic delivery channels with personalised services.

Wah (1999) predicts the success of banks on the Internet to be pegged to *portal* i.e own websites. Banks in Kenya have responded positively to this with each institution having an official web site as part of its product operations. Much as these portals have been customized largely around retail, corporate/business banking, foreign exchange, investment banking and supportive services (consultancy), Karjaluoto (2002) suggests that there is no agreement about whether banks' portals should be designed for banking only or whether they should also contain shopping activities, chat rooms, news groups or other activities. With regard to cost effective banking, technology related channels offer customers an attractive bounty compared to branch based counterparts.

In conclusion, the banking sector in Kenya is vibrant and has made considerable milestones in embracing technology in their operations. As the trajectory of growth advances towards technology choices and prices continue to fall, the increasingly knowledgeable customers are likely to turn to Internet banking for affordable services.

2.5   Advantages of Internet Banking.

The ubiquity of Internet and the WWW has been known to accord businesses the opportunity to reach far more customers by availing services where they spend most of their time, at a fraction of the cost. Many Information Systems researchers have established that both banks and customers are set to benefit from implementing Internet banking. We will outline the benefits to banks and customers, each in turn:

2.5.1   Advantages accruing to Banks.

i.   **Reduced cost of doing business.**

Compared to other alternative banking channels, electronic banking dramatically reduces cost per transaction (Orr, 1999; Bradley and Stewart, 2003;

Rotchanakitumnuai and Speece, 2003; Nath et al., 2007). The graph below gives the comparative figures for various channels of banking.
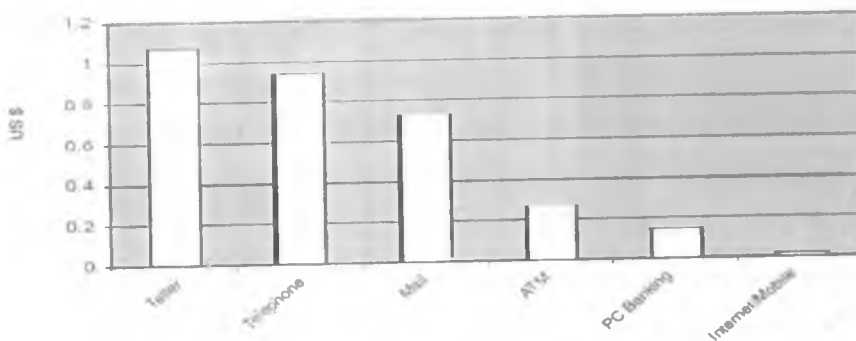
Fig. 2.1: Transaction cost per distribution channel.

It is evident that Internet banking can reduce the cost of doing bank transactions owing to little channel set up costs for the customers. This translates into higher profits and increased shareholder value. Banks in deciding to adopt Internet banking should justify their investment in the medium and long term because the technology commands sizeable initial investment at start up and requires some time to break even.

ii. Loyal Customers.

It is no doubt that Internet banking bundles a number of banking services into one channel and uses the WWW to reach out to a large number of customers simultaneously. Customers would generally patronize websites that offer convergence on the belief that they will get all their needs met in one place. Their increased patronage signals higher chances of using services available in these sites and this serves to boost their loyalty (AL-Sukkar and Hasan, 2005; Nath et al., 2007).

iii. Offering Additional Services in financial portals.

Internet banking facilitates customer profiling and dubs as a cheap source of customer survey information. This combination enables the decision makers within banks to determine with a degree of precision, the needs of customers and either customize existing products or develop new product programs that conveniently meet these needs beyond the core services. This has been the single driving force behind the exponential growth of non-core services within Internet banking (Jayawardhena and Foley, 2000; Nath et al., 2007). By creating financial portals where consumers can

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manage a broad range of financial activities such as stocks and mortgages, banks can profit from offering Internet capabilities to clients (Wah, 1999).

iv.   Internet Profit Generation.

Booz et al., (2003) in their article 'The payment wars' noted that transaction revenue accounts for up to 50% of banks' profits worldwide. Driving financial service consolidation in this sector is the key to achieving higher profits from Internet banking activities. Therefore by automating customer transactions without the need for manual handling as well as forming strategic alliances with alternative financial services partners notably cellular phone money transfer service providers in Kenya is seen as a key component of transaction volume mobilization for increased profitability. Kenya has the highest mobile footprint in Africa and Safaricom's M-Pesa and Airtel's Zap have realized wide acceptance in money transfer services. Banks therefore need to partner with them to interface the customers' bank accounts with (customers') cellular accounts for increased efficiency in money transfer service. This in turn creates a win-win scenario for banks and cellular money transfer service providers who have about 16 million subscribers at present.

v.   High Profit Customers.

Customers are becoming increasingly knowledgeable and cost-conscious. Corporate customers particularly, are interested in real-time financial information to enable them make decisions. Based on the high amounts of financial information the handle, banks that can demonstrate ability to surpass their expectations in financial information availability tend to be a darling to these corporates who are generally high profit customers. Similarly, these tech savvy customers tend to prefer financial independence, whereby they manage their personal and organizational finances themselves without relying on institutions for support. Nath et al., (2007), acknowledges that the demographics of Internet banking customers are enticing and banks should find best ways to attract and retain them.

vi.   Growth in Shareholder wealth.

Internet banking is considered an efficient channel of service delivery that is able to drive costs down while reaching out to more customers for increased profitability.

This in turn becomes a gain for shareholders as banks generate more revenue on lean and efficient organization structures.

vii. Cheaper Channels of Marketing and Communication

Most Internet banking portals offer basically similar services. The differentiating aspect is the place the product occupies in the customer's mind which is driven largely by how aggressively the product is marketed. Internet has proved to be the single most effective way of passing marketing information to customers. Banks rolling out Internet banking can segment their market niches and package advertisements with strong customer appeal to these identified in the most efficient and cost effective way, i.e through the Internet. Also secure mail facility available in Internet banking portals facilitate a cost-effective way to communicate with customers (Jayawardhena and Foley, 2000; Corrocher, 2006).

viii. Increased Customer Base/ability to attract new customers.

Marketing intelligence posits that satisfied customers tend to recommend to their friends and families products they believe are useful. This coupled with intense marketing activities, the ubiquity of Internet and the WWW has the potential of increasing customer base for banks offering Internet banking to their customers. More so, new customers to Internet banking always refer and decide based on the opinion of those already using the technology (Bradley and Stewart, 2003; Jayawardhena and Foley, 2000; AL-Sukkar and Hasan, 2005). In the Kenyan context, 50% of the population consists of youth below 15 years, (Lilech, 2009). ICT diffusion is on a rising trend especially in the education sector and this creates a great potential for Internet banking in the near future in terms of subscriptions.

2.5.2 Advantages accruing to Customers.

Nath et al., 2007 identified benefits of Internet banking to customers as below:

i. Cost Savings.

Banks usually pass the costs they incur to customers in the form of fees or commissions. Cyberspace is cheaper to operate in than traditional bricks-and-mortar banks and this cost benefit is passed to customers as expounded in the reduced cost of doing business by banks above.

ii.   Access to Additional Services.

The financial institutions that offer expanded online services (non-core services) above the basic services are poised to be market leaders (Nath et al., 2007). By offering this cohort of services from one trusted banking institution, these banks are set to garner greater proportions of the customers' financial businesses. Using the Internet, financial information can be linked to account information stored in programs such as QuickBooks, Microsoft Money etc on a home PC (Fysh, 1999) and this enables customers to manage their finances independently. These features improve "stickiness" of customers leading to a lower attrition rates.

iii.   Convenient One-Stop Shopping.

Banks are adding real-time loan applications, the ability to make investments, and the opportunity to trade stocks through their web sites. The trend towards "convergence banking" is predicted to shape the future of Internet banking. This concept of "one-stop" shopping is convenient and leads to more satisfied customers (Engen, 2000).

2.6   Disadvantages of Internet banking

AL-Sukkar and Hasan (2005) identified potential disadvantages of deploying Internet banking mainly to customers as follows:-

i.   *Indirect cost to the customer* - Internet banking has certain systems requirements such as accessibility to computers and browsers connectivity which are additional costs to the customer.

ii.   *Cash availability*- customers cannot make deposits or withdrawals of hard cash when using the Internet banking and have to turn to ATMs or branches for the same.

iii.   *Security concerns*- banks and customers alike are concerned about unauthorized access to their systems.

iv.   *High attrition rates* – customers convinced with the value of Internet banking marketed to them decide subscribe only to find that these services fall short of their expectations, prompting them to discontinue. A myriad of reasons have been advanced to contribute to this including poor customer service in addressing mistakes, the inconvenience of having to visit a branch in order to have a mistake corrected, marketing hype where more features are touted than actually in operation etc (Nath et al., 2007).

2.7   Security and Confidentiality in Internet Banking.

Security appears to be the main obstacle to adoption of Internet banking. Many studies suggest that banks must first convince their customers that their Internet banking portals and indeed the customers' transactions are secure before customers show willingness to use Internet banking (Nath et al., 2007; Bradley et al., 2003; Karjaluoto, 2002; AL-Sukkar and Hasan, 2005). Adam et al. (1999) claim that security and confidentiality are fundamental prerequisites before any commercial activities involving sensitive information can take place, adding that security is the leading barrier to widespread electronic business on the Internet. Good progress has been made to secure Internet banking portals but the security challenges still persist.

With regard to security technology, Gesner (1996) says that security is becoming a non-issue since answers to security and confidentiality are at hand.

2.7.1   Security architecture for Internet banking.

A lot of effort has been put by software developers worldwide to ensure security of data over Internet channels. The below section describes some salient features that are pertinent to Internet banking security.

i.   Anti-virus and anti-malware programs.

These are installed on PCS and servers and are constantly updated to counter the effects of viruses, works, Trojans, malware etc that may infect the servers/PCs and cause damage to the servers e.g Symantec, McAfee, Kaspersky etc.

ii.   Firewalls.

Computer networks are generally designed to allow free exchange of information between computers in the same network. Individual computers are free to decide who they want to communicate with, what information they want to allow access to and which services they will make available. This way of operating is called "host based security", because individual computers or hosts, implement security mechanisms. The Internet is designed this way based on universal access to information and trust amongst hosts. Internet interconnects networks therefore posing a serious threat to trust. This demands additional mechanism of providing adequate security by protecting resources on the trusted network from potential access by attackers on the

un-trusted part of the network. This is where firewalls come into play. Figure 2.2 below outlines a firewall in its basic form.
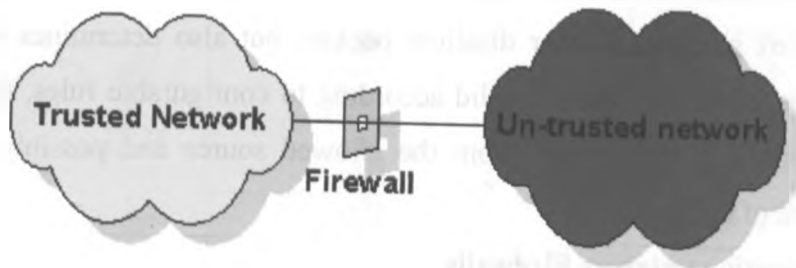
Fig. 2.2: Basic form of firewall.

A Firewall disrupts free communication between trusted and un-trusted networks, attempting to manage the information flow and restrict dangerous free access.

There are a number of different kinds of technique which may be employed by a Firewall in order to correctly identify a conversation and act on it.

The techniques used by a particular Firewall have an impact on the accuracy with which it can identify traffic, the level of sophistication of the checks it can implement, but also its complexity and therefore cost and likelihood that it incorporates bugs.

a. Packet filtering firewalls

Information on the Internet is exchanged in form of packets. A packet is a quantity of data of limited size, kept small for easy handling. When larger amounts of continuous data must be sent, it is broken up into numbered packets for transmission and reassembled at the receiving end. Therefore packet filtering firewalls examine incoming or outgoing packets and allowing or disallowing their transmission or acceptance on the basis of a set of configurable rules, called policies.

b. Stateful inspection Firewalls

Stateful inspection takes the basic principles of packet filtering and adds the concept of history, so that the Firewall considers the packets in the context of previous packets. So for example, it records when it sees a TCP SYN packet in an internal table, and in many implementations will only allow TCP packets that match an existing conversation to be forwarded to the network.

c. Circuit relay Firewalls

These are also called Circuit Level Gateways. In addition to packet filtering, they validate connections before allowing data to be exchanged. This means is that the firewall doesn't simply allow or disallow packets but also determines whether the connection between both ends is valid according to configurable rules, then opens a session and permits traffic only from the allowed source and possibly only for a limited period of time.

d. Application gateway Firewalls

The Application Level Gateway acts as a **proxy** for applications, performing all data exchanges with the remote system in their behalf. This can render a computer behind the firewall all but invisible to the remote system. It can allow or disallow traffic according to very specific rules, for instance permitting some commands to a server but not others, limiting file access to certain types, varying rules according to authenticated users and so forth. This type of firewall may also perform very detailed logging of traffic and monitoring of events on the host system, and can often be instructed to sound alarms or notify an operator under defined conditions. Application-level gateways are generally regarded as the most secure type of firewall. They certainly have the most sophisticated capabilities.

e. DMZ Firewalls.

Internet mail communication using SMTP which is an essential component of Internet banking system opens up holes in the incoming traffic on the firewall thereby creating vulnerabilities. This is often sealed using demilitarized zone or DMZ firewall but is expensive to small and medium sized organizations as it requires three devices namely; an external Firewall, an internal Firewall and the DMZ server machine. This therefore costs three times more to protect the network. Figure 2.3 below gives the outline of a typical DMZ configuration.
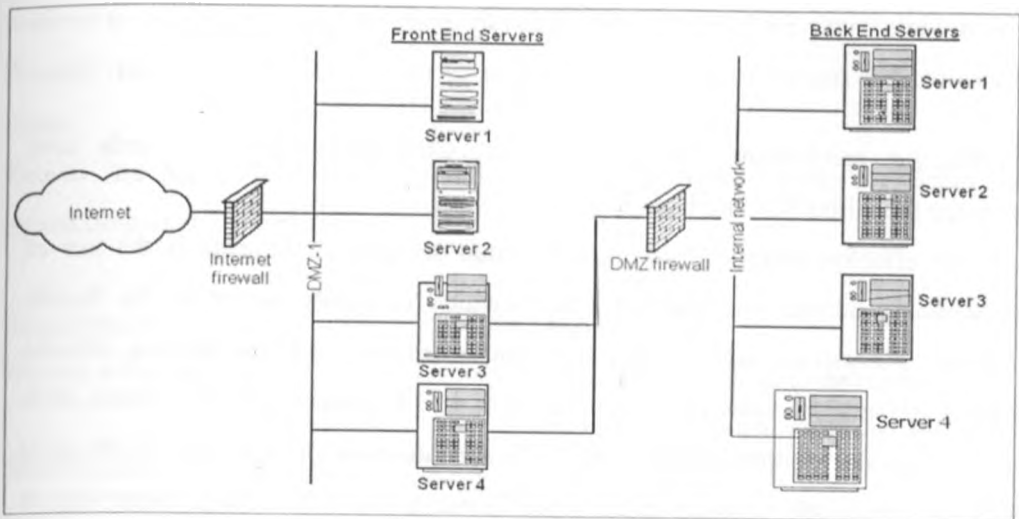
Fig. 2.3: Typical Internet banking architecture diagram.

iii.   Data encryption.

A number of security mechanisms have been put in place to ensure information on the Internet is exchanged between intended parties while keeping intruders out. These developments include:

    a.   Web browsers are incorporating 128-bit RSA encryption key technology that is widely used in e-commerce protocols and is believed to be secure given sufficiently long keys and the use of up-to-date implementations. This is known as Public Key Encryption (PKE). The exchange of keys is useful in identifying parties/terminals in Internet communication and is a basic requirement by most Internet banking software vendors.

    b.   The use of digital certificates has made identification easier and cheaper. A definition of digital certificate according to (techtarget.com) is: *an electronic "credit card" that establishes your credentials when doing business or other transactions on the Web. It is issued by a certification authority (CA). It contains your name, a serial number, expiration dates, a copy of the certificate holder's public key (used for encrypting messages and digital signatures), and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real.*

iv.   Authorization and Identification techniques.

This ensures the authorized user is identified by the system and given access to permitted system resources. At the most basic level, we have user ID and PIN. Other

identification mechanisms include Biometric, Chip cards and TAN cards used alongside the initial PIN and User IDs.

A recent effective Internet banking transaction security instruments is the use of Transaction Authorization Number (TAN) which is widely in use in the Nordic countries. As part of authorization and authentication modules of these Internet banking systems, the systems generate a set of 4 to 6 unique random numbers, each set is assigned a unique authorisation code and are printed on a card (TAN card) which is given to the customer at the time of subscription. When the customer logs in using user ID and password, the system randomly picks an authorisation code from the TAN card and requests the customer to key in the associated random number. The system then verifies this input before eventually granting access. There is a limit to the number of tries in order to thwart impersonation. The same is repeated before the customer completes a transaction. This security at access and transaction levels keep intruders off since it is nearly impossible to guess the correct random number combination in just 3 tries at each of the levels.

v.   SSL Certification

The other notable development in securing online transactions is the use of Secure Socket Layer (SSL) technology developed by Netscape (Frier et al., 1996). This is a general cryptographic protocol used at the transport of the TCP/IP suite for securing bi-directional communication channels. SSL consists of a two-phase handshake protocol for server and client authentication using public key certificates. Once the connection is established, the SSL protocol can be used to transfer data in all forms (Adam et al. 1999). Verisign is one of the major suppliers of SSL certificates.

vi.   Penetration Testing

This emulates all possible security threats to Internet banking and tests end to end to ensure all loopholes in the system are identified and sealed. It should be continuous and if possible be done by information security experts to guarantee high level testing.

Gesner sums up by suggesting that Internet will soon be the most secure way of doing business. However, customer education on these developments is of paramount importance because nobody stands to benefit if customers do not trust the banks in delivering security. The channel has been by and large secured and the onus is on

bankers to create awareness on these developments amongst the user communities through rigorous advertisements so as to build trust in their systems for increased usage.

Furnell and Karweni (1999) summarises the security requirements for electronic transactions as in the table below:

Requirement	Typical Considerations
Security at the user side	• Physical address control to the machine • User authentication and authorization
Security during transport of data	• Confidentiality • Data integrity
Security at the back-end (bank)	• Secure storage of user information • User's privacy protection • Authentication of parties involved

Table 2.2: Components of electronic banking system requiring security.

Karjaluoto (2002) proposes that for there to be **trust** in the open Internet banking channel, three security requirements must be certified: (a) if the other party is not known directly, then there needs to be the additional involvement of someone else known to both sides (a third party), (b) data need to be secured at all stages (see table 2.2 above), and (c) common rules need to be established or, failing that, at least a known and acceptable legal environment. Trust is expounded in chapter 3.

Most banks in Kenya buy commercial off the shelf (COTS) Internet banking software applications which have these features in-built and only procure the hardware and software as per the vendor's specifications prior to implementation. Most vendors will have considered Confidentiality, Integrity and Availability (CIA) issues whilst building their systems. They need to overcome integration issues between these systems and their legacy banking systems which sometimes is a major hindrance. Further to that, they need to put in place a responsive customer service that is able to resolve customer issues without the need for customers visiting the branch. The marketing functions are also called to increase awareness especially on the security requirements if customers are to trust these systems and use them for the good of the banks. More so, Internet banking demos need to be part and parcel of the delivery since they enable customers gain confidence in using the service in demo mode before going live. This eliminates fear of mistakes and boosts confidence in using the

products. So far, only Equity Bank has this as part of its Internet banking portal delivery.

2.8   Customer Perceptions and Reactions to Internet Banking.

Literature suggests that both banks and customers can benefit from Internet banking. However, evidence to this is either anecdotal or in the form of case studies (Nath et. al, 2007). In order to provide a wholesome picture of Internet banking delivery channel and be able to propose a framework for increasing participation in as outlined in our objectives earlier on, we take a look at Internet banking as viewed by the customer.

2.8.1   Customer Perceptions on Internet Banking - International studies

Internet banking has created highly competitive market conditions which have had a critical impact on customer behaviour (Karjaluoto, 2002). Banks must therefore understand their customers' attitude towards technology in general in order to be able map out strategies to influence their behaviour by creating competitive advantage in the future. Many studies around the world have focussed on customer behaviour and reactions towards Internet banking. A number of factors influence the customer's choice to use or not to use Internet banking as below:

Researcher	Country Researched	Factors influencing customers choice of Internet Banking
Jayawardhena and Foley (2004)	UK	Time
		Privacy control
		Economic issues
		Convenience
		Trust
Sathye (1999)	Australia	Customer knowledge of IB benefits
		Ease of use
		Security and safety
		Price
		Resistance to change
Dube et al., (2008)	Zimbabwe	Security
		Trust
Dhekra Azouzi (2009)	Tunisia	Awareness of e-banking products
		Ease of use
		Attitude towards change
		Convenience
		Internet access
Nath et al., (2007)	USA	Security
		Trust
Metta and Worasri (2002)	Thailand	Security
		Perceived benefits
		Trust
Tat, Nor, et al. (2008)	Malaysia	Trust
		Compatibility
		Ease of use
Divya Singhal and V. Padhmanabhan (2008)	India	Security
		Ease of use
		Trust

Table 2.3: Factors influencing customer choice of Internet banking

We note that the table is not fully inclusive as there are far more studies than portrayed here.

The above has been summarised in figure 2.4 below:

FACTORS INFLUENCING CUSTOMERS CHOICE OF INTERNET BANKING
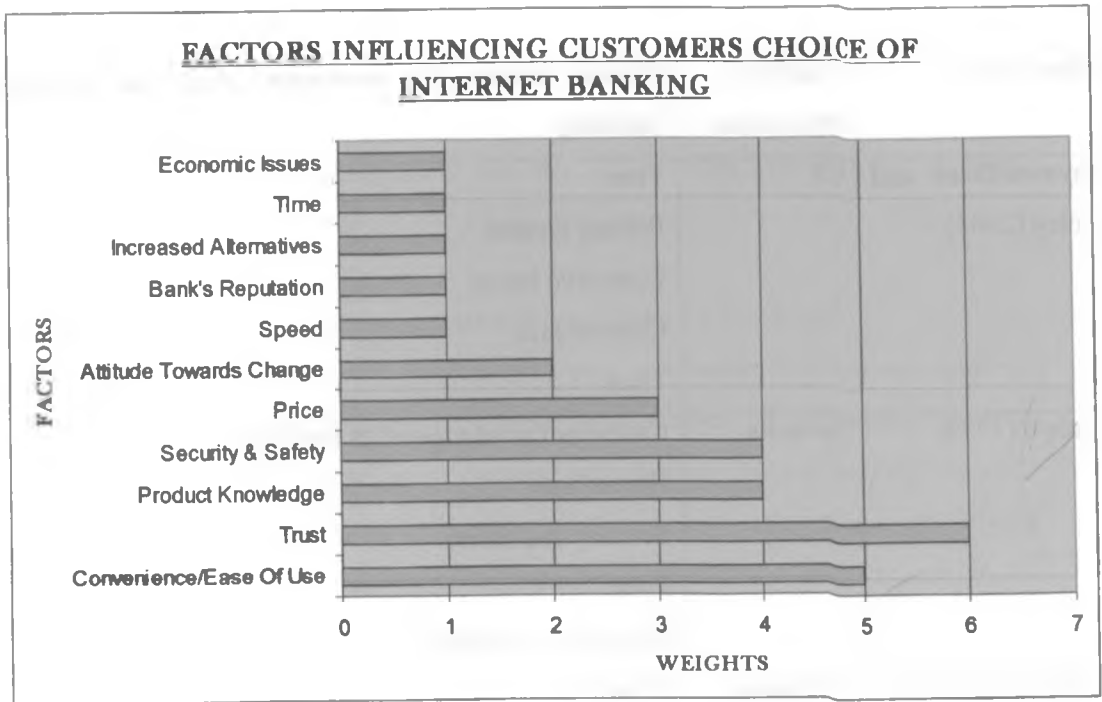
Fig. 2.4: Factors influencing customer choice of Internet banking-Summary

Customers' choice of Internet banking products is underpinned by trust. Unless trust is built in Internet banking, usage for the same is likely to be low. This makes trust the most important aspect of Internet banking and chapter three proposes a model based on trust.

2.8.2   Studies of Trust in Internet banking.

Trust is defined as an individual's willingness to be vulnerable to the actions of another person or people (Mayer et al., 1995). Due to greater perception of risk and uncertainty in online environments such as Internet banking, trust is paramount in building economic relationships. Adopters will justify their actions to use or not use the innovation by convincing themselves that adequate security has been put in place and that they will not incur financial losses as a result of security attacks resulting from their use of the technology.

The table 2.4 below adapted from Khalil and Pearson, (2007) serve to demonstrate the role trust plays in online environments:

Source	Relevant Findings
Jarvenpaa et al., 2000	Willingness to buy in an Internet store was affected by attitude and perception of risk. Attitude and perception of risk were affected by trust, which in turn was affected by consumer's perception of size and reputation of the store.
Suh and Han (2002)	Trust had a significant effect on intention to use and attitudes towards using Internet banking.
George (2002)	Privacy and Internet trustworthiness were significant determinants of attitude towards Internet purchasing. In turn, attitude had significant effect on intent to purchase.
Bhattacherjee (2002)	Consumers' willingness to transact online was influenced by trust, which in turn was affected by familiarity. Familiarity was significant on consumers' willingness to transact.
Gefen (2002)	Purchase intention was influenced by trust, which in turn, was affected by integrity and benevolence.
Gefen et al., 2003	Trust was significant predictor of purchase intention for both potential and repeat customers. Familiarity and disposition to trust were significant on trust for both customers.
Sohail and Shanmugham (2003)	Trust in one's bank had a significant influence on him or her to use Internet banking. Other factors were Internet accessibility, attitude towards change, computer and Internet costs, security concerns, ease of use and convenience.
Pavlou (2003)	Trust was a significant predictor of intention to transact in both samples. Trust had a significant effect on perceived risk, perceived usefulness and perceived ease of use.

Table 2.4: Studies on Trust in online environments adapted from Khalil and Pearson (2007).

Trust is therefore a fundamental consideration that will underpin our framework since it significantly affects attitude towards Internet banking as found by early researchers (Khalil and Pearson, 2007; Gefen et al., 2003; Jarvenpaa et al., 2000).

2.9 Basic Internet Banking Architecture

An Internet banking system architecture should embody at least:

- Two (2) firewalls, one at the front end and another between the front end and the back-end. A DMZ firewall configuration is preferred owing to its security

status. This structure ensures perimeter security of the Internet banking system.

- A traffic handling component to ensure customer requests are services efficiently. This is typically called load balancing.
- Front end servers to handle customer identification and authentication. These should have no processing capacity and should serve just identification purposes only.
- Back end systems should handle processing of requests forwarded to them by the front-end servers. This serves more like a client-server architecture.

This ensures segregation of roles and as much as possible, back-end servers should be secured completely from any intrusion.

In conclusion, Internet banking is viewed differently by users and non-users. Non-users are largely unaware of the services and benefits Internet banking offers. Users appreciate accessibility, functionality and low-cost service (Karjaluoto, 2002). However, trust is the most important factor in Internet banking and banks should device strategies that win customers' trust so as to register higher subscriptions. This should not only be built at the entry point but should be maintained throughout the entire relationship. There is little or no data on Internet banking business in Kenya. Going by the results of international studies on the subject, banks should focus on enhancing trust so as to win customers to their Internet banking platforms.

CHAPTER 3: THEORETICAL FRAMEWORK

3.0   Chapter Overview

Our research seeks to understand why Internet banking technology exists in Kenya but with minimal features by establishing the extent to which the forces affecting banking industry interplay to jolt banks towards implementing quality Internet banking. Quality is measured in customer's terms (Garvin, 2003) hence the research seeks to understand from the customer what constitutes quality as a critical input to banks in their implementation of Internet banking systems.

To assess quality from customer's perspective, Unified Theory of Acceptance and Use of Technology - UTAUT (Venkatesh et. al, 2003) has been selected for inclusion.

3.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

The theory was developed by Venkatesh et., al (2003). It posits that an adopter's intention to use an innovation is affected by the PU (Performance Expectancy), PEOU (Effort Expectancy), SN (Social Influence) and PBC (facilitating conditions). These constructs are further moderated by Gender, Age, Experience and Voluntariness of use.
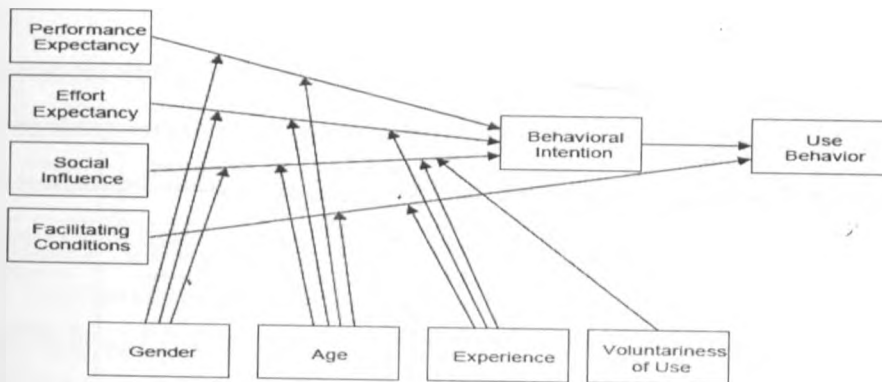
Fig. 3.1: Unified Theory of Acceptance and Use of Technology

The proposed framework is stratified into bank and customer orientations. This delivers a wholesome view of Internet banking in line without objectives.

3.2   Significance of theory to Internet banking

We considered UTAUT as a theory for use in our research based on the following merits:

i.   It amalgamates all earlier theories of human behaviour i.e TRA, TPB etc in terms of their constructs.

ii. It has gained wide acceptance and use in many information-related studies

iii. It has been tested in many studies across the globe with positive results in both developed and developing countries.

iv. It has been tested in the same line of Internet banking in other areas with positive results making it ideal for our study.

3.3 Portal Quality/usability of Internet banking

A usable Internet banking portrays the right quality considerations in the face of the user. To this far, a thin line exists between quality and usability and we will use them interchangeably in this section. Figure 3.2 below outlines the overall measurement of portal quality.
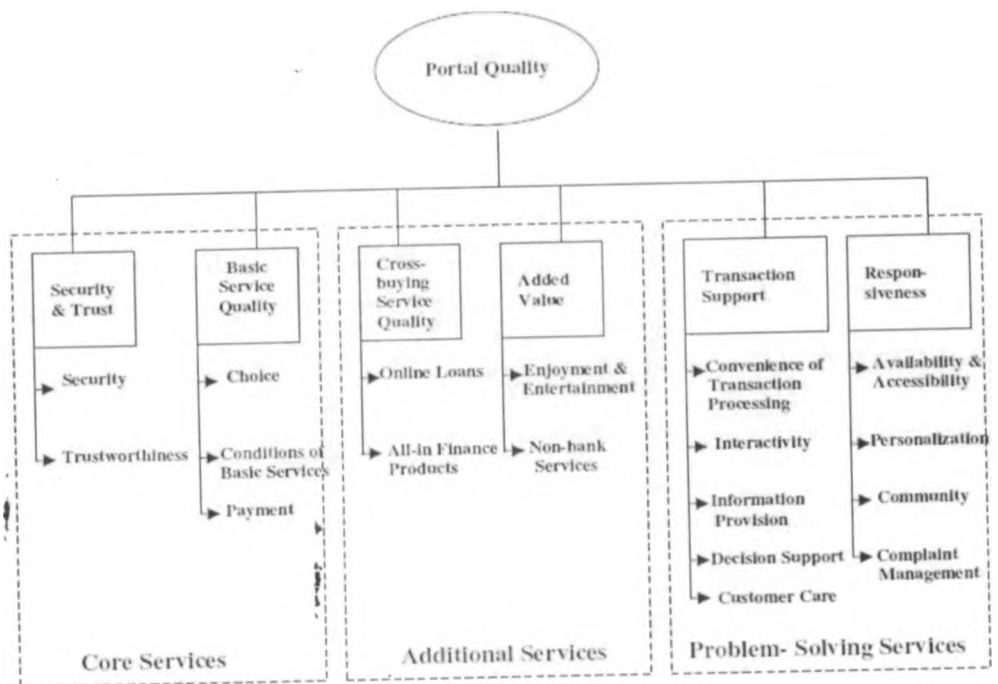
Fig. 3.2: The validated measurement of portal quality adapted from Bauer et al., (2005)

The authors acknowledged that the assumption of a universal perception of service quality on the Internet was not adequate; instead the assumption of varying quality dimensions across industries was confirmed. Consequently, the e-banking portal quality could not be described as a one-dimensional customer rating; instead, it

represented a multi-dimensional and multi-factor construct, which is composed of partial quality assessment with regard to the portal's diverse service categories (Bauer et al., 2005).

UTAUT has been selected for assessing customer's perceptions about Internet banking on the following merits:

i.   It has wide applicability in information systems research including online banking studies

ii.   It is a unifying framework that incorporates various elements from other IS theories.

From the above collection, we have proposed a conceptual framework for increasing Internet banking business as per figure 3.3 below:

3.4   Suggested Internet banking Improvement Framework

Our suggested Internet banking improvement framework is based on contributions from: (1) Jayawardhena and Foley (2000), "Banking Industry and interaction with forces", (2) Venkatesh, (2003) "Unified Theory of Acceptance and Use of Technology" (UTAUT) and (3) "Validated Measurement of Portal Quality", Bauer et al., (2005).

The first model outlines the forces shaping the banking industry decisions towards Internet banking business. (Garvin 2003) suggests that quality should be assessed from the customers' point of view. Therefore, banks must implement Internet banking in the customers' context. Internet banking is delivered through a portal or website. We have incorporated a past Internet banking portal quality assessment by Bauer et al., (2005) that was previously tested in the UK by Kholoud Al-Qeisi (2009) on the following strengths:

i.   Is captures broad issues relating to quality or usability in Internet banking business as a whole.

ii.   The model has already been tested in a different environment and suits our model for purposes of replicability of study.

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Fig. 3.3: Suggested Internet banking improvement framework

INTERNET BANKING SYSTEM COMPONENT BUILD:

- Security & Trust
- Basic service Quality
- Cross-buying service Quality
- Added Value
- Transaction Support
- Responsiveness

Customers' response to the banks' implemented Internet banking systems

Performance Expectancy

Effort Expectancy

Social Influence

Facilitating Conditions

Gander

Age

Experience

Voluntariness of use

H1

H2

H3

H4

Behavioural Intention (BI)

Internet Banking Usage/Non-usage
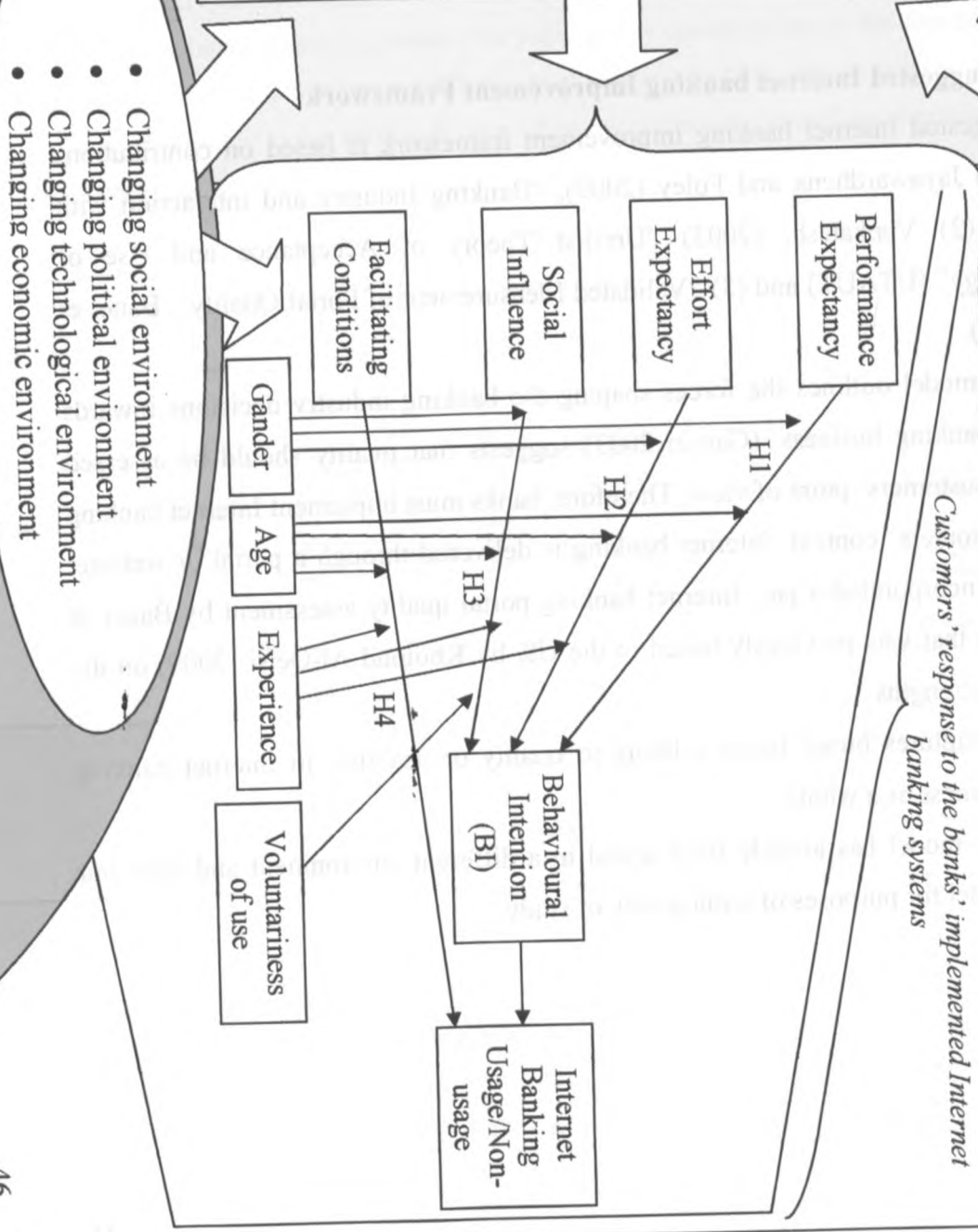
EXTERNAL FORCES AFFECTING BANKING INDUSTRY

- Changing social environment
- Changing political environment
- Changing technological environment
- Changing economic environment

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3.5 Description of the Proposed Conceptual Framework

Broadly, the proposed conceptual framework above is divided into two main sections in line with our research objectives:

1. The bank orientation.
2. The customer orientation.

Both internal and external forces push banks towards embracing Internet enabled business. As they do so, usability is paramount hence Bauer's Portal Quality dimensions come into play to guide them on the appropriate set of quality items to incorporate in their 'to be' Internet banking systems. Bauer et al., 2005) Portal Quality also ensures these banks present a consistent and appealing portal interface that captures the customer appeal.

Using these forces as drivers and quality aspects as benchmarks, banks implement quality Internet banking in customer's frame of reference (Garvin, 2003). Customers then gauge the level of quality of the availed Internet banking and derive satisfaction from the product by subscribing or not based on their assessment of the level of trust they place on the system. For this assessment, UTAUT will be used as a benchmark.

3.5.1 Internet Banking Service Quality (Usability)

Research has shown that electronic service quality is a significant factor in the success of Internet banking (Akinci et al., 2004). According to Zeitham et al. (1996), in order to enhance a bank's reputation, improve its customer retention, attract new customers, and increase its financial performance and profitability, banks should provide quality service to their customers. The customers use different criteria to evaluate the quality of service they receive from Internet banking. These criteria are likely to differ in their importance with some being more important than others. Therefore, based on the traditional dimensions of service quality, recent studies attempt to identify the dimensions of Internet service quality. Garvin David (1985) proposed eight dimensions of online banking service quality including performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. Zeithaml et al. (2001) contend that access, ease of navigation, efficiency, flexibility, reliability, personalization, security, responsiveness, assurance, site aesthetics and price knowledge are attributes of Internet service quality. Research has shown that ease of use is a significant dimension of e-service quality (Davis, 1989; Venkatesh, 2000). Technology must be easy to use to ensure consumer adopt the service (Wallis

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- Threat of new entrants
- Increasing customer power
- Volatile supply forces

Report, 1997; Sathye, 1999). Gefen and Straub (2000) contend that ease of use is a significant determinant of service quality for new customers. Cox and Dale (2001) also found other attributes such as customer confidence, online resources and relationship services to evaluate e-service quality. Santos (2003) uncovered reliability, efficiency, support, communication, security and incentive as dimensions of online service quality. Based on a research conducted among British Internet banking users, White and Nteli (2004) found that security is the most important attribute among the users, followed by responsiveness of service delivery, ease of use, credibility of the bank and product variety. Liao and Cheung (2003) found that Singaporeans expectations regarding accuracy, security, transaction speed, user-friendliness, user involvement, and convenience were the most important quality attributes in the perceived usefulness of Internet-based e-banking. Among these quality attributes, the first five dimensions determined customers' willingness to use the service. Jayawardhena (2004) developed a model consisting of five dimensions: access, web site interface, trust, attention and credibility and it was found that customers place more importance upon access and web site interface than the other dimensions and concluded that banks should focus on building trust through ensuring the security and privacy of customer information. Internet banking has been portrayed as an "Internet portal through which customers can use different kind of banking services ranging from bill payment to making investments" (Pikkarainen *et al.*, 2004: 224). Yang *et al.* (2004) argue that customers assess the online product portfolio as they prefer firms which offer a substantial selection of e-products to satisfy their diverse needs. Banks have realized that in order to remain competitive, they need to restructure their services to make use of rapid technology as well as to offer diverse service portfolio (Arasli *et al.*, 2005). See appendix 3 for dimensions of Usability assessment.

3.5.2   Unified Theory of acceptance and Use of Technology (UTAUT)

i.   Performance Expectancy

This is the degree to which one believes that using a particular system would enhance his/her job performance (Davis, 1989) and it affects user acceptance towards information systems. Several researchers provide evidence of this significance (Davis, 1989; Pikkarainen et al., 2004; Wang et al., 2003). When users think Internet banking

system is useful, they are likely to accept it. Thus the below hypotheses will be tested in the context of Internet banking:

H1a: Performance Expectancy will positively influence Behavioural Intention.

H1b: The influence of Performance Expectancy on Behavioural Intention will be moderated by gender and age.

ii.   Effort Expectancy

This is the degree to which a person believes that using a particular system is free of efforts (David, 1989). UTAUT posits that effort expectancy is an important factor that affect IS acceptance either directly or indirectly through performance expectancy (Davis et al., 1989). Internet banking systems that are easy to use are more likely to be accepted by the target users. The below hypotheses will be tested with regard to Internet banking:

H2a: Effort Expectancy will positively influence Behavioural Intention.

H2b: The influence of Effort Expectancy on Behavioural Intention will be moderated by gender, age and experience.

iii.   Social Norm (SN)

Social or subjective norm is defined as what the consumer believes other people would think of the behaviour being performed or simply put, the influence of social environment on behaviour. It attempts to integrate attitude theory with research on reference group and group influence (Runyon and Stewart, 1987). In other words, the subjective norm is determined by the perceived expectations of specific referent individuals or groups, and by the person's motivation to comply with those expectations i.e doing what other people want me to do. With regard to Internet banking, consumers gather information before deciding to subscribe to Internet banking and the decision is largely based on opinion of those already using the technology. Therefore, if current users of Internet banking trust the system, they ate more likely to convince new users to gain confidence which in turn enhance their level of trust in the Internet banking system, leading to usage of the same. We therefore assume subjective norm is important in determinant of Internet banking business in Kenya. We will test this with the following hypotheses:

H3a: Social Influence will positively influence Behavioural Intention.

H3b: The influence of Social Influence on Behavioural Intention will be moderated by gender, age, experience and voluntariness of use

iv. Facilitating Conditions

There must be adequate resources and skills to promote use of Internet banking. The resources should be in form of computers, hand held devices used to access the Internet as well as a reliable and affordable Internet connection. Appropriate software on which Internet banking is run must be present at no extra cost to the customer. With regard to skills, Layla and Emad (2008) propose that comprehensive FAQ and/or product demo should form part of the delivery so that customers get ready answers to their issues without referring elsewhere for support and assistance. This way, their confidence will be boosted which leading to higher usage of the Internet banking system. On this front, we wish to test the below Hypotheses:

H4a: Facilitating Conditions will positively influence Use Behaviour.

H4b: The influence of Facilitating Conditions on Use Behavioural will be moderated by age and experience

v. Behavioural Intention

Positive opinion formed by customers result behavioural intention towards usage of Internet banking and is largely based on trust of the system to meet customer expectations. Trust has been discussed considerably in the literature review section of the previous chapter. Thus building trust in Internet banking system entails overcoming fear occasioned by usage. This gives the customers a comfort zone in providing sensitive information such as financial details on the net. According to Rotchanakitumnuai and Speece (2003) customers frequently do not trust Internet technology for three reasons: security of the system, distrust of service providers, and worries about the reliability of the service. The more users are confident about the banks and about technology, the more they will be willing to use Internet banking systems offered by these banks. Sathye (1999) suggests that banks should undertake to indemnify the customer for losses incurred through unauthorised use. This serves to boost the customers' trust on banks. Trust has varied dimensions. We chose to focus on users' trust on Internet banking technology (Chandio, 2008) which we tested with the following hypothesis:

H5: Behavioural Intention will positively influence Use Behaviour.

CHAPTER 4: RESEARCH METHODOLOGY

4.0   Chapter overview

Our research approach is exploratory research design whose objective is to examine the level of penetration of Internet banking in Kenya with a view to proposing a framework for improving Internet banking business channel.

In approaching this study, we sought to answer the following questions;

- What does it require to roll out a successful Internet banking in Kenya?
- Is Internet banking of strategic value in bank-customer relationship?
- What hindrances do customers face in adopting Internet banking in Kenya?

4.1   Target population

Our research targets 43 commercial banks in Kenya (CBK, 2009) and over 10 million bank account holders (CBK Revised Annual Report, 2009 p. 46). This target population is selected on the basis that:

- ❖ There is little statistical data on the exact numbers of bank account holders and these estimates from CBK are the most reliable for our use.
- ❖ Part of this target population is considered to have subscribed and used Internet banking service at some point in time and is our main target. Their experience with Internet banking service is considered key in delivering the objectives of the study.
- ❖ The fact that this target population has a nationwide coverage is useful in capturing the diverse issues affecting Internet banking across the country and this serves to strengthen our proposed framework.

4.2   Sampling frame selection

As earlier indicated, the sampling unit constitutes two broad categories:

a. 10 million customers (bank account holders), (CBK, 2009) segmented into corporate and institutions numbering approximately 2 · million (yellowpagesKenya.com) and individual customers making the balance i.e 8 million. Individual/personal customers will be used interchangeably in this research as it refers to non-corporate account holders with commercial banks.

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b. 43 commercial banks in Kenya (CBK, 2009).

4.3   Sample size determination

The following section outlines how we arrived at the appropriate sample for this research.

4.3.1   Customers Segment Sample Size

Where time and resources allow, a research should take as big a sample as possible, since this would ensure reliability of results (Mugenda & Mugenda, 2003). In order to get the required information from customers with the least sampling error, we used Cochran's (1977) formula to determine the minimum sample size:

$$n = \frac{Z\alpha^2 \times p \times q}{d^2}$$

Where:

$Z\alpha$ – the standard normal derivate at the required confidence level.

n – the desired sample size

p – the proportions of target population estimated to have characteristics being measured.

q – (1 - p)

$Z\alpha$ represents that value such that the probability of a standard normal variable exceeding it is $(1 - \alpha)/2$. This value for a chosen α level can be obtained directly from the table giving Z value for the standard normal distribution. Using a confidence level of 95%, the $Z\alpha$ is 1.96. Since there is no accurate estimate available of the proportion of Internet banking users in the target population, then 50% was used (Mugenda & Mugenda, 2003) i. e. $P = 50\%$ and we desire accuracy at the 0.05 level, i.e. $d = 0.05\%$, then sample size is:

$$= \frac{(1.96)^2 \times 0.52 \, (1 - 0.5)}{(0.05)^2}$$

$$= 399.5264$$

$$= \underline{\mathbf{400}}$$

From the above formula, the sample size to be used must be at least 400. However, larger sample size gives more reliable results. Since sample size here refers to the number of responses obtained and not necessarily the number of questionnaires emailed, Salkind (1997) recommends a 40% - 50% over-sampling when collecting data through questionnaires to account for lost responses and uncooperative subjects. We therefore targeted over 400 valid responses. To achieve this, we picked a sample size of 600. Our sample was drawn from corporate and individual Internet banking users who are the current users of Internet banking service in Kenya.

The researcher considered the estimate sizes of both individual and corporate bank account holders in coming up with the number of respondents in each category thus:

Category	No. of Respondents targeted	Estimated Number of account holders
Individual account holders	480	8,000,000
Corporate account holders	120	2,000,000
Total	600	10,000,000

Table 4.1: Allocation of targeted respondents.

4.3.2 Commercial banks sample size determination.

Similarly, we used Yamane's (1967) formula to determine the minimum sample size to be drawn from Commercial Banks thus:

$$n = \frac{N}{1 + N(e)^2}$$

Whereby:

N = The Population size i.e 43 in our case (CBK, 2009)

e = 10% i.e $\pm$ 10% precision.

n = sample size

Therefore:

$$n = \frac{43}{1 + 43(0.1)^2}$$

$$= \underline{\mathbf{30}}$$

We expected not less than 30 valid responses from commercial banks to be able to draw accurate conclusions. To achieve this, we contacted all the 43 commercial banks. Special emphasis was however places on responses from 11 banks that had implemented Internet banking as outlined in the problem definition section.

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Further to the statistically determined sample sizes, 6 specialists were selected across the banks for this exercise. Based on their strategic roles within their organizations, they were deemed to be useful source of information on Internet banking. However, most of the other parts of the research were largely qualitative. Purposive, judgmental and snowball sampling techniques were used to draw samples for the target population viz:

- ❖ Purposive – we selected samples of the population deemed to have the required information as per the study objectives due to confidentiality of the data. Purposive samples included staffs working in the following departments of the banks: internal audit, business process re-engineering, ICT, electronic banking, retail banking and customer service.
- ❖ Snowball – we received recommendations by persons above to contact certain personalities who in their opinion had the information pertinent to our study.

4.4   Data collection

Questionnaires and interviews were used to collect primary data whilst Internet banking document reviews were used to collect secondary data. Questionnaire was chosen to collect primary data on the following strengths:

- It is ideal where resources are limited and data is required from many people as is the case in our study.
- It is ideal in gathering data about knowledge, beliefs, attitudes and behaviours; all which are unique to individuals about the concept of Internet banking. The research purposes to draw on the Internet banking experiences of individuals and corporate institutions in order to propose an all-inclusive framework for Internet banking business in Kenya.
- It is useful in gathering information where privacy of participants is paramount as is the case with banking business in general. The researcher has the daunting task of treating the data collected with due confidentiality and using it only for the purpose for which it was collected.

Interviews were used to supplement questionnaires as source of gathering primary data for the following reasons:

- It allows prompt feedback from the respondent as well as accords the interviewer an opportunity to probe deeper into responses given by the interviewee. As a supplementary technique to the questionnaire, this is key in unlocking areas that are not clear to the researcher.
- It produces higher response rate since it is administered face to face and direct answers sought.

Document reviews was used to collect secondary data owing to the following strengths:

- They provide hindsight into the subject matter considering they embody the opinions of previous researchers on the subject of Internet banking. We can therefore draw from their experiences in enriching our research.
- Document review is source of unobtrusive data that can be checked and re-checked for reliability.

To counter the effect of late or no response to questionnaires, the questionnaires were administered by post in some cases and to provide opportunity for conducting interviews, the questionnaires were personally administered in most cases. The intention of conducting interviews was to supplement information collected using questionnaires.

4.5 Data gathering Instrument

4.5.1 Questionnaire

The questionnaire was designed to be as straightforward as possible to allow the respondents answer the questions correctly. Major considerations employed in our study in formulating questions are *content, structure, format* and *sequence* (Nachmias, 2005).

Our survey centered on facts, futuristic opinions, attitudes and opinions about Internet banking business in Kenya. The questions in our questionnaire were unambiguous and easy for respondents to complete. We adopted a 5-point likert-type questions in our research. Likert-type questions are used to assess perceptions and they have the merit of yielding continuous data that lends itself to many statistical analyses. .

In planning for our questionnaire, we made the following considerations:

- o **Open versus closed-ended questions:** we considered largely closed-questions on the basis that they allow for ease of analysis and coding the answers

sought. Open-ended questions were limited general opinions on specific aspects of Internet banking.

o **Demographic questions:** we included selected demographic aspects such as sex, age, education, marital status, Internet use etc in our questionnaire in order to describe the sub-groups of the respondents.

o **Sequencing of the questions:** after reviewing the questionnaire, it was sequenced such that less sensitive questions were placed at the start to gain rapport with the respondents. More sensitive questions were placed later in the questionnaire. The questions were logically ordered by topic areas to enable easy grouping and coding of responses.

To collect the required data, the questionnaire was divided into 3 parts. Each part was further divided into sections, each eliciting specific information from the respondents. In the formulating the questions, the 'Banking Industry and Interaction with Forces' model was used. It was supplemented by Bauer's Portal Quality in assessing commercial banks and UTAUT was used for customers. Most of the information obtained was quantitative though most parts of it were qualitative.

4.5.2   Parts of the Questionnaire and their Objectives

Part 1: was administered to commercial banks. It purposed to elicit information about *organization* of Internet banking i.e the strategic value of the technology in their relationship with customers as well as considerations for implementing Internet banking.

Part 2: was administered to corporate customers who are currently users of Internet banking. It purposed to elicit information on *utilization* of Internet banking i.e their expectations of quality in Internet banking as well as any hindrances to their use of the service.

Part 3: was administered to individual customers who are Internet banking users. It was also meant to elicit information on *utilization* of Internet banking i.e examine their level of trust in this service as well as expectations for increased use.

4.5.3   Questionnaire Pre-Test

After developing the questionnaire, it was pre-tested using content validity index (CVI). 4 experts (an internal auditor, an ICT Manager, an Electronic banking portfolio

manager and a university professor) were given the questionnaire to rate relevance using 4-point scale i.e very relevant, quite relevant, somewhat relevant and not relevant. Their ratings were computed to give the CVI. The CVI was 1.00, 1.00, 0.75, 0.75, which is above the 0.5 that qualify the instrument. See table 4.2 below:

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
RELEVANT	4	.75	1.00	3.50	.8750	.14434
Valid N (listwise)	4					

Table 4.2: Content Validity Index of the Questionnaire

4.5.4 Questionnaire Piloting

Pre-test interviews were conducted to assess and enhance the semantic content validity of the items by assessing the correspondence between candidate items and the definitions of the constructs they are intended to measure. The assessment resulted in re-organization of the test items into different domain constructs. Some test items were re-framed for clarity.

The resulting items were piloted on a representative sample in order to assess the reliability and factorial validity of the test items. A total of 300 questionnaires were prepared and used to collect information from respondents who were picked at random from Co-operative Bank of Kenya, out of which 250 were individual customers while 50 were corporates.

Responses from 245 respondents were received. Out of the 245 received, 23 were invalid due to incomplete filling. The total valid responses were 222, giving a response rate of 88%.

4.6 Interviews

Interviews were conducted to supplement questionnaire for purposes of clarifying certain concepts that did not come out clearly from the questionnaires. Bank directors, business managers, audit managers and ICT managers were identified and asked oral questions guided by the questionnaire. The selection was based on their roles within the banking institutions in as far as implementations of these systems are concerned. Individual interviews and on-spot discussions were also done with some managers.

4.7   Documentary Review

A number of relevant documents were surveyed e.g CBK annual reports, CBK monthly reviews, FinAccess and World Bank reports among others. Past IS research reports on Internet banking was reviewed. The review of documents from varied sources provided deep insights into the issues affecting Internet banking and helped in enriching our proposed framework.

4.8   Reliability and Validity of the instruments

4.8.1   Reliability test

Reliability is the measurement of the degree of consistency between multiple measurements of a variable. It shows to which extent the operations of a study e.g data collection procedure can be repeated with similar results. A measure is reliable if a person's score on the same test given twice is similar.

Reliability measurement was done by analysing the valid responses from the pilot study conducted at Co-operative Bank of Kenya Ltd.

The pilot data was subjected to reliability analysis using alpha (Cronbach) to measure internal consistency based on average inter-item correlation. An alpha of more than 0.7 would indicate that the items are homogeneous and measuring the same constant. The reliability analysis result below shows alpha coefficient of 0.8639 for individual, 0.9406 for corporate Internet banking users and 0.7470 for commercial banks, all of which are considered very good (Nunnally, 1978). Hence the results indicate that the questionnaire as being a reliable measurement instrument. Therefore, all items appear to be worthy of retention and all items correlate with the total scales to a good degree.

Reliability analysis results for Individual Internet banking users.

R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
IB_VALUE	52.4175	52.4310	.7063	.6592	.8470
IB_FAST	52.5670	52.2675	.6869	.7463	.8474
EFECTIVE	52.5309	53.3177	.6412	.7609	.8503
QUALITY	52.7165	51.6964	.6365	.6213	.8486
IBSIMPLE	52.7887	52.1157	.6456	.5760	.8486
IBSKILLS	52.8093	53.0671	.5697	.6133	.8525
IBEASY	52.8763	53.7049	.5521	.5101	.8537
TUNE_IB	53.1546	52.9501	.4714	.4165	.8576
FAMILY	53.4021	51.9722	.4678	.4296	.8588
FRIENDS	52.7320	52.3630	.5759	.5162	.8518
SUPPORT	52.8247	53.6168	.4641	.5339	.8578
RESOURCE	52.7680	54.1169	.5123	.4545	.8555
SECURITY	53.2990	53.6304	.3169	.3756	.8702
TRUST	53.1082	52.6981	.3495	.4405	.8692

Reliability Coefficients   14 items

Alpha =   .8639   Standardized item alpha =   .8806

Table 4.3: Reliability Analysis results for Individual Internet banking customers.

Reliability Analysis for Corporate Customers

R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H A)

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
USEFUL	48.4545	69.9740	.7738	.9174	.9344
IB_FAST	48.5455	72.8312	.6055	.8623	.9392
EFECTIVE	48.6818	67.1797	.8264	.8979	.9324
QUALITY	48.7727	68.2792	.7688	.8403	.9344
IBSIMPLE	49.0000	66.6667	.9147	.9318	.9295
IBSKILLS	49.0909	70.5628	.7395	.7646	.9354
IBEASY	48.6364	71.3853	.6693	.8295	.9375
TUNE_IB	49.5000	70.5476	.6002	.8271	.9402
CUST4_IB	49.0455	71.6645	.6820	.7134	.9371
CL_USEIB	49.4545	74.8312	.4195	.6335	.9446
MGT_4IB	48.9545	70.9026	.7466	.7757	.9354
SUPPORT	49.5000	66.3571	.7911	.9049	.9338
RESOURCE	48.9091	68.9437	.8147	.8947	.9330

Reliability Coefficients   13 items

Alpha =   .9406   Standardized item alpha =   .9407

Table 4.4: Reliability Analysis results for corporate customers

4.8.2 Factorial validity

Validity is concerned with whether findings are really about what they appear to be about (Kothari, 2008). Validity is the extent to which the data collection methods accurately measure what they are intended to measure. Two forms of validity are internal and external validity. The external validity of research findings imply the data's ability to be generated across persons, settings and times. Internal validity is the ability of research instruments to measure what it is supposed to measure.

The following measures were taken to ensure validity:

❖ data was collected from reliable sources

❖ survey questions were designed based on literature review to ensure validity of results

❖ Questionnaire was pre-tested for meaning and semantics against definitions of constructs by experts.

Factor analysis is one way for researchers to test the validity of certain constructs. By clustering related items together in scales or indices, for example, researchers can examine how well those related items 'hold together' in a statistical sense (this 'scale reliability' is most commonly measured using Cronbach's Alpha or measured using factor loadings derived from factor analyses).

From the results of the Cronbach's alpha performed, since none of the items that had a correlation of less than 0.3, all items were considered for the final administration of the questionnaire.

Factor Analysis was done on the 37 factors that are believed to influence and promote Internet banking use. These factors were selected after doing an extensive literature review. Exploratory factor analysis was conducted and the initial results of tests of sampling adequacy showed the results in table 4.5 below.

4.8.2.1 KMO and Barlett's test for pilot data

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.664
Bartlett's Test of Sphericity	Approx. Chi-Square	11400.342
	df	666
	Sig.	.000

Table 4.5: KMO and Barlett's test for pilot data

A KMO score of 0.6 is an acceptable score and since there were no factors with correlations less than 0.3, all the 37 factors were considered for the analysis.

4.8.2.2 Communities Table of Internet banking Pilot Data

Communalities

	Initial	Extraction
I find internet banking useful to me.	1.000	.674
Using Internet banking enables me to accomplish banking tasks more quickly.	1.000	.692
Using internet banking increases the effective use of my time in doing my banking tasks.	1.000	.851
Using internet banking increases the quality of my banking services output at minimal efforts.	1.000	.783
My interaction with Internet banking is clear and Understandable.	1.000	.621
I am skilful at using internet banking.	1.000	.600
Learning to use the Internet banking system is easy for me.	1.000	.685
I find it easy to get the Internet banking system to do what I want it to do.	1.000	.711
My family members think that I should use Internet banking.	1.000	.612
My friends / business associates think I should use Internet banking.	1.000	.709
My bank encourages and fully supports me in the use of Internet banking.	1.000	.710
I have the requisite resources and knowledge necessary to use internet banking.	1.000	.614
Visible security features e.g SSL certification	1.000	.731
Additional Authentication over and above initial user ID/password	1.000	.757
Security of payment and data transfer on Ibanking	1.000	.583
Assurance of the customer on how his/her privacy is guaranteed.	1.000	.780
IB offered on a reliable IT system	1.000	.813
Offering a broad and deep range of bank products.	1.000	.858
System that is easy to use	1.000	.867
Features options for different modes of payment	1.000	.722
Simple online loan applications/tracking	1.000	.815
Offering branded financial products	1.000	.782
Uses different multimedia features	1.000	.701
Offers a variety of non-bank products and services e.g online ticketing etc	1.000	.941
Straight through processing of transactions	1.000	.748
Features language or geographic options	1.000	.505
Explanations on proper usage e.g mouse-over texts on menus/buttons	1.000	.686
Current and timely information	1.000	.905

Provided information rich in detail	1.000	.854
Possibility of downloading information from IB to third party applications	1.000	.588
Relevant FAQ to help customers solve problems by themselves	1.000	.764
Call-back/e-mail system tells the customer when to expect a response	1.000	.746
Services available (24/7) all the time	1.000	.751
Offers the possibility to personalize the interface to my preference	1.000	.782
Offers newsgroups/communities	1.000	.758
The achievable service level is stated on the site	1.000	.833
Inbound/outbound email system to deal with customer complains	1.000	.747

Extraction Method: Principal Component Analysis

Table 4.6: Communities Table of Internet banking pilot data

4.8.2.3 Total Variance Explained on Pilot Data

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.796	18.367	18.367	6.796	18.367	18.367	4.357
2	4.681	12.652	31.019	4.681	12.652	31.019	4.301
3	2.854	7.714	38.733	2.854	7.714	38.733	3.237
4	2.464	6.659	45.392	2.464	6.659	45.392	4.258
5	1.868	5.050	50.442	1.868	5.050	50.442	3.378
6	1.801	4.868	55.310	1.801	4.868	55.310	3.118
7	1.706	4.610	59.920	1.706	4.610	59.920	3.958
8	1.480	3.999	63.919	1.480	3.999	63.919	3.612
9	1.381	3.733	67.652	1.381	3.733	67.652	2.956
10	1.225	3.311	70.963	1.225	3.311	70.963	1.780
11	1.022	2.761	73.724	1.022	2.761	73.724	1.732
12	.947	2.560	76.284				
13	.804	2.174	78.458				
14	.737	1.992	80.450				
15	.677	1.831	82.280				
16	.637	1.723	84.003				

17	.576	1.557	85.560				
18	.566	1.530	87.090				
19	.512	1.385	88.474				
20	.471	1.274	89.748				
21	.431	1.165	90.914				
22	.403	1.089	92.003				
23	.390	1.053	93.056				
24	.378	1.022	94.077				
25	.328	.885	94.963				
26	.314	.848	95.811				
27	.277	.748	96.559				
28	.247	.667	97.226				
29	.214	.579	97.805				
30	.170	.460	98.265				
31	.155	.418	98.683				
32	.140	.379	99.062				
33	.107	.290	99.351				
34	.093	.251	99.602				
35	.074	.199	99.802				

Extraction Method: Principal Component Analysis

Table 4.7: Total Variance on Internet banking pilot data

4.9 Implementation Framework

In order to propose a framework, extensive literature review was done and a number of frameworks studied which looks at how best in the interest of customers and in the most cost-effective way can Internet banking be implemented in Kenya.

CHAPTER 5: FINDINGS AND DISCUSSIONS

5.0   Chapter Overview

The findings of the study are presented and discussed here. Attempts have been made to extract common trends existing in support of or contradicting the hypotheses stated in the proposed framework. Internet banking has gained acceptance and use in developed countries and some extent, in developing countries. Internet banking is considered new in the banking industry in Kenya.

In gathering information pertaining to the above study, a questionnaire was used as the main instrument for data collection. Data collection was carried out between April 2010 and September 2010 where both printed and electronic questionnaires were distributed to the respondents.

We used the statistical package for social sciences (SPSS) version 17.0 to generate basic descriptive and inferential statistics. Cronbach's Alpha coefficient was used to assess the reliability of the internal consistency of scales. We begin our analysis by looking at each of the identified segments of customers.

5.1   Statistical analysis of customer responses

5.1.1   Overall Questionnaire distribution and response rate

Overall, the questionnaire received a response rate of 60.71% with 615 valid responses received out of a total of 1013 questionnaires sent out.

QUESTIONNAIRE RESPONSE		
CATEGORY	**SENT OUT**	**VALID RECEIVED**
CUSTOMERS	750	483
CORPORATE	220	112
BANKS	43	20
TOTAL	**1,013**	**615**

Table 5.1: Questionnaire distribution and response rate.

5.1.2   Useful responses obtained per Province

Table 67 below shows the number of valid responses received from each province for individual customers and corporate Internet banking users. Nairobi contributed the highest number of respondents (38.6%).

	Valid Responses Received		
Province	Individual Customers	Corporate	Total
Central	57	9	66
Western	52	7	59
Nyanza	42	8	50
Rift Valley	84	19	103
Nairobi	172	57	229
Coast	27	8	35
Eastern	38	3	41
North Eastern	11	1	12
Total	483	112	595

Table 5.2: Useful responses received per province.

5.2   Individual Customer segment data analysis

5.2.1   Reliability Analysis

Reliability Analysis on the questionnaire using the data forn field was performed using ronbatch's Alpha. Generally, an ICR above 0.9 is considered as excellent, one between 0.7 and 0.9 as high, one between 0.5 and 0.7 as moderately high, and one below 0.5 as low (Hinton et al. 2004).

Reliability tests were carried out before doing further analysis. Table 5.1 displays values of Cronbach's Alpha of Internet banking usage for individual customer respondents. The results suggest that the instrument used in the study was highly reliable as the reliability statistics of the KM components category fell well above 0.7 (Hair et al 1998).

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****** Method 1 (space saver) will be used for this analysis ******
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  R E L I A B I L I T Y    A N A L Y S I S   —   S C A L E    (A L P H
A)


Item-total Statistics

                  Scale         Scale      Corrected
                  Mean        Variance       Item-          Alpha
                  if Item      if Item       Total         if Item
                  Deleted      Deleted     Correlation      Deleted

IB_VALUE        45.2777       40.4227        .7168          .8710
IB_FAST         45.4342       40.3801        .6765          .8724
EFECTIVE        45.4175       40.5073        .6769          .8726
QUALITY         45.5574       40.2514        .6601          .8730
IBSIMPLE        45.6973       39.6467        .7109          .8701
IBSKILLS        45.7182       40.7468        .6121          .8756
IBEASY          45.7015       41.9086        .4852          .8821
TUNE_IB         45.9165       39.4156        .5922          .8768
FAMILY          46.1420       39.1932        .4924          .8861
FRIENDS         45.5762       39.5501        .6018          .8761
SUPPORT         45.8121       41.3161        .4997          .8816
RESOURCE        45.7286       42.0559        .4596          .8835


Reliability Coefficients

N of Cases =    479.0                   N of Items = 12

Alpha =    .8639
```
Table 5.3: Chronbach's alpha on Individual customer field data.

5.2.2 Factor Analysis

Factor Analysis was done on the 37 factors that are believed to influence and promote Internet banking. These factors were selected after doing an extensive literature review. Exploratory factor analysis was conducted and the initial results of tests of sampling adequacy showed the following results.

The 37 factors that promote Internet banking were subjected to principal components analysis (PCA) using SPSS. An inspection of the correlation matrix revealed no coefficients of 0.3 and above. The Kaiser Meyer-Oklin (KMO) value was 0.796, which is great and a significant value of 0.000.

The Factor Analysis using Principal Component Analysis (PCA) method with varimax rotation through Kaiser Variation was used to generate factors. Factor analysis for the instrument explaining the percentage variance and Eigen values is

given in Table 5.4. All the considered factors had loadings above 0.6 hence were considered. The percentage variance extracted by the given number of factors is 93.30%. Thus, with a reasonable degree of confidence, it could be concluded that the instruments used have measured what they were expected to measure.

(a) KMO and Barlett's test on customer field data

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.664
Bartlett's Test of Sphericity	Approx. Chi-Square	11400.342
	df	666
	Sig.	.000

22Table 5.4: KMO and Barlett's test on customer field data

(b) Communities table on customer field data

Communalities	Initial	Extraction
I find internet banking useful to me.	1.000	.617
Using Internet banking enables me to accomplish banking tasks more quickly.	1.000	.831
Using internet banking increases the effective use of my time in doing my banking tasks.	1.000	.846
Using internet banking increases the quality of my banking services output at minimal efforts.	1.000	.660
My interaction with Internet banking is clear and Understandable.	1.000	.583
I am skilful at using internet banking.	1.000	.631
Learning to use the Internet banking system is easy for me.	1.000	.622
I find it easy to get the Internet banking system to do what I want it to do.	1.000	.646
My family members think that I should use Internet banking.	1.000	.509
My friends / business associates think I should use Internet banking.	1.000	.584
My bank encourages and fully supports me in the use of Internet banking.	1.000	.740
I have the requisite resources necessary to do internet banking.	1.000	.619
Current insecurity in the country e.g abductions and carjackings make internet banking risky for me.	1.000	.925
I do not trust internet service providers with internet banking security.	1.000	.949
Visible security features e.g SSL certification	1.000	.925
Additional Authentication over and above initial user ID/password	1.000	.949
Security of payment and data transfer on Ibanking	1.000	.490
Assurance of the customer on how his/her privacy is guaranteed.	1.000	.815

IB offered on a reliable IT system	1.000	.793
Offering a broad and deep range of bank products.	1.000	.890
System that is easy to use	1.000	.872
Features options for different modes of payment	1.000	.730
Simple online loan applications/tracking	1.000	.760
Offering branded financial products	1.000	.740
Uses different multimedia features	1.000	.663
Offers a variety of non-bank products and services e.g online ticketing etc	1.000	.988
Straight through processing of transactions	1.000	.576
Features language or geographic options	1.000	.670
Explanations on proper usage e.g mouse-over texts on menus/buttons	1.000	.564
Current and timely information	1.000	.970
Provided information rich in detail	1.000	.987
Possibility of downloading information from IB to third party applications	1.000	.331
Relevant FAQ to help customers solve problems by themselves	1.000	.828
Call-back/e-mail system tells the customer when to expect a response	1.000	.805
Services available (24/7) all the time	1.000	.772
Offers the possibility to personalize the interface to my preference	1.000	.755
Offers newsgroups/communities	1.000	.805
The achievable service level is stated on the site	1.000	.851
Inbound/outbound email system to deal with customer complains	1.000	.671

Extraction Method: Principal Component Analysis

Table 5.5: Communities table on customer data

(c)   Total Variance explained on customer field data

Comp onent	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	7.216	18.502	18.502	7.216	18.502	18.502	4.728
2	4.888	12.533	31.035	4.888	12.533	31.035	4.104
3	3.537	9.069	40.104	3.537	9.069	40.104	4.579
4	2.498	6.404	46.508	2.498	6.404	46.508	3.822
5	2.310	5.924	52.432	2.310	5.924	52.432	3.924
6	1.962	5.030	57.462	1.962	5.030	57.462	3.774
7	1.623	4.161	61.623	1.623	4.161	61.623	3.627
8	1.465	3.757	65.380	1.465	3.757	65.380	3.199
9	1.308	3.355	68.735	1.308	3.355	68.735	2.974
10	1.105	2.834	71.569	1.105	2.834	71.569	2.571
11	1.048	2.687	74.256	1.048	2.687	74.256	1.498
12	.992	2.544	76.800				
13	.893	2.290	79.091				
14	.849	2.176	81.266				
15	.825	2.114	83.380				
16	.750	1.924	85.304				
17	.689	1.765	87.070				
18	.631	1.617	88.687				
19	.563	1.444	90.130				
20	.517	1.327	91.457				
21	.469	1.202	92.659				
22	.430	1.103	93.762				
23	.389	.998	94.760				
24	.351	.899	95.660				
25	.314	.806	96.466				
26	.274	.702	97.167				
27	.249	.639	97.806				
28	.181	.464	98.270				
29	.155	.398	98.668				
30	.141	.361	99.030				
31	.116	.299	99.328				
32	.083	.214	99.542				
33	.069	.178	99.720				
34	.052	.134	99.853				
35	.032	.082	99.935				
36	.023	.060	99.995				
37	.002	.005	100.000				

Extraction Method: Principal Component Analysis

Table 5.6: Total Variance explained on customer data

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5.2.3 Descriptive Analysis

Descriptive analysis is the transformation of raw data into a form that will make them easy to understand and interpret. The analysis usually includes a statistical summary that succinctly characterize the observations and variables. In this study the analysis was used to describe the demographic profile of the respondents in terms of distributions and percentages. Also, it was used to determine the respondent's KM practices.

5.2.3.1 Demographic Profile of the respondents

The first section of the questionnaire is dedicated to obtain the demographics profile of the respondents and the departments that they are attached to as shown in table 4.5. This section also includes the number of years of employment, the education level and the number of years worked at the company.

5.2.3.2 Distribution of respondents by sector

We can see from the table below that Private sector contributed the highest number of respondents (72.8%)

Nature of employment.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Public Sector	70	14.5%	14.5%	14.5%
	Private Sector	351	72.7%	72.8%	87.3%
	Free lancing	35	7.2%	7.3%	94.6%
	My own business	26	5.4%	5.4%	100.0%
	Total	482	99.8%	100.0%	
Missing	0	1	.2%		
Total		483	100.0%		

Table 5.7: Useful responses obtained per sector

5.2.3.3 Distribution of respondents by level of education

Table 5.8 shows that majority of the respondents were graduate degree holders.

		Frequency	Percent	Valid Percent	Cumulative Percent
Describe your level of education?					
Valid	High School	5	1.0%	1.0%	1.0%
	College	40	8.3%	8.3%	9.3%
	Graduate	344	71.2%	71.2%	80.5%
	Post Graduate	94	19.5%	19.5%	100.0%
	Total	**483**	**100.0%**	**100.0%**	

Table 5.8: Distribution of respondents by level of education

5.2.3.4 Distribution of respondents by Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender.					
Valid	Male	293	60.7%	60.7%	60.7%
	Female	190	39.3%	39.3%	100.0%
	Total	**483**	**100.0%**	**100.0%**	

Table 5.9: Distribution of respondents by gender

5.2.3.5 Distribution of respondents by Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Select your age from the sets given below.					
Valid	18 – 24 yrs	64	13.3%	13.3%	13.3%
	25 – 30 yrs	204	42.2%	42.2%	55.5%
	31 – 35 yrs	132	27.3%	27.3%	82.8%
	36 – 40 yrs	43	8.9%	8.9%	91.7%
	41 – 45 yrs	14	2.9%	2.9%	94.6%
	46 – 50 yrs	12	2.5%	2.5%	97.1%
	51 – 55 yrs	7	1.4%	1.4%	98.6%
	> 55 yrs	7	1.4%	1.4%	100.0%
	Total	**483**	**100.0%**	**100.0%**	

Table 5.10: Distribution of respondents by Age
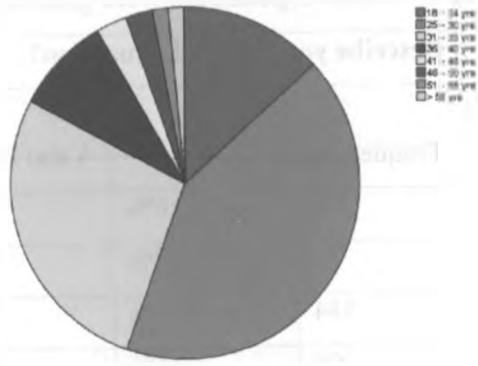
Fig. 5.0: Distribution of Individual customers by age

5.2.3.6 Distribution of respondents by Marital Status

65.6% of the individual customer respondents which formed the majority were married.

Marital status.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	157	32.5%	32.5%	32.5%
	Married	317	65.6%	65.6%	98.1%
	Divorced / Separated	5	1.0%	1.0%	99.2%
	Other (specify):	4	.8%	.8%	100.0%
	Total	**483**	**100.0%**	**100.0%**	

Table 5.11: Distribution of respondents by Marital Status

5.2.4 Digital Divide assessment of customer respondents

This section of the questionnaire sought to assess the indidivual respondents preparedness for Internet banking technology by looking at their knowledge of Computers, Internet as a preamble to Internet banking use.

5.2.4.1 Computer Literacy

As can be seen from the frequency table below, most individual customers described their knowledge of computer as being Good or above average (60.2%). This means they had some mastery of computer use and were using the same at their places of work.

How would you describe your computer knowledge?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderate	83	17.2%	17.2%	17.2%
	Good	291	60.2%	60.2%	77.4%
	Excellent	109	22.6%	22.6%	100.0%
	Total	**483**	**100.0%**	**100.0%**	

Table 5.12: Individual customer respondent computer literacy

5.2.4.2 Internet Literacy

A good proportion of individual customers (61.3%) had good knowledge of Internet. This is a good indicator especially when they subscribe to Internet banking since most of them are conversant with the general outlay of websites and can easily find their way around.

How would you describe your internet knowledge?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderate	88	18.2%	18.2%	18.2%
	Good	296	61.3%	61.3%	79.5%
	Excellent	99	20.5%	20.5%	100.0%
	Total	**483**	**100.0%**	**100.0%**	

Table 5.13: Individual customer respondents Internet literacy

5.2.4.3 Duration of Internet use

Most of the respondents had used Internet for the last two years (91.9%) as displayed in the frequency table below.

How long have you been using the internet?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 1 yr	6	1.2%	1.2%	1.2%
	1 – 2 yrs	33	6.8%	6.8%	8.1%
	> 2 yrs	444	91.9%	91.9%	100.0%
	Total	**483**	**100.0%**	**100.0%**	

Table 5.14: Duration of Internet use by individual customers

5.2.4.4 Hours spent on the Internet

Internet visits for most respondents was daily (69.8%) with at least an hour or less spent on the Internet. A good number of novice individuals and academic students spent up to 3 hours (20.3%).

How many hours do you spend on the internet on average in a day?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	< 1 hr	337	69.8%	69.8%	69.8%
	1 – 3 hrs	98	20.3%	20.3%	90.1%
	> 3 hrs	48	9.9%	9.9%	100.0%
	Total	483	100.0%	100.0%	

Table 5.15: Average hours spent on the Internet by Individual Respondents

5.2.5   Internet Banking Subscriptions

This section elicited information about Internet banking by seeking to establish the customers awareness of the existence of Internet banking service by their bankers as well as their response in terms of subscription as well as intention for those not registered.

5.2.5.1 Awareness of Internet Banking Service Presence

95% of the respondents were aware of Internet banking being in existence with their bankers.

Do any of your banks offer personalized banking services to you over the internet?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	459	95.0%	95.0%	95%
	No	24	5.0%	5.0%	100%
	Total	483	100%	100%	

Table 5.16: Awareness of individuals that their banks offer Internet banking

5.2.5.2 Internet Banking Subscriptions

82.6% of the respondents had actually subscribed to Internet banking. This is high subscription rate depicts the customers yearn for electronic forms of business and is a good prospect for Internet banking business. The banks are therefore challenged to address issues of non-usage of Internet banking services.

Have you subscribed to internet banking service offered by your bank?		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	385	79.7%	82.6%	82.6%
	No	81	16.8%	17.4%	100.0%
	Total	466	96.5%	100.0%	
Missing	0	17	3.5%		
Total		483	100.0%		

Table 5.17: Number of Internet banking subscribers among individual customers

It's worth noting that 17 valid respondents were not offered the service by their banks but were willing to sign up if the service was made available.

5.2.5.3 Statistics of intention for Non-Subscribers

If your answer to question 12 is no, do you intend to subscribe to internet banking in the near future?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	77	15.9%	85.6%	85.6%
	No	4	.8%	4.4%	90.0%
	Undecided	9	1.9%	10.0%	100.0%
	Total	90	18.6%	100.0%	
Missing	0	393	81.4%		
Total		483	100.0%		

Table 5.18: Way forward for individual customers non-subscribers

NB: the missing responses are respondents who have signed up for the service.

5.2.5.4 Internet banking subscriptions across sectors.

Private sector contributed the highest number of subscribers (283) to Internet banking followed by public, free-lance and private business owners with 51, 26 and 25 respectively.

Nature of employment. * Have you signed up for Internet banking? Crosstabulation

Count

		Have you signed up for Internet banking?		Total
		Yes	No	
Nature of employment.	Public Sector	51	20	71
	Private Sector	283	68	351
	Free lancing	26	9	35
	My own business	25	1	26
Total		385	98	483

Table 5.19: Internet banking subscription per Sector crosstabulation
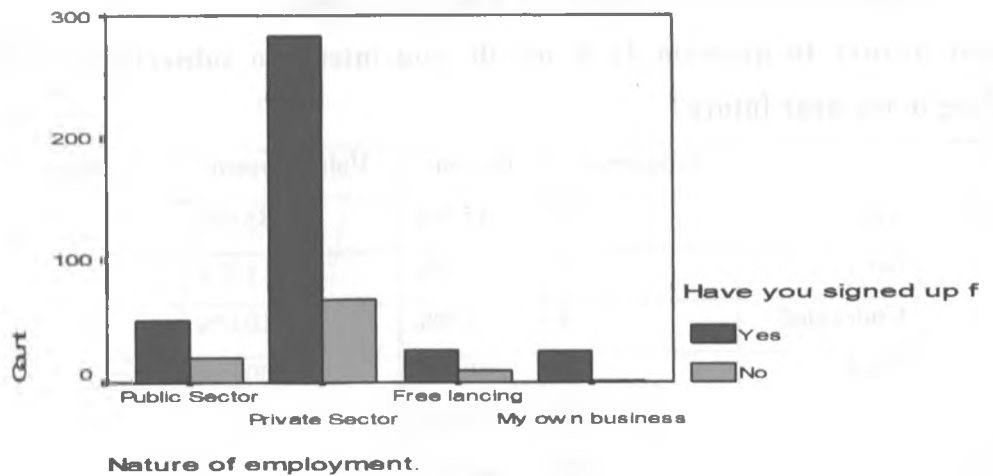
Fig. 5.1: Internet banking subscription per Sector

Internet banking is more popular within the private sector (73.5%).

5.2.5.5 Subscription across marital status

Marital status. * Have you signed up for Internet banking? Crosstabulation

		Have you signed up for Internet banking?		Total
		Yes	No	
Marital status.	Single	119	38	157
	Married	258	59	317
	Divorced / Separated	4	1	5
	Other (specify):	4	0	4
Total		385	98	483

Table 5.20: Internet banking subscription my marital status crosstabulation

Again, Internet banking subscription is dominant among married class (67.0%) and single class (33.2%).

5.2.5.6 Correlation of the digital divide constructs

An analysis of the correlations of the four constructs of digital divide indicates that they are at least partially correlated hence good for the model with most being 0.3 and above.

Correlations

		How would you describe your computer knowledge?	How would you describe your internet knowledge?	How long have you been using the internet?	How many hours do you spend on the internet on average in a day?
How would you describe your computer knowledge?	Pearson Correlation	1	.861(**)	.184(**)	.286(**)
	Sig. (2-tailed)		.000	.000	.000
	N	483	483	483	483
How would you describe your internet knowledge?	Pearson Correlation	.861(**)	1	.212(**)	.325(**)
	Sig. (2-tailed)	.000		.000	.000
	N	483	483	483	483
How long have you been using the internet?	Pearson Correlation	.184(**)	.212(**)	1	.086
	Sig. (2-tailed)	.000	.000		.060
	N	483	483	483	483
How many hours do you spend on the internet on average in a day?	Pearson Correlation	.286(**)	.325(**)	.086	1
	Sig. (2-tailed)	.000	.000	.060	
	N	483	483	483	483

(**) Correlation is significant at the 0.01 level (2-tailed).

Table 5.21: Correlation of e-readiness constructs for individual customers

The results indicate that there is positive correlation of all the four constructs of e-readiness. The items indicate that customers have good knowledge of computers and Internet. It further shows that they have used Internet for sometime and regularly visit the Internet. This level of proficiency sounds good for Internet banking use.

5.2.6 Internet banking portal usability assessment

This section of the questionnaire sought to elicit information on the experiences of already subscribed individuals in order to assess the enablers that banks can target to improve on for higher usage and increased subecriptions. 25 factors were considered here as per Bauer et., al's model. From Bauer et al.,'s model, Usability is assessed by examining the level of satisfaction with core, additional and problem-solving services.

5.2.6.1 Assessing the usability of core services of Internet banking

Security appears to be paramount to Internet banking users with a mean of 4.40 followed by Internet banking system stability at 4.35. Ease of use of the Internet banking system received a mean of 4.33 while financial product portfolio got a mean of 4.34. Different modes of payment through Internet banking received a mean of 4.29 while Customer privacy preservation received a mean of 4.28. The least of security features were additional authentication and visible security i.e SSL certification with means of 3.80 and 3.69 respectively.

Descriptive Statistics		
Contents (average = 4.18)	Mean	Std. Deviation
Visible security features e.g SSL certification	3.69	1.208
Additional Authentication over and above initial user ID/password	3.80	1.293
Security of payment and data transfer on IBanking	4.40	.791
Assurance of the customer on how his/her privacy is guaranteed.	4.28	.702
IB offered on a reliable IT system	4.35	.686
Offering a broad and deep range of bank products.	4.34	.652
System that is easy to use	4.33	.696
Features options for different modes of payment	4.29	.750

Table 5.22: Descriptive statistics for Internet banking Core services.

We note that basic service quality as well as security were important factors that could enhance customers' use of Internet banking.

i. Security while making payments through Internet Banking

The majority of individual Internet banking users (91.6%) felt that it was either useful or very useful to them if their banks ensured safety of their transactions during origination and data transfer stages.

Security of payment and data transfer on Ibanking		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	6	1.2%	1.4%	1.4%
	Somewhat useful	9	1.9%	2.0%	3.4%
	Indifferent	22	4.6%	5.0%	8.4%
	Useful	171	35.4%	38.8%	47.2%
	Very useful	233	48.2%	52.8%	100.0%

Table 5.23: Security considerations for Internet banking.

ii. Customer Privacy

Similarly, 92.3% of the respondents felt it was either useful or very useful to them if their banks assured them of them that their privacy will be upheld during Internet banking transactions. This means that banks have to device proper Internet banking disclaimers and be able to uphold them without breach.

Assurance of the customer on how his/her privacy is guaranteed.		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	2	.4%	.5%	.5%
	Somewhat useful	10	2.1%	2.3%	2.7%
	Indifferent	22	4.6%	5.0%	7.7%
	Useful	235	48.7%	53.3%	61.0%
	Very useful	172	35.6%	39.0%	100.0%

42Table 5.24: Customer privacy over Internet banking

iii. Internet banking system stability

93% of the respondents felt that if Internet banking was offered on a stable IT platform, they would be encouraged to use it. This means that banks have to size their systems well to ensure business continuity for Internet banking transactions.

IB offered on a reliable IT system				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	1	.2%	.2%	.2%
	Somewhat useful	8	1.7%	1.9%	2.2%
	Indifferent	20	4.1%	4.9%	7.0%
	Useful	201	41.6%	48.8%	55.8%
	Very useful	182	37.7%	44.2%	100.0%

Table 5.25: Effect of reliable IT system on Internet banking

iv.   Offering a broad and deep range of bank products.

52.2% of the respondents expected broad range of bank products to be available on Internet banking in order to encourage their use of the service. This means that banks have to device strategies of incorporating as many products as possible.

Offering a broad and deep range of bank products.				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat useful	9	1.9%	2.0%	2.0%
	Indifferent	17	3.5%	3.9%	5.9%
	Useful	230	47.6%	52.2%	58.0%
	Very useful	185	38.3%	42.0%	100.0%

Table 5.26: Internet banking product range

v.   System that is easy to use

91.6% of the respondents felt that they would use Internet banking system more if it was generally easy to use. This calls for banks to embrace designs that maximize on speed and also the ability to run on different platforms especially portable and hand held devices.

System that is easy to use				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	1	.2%	.2	.2
	Somewhat useful	8	1.7%	1.8%	2.1%
	Indifferent	28	5.8%	6.4%	8.4%
	Useful	212	43.9%	48.3%	56.7%
	Very useful	190	39.3%	43.3%	100.0%

Table 5.27: Effect of Ease of Use of Internet banking systems

vi.   Modes of payment over Internet banking

Many respondents i.e 89.3% was of the opinion that it was either useful or very useful to them if their banks could offer different payment choices on Internet banking. This calls for banks to examine their product portfolios with an aim of availing as many options as possible in order to satisfy this requirement.

Features options for different modes of payment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	1	.2%	.2%	.2%
	Somewhat useful	13	2.7%	2.9%	3.2%
	Indifferent	33	6.8%	7.5%	10.7%
	Useful	202	41.8%	45.8%	56.5%
	Very useful	192	39.8%	43.5%	100.0%

Table 5.28: Various channels of payment on Internet banking

vii.   Visible security features

Most individual customers just expected this to be a standard delivery of Internet banking with least effect on stimulating their usage of the service. Banks therefore have the mandate to still maintain this standard.

Visible security features e.g SSL certification					
		Frequency	Percent	Valid Percent	Cumulative Percen
Valid	Not useful	35	7.2%	7.2%	7.2%
	Somewhat useful	52	10.8%	10.8%	18.0%
	Indifferent	83	17.2%	17.2%	35.2%
	Useful	170	35.2%	35.2%	70.4%
	Very useful	143	29.6%	29.6%	100.0%

Table 5.29: Effect of visible security features on Internet banking use

viii.   Additional Authentication over and above initial user ID/password

67.5% of the respondents expected their banks to offer them second level authentication over and above initial user ID and password on Internet banking. This means that banks have to examine the combinations of authentications to offer. Typical ones are:

- Biometric access using iris, finger print etc
- Chip card with security information

- Transaction Authorization Number (TAN) cards etc

Banks should consider the costs of these as they select which options to deploy so that the overall cost of acquisition does not prove a burden to the individual customers.

Additional Authentication over and above initial user ID/password					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	36	7.5%	7.5%	7.5%
	Somewhat useful	61	12.6%	12.7%	20.2%
	Indifferent	59	12.2%	12.3%	32.4%
	Useful	131	27.1%	27.2%	59.7%
	Very useful	194	40.2%	40.3%	100.0%

Table 5.30: Effect of additional authentication on Internet banking use

5.2.6.2 Additional Services

Additional services were considered the highest scoring of the three areas with an average mean of 4.39. Emphasis was placed on the availability of non-bank products and services over Internet banking (mean of 4.45) followed by branded financial services at 4.38. Online loans received a mean of 4.36 and multimedia features received a mean of 4.35.

Descriptive Statistics		
contents (average = 4.39)	Mean	Std. Deviation
Simple online loan applications/tracking	4.36	.753
Offering branded financial products	4.38	.739
Uses different multimedia features	4.35	.779
Offers a variety of non-bank products and services e.g online ticketing etc	4.45	.699

Table 5.31: Descriptive statistics of the influence of additional services on Internet banking use

We conclude that everybody seems to agree that additional services are important to the continued use of Internet banking.

(a) Offering a variety of non-bank products online

This is the highest ranking additional services over Internet banking. With 92.9% of the respondents finding it either useful or very useful if they could access other useful

non-bank services and make payments for the same directly from their Internet banking site. This calls for banks to think away from core-banking and embrace interfacing with alternative channels to ensure customers are able to access these services from one location.

Offers a variety of non-bank products and services e.g online ticketing etc				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat useful	11	2.3%	2.5%	2.5%
	Indifferent	20	4.1%	4.5%	7.0%
	Useful	169	35.0%	38.3%	45.4%
	Very useful	241	49.9%	54.6%	100.0%

Table 5.32: Influence of provision of non-bank products on Internet banking use

(b) Offering Branded financial products

93% of the respondents felt that branding of the financial products was key to their use of the product over Internet banking. This would ensure that Internet banking as a customer touch point is similar to other channels. Banks therefore have to incorporate Internet banking product designs that help realize this expectation.

Offering branded financial products				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	3	.6%	.7%	.7%
	Somewhat useful	9	1.9%	2.0%	2.7%
	Indifferent	23	4.8%	5.2%	8.0%
	Useful	188	38.9%	42.7%	50.7%
	Very useful	217	44.9%	49.3%	100.0%

Table5.33: Effect of branded financial services on Internet banking use

(c) Simple online loan applications/tracking

90.2% of the respondents felt that they would gain more from Internet banking if they incorporated online loan application processes and tracking so that they could originate their loan applications online and be able to track their progress without having to visit or call the branches for the status.

Simple online loan applications/tracking					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	1	.2%	.2%	.2%
	Somewhat useful	13	2.7%	2.9%	3.2%
	Indifferent	29	6.0%	6.6%	9.8%
	Useful	181	37.5%	41.0%	50.8%
	Very useful	217	44.9%	49.2%	100.0%

Table 5.34: Effect of online loan application services on Internet banking use

(d) Use of different multimedia features.

This is the least of the additional services over Internet banking. From Interviews with select novice customers, multimedia features serve to slow speeds of service on Internet banking as they would introduce graphics that take time to load and would make Internet banking unsuitable for hand held devices.

Uses different multimedia features					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	4	.8%	.9%	.9%
	Somewhat useful	11	2.3%	2.5%	3.4%
	Indifferent	26	5.4%	5.9%	9.3%
	Useful	185	38.3%	42.0%	51.4%
	Very useful	214	44.3%	48.6%	100.0%

Table 5.35: Effect of different multimedia features on Internet banking use

5.2.6.3 Problem Solving Services

Of the identified problem-solving services, transaction support got a higher mean followed by responsiveness.

Descriptive Statistics		
Contents (average = 4.38)	Mean	Std. Deviation
Straight through processing of transactions	4.35	.710
Features language or geographic options	4.05	.920
Explanations on proper usage e.g mouse-over texts on menus/buttons	4.85	.485
Current and timely information	4.44	.714
Provided information rich in detail	4.45	.699
Possibility of downloading information from IB to third party applications	4.39	.715
Relevant FAQ to help customers solve problems by themselves	4.35	.670
Callback/e-mail system tells the customer when to expect a response	4.34	.730
Services available (24/7) all the time	4.32	.718
Offers the possibility to personalize the interface to my preference	4.34	.710
Offers newsgroups/communities	4.35	.662
The achievable service level is stated on the site	4.38	.695
Inbound/outbound email system to deal with customer complains	4.34	.742

Table 5.36: Descriptive statistics: problem-solving services and Internet banking use

(a) Explanations on proper usage of Internet banking systems

88% of the customers found it very useful to be able to be guided accordingly as they navigate the Internet banking pages with clear explanations on usage and links.

Explanations on proper usage e.g mouse-over texts on menus/buttons

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	2	.4%	.5%	.5%
	Somewhat useful	2	.4%	.5%	.9%
	Indifferent	5	1.0%	1.1%	2.0%
	Useful	44	9.1%	10.0%	12.0%
	Very useful	389	80.5%	88. 0%	100.0%

Table 5.37: Effect of Internet banking menus explaining usage

(b) Detailed information on Internet banking

More than half of the respondents (54.5%) felt that detailed information was crucial to their use of Internet banking so that they do not have to refer elsewhere for information especially financial. This means that banks have to ensure pertinent information provided to customers over banking halls are availed on Internet banking e.g Forex rates, etc

Provided information rich in detail					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat useful	10	2.1%	2.3%	2.3%
	Indifferent	23	4.8%	5.2%	7.5%
	Useful	167	34.6%	38.0%	45.5%
	Very useful	240	49.7%	54.5%	100.0%

Table 5.38: Effect of providing detailed information on Internet banking on usage

(c) Current and timely Information on Internet Banking

54% of the customers considered it very useful to get updated information on what is happening on the bank through Internet banking sites. This calls for banks to incorporate banners with information on current happenings on Internet banking with soft links to the main banks website for details.

Current and timely information					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat useful	12	2.5%	2.7%	2.7%
	Indifferent	22	4.6%	5.0%	7.7%
	Useful	169	35.0%	38.3%	46.0%
	Very useful	238	49.3%	54.0%	100.0%

Table 5.39: How up-to-date Internet banking information influences usage

(d) Interface Internet banking with customer third party applications

In order to ensure personal financial information management at the customer side, 93.1% of the customers found it either useful or very useful for them to download financial information from the bank's Internet banking site to their third party applications directly. Banks should therefore identify such applications and customize their sites to facilitate this information exchange.

Possibility of downloading information from IB to third party applications					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	3	.6%	.7%	.7%
	Somewhat useful	7	1.4%	1.6%	2.3%
	Indifferent	20	4.1%	4.6%	6.9%
	Useful	191	39.5%	43.8%	50.7%
	Very useful	215	44.5%	49.3%	100.0%

Table 5.40: The effect of integrating Internet banking with third party applications

(e) Achievable Service Level stated on Internet banking site

92.6% of the respondents felt that it was either useful or very useful if the bank could categorically state when they should expect a response to their querries and/or when they expect their transactions to be processed if systems are not online. This will enhance the quality of their financial decisions.

The achievable service level is stated on the site

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	1	.2%	.2%	.2%
	Somewhat useful	8	1.7%	1.9%	2.1%
	Indifferent	23	4.8%	5.4%	7.5%
	Useful	193	40.0%	45.0%	52.4%
	Very useful	204	42.2%	47.6%	100.0%

Table 5.41: The effect of maintaining achievable service level on Internet banking

(f) Straight through processing of Internet banking transactions

91.6% of customers found it either useful of very useful if their transactions could be processed end to end on completion with immediate results of success or failure. This means that banks have to address integration of Internet banking with back-end systems to realize this.

Straight through processing of transactions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	2	.4%	.5%	.5%
	Somewhat useful	7	1.4%	1.6%	2.0%
	Indifferent	28	5.8%	6.3%	8.4%
	Useful	203	42.0%	46.0%	54.4%
	Very useful	201	41.6%	45.6%	100.0%

Table 5.42: The effect of ensuring STP of Internet banking transactions on usage

(g) Relevant FAQ to help customers solve problems by themselves

93.5% of the respondents found it useful or very useful if they had comprehensive FAQs on Internet banking. This would help them find answers to common problems. Banks should look at ways of analysing querries to Customer care and incorporate standard querries on this FAQ page of Internet banking.

Relevant FAQ to help customers solve problems by themselves

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat useful	10	2.1%	2.2%	2.2%
	Indifferent	19	3.9%	4.3%	6.5%
	Useful	221	45.8%	49.6%	56.1%
	Very useful	196	40.6%	43.9%	100.0%

Table 5.43: The effect of maintaining comprehensive FAQ on Internet banking

(h) Newsgroups or communities on Internet Banking

50% of the customers wished to catch up with Internet newsgroups while performing Internet banking.

Offers newsgroups/communities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat useful	9	1.9%	2.1%	2.1%
	Indifferent	18	3.7%	4.2%	6.3%
	Useful	215	44.5%	50.0%	56.3%
	Very useful	188	38.9%	43.7%	100.0%

Table 5.43: The effect of featuring newsgroups to Internet banking use

(i) Call-back/e-mail system telling the customer when to expect a response

Once a querry has been raised by a customer, 91.3% find it useful or very useful if the bank could customize their systems to contact them within the stated SLA on the progress or solution to their querry using the contact information provided by the customer.

Call-back/e-mail system tells the customer when to expect a response

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	1	.2%	.2%	.2%
	Somewhat useful	12	2.5%	2.7%	3.0%
	Indifferent	25	5.2%	5.7%	8.7%
	Useful	198	41.0%	45.3%	54.0%
	Very useful	201	41.6%	46.0%	100.0%

Table 5.44: The effect of having an auto-notification email on Internet banking

(j) Personalization of Internet banking site

Just like email service providers Yahoo, MSN etc, 47.8% of respondents found it useful to be able to personalize internet banking site to their preference. 44.5% of the respondents found the same to be very useful.

Offers the possibility to personalize the interface to my preference

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	1	.2%	.2%	.2%
	Somewhat useful	10	2.1%	2.5%	2.7%
	Indifferent	20	4.1%	5.0%	7.7%
	Useful	192	39.8%	47.8%	55.5%
	Very useful	179	37.1%	44.5%	100.0%

Table 5.45: The effect of providing a custom Internet banking interface on use

(k) Inbound/outbound email system to deal with customer querries

90.3% of the customers found it either useful of very useful if they could access feedback channel on Internet banking to address their problems to the bank. Banks therefore are challenged to build this capability on Internet banking and be able to interface it with call centre systems that log such calls and are able to track progress of solution as per SLA. This will help ensure that the customer gets timely information on their querries.

Inbound/outbound email system to deal with customer complains

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	14	2.9%	3.2%	3.2%
	3	28	5.8%	6.5%	9.7%
	4	186	38.5%	43.1%	52.8%
	5	204	42.2%	47.2%	100.0%

Table 5.46: The effect of maintaining an email feedback on Internet banking use

(l) Internet banking service availability

92.1% of the respondents found it useful or very useful to have the Internet banking services up and running 24/7 in-keeping with the notion that Internet banking breaks the restrictions of conventional banking hours available in the bricks-and-mortar banking models.

Services available (24/7) all the time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	2	.4%	.5%	.5%
	Somewhat useful	10	2.1%	2.3%	2.8%
	Indifferent	22	4.6%	5.1%	7.9%
	Useful	211	43.7%	48.8%	56.7%
	Very useful	187	38.7%	43.3%	100.0%

Table 5.47: The effect of high uptime of Internet banking systems

(m)Multi language options on Internet banking

Least of the factor is the opinion that Internet banking be offered in various languages. This received support from 46% of the respondents who found it useful with 34.2% feeling it was very useful.

Features language or geographic options					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful	8	1.7%	1.8%	1.8%
	Somewhat useful	24	5.0%	5.4%	7.3%
	Indifferent	55	11.4%	12.5%	19.7%
	Useful	203	42.0%	46.0%	65.8%
	Very useful	151	31.3%	34.2%	100.0%

Table 5.48: The effect of availing Internet banking on different languages

(n) Assessing how usability affects Internet banking usage

In order to determine the extent to which the dimensions of usability contributed to Internet banking use, we ran one sample t-test. Considering that a five-point Likert scale was used, the t-tests were run with a test value of 4.185.

The tables below report the obtained results showing that some of the dimensions are significantly higher than the test value of 4.185. This indicates that banks have attempted to build some of these dimensions into their Internet banking systems hence the need of such a framework to validate the build and point gaps that can be improved or added to make Internet banking service more inclusive. The results are presented in the t-tables 5.49, 5.50 and 5.51 below for core-services, additional services and problem-solving services respectively.

5.2.6.4 T-test for Core Services

	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
One-Sample Test						
			Test Value = 4.185			
					95% Confidence Interval of the Difference	
Visible security features e.g SSL certification	-5.624	408	.000	-.302	-.41	-.20
Additional Authentication over and above initial user ID/password	-2.682	408	.008	-.153	-.27	-.04
Security of payment and data transfer on Ibanking	7.077	408	.000	.253	.18	.32
Assurance of the customer on how his/her privacy is guaranteed.	3.240	408	.001	.108	.04	.17
IB offered on a reliable IT system	4.773	408	.000	.162	.10	.23
Offering a broad and deep range of bank products.	4.539	408	.000	.145	.08	.21
System that is easy to use	4.700	408	.000	.152	.09	.22
Features options for different modes of payment	2.904	408	.004	.104	.03	.17

Table 5.49: T-test for core services

5.2.6.5 T-test for Additional Services

	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
One-Sample Test						
			Test Value = 4.185			
					95% Confidence Interval of the Difference	
Simple online loan applications/tracking	4.940	438	.000	.177	.11	.25
Offering branded financial products	5.537	438	.000	.195	.13	.26
Uses different multimedia features	4.399	438	.000	.164	.09	.24
Offers a variety of non-bank products and services e.g online ticketing etc	8.209	438	.000	.271	.21	.34

Table 5.50: T-test for additional services

5.2.6.6 T-test for Problem Solving Services

					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Straight through processing of transactions	4.798	349	.000	.169	.10	.24
Features language or geographic options	-3.692	349	.000	-.174	-.27	-.08
Explanations on proper usage e.g mouse-over texts on menus/buttons	32.184	349	.000	.695	.65	.74
Current and timely information	6.722	349	.000	.249	.18	.32
Provided information rich in detail	7.213	349	.000	.266	.19	.34
Possibility of downloading information from IB to third party applications	4.988	349	.000	.184	.11	.26
Relevant FAQ to help customers solve problems by themselves	4.054	349	.000	.144	.07	.21
Call-back/e-mail system tells the customer when to expect a response	4.101	349	.000	.149	.08	.22
Services available (24/7) all the time	4.213	349	.000	.146	.08	.21
Offers the possibility to personalize the interface to my preference	4.076	349	.000	.149	.08	.22
Offers newsgroups/communities	4.081	349	.000	.144	.07	.21
The achievable service level is stated on the site	5.754	349	.000	.192	.13	.26
Inbound/outbound email system to deal with customer complains	3.544	349	.000	.132	.06	.21

Note: One-Sample Test, Test Value = 4.185

Table 5.51: T-test for problem-solving services

5.2.6.7 Spearman Correlation Analysis

Spearman rank correlation is a non-parametric test that is used to measure the degree of association between the two variables. Spearman rank correlation test does not assume any assumptions about the distribution, meaning that the above data has a non-normal distribution. We used Spearman's Correlation analysis to determine the relationships between the various aspects of Internet banking usability, which are core services, additional services and problem-solving services. The tables below show their relationships.

Correlations		CSS1	CSS2	CSS3	CST1	CST2	CBC1	CBC2	CBP1
Spearman's rho	CSS1	1.000	.527(**)	.025	.024	.004	-.002	-.027	-.031
	CSS2	.527(**)	1.000	.149(**)	.080	.033	.046	.027	-.025
	CSS3	.025	.149(**)	1.000	.493(**)	.410(**)	.223(**)	.067	.042
	CST1	.024	.080	.493(**)	1.000	.718(**)	.501(**)	.245(**)	.114*
	CST2	.004	.033	.410(**)	.718(**)	1.000	.563(**)	.227(**)	.165(**)
	CBC1	-.002	.046	.223(**)	.501(**)	.563(**)	1.000	.471(**)	.181(**)
	CBC2	-.027	.027	.067	.245(**)	.227(**)	.471(**)	1.000	.372(**)
	CBP1	-.031	-.025	.042	.114*	.165(**)	.181(**)	.372(**)	1.000

**.Correlation is significant at the 0.01 level (2-tailed).
*.Correlation is significant at the 0.05 level (2-tailed).

Table 5.52: Spearman Correlation Analysis results for Core Services

Correlations		ACO1	ACA1	AAE1	AAN1
Spearman's rho	ACO1	1.000	.752(**)	.604(**)	.056
	ACA1	.752(**)	1.000	.696(**)	.036
	AAE1	.604(**)	.696(**)	1.000	.108*
	AAN1	.056	.036	.108*	1.000

**.Correlation is significant at the 0.01 level (2-tailed).
*.Correlation is significant at the 0.05 level (2-tailed).

Table 5.53: Spearman Correlation Analysis results for Additional Services

Correlations

Spearman's rho		PTC1	PTI1	PTI2	PTP1	PTP2	PTD1	PTC2	PTC3	PRA1	PRP1	PRC1	PRM1	PRM2
	PTC1	1.000	.219[**]	.099[*]	.272[**]	.258[**]	-.057	.160[**]	.133[*]	.126[**]	.143[*]	.170[**]	.162[**]	.029
	PTI1	.219[**]	1.000	-.004	.101[*]	.105[*]	.120[*]	.161[**]	.128[**]	.086	.039	.147[**]	.157[**]	.194[**]
	PTI2	.099[*]	-.004	1.000	.146[**]	.105[*]	-.006	.091	.122[*]	.174[**]	.074	.135[*]	.199[**]	.174[**]
	PTP1	.272[**]	.101[*]	.146[**]	1.000	.943[**]	-.042	.168[**]	.150[**]	.180[**]	.220[**]	.238[**]	.167[**]	.098[*]
	PTP2	.258[**]	.105[*]	.105[*]	.943[**]	1.000	-.013	.174[**]	.122[*]	.192[**]	.229[**]	.237[**]	.139[*]	.085
	PTD1	-.057	.120[*]	-.006	-.042	-.013	1.000	.044	.020	-.063	-.028	-.012	.021	.197[**]
	PTC2	.160[**]	.161[**]	.091	.168[**]	.174[**]	.044	1.000	.398[**]	.373[**]	.420[**]	.746[**]	.377[**]	.146[**]
	PTC3	.133[*]	.128[**]	.122[*]	.150[**]	.122[*]	.020	.398[**]	1.000	.188[**]	.174[**]	.383[**]	.791[**]	.292[**]
	PRA1	.126[**]	.086	.174[**]	.180[**]	.192[**]	-.063	.373[**]	.188[**]	1.000	.667[**]	.459[**]	.258[**]	.196[**]
	PRP1	.143[*]	.039	.074	.220[**]	.229[**]	-.028	.420[**]	.174[**]	.667[**]	1.000	.586[**]	.194[**]	.184[**]
	PRC1	.170[**]	.147[**]	.135[*]	.238[**]	.237[**]	-.012	.746[**]	.383[**]	.459[**]	.586[**]	1.000	.427[**]	.187[**]
	PRM1	.162[**]	.157[**]	.199[**]	.167[**]	.139[*]	.021	.377[**]	.791[**]	.258[**]	.194[**]	.427[**]	1.000	.378[**]
	PRM2	.029	.194[**]	.174[**]	.098[*]	.085	.197[**]	.146[**]	.292[**]	.196[**]	.184[**]	.187[**]	.378[**]	1.000

(**). Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5.54: Spearman Correlation Analysis results for Problem-Solving Services

5.2.6.8 Overall correlation analysis of the constructs of Usability

The table below shows the findings of correlation analysis which indicates that core services is significantly correlated to additional services (0.3679). Core services is also correlated to problem solving services (0.5935). The results also show that problem-solving service is significantly correlated additional services with a coefficient of 0.6590. The correlations between the test items were significant with all having a value of above 0.3.

Correlation Matrix			
	CORE	EXTRA	PROBSOLV
CORE	1.0000		
EXTRA	.3679	1.0000	
PROBSOLV	.5935	.6590	1.0000

Table 5.55: Overall Correlations between the Usability Components

5.2.6.9 Spearman's Correlation Analysis between Constructs

Correlations			
	CORE	EXTRA	PROBSOLV
CORE	1.000	0.368	0.319
EXTRA	0.368	1.000	0.659
PROBSOLV	0.319	0.659	1.000

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.56: Spearman's Correlation Analysis between the Overall Components

The above table indicates that all the dimensions of usability are significantly correlated to each other.

5.2.7 Mediation assessment of Personal customer data

The following section analyses the response of the Individual customers on the validity of UTAUT constructs i.e PE, EE, SN and FC as well as the effect of moderators (root cinstructs of digital divide research) e.g gender, age, experience and voluntariness of use on the usage of Internet banking.

The table below summarises the construct definitions as well as the questions asked under each construct:

Core Construct	Definition	Items
Performance Expectancy (Venkatesh et al. 2003, Davis et al. 1989, Moore & Benbasat 1991)	The degree to which an individual believes that using the internet will help him or her to attain gains in personal performance.	PE1: I find internet banking useful to me.
		PE2: Using Internet banking enables me to accomplish banking tasks more quickly.
		PE3: Using internet banking increases the effective use of my time in doing my banking tasks.
		PE4: Using internet banking increases the quality of my banking services output at minimal efforts.
Effort Expectancy (Venkatesh et al. 2003, Davis et al. 1989, Moore & Benbasat 1991)	The degree of ease associated with the use of the internet.	EE1: My interaction with the internet would be clear and understandable.
		EE2: I am skilful at using internet banking.
		EE3: Learning to use the Internet banking system is easy for me.
		EE4: I find it easy to get the Internet banking system to do what I want it to do.
Social Influence (Venkatesh et al. 2003, Aijzen 1991, Davis et al. 1989, Thompson et al. 1991)	The degree to which an individual perceives that important others believe he or she should use the internet.	SN1: My family members think that I should use Internet banking.
		SN2: My friends / business associates think I should use Internet banking.
Facilitating Conditions (Venkatesh et al. 2003, Moore & Benbasat 1991, Aijzen 1991, Taylor & Todd 1995)	The degree to which an individual believes that 'circumstantial and technical setting exists to support use of the internet.	FC1: My bank encourages and fully supports me in the use of Internet banking.
		FC2: I have the requisite resources and knowledge necessary to use internet banking.
Behavioural Intention (Venkatesh et al. 2003, Davis et al. 1989, Taylor & Todd 1995)	The degree to which an individual will want to use the internet for personal activities.	BI1: Do you intend to subscribe to internet banking in the near future?
		BI2: Do you plan to use Internet banking in the near future?

Use Behaviour (USE)	Actual usage of the internet for personal activities.	USE1: Have you subscribed to and accessed banking services through Internet banking?

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Table 5.57: Tabulation of UTAUT constructs for Individual Customer Data

a. Effect of Performance Expectancy on Internet banking behavioural intention

The Hypotheses under test here were:

H1a: Performance Expectancy will positively influence Behavioural Intention.

H1b: The influence of Performance Expectancy on Behavioural Intention will be moderated by gender and age.

We wish to examine whether Behavioural Intention (BI) of individual customers towards Internet banking is a result of their assessment of Performance Expectancy (PE). In addition, part of this behavioural intention is also moderated by the consumers age and gender. Three conditions that must be present for mediation to occur are:

    i.   The Independent variable must me significantly related to the mediator

    ii.   The mediator must be significantly related to the dependent variable

    iii.   Adding the mediator to a regression model where the DV is regressed on the IV significantly reduces the effect of the IV on the DV, i.e the mediator prodicts the Dependent variable (DV).
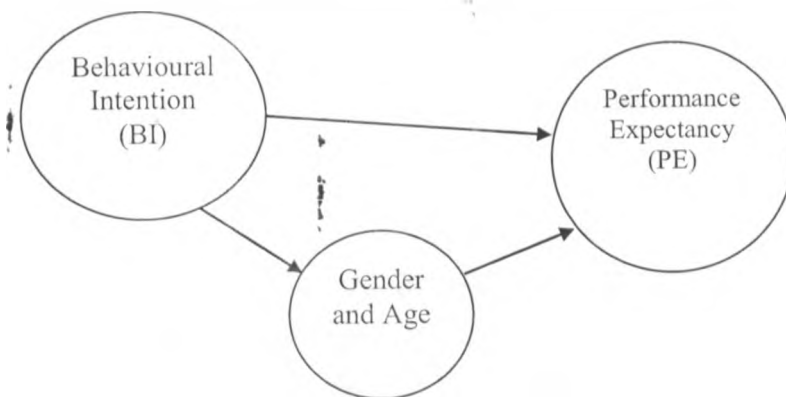
Fig. 5.2: Mediation analysis model for individual customers

In order to test whether these three conditions exist, we obtain correlation coefficients for these three relationships as below:

❖ **Descriptive Statistics:**

Descriptive Statistics

	Mean	Std. Deviation	N
BI	2.8758	1.06290	483
PE	4.3934	.66750	483
GENAGE	4.0580	1.46634	483

Table 5.58: Descriptive statistics for age and gender mediating between PE and BI on individual customer data

Correlations

		BI	PE	GENAGE
BI	Pearson Correlation	1	-.119(**)	-.140(**)
	Sig. (2-tailed)		.009	.002
	N	483	483	483
PE	Pearson Correlation	-.119(**)	1	-.127(**)
	Sig. (2-tailed)	.009		.516
	N	483	483	483
GENAGE	Pearson Correlation	-.140(**)	-.127(**)	1
	Sig. (2-tailed)	.002	.516	
	N	483	483	483

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.59: Correlation for presence of mediation on individual customer data

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role of a mediator has been met. Hence, Hypothesis H1a is proved that performance expectancy will positively influence behavioural Intention.

We proceeded to test the effect of mediation using Sobel test. To begin with, we compute the raw regression coefficient and the standard error of this regression coefficient for the association between the IV and the mediator, and then the association between the mediator and the DV (adjusting for the IV). We used linear regression with the results below:

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.594	.236		15.238	.000
	GENAGE	-.102	.033	-.140	-3.111	.002

a Dependent Variable: Behavioral Intention

Table 5.60: Regression Coefficient between BI and mediator – individual customer data

The raw regression coefficient (in the column labelled 'B' under the heading 'unstandardized coefficients' for the association between behavioural Intention - BI (the IV) and gender and age (the mediator) is -.102. The standard error for this raw regression coefficient (labelled 'Std. Error') is .033.

To compute the corresponding values for the association between 'gender and age' and performance expectancy (controlling for behavioural intention), we use linear regression whose coefficients are as shown on table 5.61 below:

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.562	.181		25.196	.000
	GENAGE	.006	.021	.013	.289	.773
	Behavioral Intention	-.073	.029	-.117	-2.556	.011

a Dependent Variable: PE

Table 5.61: Regression coefficient between Mediator and DV controlling for IV-individual customer data

❖ **Sobel test for Mediation using Aroian test equation**

Sobel test divides the estimate of the indirect path a*b by its (estimated) standard error to get a z value. This is a sample-independent value of the true population standard error which assumes a large number of observations i.e N>200.

The standard error of a*b for the Sobel test can be calculated in three different ways:

- Sobel Test Equation: i.e $z\text{-value} = a*b/\textbf{SQRT}(b^2*s_a{}^2 + a^2*s_b{}^2)$

- Aroian Test Equation: i.e $z\text{-value} = a*b/\textbf{SQRT}(b^2*s_a{}^2 + a^2*s_b{}^2 + s_a{}^2*s_b{}^2)$

- Goodman Test Equation: i.e $z\text{-value} = a*b/\textbf{SQRT}(b^2*s_a{}^2 + a^2*s_b{}^2 - s_a{}^2*s_b{}^2)$

To overcome the shortcomings of large samples in mediation analysis, **bootstrapping** is preffered. Bootstrapping can be defined as : the practice of estimating properties of an estimator (such as its variance) by measuring those properties when sampling from an approximating distribution. One standard choice for an approximating distribution is the empirical distribution of the observed data. In the case where a set of observations can be assumed to be from an independent and identically distributed population, this can be implemented by constructing a number of resamples of the observed dataset (and of equal size to the observed dataset), each of which is obtained by random sampling with replacement from the original dataset. (wikipedia.com).

We will use Preacher's recommendation of Aroian test equation because it is the one produced by his bootstrapping SPSS macro.

❖ **Sobel test**

We use the unstandardized coefficients to determine the effect of mediating variables on the association between Internet banking behavioural Intention and Performance Expectancy.

The Aroian test equation is found online at Preacher and Hayes below: http://people.ku.edu/~preacher/sobel/sobel.htm. Preacher and

Hayes online mediation calculator gives us the following restlts based on the above statistics:

Input:		Test statistic:	Std. Error:	p-value:
a 3.594	Sobel test:	-2.48354195	0.10564025	0.0130083
b -0.073	Aroian test:	-2.47834632	0.10536172	0.0131993
s_a 0.236	Goodman test:	-2.48877039	0.10541832	0.01281857
s_b 0.029	Reset all		Calculate	

Fig. 5.3: Gender and age mediating PE and BI for individual customers

The test statistic for the Aroian test is -2.48, with an associated p-value of 0.01. The fact that the observed p-value falls below the established alpha level of .05 indicates that the association between the IV and the DV (in this case, behavioural intention towards Internet banking and performance expectancy) is reduced significantly by the inclusion of the mediator (in this case, gender and age) in the model; in other words, there is evidence of mediation. Hence the Hypothesis is true.

b. Effect of Effort Expectanct on Internet banking behavioural intention

The Hypotheses under test here were:

H2a: Effort Expectancy will positively influence Behavioural Intention.

H2b: The influence of Effort Expectancy on Behavioural Intention will be moderated by gender, age and experience.

We follow similar steps as for performance expectancy above with the following results.

❖ **Descriptive Statistics:**

Descriptive Statistics

	Mean	Std. Deviation	N
Behavioral Intention	2.88	1.063	483
Effort Expectancy	4.06	.679	483
GENAGEXP	7.15	1.512	483

Table 5.62: Descriptive statistics for BI, EE and Mediators-individual customer

❖ **Corelations**

Correlations

		Behavioural Intention	Effort Expectancy	GENAGEXP
Behavioural Intention	Pearson Correlation	1	-.131(**)	-.161(**)
	Sig. (2-tailed)		.004	.181
	N	483	483	483
Effort Expectancy	Pearson Correlation	-.131(**)	1	-.143(**)
	Sig. (2-tailed)	.004		.503
	N	483	483	483
GENAGEXP	Pearson Correlation	-.161(**)	-.143(**)	1
	Sig. (2-tailed)	.181	.503	
	N	483	483	483

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.63: Correlation between Mediators, EE and BI-individual customer

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role of a mediator has been met. This proves hypothesis 112a that effort expectancy will positively influence behavioural Intention.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.182	.234		13.606	.000
	GENAGEXP	-.043	.032	-.061	-1.340	.181

a Dependent Variable: Behavioral Intention

Table 5.64: Regression coefficient between IV and Mediator-individual customer

The raw regression coefficient (in the column labelled 'B' under the heading 'unstandardized coefficients' for the association between behavioural Intention - BI (the IV) and gender, age and experience (the mediator) is -.043. The standard error for this raw regression coefficient (labelled 'Std. Error') is .032.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.224	.175		24.167	.000
	GENAGEXP	.010	.020	.023	.499	.618
	Behavioral Intention	-.083	.029	-.129	-2.853	.005

a Dependent Variable: Effort Expectancy

Table5.65: Regression coefficient between the mediator and the DV controlling for IV-individual customer

❖ **Sobel test for Mediation using Aroian test equation**

Input:		Test statistic:	Std. Error:	p-value:
a 3.182	Sobel test:	-2.80070724	0.09429975	0.00509908
b -0.083	Aroian test:	-2.79348351	0.0945436	0.00521437
s_a 0.234	Goodman test:	-2.8079873	0.09405527	0.00498522
s_b 0.029	Reset all		Calculate	

Fig. 5.4: Gender, age, experience mediating EE and BI for individual customers

The test statistic for the Aroian test is -2.79, with an associated p-value of 0.005. The fact that the observed p-value falls below the established alpha level of .05 indicates that the association between the IV and the DV (in this case, behavioural intention towards Internet banking and effort expectancy) is reduced significantly by the inclusion of the mediator (in this case, gender, age and experience) in the model; in other words, there is evidence of mediation. Hence the Hypothesis H2b is therefore true.

c. **The effect of Social Norm on Internet banking behavioural intention**

The Hypotheses under test here were:

H3a: Social Influence will positively influence Behavioural Intention.

H3b: The influence of Social Influence on Behavioural Intention will be moderated by gender, age, experience and voluntariness of use

❖ **Descriptive Statistics:**

Descriptive Statistics

	Mean	Std. Deviation	N
Behavioral Intention	2.88	1.063	483
Social Norm	3.95	.907	483
GENAGXPV	9.7981	1.71947	483

Table 5.66: Descriptive statistics for BI, SN and Mediators-individual customers

Correlations

		Behavioral Intention	Social Norm	GENAGXPV
Behavioral Intention	Pearson Correlation	1	-.121(**)	.385(**)
	Sig. (2-tailed)		.008	.000
	N	483	483	483
Social Norm	Pearson Correlation	-.121(**)	1	.163(**)
	Sig. (2-tailed)	.008		.167
	N	483	483	483
GENAGXPV	Pearson Correlation	.385(**)	.163(**)	1
	Sig. (2-tailed)	.000	.167	.
	N	483	483	483

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.67: Correlation between Mediators, SN and BI-individual customers

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role of a mediator has been met. This proves hypothesis H3a that social norm will positively influence behavioural intention.

❖ **Regression coefficient between IV and Mediator**

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.542	.259		2.096	.037
	GENAGXPV	.238	.026	.385	9.156	.000

a Dependent Variable: Behavioral Intention

Table 5.68: Regression coefficient between IV and Mediator-individual customers

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The raw regression coefficient (in the column labelled 'B' under the heading 'unstandardized coefficients' for the association between behavioural Intention - BI (the IV) and gender, age, experience and voluntariness of use (the mediator) is .238. The standard error for this raw regression coefficient (labelled 'Std. Error') is .026.

❖ **Regression coefficient between the mediator and DV controlling for IV**

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.701	.237		15.599	.000
	GENAGXPV	.068	.026	.129	2.638	.009
	Behavioral Intention	-.145	.042	-.170	-3.495	.001

a Dependent Variable: Social Norm

Table5.69: Regression coefficient between the mediator and the DV controlling for IV-individual customers

❖ **Sobel test for Mediation using Aroian test equation**

Input:		Test statistic:	Std. Error:	p-value:
a 0.542	Sobel test:	-1.7895701	0.04391557	0.07352305
b -0.145	Aroian test:	-1.73707297	0.04524277	0.08237429
s_a 0.259	Goodman test:	-1.84713395	0.042547	0.06472773
s_b 0.042	Reset all		Calculate	

Fig. 5.5: Gender, age, experience, voluntariness of use mediating SN and BI for individual customers

The test statistic for the Aroian test is -1.737, with an associated p-value of 0.082. The fact that the observed p-value is more than the established alpha level of .05 indicates that the association between the IV and the DV (in this case, behavioural intention towards Internet banking and social norm) is not reduced significantly by the inclusion of the mediator (in this case, gender, age, experience and voluntariness of use) in the model; in other words, there is no evidence of mediation. Hence the Hypothesis H3b is therefore false.

d. The effect of Facilitating Conditions on Internet banking behavioural intention

The Hypotheses under test here were:

H4a: Facilitating Conditions will positively influence Use Behaviour.

H4b: The influence of Facilitating Conditions on Use Behavioural will be moderated by age and experience

❖ **Descriptive Statistics:**

Descriptive Statistics

	Mean	Std. Deviation	N
Behavioral Intention	2.88	1.063	483
Facilitating Conditions	4.04	.753	482
AGEXP	5.7609	1.41651	483

Table 5.70: Descriptive statistics for BI, FC and Mediators-individual customers

Correlations

		Behavioral Intention	Facilitating Conditions	AGEXP
Behavioral Intention	Pearson Correlation	1	-.024	-.055
	Sig. (2-tailed)		.600	.228
	N	483	482	483
Facilitating Conditions	Pearson Correlation	-.024	1	-.038
	Sig. (2-tailed)	.600		.403
	N	482	482	482
AGEXP	Pearson Correlation	-.055	-.038	1
	Sig. (2-tailed)	.228	.403	
	N	483	482	483

Table 5.71: Correlation between Mediators, FC and BI-individual customers

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically not significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role of a mediator has not been met. This disproves hypothesis H4a that facilitating will positively influence behavioural intention.

Regression coefficient between IV and Mediator

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.113	.203		15.362	.000
	AGEXP	-.041	.034	-.055	-1.206	.228

a Dependent Variable: Behavioral Intention

Table 5.72: Regression coefficient between IV and Mediator-individual customers

The raw regression coefficient (in the column labelled 'B' under the heading 'unstandardized coefficients' for the association between behavioural Intention - BI (the IV) and age and experience (the mediator) is -0.041. The standard error for this raw regression coefficient is 0.034.

❖ **Regression coefficient between the mediator and the DV controlling for IV**

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.213	.176		23.956	.000
	AGEXP	-.021	.024	-.040	-.867	.386
	Behavioral Intention	-.019	.032	-.026	-.573	.567

a Dependent Variable: Facilitating Conditions

Table5.73: Regression coefficient between the mediator and the DV controlling for IV-individual customers

❖ **Sobel test for Mediation using Aroian test equation**

Input:		Test statistic:	Std. Error:	p-value:
a 3.113	Sobel test:	-0.59330544	0.09969064	0.55297676
b -0.019	Aroian test:	-0.59204984	0.09990206	0.55381721
s_a 0.203	Goodman test:	-0.59456907	0.09947377	0.55213156
s_b 0.032	Reset all		Calculate	

Fig. 5.6: Age and experience FC and BI for individual customers

The test statistic for the Aroian test is -0.592, with an associated p-value of 0.55. The fact that the observed p-value falls above the established alpha level of .05 indicates

that the association between the IV and the DV (in this case, behavioural intention towards Internet banking and facilitating conditions) is not reduced significantly by the inclusion of the mediator (in this case, age and experience) in the model; in other words, there is no evidence of mediation. Hence the Hypothesis H4b is therefore false.

e. The effect of Internet banking behavioural intention on Use Behaviour
As held by Venkatesh that Behavioural Intention affects use behaviour, we tested this using the following hypothesis:

H5: Behavioural Intention will positively influence Use Behaviour.

❖ Descriptive Statistics:
Descriptive Statistics

	Mean	Std. Deviation	N
Behavioral Intention	2.88	1.063	483
USE	1.17	.379	466

Table 5.74: Descriptive statistics for BI, and Use behavior-individual customer

Correlations

		Behavioral Intention	USE
Behavioral Intention	Pearson Correlation	1	.482(**)
	Sig. (2-tailed)		.000
	N	483	466
USE	Pearson Correlation	.482(**)	1
	Sig. (2-tailed)	.000	
	N	466	466

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.75: Correlation between BI, and Use behavior-individual customer

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. This proves hypothesis H5 that Behavioural Intention will positively influence use behaviour of Internet Banking. In other words, the kind opinion formed by individual Internet banking users will reflect in the type of behaviour they adopt towards the same.

5.2.8 Pearson Correlation Analysis for Internet banking usability constructs

					Correlations					
	USE	BI	PE	EE	SN	FC	GEN	AGE	EXP	VOL
USE	1	0.482(**)	-0.322(**)	-0.360(**)	-0.262(**)	-0.199(**)	-0.011	0.017	-0.020	0.061
BI	0.482(**)	1	-0.119(**)	-0.131(**)	-0.121(**)	-0.024	-0.030	-0.140(**)	0.276(**)	0.854(**)
PE	-0.322(**)	-0.119(**)	1	0.599(**)	0.488(**)	0.449(**)	0.046	0.015	0.099(**)	0.085
EE	-0.360(**)	-0.131(**)	0.599(**)	1	0.517(**)	0.394(**)	0.050	0.005	0.035	0.097(**)
SN	-0.262(**)	-0.121(**)	0.488(**)	0.517(**)	1	0.421(**)	0.147(**)	0.002	-0.014	0.045
FC	-0.199(**)	-0.024	0.449(**)	0.394(**)	0.421(**)	1	0.066	-0.047	0.025	0.142(**)
GEN	-0.011	-0.030	0.046	0.050	0.147(**)	0.066	1	0.033	-0.008	-0.011
AGE	0.017	-0.140(**)	0.015	0.005	0.002	-0.047	0.033	1	-0.026	-0.145(**)
EXP	-0.020	0.276(**)	0.099(**)	0.035	-0.014	0.025	-0.008	-0.026	1	0.342(**)
VOL	0.061	0.854(**)	0.085	0.097(**)	0.045	0.142(**)	-0.011	-0.145(**)	0.342(**)	1

** *Correlation is significant at the 0.01 level (2-tailed).*

** *Correlation is significant at the 0.05 level (2-tailed).*

Table 5.76: Pearson Correlation analysis for acceptance and Use constructs

Results in the table above shows that most of the aspects of Internet banking use are significantly correlated with each other. On average most of the items are correlated. Use behaviour (USE) alone is not correlated with any of our the mediating variables. Behavioural Intention (BI) is not correlated with Facilitating Conditions (FC) and the moderating variable gender. Similarly, Performance Expectancy (PE) is not correlated with the moderating variables gender, age and voluntariness of use. Effort Expectancy (EE) on the other hand is not correlated with the moderating variables gender, age and experience. Social Norm (SN) is not correlated with the moderating variables gender, age and experience while Facilitating Conditions (FC) is not correlated with the moderating variables gender, age and experience.

5.3 Analysis of data for Corporate customer respondents

5.3.1 Reliability analysis using Chronbatch's Alpha

```
****** Method 1 (space saver) will be used for this analysis ******


    R E L I A B I L I T Y    A N A L Y S I S    -    S C A L E    (A L P H
A)


Item-total Statistics

                  Scale         Scale       Corrected
                  Mean         Variance       Item-          Alpha
                 if Item       if Item        Total         if Item
                 Deleted       Deleted      Correlation     Deleted

IBVALUE          48.4018       50.0083         .7509          .9143
IBFAST           48.3661       51.2612         .5971          .9202
EFFECTIV         48.3304       49.0881         .7881          .9127
QUALITY          48.5446       48.5385         .8788          .9093
IBSIMPLE         48.6786       48.1120         .9636          .9064
IBSLKILL         48.6339       49.1351         .8412          .9109
IBEASY           48.8036       53.2403         .5633          .9210
TUNE_IB          49.1250       48.7590         .7437          .9145
CUSTREQ          48.8036       52.9521         .5084          .9231
CUST_USE         49.5000       62.0360        -.3141          .9428
MGTSPRT          48.9643       53.1338         .6783          .9182
SUPPORT          49.1875       47.9555         .7041          .9170
RESOURCE         48.7321       48.5222         .8588          .9099


Reliability Coefficients

N of Cases =    112.0                    N of Items = 13

Alpha =    .9234
```

Table 5.77: Chronbach's Alpha on Corporate customer field data.

Since the Apha velue is greater than 0.7, we conclude that the constructs are highly reliale.

5.3.2 Factor Analysis

Factor Analysis was done on the 37 factors that are believed to influence and promote Internet banking usage. These factors were selected after an extensive literature review. Exploratory factor analysis was conducted and the initial results of tests of sampling adequacy showed the following results.

These were subjected to principal components analysis (PCA) using SPSS. An inspection of the correlation matrix revealed no coefficients of 0.3 and above. The

Kaiser Meyer-Oklin (KMO) value was 0.859, which is great and a significant value of 0.000.

The Factor Analysis using Principal Component Analysis (PCA) method with varimax rotation through Kaiser Variation was used to generate factors. Factor analysis for the instrument explaining the percentage variance and Eigen values is given in Table 5.4. All the considered factors with loadings below 0.6 hence were dropped. A total of 6 factors were dropped leaving 31 for inclusion. The percentage variance extracted by the given number of factors is 93.30%. We therefore conclude that the instruments used have measured what they were supposed to measure.

KMO and Bartlett's Test(a)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.859
Bartlett's Test of Sphericity	Approx. Chi-Square	2979.804
	df	66
	Sig.	.000

Table 5.78: KMO on corporate customer field data

Communalities		
	Initial	Extraction
PE1: I find internet banking useful to me.	1.000	0.614
PE2: Using Internet banking enables me to accomplish banking tasks more quickly.	1.000	0.829
PE3: Using internet banking increases the effective use of my time in doing my banking tasks.	1.000	0.842
PE4: Using internet banking increases the quality of my banking services output at minimal efforts.	1.000	0.664
EE1: My interaction with Internet banking is clear and Understandable.	1.000	0.583
EE2: I am skilful at using internet banking.	1.000	0.630
EE3: Learning to use the Internet banking system is easy for me.	1.000	0.632
EE4: I find it easy to get the Internet banking system to do what I want it to do.	1.000	0.624
SN1: My family members think that I should use Internet banking.	1.000	0.487
SN2: My friends / business associates think I should use Internet banking.	1.000	.0.577
FC1: My bank encourages and fully supports me in the use of Internet banking.	1.000	0.732
FC2: I have the requisite resources necessary to do internet banking.	1.000	0.607

I do not trust internet service providers with internet banking security.	1.000	0.951
CSS1: Visible security features e.g SSL certification	1.000	0.931
CSS2: Additional Authentication over and above initial user ID/password	1.000	0.951
CSS3: Security of payment and data transfer on IBanking	1.000	0.515
CST1: Assurance of the customer on how his/her privacy is guaranteed.	1.000	0.813
CST2:IB offered on a reliable IT system	1.000	0.795
CBC1: Offering a broad and deep range of bank products.	1.000	0.886
CBC2:System that is easy to use	1.000	0.780
CBP1:Features options for different modes of payment	1.000	0.643
ACO1:Simple online loan applications/tracking	1.000	0.793
ACA1:Offering branded financial products	1.000	0.806
AAE1:Uses different multimedia features	1.000	0.715
AAN1:Offers a variety of non-bank products and services e.g online ticketing etc	1.000	0.989
PTC1:Straight through processing of transactions	1.000	0.622
PTI1:Features language or geographic options	1.000	0.692
PTI2:Explanations on proper usage e.g mouse-over texts on menus/buttons	1.000	0.574
PTP1:Current and timely information	1.000	0.972
PTP2:Provided information rich in detail	1.000	0.988
PTD1:Possibility of downloading information from IB to third party applications	1.000	0.425
PTC2:Relevant FAQ to help customers solve problems by themselves	1.000	0.832
PTC3: call-back/e-mail system tells the customer when to expect a response	1.000	0.756
PRA1:Services available (24/7) all the time	1.000	0.778
PRP1:Offers the possibility to personalize the interface to my preference	1.000	0.767
PRC1:Offers newsgroups/communities	1.000	0.783

Extraction Method: Principal Component Analysis.

Table 5.79: Communities Table on corporate customers data

	Total Variance Explained						
	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
Comp onent	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	16.670	43.869	43.869	16.670	43.869	43.869	13.054
2	4.931	12.976	56.845	4.931	12.976	56.845	12.432
3	4.848	12.757	69.602	4.848	12.757	69.602	9.165
4	3.778	9.942	79.544	3.778	9.942	79.544	5.229
5	2.236	5.885	85.429	2.236	5.885	85.429	4.456
6	1.196	3.147	88.576	1.196	3.147	88.576	6.510
7	1.009	2.655	91.231	1.009	2.655	91.231	4.315
8	0.695	1.829	93.060				
9	0.640	1.685	94.745				
10	0.534	1.405	96.151				
11	0.418	1.100	97.250				
12	0.297	0.782	98.032				
13	0.228	0.601	98.633				
14	0.151	0.397	99.030				
15	0.126	0.332	99.362				
16	0.109	0.286	99.648				
17	0.045	0.119	99.767				
18	0.033	0.086	99.853				
19	0.024	0.062	99.915				
20	0.017	0.046	99.961				
21	0.010	0.025	99.986				
22	0.003	0.007	99.994				
23	0.002	0.004	99.998				
24	0.001	0.002	100.000				
25	0.000	0.000	100.000				
26	0.000	0.000	100.000				
27	0.000	0.000	100.000				
28	0.000	0.000	100.000				
29	0.000	0.000	100.000				
30	0.000	0.000	100.000				
31	0.000	0.000	100.000				
32	0.000	0.000	100.000				
33	0.000	0.000	100.000				
34	0.000	0.000	100.000				
35	0.000	0.000	100.000				
36	0.000	0.000	100.000				

Table 5.65: Total Variance on corporate customer field data.

5.3.3 Descriptive Analysis on corporate customer respondents data

The ensuing statistics describes the nature of corporate customers responses using frequency tables in order to highlight areas that received great attention for users of the report to focus on with an aim of improving the service.

5.3.3.1 Demographines of corporate customer respondents

This section uses frequency statistics to analyze responses from corporate customers as highlighted in the introductory section above.

(a) Profile summary of corporate customer respondents

			Frequency	Percent
Valid	Education	College	26	23.2%
		Graduate	19	17.0%
		Post Graduate	67	59.8%
	Age	25 – 30 years	36	32.1%
		31 – 35 years	15	13.4%
		36 – 40 years	53	47.3%
		41 – 45 years	4	3.6%
		46 – 50 years	2	1.8%
		51 – 55 years	2	1.8%
	Level of Responsibility	Employee	98	87.5%
		Partner/Director	14	12.5%

Table 5.81: Age distribution of corporate customers

From figure 22 above, 26 (23.2%) of respondents were educated to post graduate diploma while 19 (17%) were undergraduate degree holders. The majority i.e 67 (59.8%) were post graduate degree holders.

(b) Gender distribution for corporate customers

We see from the table below that majority of the respondents were males (68.8%) while females were 31.2%.

Gender.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	77	68.8%	68.8%	68.8%
	Female	35	31.3%	31.3%	100.0%
	Total	**112**	**100.0%**	**100.0%**	

Table 5.82: Gender distribution of corporate customers
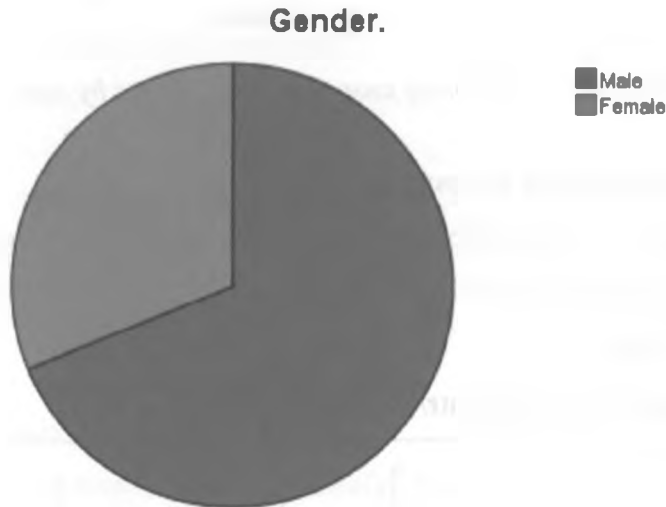
Gender.

Fig. 5.7: Gender distribution of corporate customers

(c) Distribution of respondents by age

Select your age from the sets given below.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25 – 30 yrs	36	32.1%	32.1%	32.1%
	31 – 35 yrs	15	13.4%	13.4%	45.5%
	36 – 40 yrs	53	47.3%	47.3%	92.9%
	41 – 45 yrs	4	3.6%	3.6%	96.4%
	46 – 50 yrs	2	1.8%	1.8%	98.2%
	51 – 55 yrs	2	1.8%	1.8%	100.0%
	Total	**112**	**100.0%**	**100.0%**	

Table 5.83: Distribution of corporate respondents by age

We see from the chart above that the age distribution of the corporate customers was varied with higher responses being received from the agres 25 – 30 .years and 36-40 years

Fig. 5.8: Distribution of corporate customer respondents by age.

(d) Management cadre of respondents

From the levels of responsibility in the corporate organizations, employees outnumbered partners/directors by 75% margin (i.e [98] 87.5% - [14] 12.5%) as seen from figure 24 below:

State your engagement with your organization?
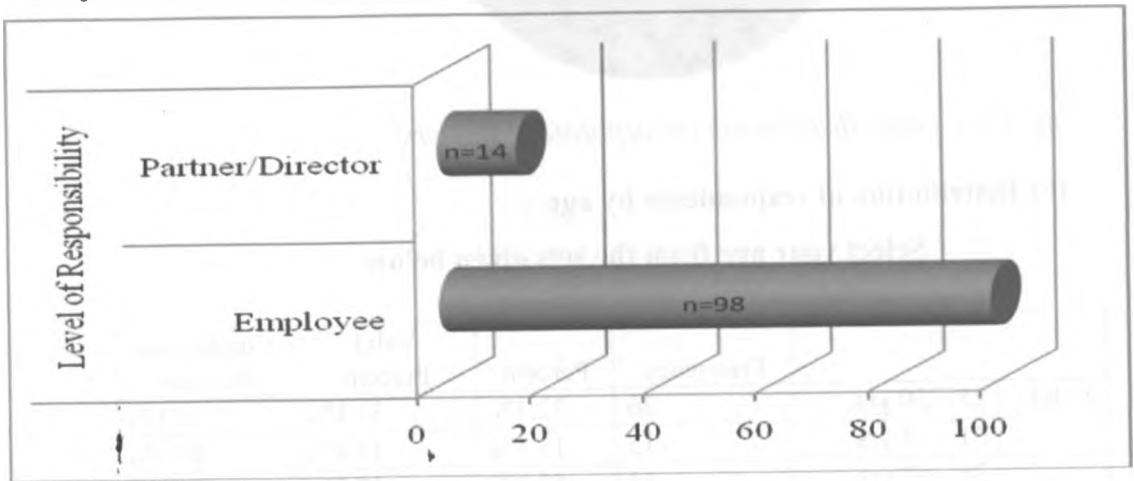
Fig. 5.9: Level of responsibility of corporate customer respondents

5.3.3.2 Level of Education
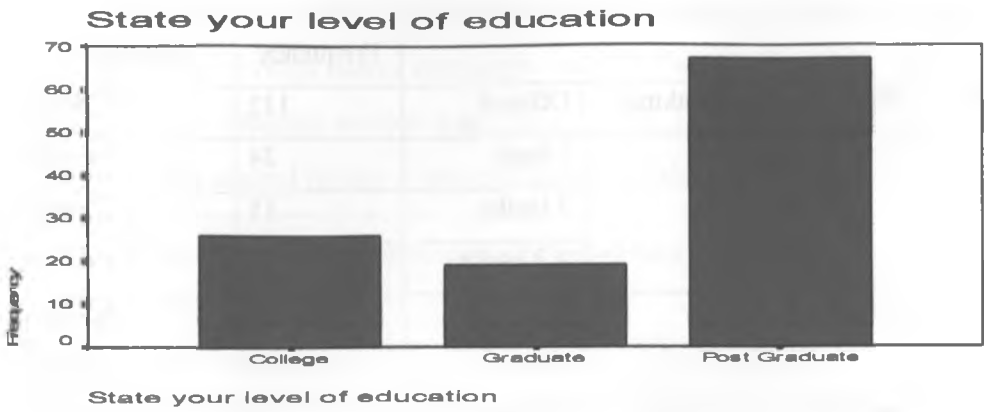
Fig. 5.10: Level of education of respondents

Figure 23 below shows that majority of the respondents were in the 36 – 40 years age group with 53 (47.3%); followed by 36 (32.1%) in the 25 – 30 years age group; 15 (13.4%) in the 31-35 years age group; 4 (3.6%) in the 41 – 45 years age group while the minority were in the 46 – 50 and 51 – 55 years age groups each receiving 2 respondents (1.8%).

5.3.3.3 Banking service providers

Indicate name(s) of your bank(s). This is optional

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Name(s) Provided	73	65.2%	65.2%	65.2%
	Name(s) Withheld	39	34.8%	34.8%	100.0%
	Total	**112**	**100.0%**	**100.0%**	

Table 5.84: Commercial banks of corporate respondents

Many corporate organizations actually gave names of their banks (73 or 65.2%) while a number chose to withhold the names of their bankers (39 or 34.8%).
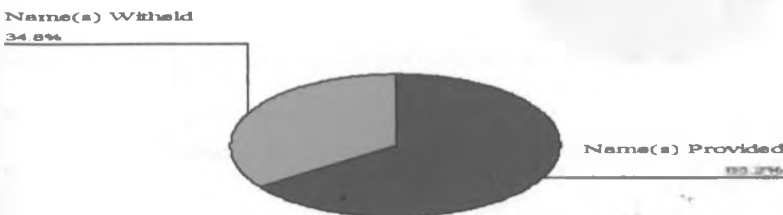
Fig. 5.11: Commercial banks of corporate respondents

5.3.3.4 Internet banking Subscription profile for corporate customers

			Frequency	Percent
Valid	Offered Internet banking	Offered	112	100%
	No. of providers	1 bank	34	30.3%
		2 banks	15	13.4%
		> 2 banks	63	56.3%
	Subscribed	Yes	99	88.4%
		No	13	11.6%
	Ownership of providers	Foreign	16	14.3%
		Local	37	33.0%
		Both	59	52.7%
	Duration of IB use	< 1 year	3	2.7%
		1 to 3 years	103	91.9%
		> 3 years	6	5.4%

Table 5.85: Internet banking profile of corporate respondents

(a) Internet banking subscriptions

From table 29 above, we see that publicity of Internet banking products is at its highest among the corporate customer respondents (100%). 99 corporates representing 88.4% have signed to at least 1 Internet banking service with 11.6% not yet subscribed.
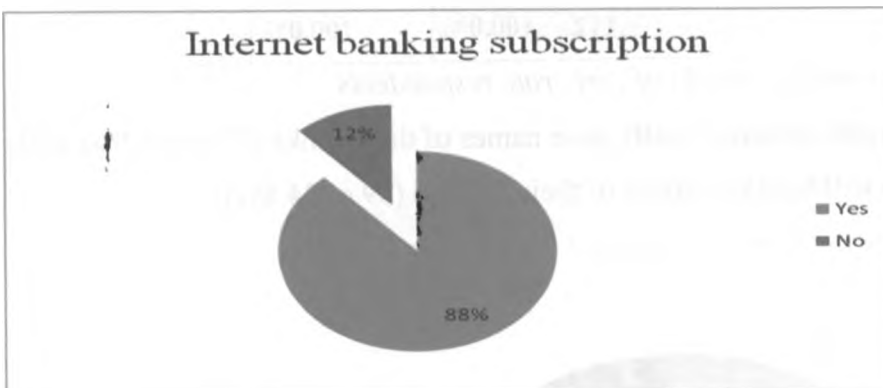
Fig. 5.12: Internet banking subscription among corporate customers

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(b) Ownership of banks to corporate customers

In terms of ownership of banks providing Internet banking service to corporate clients, both local and foreign banks dominate with 52.7%. 33.0% of the respondents are accessing Internet banking service local banks while 14.3% are accessing Internet banking from foreign owned banks. Figure 30 below outlines the rankings.
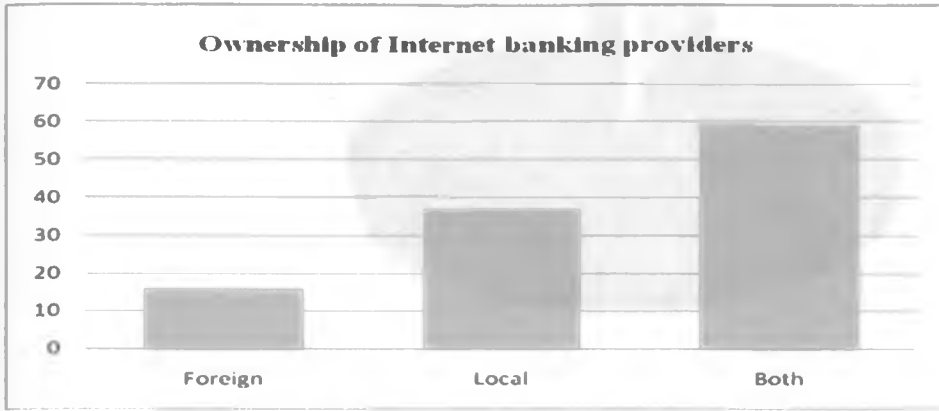
Fig. 5.13: Ownership of banks to corporate customers

(c) Number of current providers of Internet banking to corporates

This confirms that most corporate customers operate accounts with more than 1 commercial bank as highlighted in figure 31 below where we find that 34 corporates (30.3%) access Internet banking from 1 bank; 15 (13.4%) from 2 banks and 63 (56.3%) from more than 2 banks.
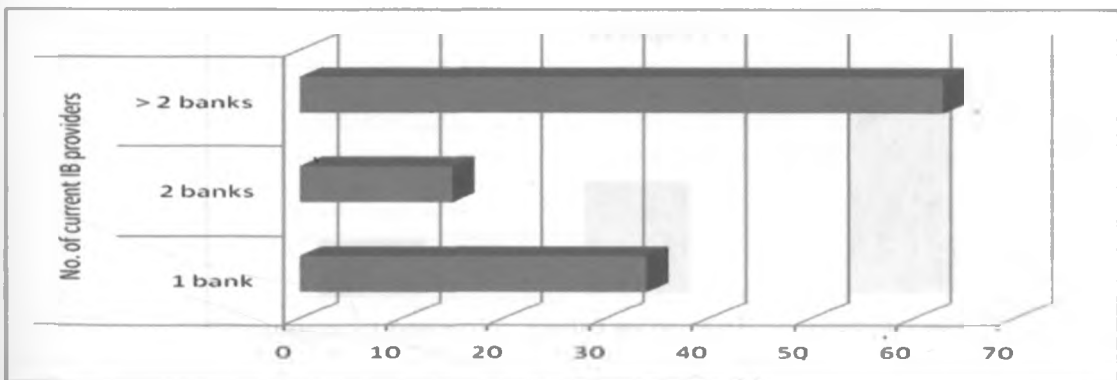
Fig. 5.14: Number of banking service providers to corporate customers

Reasons for multibanking by corporates are amongst others:

- Investment profiles of the organizations
- Separation of functions i.e different accounts for different cunctionalities
- Ease of access to customers since different banks have different numbers of branches in different locations

(d) Duration of Internet banking access

Finally, duration of Internet banking use among corporates is at its highest within 1 – 3 years (91.9%).
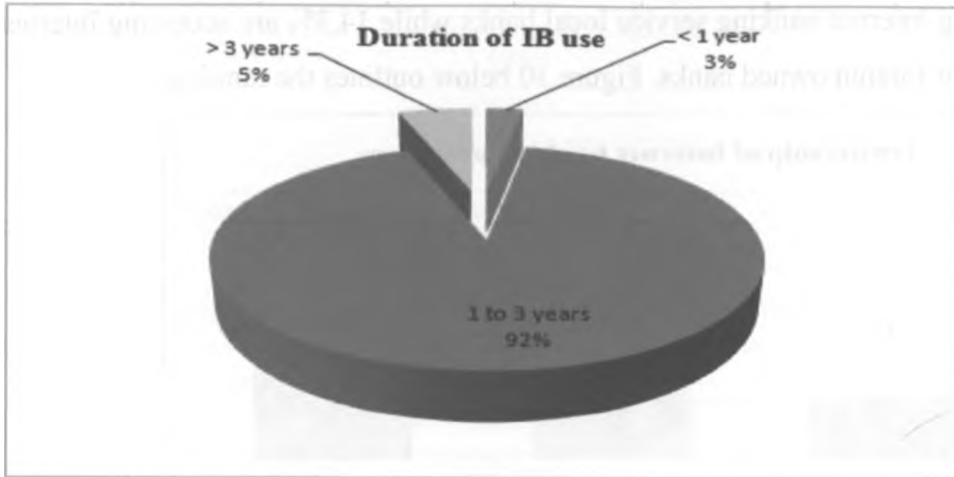
Fig. 5.15: Duration of Use of Internet banking by corporate customers

(e) Prospects for non-subscribed corporate customers

For those not yet subscribed, 7 (53.8%) are in the process of doing so while the other 4 (30.8%) intend to do so when their business environment improves. 2 of the corporates i.e 15.4% feel their current businesses do not justify Internet banking subscription. This is outlined in figure 33 below.
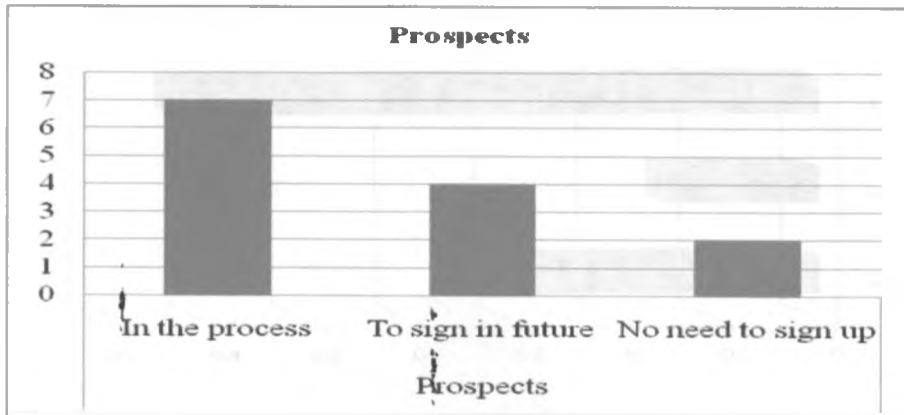
Fig. 5.16: Prospects for corporates not subscribed to Internet banking

5.3.4 Mediation assessment for Corporate responsents

The following section analyses the response of the individual customers on the validity of UTAUT constructs i.e PE, EE, SN and FC as well as the effect of moderators (root cinstructs of digital divide research) e.g gender, age, experience and voluntariness of use on the usage of Internet banking.

The table below summarises the construct definitions as well as the questions asked under each construct:

Core Construct	Definition	Items
Performance Expectancy (Venkatesh et al. 2003, Davis et al. 1989, Moore & Benbasat 1991)	The degree to which an individual believes that using the internet will help him or her to attain gains in personal performance.	PE1: I find internet banking useful to this organization.
		PE2: Using Internet banking enables me to accomplish banking tasks more quickly.
		PE3: Using internet banking increases the effective use of my time in handling my banking tasks.
		PE4: Using internet banking increases the quality of my banking services output at minimal efforts.
Effort Expectancy (Venkatesh et al. 2003, Davis et al. 1989, Moore & Benbasat 1991)	The degree of ease associated with the use of the internet.	EE1: My interaction with Internet banking is clear and understandable.
		EE2: I am skilful at using Internet banking.
		EE3: Learning to use an Internet banking system is easy for me.
		EE4: I find it easy to get the Internet banking system to do what I want it to do.
Social Influence (Venkatesh et al. 2003, Aijzen 1991, Davis et al. 1989, Thompson et al. 1991)	The degree to which an individual perceives that important others believe he or she should use the internet.	SN1: Key customers of this organization think that we should use Internet banking.
		SN2: Key customers of this organization are already using Internet banking.
		SN3: Stakeholders of this organization think we should use the Internet banking.
Facilitating Conditions (Venkatesh et al. 2003, Moore & Benbasat 1991, Aijzen 1991, Taylor & Todd 1995)	The degree to which an individual believes that circumstantial and technical setting exists to support use of the internet.	FC1: Bank staffs are helpful to us in the use of Internet banking system.
		FC2: My organization has the requisite resources and expertise necessary to carry out internet banking.
Behavioural	The degree to which an	BI1: Does your organization intend to subscribe

Intention (Venkatesh et al. 2003, Davis et al. 1989, Taylor & Todd 1995)	individual will want to use the internet for personal activities.	to internet banking in the near future?
Use Behaviour (USE)	Actual usage of the internet for personal activities.	USE1: Have you subscribed to and used internet banking service offered by your bank?

Acceptance and Use of Information Technology: Root Constructs, Definitions, and Scales

Table 5.86: Coding of UTAUT model for corporate customers

(a) Performance Expectancy on Internet banking behaviour

The Hypotheses under test here were:

H1a: Performance Expectancy will positively influence Behavioural Intention.

H1b: The influence of Performance Expectancy on Behavioural Intention will be moderated by gender and age.

We wish to examine whether Behavioural Intention (BI) of corporate customers towards Internet banking is a result of their assessment of Performance Expectancy (PE). In addition, part of this behavioural intention is also moderated by the consumers age and gender. Three conditions preclude our analysis which are:

The Independent variable predicts the dependent variable i.e BI predicts PE

 i. The Independent variable predicts the mediator i.e PE predicts the mediators

 ii. The mediators predict dependent variable i.e Gender and age predict BI
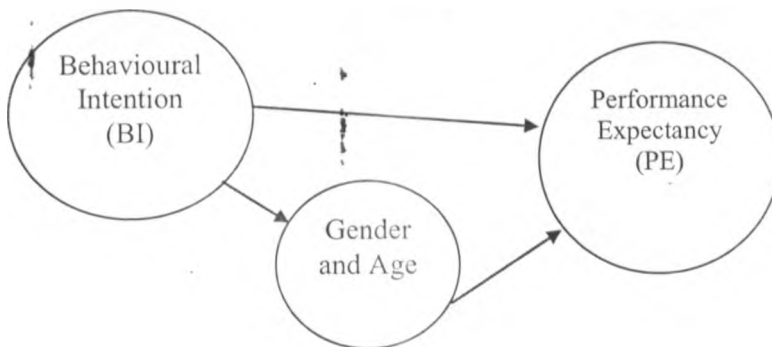
Fig. 5.17: Mediation analysis model for corporate customers

In order to test whether these three conditions exist, we obtain correlation coefficients for these three relationships as below:

❖ Descriptive Statistics

	Mean	Std. Deviation	N
BI	5.5089	1.19304	112
PE	17.7143	3.10602	112
GENAGE	3.3482	1.12874	112

Table 5.87: Descriptive statistics for BI, and PE-corporate customer data

Correlations

		BI	PE	GENAGE3
BI	Pearson Correlation	1	.689(**)	-.260(**)
	Sig. (2-tailed)		.000	.006
	N	112	112	112
PE	Pearson Correlation	.689(**)	1	-.258(**)
	Sig. (2-tailed)	.000		.542
	N	112	112	112
GENAGE	Pearson Correlation	-.260(**)	-.258(**)	1
	Sig. (2-tailed)	.006	.542	.
	N	112	112	112

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.88: Correlation between BI, and PE-corporate customer data

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role of a mediator has been met. Hence, Hypothesis H1a is proved that performance expectancy will positively influence behavioural Intention.

We proceeded to test the effect of mediation using Sobel test. To begin with, we compute the raw regression coefficient and the standard error of this regression coefficient for the association between the IV and the mediator, and then the association between the mediator and the DV (adjusting for the IV). We used linear regression with the results below:

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.872	.496		13.864	.000
	GENAGE	-.151	.054	-.260	-2.820	.006

a Dependent Variable: BI

Table 5.89: Regression coefficient between IV and Mediator-corporate customer data

The raw regression coefficient for the association between behavioural Intention - BI (the IV) and gender and age (the mediator) is -.151. The standard error for this raw regression coefficient (labelled 'Std. Error') is .054.

To compute the corresponding values for the association between 'gender and age' and performance expectancy (controlling for behavioural intention), we use linear regression whose coefficients are as shown on table 5.93 below:

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.586	1.589		3.515	.001
	GENAGE	.196	.107	.129	1.826	.071
	BI	1.881	.184	.722	10.197	.000

a Dependent Variable: PE

Table5.90: Regression coefficient between the mediator and the DV controlling for IV-corporate customer data

❖ Test for Mediation using Aroian test equation

Finally, we use the unstandardized coefficients to determine the effect of mediating variables on the association between Internet banking behavioural Intention and Performance Expectancy.

Using the test statistics on the online sobel test calculator at Preacher and Hayes http://people.ku.edu/~preacher/sobel/sobel.htm gives the following results:

Input:		Test statistic:	Std. Error:	p-value:
a	6.872	Sobel test: 8.2259752	1.57139205	0
b	1.881	Aroian test: 8.21213666	1.57404005	0
s_a	0.496	Goodman test: 8.23988394	1.56873957	0
s_b	0.184	Reset all	Calculate	

Fig. 5.18: Gender and age mediating PE and BI for corporate customers

The test statistic for the Aroian sobel test is 8.21, with an associated p-value of 0. The fact that the observed p-value falls below the established alpha level of .05 indicates that the association between the IV and the DV (in this case, behavioural intention towards Internet banking and performance expectancy) is reduced significantly by the inclusion of the mediator (in this case, gender and age) in the model; in other words, there is evidence of mediation. Hence the Hypothesis is true.

(b) Effort Expectancy on Internet banking behaviour

The Hypotheses under test here were:

H2a: Effort Expectancy will positively influence Behavioural Intention.

H2b: The influence of Effort Expectancy on Behavioural Intention will be moderated by gender, age and experience.

We follow similar steps as for performance expectancy above with the following results.

❖ **Descriptive Statistics:**

Descriptive Statistics

	Mean	Std. Deviation	N
BI	5.5089	1.19304	112
EE	16.1161	2.75990	112
GENAGEXP	6.6875	1.40803	112

Table 5.91: Descriptive statistics for BI, and EE-corporate customer data

Correlations

		BI	EE	GENAGEXP
BI	Pearson Correlation	1	.288(**)	-.265(**)
	Sig. (2-tailed)		.002	.494
	N	112	112	112
EE	Pearson Correlation	.288(**)	1	.253(**)
	Sig. (2-tailed)	.002		.007
	N	112	112	112
GENAGEXP	Pearson Correlation	-.265(**)	.253(**)	1
	Sig. (2-tailed)	.494	.007	
	N	112	112	112

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.92: Correlation between BI, and EE-corporate customer data

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role of a mediator has been met. This proves hypothesis H2a that effort expectancy will positively influence behavioural Intention.

❖ **Regression coefficient between IV and Mediator**

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.879	.551		10.674	.000
	GENAGEXP	-.055	.081	-.065	-.687	.494

a Dependent Variable: BI

Table 5.93: Regression coefficient between IV and Mediator-corporate customer

The raw regression for the association between behavioural Intention - BI (the IV) and gender, age and experience (the mediator) is -.055. The standard error for this raw regression coefficient (labelled 'Std. Error') is .081.

❖ **Regression coefficient between the mediator and the DV controlling for IV**

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.638	1.680		5.141	.000
	GENAGEX P	.535	.173	.273	3.096	.002
	BI	.708	.204	.306	3.475	.001

a Dependent Variable: EE

Table5.94: Regression coefficient between the mediator and the DV controlling for IV-corporate customers

❖ **Sobel Test Statistics**

Input:		Test statistic:	Std. Error:	p-value:
a	5.879	Sobel test: 3.30038036	1.26116736	0.00096554
b	0.708	Aroian test: 3 28734947	1.26616657	0.00101135
s₁ 0.551		Goodman test: 3.31356745	1.25614826	0.00092114
sb 0.204		Reset all	Calculate	

Fig. 5.19: Gender, age, experience mediating EE and BI for corporate customers

The test statistic for the Aroianl test is -3.29, with an associated *p*-value of 0.001. The fact that the observed *p*-value falls below the established alpha level of .05

indicates that the association between the IV and the DV (in this case, behavioural intention towards Internet banking and effort expectancy) is reduced significantly by the inclusion of the mediator (in this case, gender, age and experience) in the model; in other words, there is evidence of mediation. Hence the Hypothesis H2b is therefore true.

(c) The effect of Social Norm on Internet banking BI

The Hypotheses under test here were:

H3a: Social Influence will positively influence Behavioural Intention.

H3b: The influence of Social Influence on Behavioural Intention will be moderated by gender, age, experience and voluntariness of use.

❖ **Descriptive Statistics:**

	Mean	Std. Deviation	N
BI	5.5089	1.19304	112
SN	11.2500	1.24119	112
GENAGXPV	11.7946	1.86063	112

Table 5.95: Descriptive statistics for BI, and SN-corporate customers

Correlations

		BI	SN	GENAGXPV
BI	Pearson Correlation	1	-.208(*)	-.429(**)
	Sig. (2-tailed)		.027	.176
	N	112	112	112
SN	Pearson Correlation	-.208(*)	1	.580(**)
	Sig. (2-tailed)	.027		.000
	N	112	112	112
GENAGXPV	Pearson Correlation	-.429(**)	.580(**)	1
	Sig. (2-tailed)	.476	.000	
	N	112	112	112

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Table 5.96: Correlation between BI, and SN-corporate customers

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role of a mediator has been met. This proves hypothesis H3a that social norm will positively influence behavioural intention.

❖ **Regression coefficient between IV and Mediator**

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.536	.724		6.266	.000
	GENAGXPV	.083	.061	.129	1.361	.176

a Dependent Variable: BI

Table 5.97: Regression coefficient between IV and Mediator-corporate customers

The raw regression for the association between behavioural Intention - BI (the IV) and gender, age, experience and voluntariness of use (the mediator) is .083. The standard error for this raw regression coefficient is .061.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.043	.678		11.865	.000
	GENAGXPV	.412	.049	.617	8.379	.000
	BI	-.299	.077	-.288	-3.907	.000

a Dependent Variable: SN

Table 5.98: Regression coefficient between the mediator and the DV controlling for IV-corporate customers

❖ **Sobel Test Statistics**

Input:			Test statistic:	Std. Error:	p-value:
a	4.536	Sobel test:	-3.30057887	0.41091701	0.00096486
b	-0.299	Aroian test:	-3.27061725	0.41468136	0.00107313
s_a	0.724	Goodman test:	-3.3313793	0.40711786	0.00086417
s_b	0.077	Reset all ▸		Calculate	

Fig. 5.20: Gender, age, experience, voluntariness of use mediating SN and BI for corporate customers

The test statistic for the Aroian test is -3.27, with an associated *p*-value of 0.001. The observed *p*-value falls below the established alpha level of .05 indicating that the association between the IV and the DV (in this case, behavioural intention towards Internet banking and social norm) is reduced significantly by the inclusion of the mediator (in this case, gender, age, experience and voluntariness of use) in the model; in other words, there is evidence of mediation. Hence the Hypothesis H3b is therefore true.

(d) The effect of Facilitating Conditions on Internet banking BI

The Hypotheses under test here were:

H4a: Facilitating Conditions will positively influence Use Behaviour.

H4b: The influence of Facilitating Conditions on Use Behavioural will be moderated by age and experience

❖ **Descriptive Statistics:**

Descriptive Statistics

	Mean	Std. Deviation	N
BI	5.5089	1.19304	112
FC	7.7589	1.85144	112
AGEXP	5.3750	1.15568	112

Table 5.99: Descriptive statistics for BI, and FC-corporate customers

❖ **Correlations**

Correlations

		BI	FC	AGEXP
BI	Pearson Correlation	1	.280(**)	-.279(**)
	Sig. (2-tailed)		.003	.059
	N	112	112	112
FC	Pearson Correlation	.280(**)	1	.253(**)
	Sig. (2-tailed)	.003		.007
	N	112	112	112
AGEXP	Pearson Correlation	-.279(**)	.253(**)	1
	Sig. (2-tailed)	.059	.007	
	N	112	112	112

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.100: Correlation between BI, and FC-corporate customers

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically not significant. These results indicate that, at the bivariate level, each of the conditions necessary to test for the possible role of a mediator has not been met. This disproves hypothesis H4a that facilitating will positively influence behavioural intention.

❖ Regression coefficient between IV and Mediator

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.501	.532		12.214	.000
	AGEXP	-.185	.097	-.179	-1.907	.059

a Dependent Variable: BI

Table 5.101: Regression coefficient between IV and Mediator-corporate customers

The raw regression coefficient for the association between behavioural Intention - BI (the IV) and age and experience (the mediator) is -0.185. The standard error for this raw regression coefficient (labelled 'Std. Error') is 0.097.

❖ Regression coefficient between the mediator and the DV controlling for IV

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.185	1.177		1.856	.066
	AGEXP	.502	.142	.313	3.541	.001
	BI	.522	.137	.336	3.801	.000

a Dependent Variable: FC

Table 5.102: Regression coefficient between the mediator and the DV controlling for IV-corporate customers

❖ Sobel Test Statistics

Input:		Test statistic:	Std. Error:	p-value:
a	6.501	Sobel test: 3.63749797	0.93292753	0.0002753
b	0.522	Aroian test: 3.62644806	0.93577019	0.00028735
s_a	0.532	Goodman test: 3.64864951	0.93007618	0.00026362
s_b	0.137	Reset all	Calculate	

Fig. 5.21: Age and experience FC and BI for corporate customers

The test statistic for the Aroian test is -3.63, with an associated p-value of 0.0003. The fact that the observed p-value falls below the established alpha level of .05 indicates that the association between the IV and the DV (in this case, behavioural

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intention towards Internet banking and facilitating conditions) is reduced significantly by the inclusion of the mediator (in this case, age and experience) in the model; in other words, there is evidence of mediation. Hence the Hypothesis H4b is therefore true.

(e) The effect of Internet banking behavioural intention on Use

As held by Venkatesh that Behavioural Intention affects use behaviour, we tested this using the following hypothesis:

H5: Behavioural Intention will positively influence Use Behaviour.

❖ **Descriptive Statistics:**

Descriptive Statistics

	Mean	Std. Deviation	N
BI	5.5089	1.19304	112
USE	3.4732	.61454	112

Table 5.103: Descriptive statistics for BI, and Use behavior-corporate customers

Correlations

		BI	USE
BI	Pearson Correlation	1	.308(**)
	Sig. (2-tailed)		.001
	N	112	112
USE	Pearson Correlation	.308(**)	1
	Sig. (2-tailed)	.001	
	N	112	112

** Correlation is significant at the 0.01 level (2-tailed).

Table 5.104: Correlation between BI, and Use behavior-corporate customers

We note that the correlation coefficients for each path, that is, the links between each of the variables, is statistically significant. This proves hypothesis H5 that Behavioural Intention will positively influence use behaviour of Internet Banking among corporate customers. In other words, the kind decisions formed by corporate Internet banking users will reflect in the type of behaviour they adopt towards the same.

5.3.5   Internet Banking Product Utilization-mean comparison

The below section uses descriptive statiscctics (mean) to compare the usage of the various products available on Internet banking in order to outline the usage patterns.

As can be seen from the table 5.108 below, the product with the highest use is balance enquiry followed by statement download and account activity enquiry with means of 3.28, 3.07 and 2.94 respectively. All these fall under informational level of Internet banking hierarchy.

Transactional level usage is largely dominated by transfers (basically payments). This suggests that if banks add more payment options, they can realize higher usage.

While bottom three products are online loan applications, air ticket payment and online credit card applications with means of 1.02, 1.04 and 1.06 respectively.

This means that the banks have to re-look at the products with lower usages and design their awareness campaigns with a view to improving their usage.

Descriptive Statistics	
	Mean
Check my organization's account balances	3.28
Download bank statements for use at the organization	3.07
View my organization's past account activity (transactions)	2.94
Place requests for bank statements	2.74
Make transfers to third party accounts in the same bank or in other banks in Kenya.	2.66
Make international funds transfers	2.27
Change my user id and password (Account Management)	2.25
Upload bulk payment file for processing e.g salaries, produce, pensions etc	1.95
Make bill payments e.g. electricity, water, airtime, KRA	1.91
Transfer funds between my organizations accounts held at the same branch or in different branch(es)	1.79
Check foreign exchange rates	1.69
View Products offered by the bank over the internet	1.68
Issue Stop cheque instructions to the bank	1.60
Place request to order cheque books	1.38
Issue Standing order or direct debit instructions to my bank	1.38
Communicate to the bank via secure electronic mail	1.34
Make requests to place fixed deposits	1.29
Repay my organizations loans and mortgages	1.16
Online loan repayment calculation	1.13
Filing various application forms online	1.13
Track loan/mortgage applications	1.12
Topping up my organizations credit cards	1.07
Apply for credit cards	1.06
Pay for air tickets online	1.04
Apply for loans and mortgages	1.02

Table 5.105: Internet banking product usage among corporate customers

We observe from the descriptive statistics above that corporate customers largely Internet banking in trial mode, and primarily for accessing basic banking information, not for much volume of transactions.

5.4   Commercial Banks data analysis

5.4.1   Demographincs data for bank respondents

(a) Distribution of rerpondents by Age

Select your age from the sets given below.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25 – 30 yrs	4	20.0%	20.0%	20.0%
	31 – 35 yrs	3	15.0%	15.0%	35.0%
	36 – 40 yrs	7	35.0%	35.0%	70.0%
	41 – 45 yrs	5	25.0%	25.0%	95.0%
	46 – 50 yrs	1	5.0%	5.0%	100.0%
	Total	**20**	**100.0%**	**100.0%**	

Table 5.106: Frequency table for Age distribution of Commercial banks respondents

The questionnaire received highest response from 36 – 40 years age group (35%) followed by 41 – 45 years (25%); 25 – 30 years (20%) and least were 31 – 35 years and 46 – 50 years receiving 15% and 5% respectively.
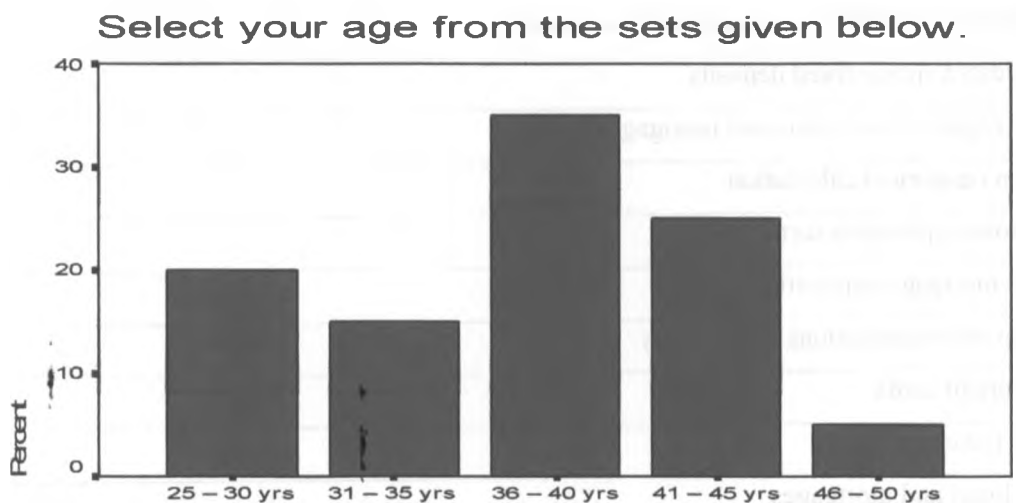
Fig. 5.22: Age distribution of commercial bank respondents.

(b) Grouping of respondents by level of education.

What is your level of education?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School	1	5.0%	5.0%	5.0%
	Graduate	12	60.0%	60.0%	65.0%
	Post Graduate	7	35.05	35.0%	100.0%
	Total	**20**	**100.0%**	**100.0%**	

Table 5.107: Frequency table for Level of Education of Commercial banks respondents

Table 55 shows that the highest number of respondents were graduates (60%) followed by post graduates with 35% and lastly O-level with 5%.
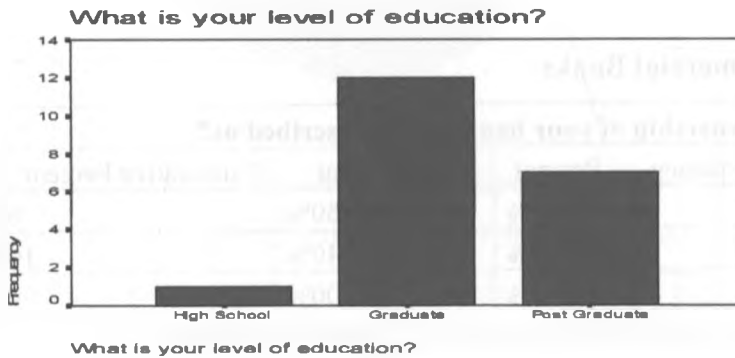
Fig. 5.23: Level of Education of commercial bank respondents.

(c) Distribution of participants by level of management

What your current level of management?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non-Managerial	1	5.0%	5.0%	5.0%
	Line Manager	3	15.0%	15.0%	20.0%
	Middle Level Manager	7	35.0%	35.0%	55.0%
	Senior Manager	5	25.0%	25.0%	80.0%
	Technical staff	4	20.0%	20.0%	100.0%
	Total	**20**	**100.0%**	**100.0%**	

Table 5.108: Frequency table for management cadre of commercial bank respondents

From figure 40 below, the highest number of respondents were from middle level managers at 55% followed by senior managers at 25%; technical staff at 20%; line managers at 15% and non-managerial or unionisable staff at 5%. Thus the concentration of respondents were in the strategic and tactical levels of management.
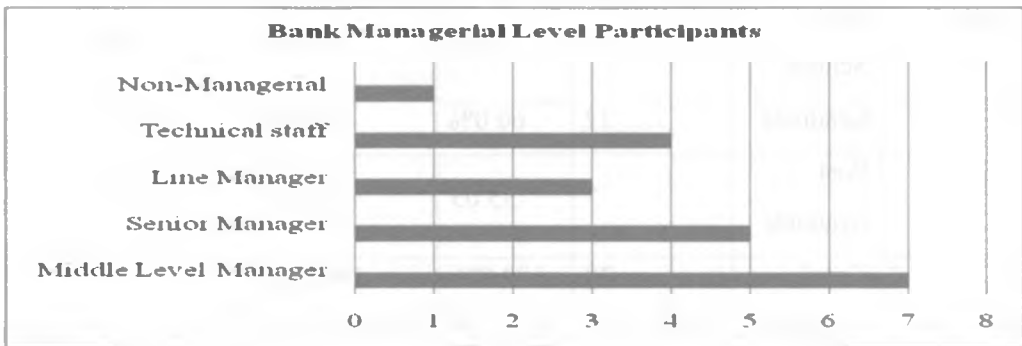
Fig. 5.24: Management cadre of commercial bank respondents.

The questionnaire received participation from operational, tactical and strategic levels.

(d) Ownership Commercial Banks

The ownership of your bank can be described as?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Indigenous	12	60%	60%	60%
	Foreign	8	40%	40%	100%
	Total	20	100%	100%	

Table 5.109: Frequency table for ownership of Commercial banks

12 out of 32 locally owned (indigenous) banks i.e 37.5% participated in the research while 8 out of 11 foreign owned commercial banks i.e 72.7% also participated.
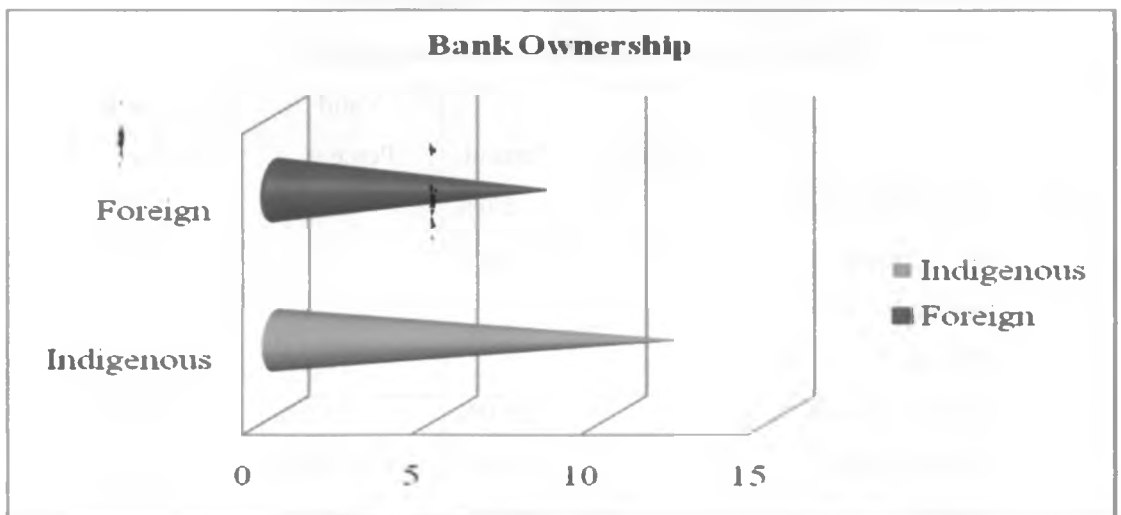
Fig. 5.25: Ownership of participating commercial banks

(e) Bank respondents technical expertise

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Indigenous	12	60%	60%	60%
	Foreign	8	40%	40%	100%
	Total	20	100%	100%	

<div align="center">The ownership of your bank can be described as?</div>

Table 5.110: Technical expertise of commercial bank respondents

Fig. 5.26: Technical expertise of participating commercial bank respondents

65% of the respondents from commercial banks had professional qualifications relevant to Internet banking. Their contributions could therefore positively impact on Internet banking delivery and support.

5.4.2   Internet banking Rollout by Commercial Banks.

Is your bank offering any personalized banking services to its customers over the Internet?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	12	60.0%	60.0%	60.0%
	No	8	40.0%	40.0%	100.0%
	Total	20	100.0%	100.0%	

Table 5.111: Commercial Banks offering Internet Banking Services

12 banks (60%) are offering Internet banking with 8 (40%) not doing so at the time of data collection.

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Offering Internet banking to customers?
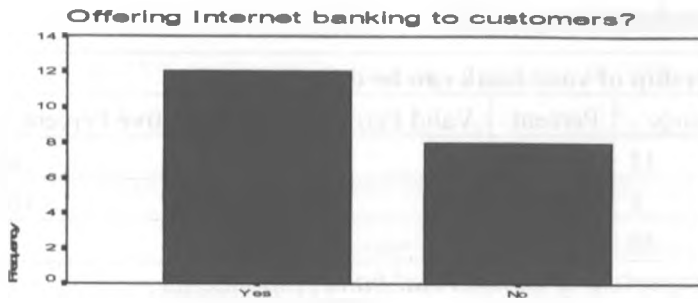
Fig. 5.27: Commercial banks offering Internet Banking services

(a) Distribution by period of use of Internet banking.

When did you go live on Internet banking?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not offered yet	8	40.0%	40.0%	40.0%
	< 1 year ago	1	5.0%	5.0%	45.0%
	1 to 3 years ago	7	35.0%	35.0%	80.0%
	> 3 years ago	4	20.0%	20.0%	100.0%
	Total	20	100.0%	100.0%	

Table 5.112: Duration of offering Internet Banking by commercial banks

20% of the banks have Internet banking products that are more than 3 years old while 35% of the procuducts are within 1 to 3 years and 5% less than 1 year as at the time of data collection. 40% were not yet offering the product in the market.

When did you go live on Internet banking?
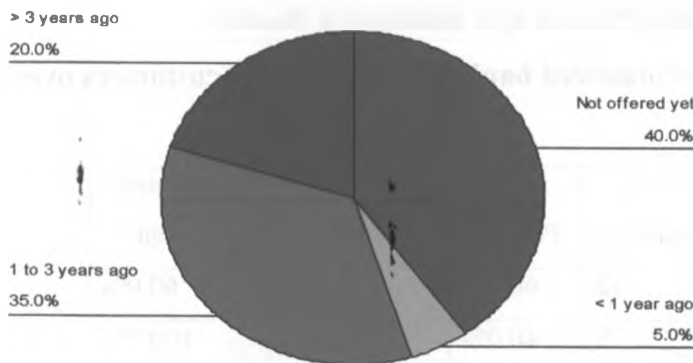
Fig. 5.28: Duration of offering Internet banking

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(b) Prospects for banks not yet offering Internet banking.

Does your bank intend to offer internet banking in the near future?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	In the process of implementation	3	15.0%	37.5%	37.5%
	In the next 1 to 3	2	10.0%	25.0%	62.5%
	In future	3	15.0%	37.5%	100.0%
	Total	**8**	**100.0%**	**100.0%**	

Table 5.113: Commercial Banks Intention to offer Internet Banking

3 banks (37.5%) are in the process of implementing Internet banking. Similarly, 3 banks (37.5%) will consider doing so in future while 2 banks (25%) are considering doing so in the next 1 to 3 years.
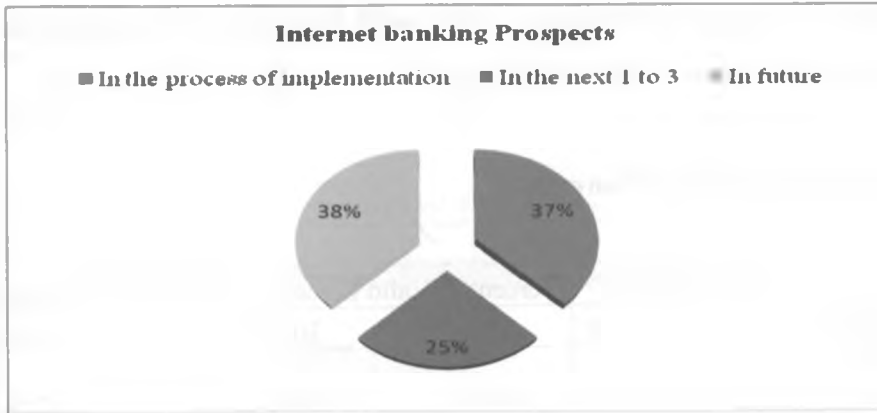
Fig. 5.29: Intention to offer Internet Banking

5.4.3   Banking industry and Interaction with External Forces

5.4.3.1 External Forces

The forces operating outside the banking industry that is responsible for increasing and competitive change within the indistry include:

i.   Changing political environment

POL					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	3	15%	15%	15%
	Somewhat Important	13	65%	65%	80%
	Important	3	15%	15%	95%
	Very Important	1	5%	5%	100%
	Total	**20**	**100%**	**100%**	

Table 5.114: The effect of changing political environment on Internet Banking use

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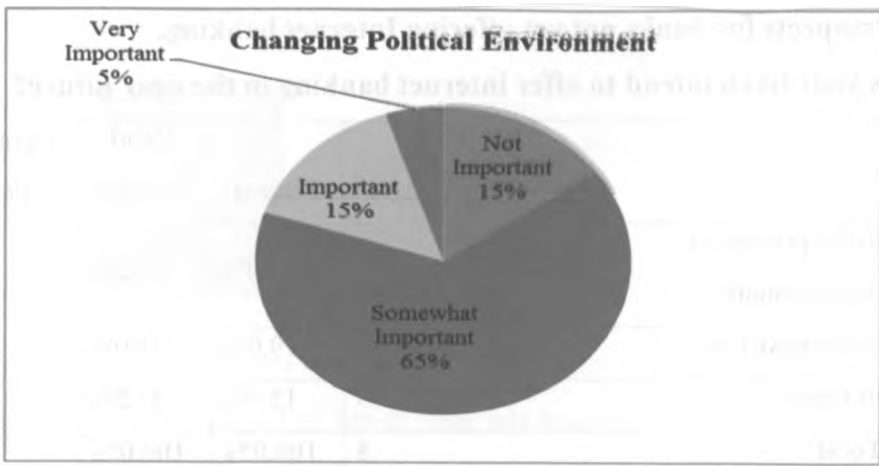
Fig. 5.30: The effect of changing political environment on Internet banking use

The importance of political environment in propoting Internet banking use seems to be barely minimal amongst the banks with only 5% of the banks feeling that it was very important and 15% being of the opinion that it is indeed important. The majority of the banks felt that it was barely important (65%) with a further 15% holding the opinion that it was not important towards propoting Internet banking in the country.

ii.   Changing economic environment

ECON					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not Important	6	30%	30%	30%
	Somewhat Important	9	45%	45%	75%
	Important	2	10%	10%	85%
	Very Important	3	15%	15%	100%
	Total	**20**	**100%**	**100%**	

Table 5.115: The effect of changing economic environment on Internet Banking use
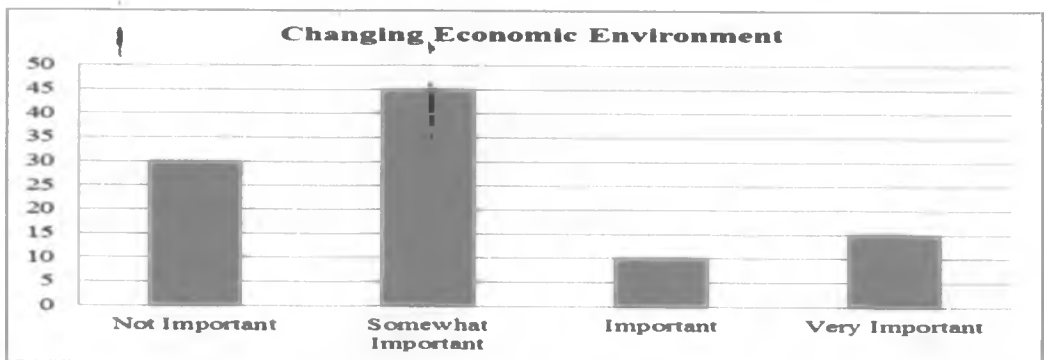
Fig. 5.31: The effect of changing economic environment on Internet banking use

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Economic environment marginaly contributes towards Internet banking use according to the banks that participated with 15% finding it very important followed by 10% who find it important. Majority of the banks (45%) feel that it is somewhat important while 30% feel it is not important.

iii. Changing social environment

		Frequency	Percent	Valid Percent	Cumulative Percent
SOCIAL					
Valid	Somewhat Important	3	15%	15%	15%
	Important	4	20%	20%	35%
	Very Important	13	65%	65%	100%
	Total	20	100%	100%	

Table 5.116: The effect of changing social environment on Internet Banking use

Social environment seems to contribute significantly towards Internet banking use with 65% confirming that it is very important to them in Internet banking use. 15% and 20% of the banks view it as somewhat important and important respectively.
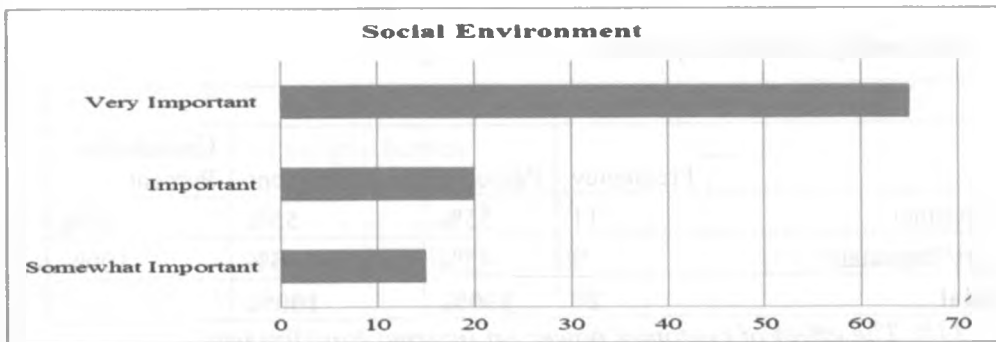
Fig. 5.32: The effect of changing social environment on Internet banking use

iv. Changing Technologocal environment

		Frequency	Percent	Valid Percent	Cumulative Percent
TECHENV					
Valid	Not Important	1	5%	5%	5%
	Somewhat Important	1	5%	5%	10%
	Important	4	20%	20%	30%
	Very Important	14	70%	70%	100%
	Total	20	100%	100%	

Table 5.117: The effect of changing technological environment on Internet Banking use

As can be seen from table 5.85 above, technological environment contributes significantly towards Internet banking use by creating an enabling environment for

facilitating Internet banking with 70% of the banks finding it very important and 20% of the banks confirming that it is indeed important. This is significant compated to the earlier three aspects of external environment i.e political, economic and social.
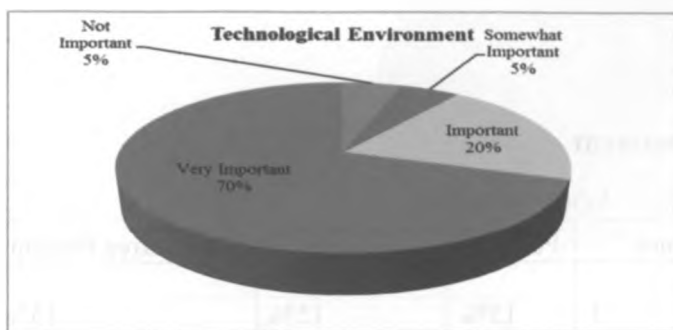
Fig. 5.33: The effect of changing technological environment on Internet banking use

5.4.3.2 Internal Forces affecting banking industry

This section focussed on those forces responsible for increased competition and change within the banking industry that serve as drivers towards Internet banking technology adoption. The forces in focus are as discussed hereunder:

i.   Increasing customer power

CUSTPWR				
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	11	55%	55%	55%
	Very Important	9	45%	45%	100%
	Total	**20**	**100%**	**100%**	

Table 5.118: The effect of customer power on Internet Banking use

As can be seen from table 5.86 above, a great number of banks agree that they responded to calls for implementing Internet banking following increased calls from their customers for the same.
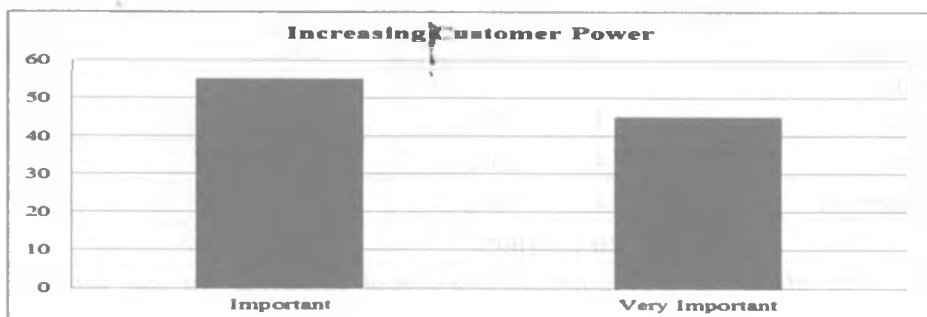
Fig. 5.34: The effect of customer power on Internet Banking use

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NEWENTR					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Somewhat Important	3	15%	15%	15%
	Important	7	35%	35%	50%
	Very Important	10	50%	50%	100%
	Total	**20**	**100%**	**100%**	

Table 5.119: The effect of threat of new entrants on Internet Banking adoption

Fear of competition is also a key driver to banks in adopting Internet banking as can be observed from table 5.87 above where more than 50% feel it is significant in driving them towards Internet banking adoption.
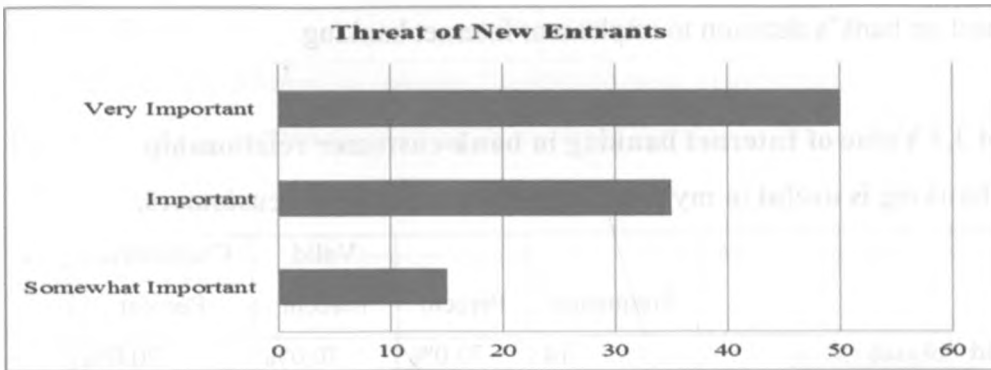
Fig. 5.35: The effect of threat of new entrants on Internet Banking adoption

iii.   **Powerful supply forces**

SPLYFORC					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	4	20%	20%	20%
	Very Important	16	80%	80%	100%
	Total	**20**	**100%**	**100%**	

Table 5.120: The effect of threat of powerful supply forces on Internet Banking adoption

80% of the banks feel that through Internet banking, they can be able to offer services to their customers at lower costs compared to other channels.

5.4.3.3 Regression analysis Forces and Internet banking rollout

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.813(a)	.661	.463	.368

a Predictors: (Constant), SPLYFORC, POL, CUSTPWR, SOCIAL, TECHENV, NEWENTR, ECON

Table 5.121: Regression coefficients for Forces and Internet Banking Acceptance and Use

We find from the table 5.124 above that the R2 value for the regression coefficient between forces affecting banking industry and decision to implement Internet banking by banks is 0.661 which is strong. We therefore confirm that the forces indeed have some impact on bank's decision to implement Internet banking.

5.4.3.4 Value of Internet banking in bank-customer relationship

Internet banking is useful in my bank's relationship with its customers.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	14	70.0%	70.0%	70.0%
	Strongly Agree	6	30.0%	30.0%	100.0%
	Total	**20**	**100.0%**	**100.0%**	

Table 5.122: Value of Internet Banking in Bank-customer relationship

Figure 66 below shows that 70% of the commercial banks agree that indeed Internet banking is useful in their relationship with customers and 30% strongly believe so.
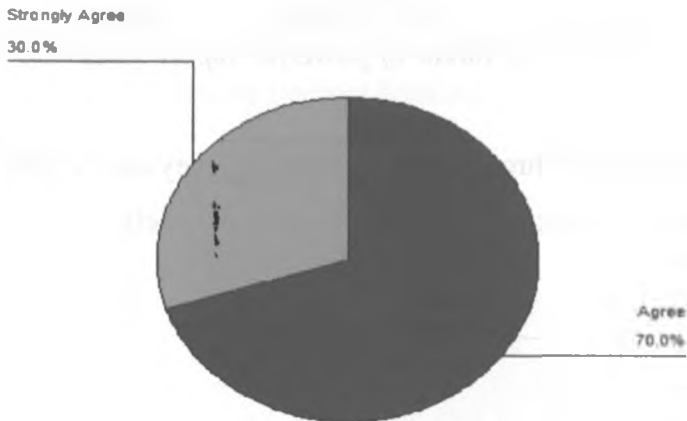
Fig. 5.36: Value of Internet Banking in Bank-customer relationship

5.4.3.5 Internet banking system Acquisition.

With regard to implementation of Internet banking, most banks preferred to buy commercial-off-the-shelf systems (85%) as opposed to developing in house.

My bank prefers buying Ibanking system from a software vendor as opposed to developing one in-house

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	5.0%	5.0%	5.0%
	Neutral	2	10.0%	10.0%	15.0%
	Agree	17	85.0%	85.0%	100.0%
	Total	**20**	**100.0%**	**100.0%**	

Table 5.123: Method of Internet Banking System Acquisition

Internet banking system acquisition (buy versus develop in-house)
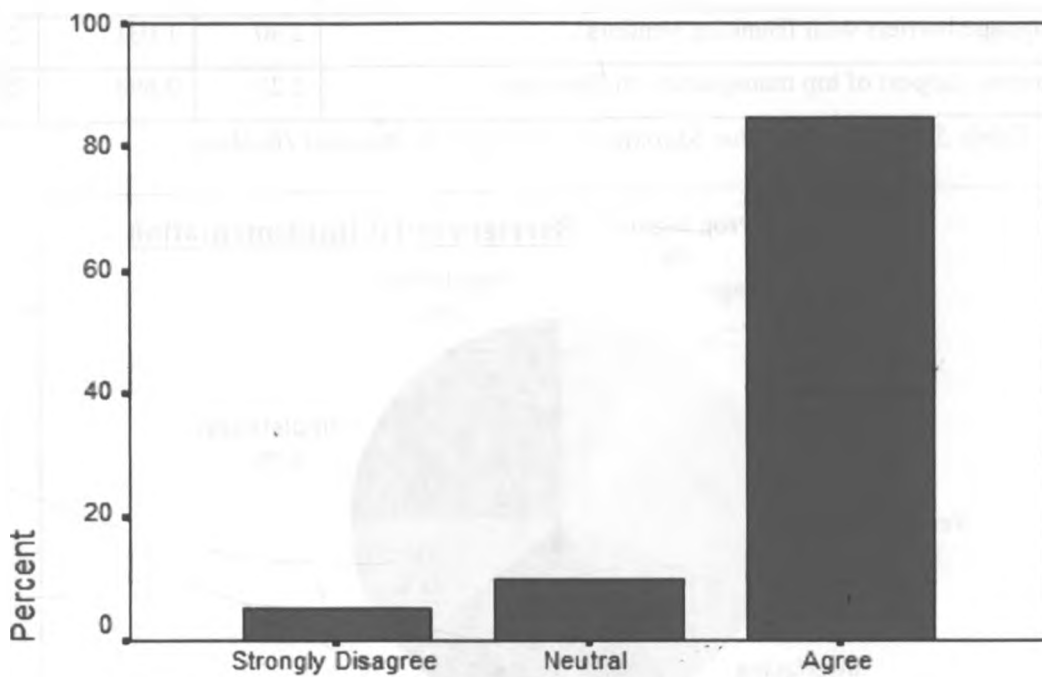
Fig. 5.37: Internet banking system acquisition

5.4.3.6 Barriers to IB implementation by Commercial banks

Descriptive Statistics for Barriers to Internet banking Implementation and Support			
	Mean	Std. Deviation	Analysis N
Suitable regulations for IBanking	3.95	0.51	20
Presenting a comprehensive internet banking website	3.90	1.373	20
Finding appropriate telecommunication, software, hardware and technical infrastructure for IBanking.	3.70	0.571	20
Integrating IBanking with bank's legacy (core) systems.	3.55	1.234	20
Understanding IBanking quality in customer's terms	3.50	0.761	20
Customizing internet banking to support mobile banking activities e.g integrate with M-Pesa, M-Kesho etc.	3.15	1.089	20
Lack of support from IBanking vendors	3.05	0.686	20
Getting educated and efficient staff in supporting internet banking	2.35	0.745	20
Language barriers with IBanking vendors	2.30	1.031	20
Winning support of top management in IBanking.	2.20	0.894	20

Table 5.124: Descriptive Statistics – Barriers to Internet Banking
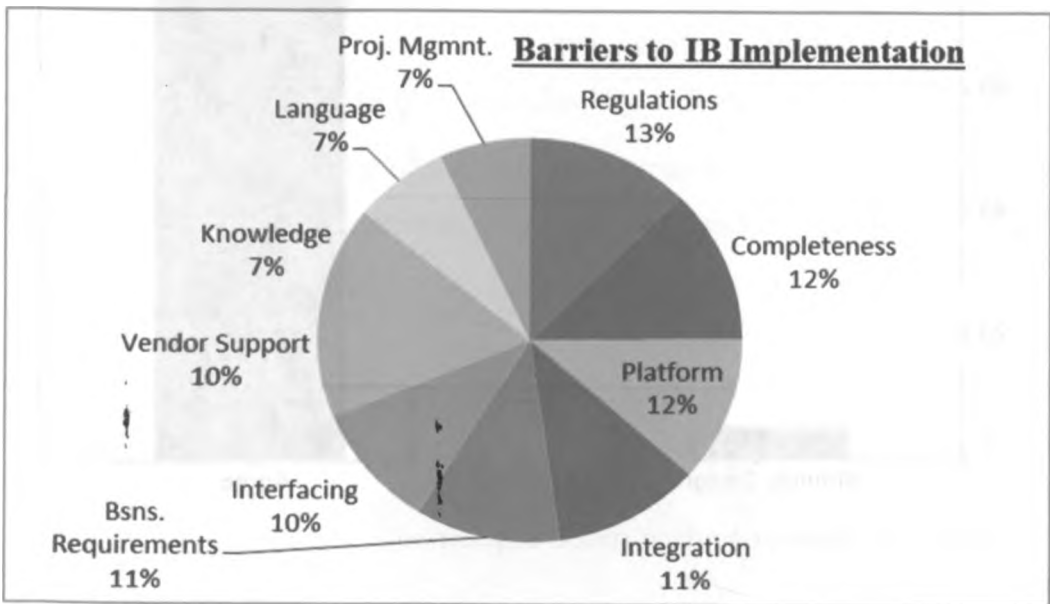
Fig. 5.38: Barriers to Internet Banking

We find from banks that the laws in Kenya have not been supportive towards Internet banking (mean-3.95). From organization perspective, Internet banking sites have not been comprehensive enough to customers' expectations (mean-3.90). This is owing to vendor acquired systems. Integration of Internet banking systems with banks core

systems is the next challenge (mean-3.70) followed by user requirements for Internet banking. Since all these are aspects that face banks internally in their implementation of Internet banking systems, it is critical for Internet banking project managers to consider all the barriers and manage them effectively in the process of implementing Internet banking systems projects.

5.5   Overall Reliability of the Instrument

The reliability of the research instrument is concerned with consistency. This research used cronbach's Alphha value in order to assess the internal consistency of the results across items within a test. The Cronbach alpha value was 0.8902 which is above the recommended value of 0.7 as suggested in the literature (Hair et al.)

```
****** Method 1 (space saver) will be used for this analysis ******


  R E L I A B I L I T Y    A N A L Y S I S   -   S C A L E    (A L P H
A)
Item-total Statistics
               Scale         Scale       Corrected
               Mean          Variance     Item-            Alpha
               if Item       if Item      Total            if Item
               Deleted       Deleted     Correlation       Deleted
IBVALUE        48.4018       50.0083       .7509            .9143
IBFAST         48.3661       51.2612       .5971            .9202
EFFECTIV       48.3304       49.0881       .7881            .9127
QUALITY        48.5446       48.5385       .8788            .9093
IBSIMPLE       48.6786       48.1120       .9636            .9064
IBSLKILL       48.6339       49.1351       .8412            .9109
IBEASY         48.8036       53.2403       .5633            .9210
TUNE_IB        49.1250       48.7590       .7437            .9145
CUSTREQ        48.8036       52.9521       .5084            .9231
CUST_USE       49.5000       62.0360      -.3141            .9428
MGTSPRT        48.9643       53.1338       .6783            .9182
SUPPORT        49.1875       47.9555       .7041            .9170
RESOURCE       48.7321       48.5222       .8588            .9099
Reliability Coefficients
N of Cases =    112.0                 N of Items = 13
 Alpha =    .9234
```

Table 5.125: Chronbach's Alpha on Corporate customer field data.

5.6 Inferential Analysis

This section illustrates the results of the testing of the statistical significance regression models. Simple linear regression was used aa the main tool in the inferential analysis.

5.7 Analysis of Regression data

At this stage, in order to determine the rate of impact of independent variables on dependent variables, a test of "multiple regression analysis" by the method of step-by step has been carried out. The dependent variable USE has related variables, which are: Usability, External and Internal Environments. The results are as follows:

5.7.1 Banking industry and interaction with forces – Internal forces

To determine the impact of independent variables on the dependent variables behavioural Intention, use behaviour, all the variables under internal forces were considered and entered in the model.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.794(a)	.631	.578	.62917

a Predictors: (Constant), BI, USE

Table 5.126: Regression analysis – Internal forces

We see a better fit between the variables since the R^2 value is .631.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.291	.705		.413	.686
	PAVER	-.129	.391	-.106	-.330	.746
	ICTAVER	.977	.355	.884	2.751	.016

a Dependent Variable: USE

Table 5.127: Regression coefficients – Internal forces

5.7.2 Banking industry and interaction with forces – External forces

To determine the impact of independent variables on the dependent variables behavioural Intention, use behaviour, all the variables under external forces were considered and entered in the model.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.304(a)	.092	.042	4.365

a Predictors: (Constant), BI, USE

Table 5.128: Regression analysis – External forces

We see a weak fit between the variables and Use since the R^2 value is .092.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	36.099	4.752		7.596	0.000
	USE	-0.234	0.250	-0.215	-0.936	0.362

a Dependent Variable: USE

Table 5.129: Regression coefficients – External forces

5.7.3 Banking industry and interaction with forces – Usability

To determine the impact of independent variables on the dependent variables behavioural Intention, use behaviour, all the variables under usability were considered and entered in the model.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.841(a)	.707	.706	3.48644

a Predictors: (Constant), BI, USE

Table 5.130: Regression analysis – Usability

We see a weak fit between the variables and Use since the R^2 value is .707.

Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	36.099	4.752		7.596	0.000
	USE	-0.234	0.250	-0.215	-0.936	0.362

a Dependent Variable: USE

Table 5.131: Regression coefficients – Usability

CHAPTER 6: SUGGESTED FRAMEWORK

6.0 Chapter Overview

This chapter explains the proposed framework as well as discussions and framework validations. Banking industry and Interaction with Forces, Usability of Internet Portals and UTAUT were used in creation of this framework.

The purpose of the study was to establish key technology considerations in offering Internet banking in Kenya and banks' perception of the strategic value of Internet Banking in their relationships with customers as well as hindrances customers face in adopting Internet banking. Finally, the researcher purposed to develop a framework for facilitating growth of Internet banking in the country.

6.1 Current state of Internet Banking in Kenya.

We established from the research that Internet banking is still at the early stages of take-off in Kenya with 12 out of 43 banks having implemented (28% of the banks). Its implementation has been restricted to the mainstream commercial banks and their mainly due to demands by Corporate clientele. Retail customers of banks are largely left out of the technology. Majority of the banks that have not implemented Internet banking have embraced the idea with many being at various stages in the implementation process. This sounds good for the technology in the near future.

It is encouraging that Infrastructure is improving in terms of connectivity with many young Kenyans turning to technology especially Internet and the government is also increasing its investment in ICT and putting in place policies to embrace electronic processing of data in its operations. This lays the ground upon which Internet banking will find its market share especially among the retail Kenyan populace.

6.2 Conceptual Framework

The suggested framework suitable for Internet banking growth in Kenya was derived from Literature review, banking Industry and Interaction with forces, Portal Quality, UTAUT and study carried out with commercial banks and customers in Kenya.
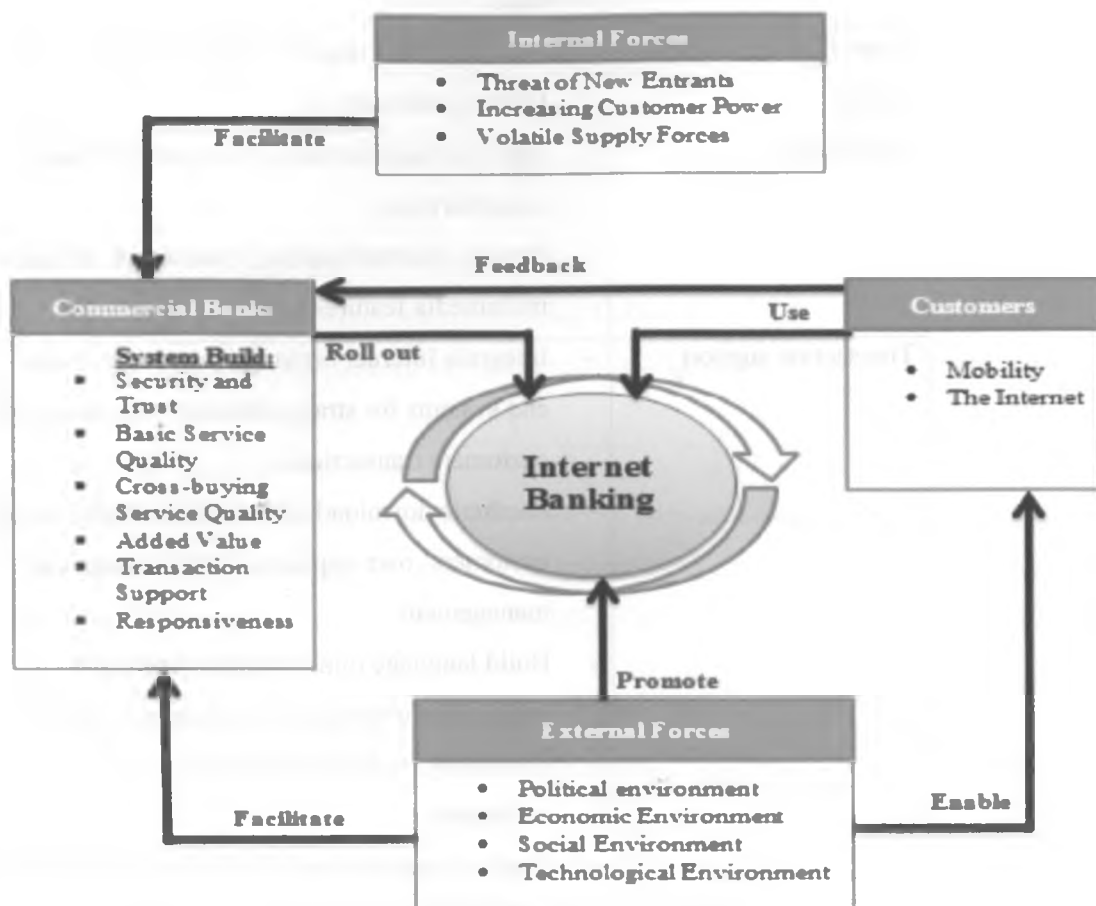
Fig. 6.0: Conceptual Framework for Improving Internet banking in Kenya

Dimension	Elements	Processes
Forces - Internal	Threat of new entrants	- Strategies to counter perceived threat
	Increasing Customer Power	- Appropriate response to customer demands for services
	Volatile Supply Forces	- Create more channels of accessing banking services
Forces - External	Political Environment	- Stable policies towards Internet banking
	Economic Environment	- Creates propensity to spend
	Social Environment	- Disseminate Internet banking product information and awareness
	Technological Environment	- Creates enabling platform for utilization of Internet banking
Usability	Security and Trust.	- Build complete security of Internet banking system and transactions
	Basic Internet banking service quality	- Create core services into Internet banking portal – typical of those offered within banking

		-	halls
	Cross-buying service quality	-	Build different modes of payment for Internet banking transactions
	Added value	-	Add non-bank services to Internet banking for customers use.
		-	Provide Internet banking system with different multimedia features.
	Transaction support	-	Integrate Internet banking system with back-end systems for straight through processing of customers transactions.
		-	Facilitate download of financial information to customers' own applications for personalised management.
		-	Build language option on the system and explain use of each button by mouse-over-texts
		-	Constantly update Internet banking information.
		-	Build a comprehensive FAQ to help customers solve their problems on Internet banking on their own.
		-	Have a call-back or email system telling the customer when to expect feedback on any issues raised.
	Responsiveness	-	Ensure the system is available 24/7
		-	Present a system that customers can personalize to their preference
		-	Let customers interact with their newsgroups while banking over the Internet
		-	State clearly the service level agreement for issues raised by customers while on Internet banking
		-	Have an in-bound or outbound email system to deal with customer complaints.
Utilization	Awareness	-	Create awareness of the existence of Internet banking among customers
	Acceptance	-	Evaluate the product based on formed

			expectations on product performance
	Use	-	Decide on the product to adopt based on how well they meet the customers' needs

Table 6.0: Dimensions for the conceptual Internet banking improvement framework

6.2.1 Components of the framework

6.2.1.1 Internal forces within banking Industry

The below section should be read alongside section 2.4.2 of the Literature review.

a. Threat of new entrants.

As more and more banks turn to Internet banking, desire to consolidate market niche and wallet-sizing (ensuring that acquired customers use the products to the optimal for increased returns) creates need for banks to follow the competition by deciding to roll out Internet banking.

b. Increasing customer power.

As more customers demand for real time information from banks, technology avails a bounty to deliver this need and since banking has evolved from its original bricks-and-mortar to its current click-and-mortar form, customers are demanding more autonomy in terms of being able to handle their financial information on their own hence the pressure on banks to deliver this using technology.

c. Volatile supply forces

Technology has brought down the cost of doing business globally and customers have come to be cost conscious in their financial management. This calls for banks to find alternative ways of offering the same range of products at lower costs so that they can maximize returns by driving transactions volumes up through these channels.

6.2.1.2 External Environmental Forces

The below section should be read alongside section 2.4.1 of the Literature review.

i. Political environment.

At the centre of every nation's progress is the political climate. This has direct bearing on the investment climate as well as policy making capacity. The political climate is essential for formulating policies that promote the use of electronic banking especially Internet.

ii. 'Economic environment

This has a direct bearing on the cyclic flow of income by affecting the net disposable income and investment patterns of consumers. It serves as an incentive to customers to spend and save hence considered an enabler to internet banking utilization.

iii. Social environment

People live and work within groups of communities and have certain shared values and norms. The communities have found great interest in computing with many people spending a lot of their time on the World Wide Web. Banks are better placed by availing baking services where these communities spend a good proportion of their time. By doing so, they will serve to make banking part of the lifestyle of these communities hence promote usage.

iv. Technological environment

Technology is changing the way businesses are conducted across the globe. With globalization brought about by technology, players in this market have positioned themselves to be competitive in this global arena. Internet banking proves to be the viable bounty to conduct banking in this globalized market.

6.2.1.3 Usability of Internet Banking Systems

The forces above form a push that inputs into banks' decisions to implement Internet banking systems as part of their delivery strategies. Once the idea has been conceived and the banking institutions are ready to embark on the process, organizational considerations set in to ensure the product that goes into the market meets customers' expectations. Key inputs into organization of Internet banking are:

i. Security and Trust

This covers the entire security apparatus of the Internet banking system in three distinct levels namely:

- Security at the user side: this covers physical access control at the machine where the user is accessing Internet banking services as well as user authentication and authorization. This also entails visible security i.e

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SSL certification as additional assurance to the customer that the bank's Internet banking site is secure.

- **Security during transport of data:** this ensures that the link between the customer terminal and the bank is secured from attacks by hackers. This ensures that the customer's information is held confidential and any data sent from the customer's terminal is kept secure and delivered to the intended destination.
- **Security at the merchant side:** this entails detail security at the banks side. It utilises appropriate security around the Internet banking system ensuring secure storage of user information, protection of users privacy and accurate authentication of the parties involved prior to granting access to use of Internet banking resources.

ii.   Basic Service Quality.

Here, banks review their products and aim to incorporate as many of the products as possible into the Internet banking system. This variety will enable customers meet their banking needs from one point (portal) without the need to get to other channels for the same services. Considerations to be in-built are ease of use of the systems and options for different modes of payment.

iii.   Cross-Buying Service Quality

Banks should brand the products offered over Internet banking channels just the same way they do to those on other channels and aim to include products whose applications/subscriptions can be initiated online. This ensures customers get the same flavour of products as they would if they visited a bank branch.

iv.   Added Value.

Entertainment is an essential component of Internet computing. Where possible, the banks could build Internet banking with some multimedia features i.e product demos etc. customers also have certain useful links they wish to access from the Internet banking site e.g utility bills, air ticket payment, online stores etc. The banks could identify these links and provide soft links to these sites with capability of customers to make payments to them.

v. Transaction support.

The following considerations are necessary to support the customers in their Internet banking transactions:

- Straight-through processing with immediate results upon completing a transaction.
- Language selection as per customers' preference.
- Explanations on proper usage of the system i.e mouse-over texts explaining usage of buttons on navigation menus.
- Current and timely information on Internet banking which is rich in detail and constantly updated.
- Capability to download financial information from Internet banking to customers own systems for personalised management.
- Comprehensive FAQ to help customers solve problems on their own while using Internet banking.
- A call-back or email system telling the customer when to expect feedback on any issue raised through Internet banking.

vi. Responsiveness.

Banks should work on the availability of the Internet banking system to ensure round-the-clock access. They should also offer the possibility to personalize the interface to customers taste as well as offer newsgroups/communities within the Internet banking so that customers can interact whilst doing banking transactions. Feedback to customers should be clearly stated on the Internet banking site in terms of achievable SLA as well as an in/outbound email system to deal with customer complaints.

6.1.2.4 Acceptance and use of Internet Banking Systems by Customers

Customers on the other hand will provide feedback to banks in terms of their expectations which the banks will use to further improve their Internet banking models. Their utilization of the Internet banking products will be pegged on two things namely:

- **Awareness:** customers have to first know about the existence of Internet banking in the market. It is the sole responsibility of banks to make their customers aware of this development in their product access channel.

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- **Acceptance:** once the customer is made aware of the existence of the product, a search process is invoked in the customers mind. The customer generates some expectations and evaluates products based on these expectations before arriving at the appropriate product. Acceptance therefore will be greatly influenced by customers assessment of:
  - Performance expectancy of Internet Banking
  - Effort Expectancy of Internet Banking
  - The effect of Social Norm or group pressure of Internet Banking users
  - Facilitating Conditions for Internet banking use
- **Use of Internet Banking:** based on the evaluation of the pre-determined expectations above, a customer selects an Internet banking system that meets his need and begins the process of subscription leading to eventual Usage of the system.

6.3   Framework Validation.

The framework was tested on its suitability for improving Internet banking business in the country. This was done by developing questionnaires based on framework elements.

A total of 150 questionnaires were distributed to individual Internet banking customers, 50 to corporate customers and 5 to commercial banks. 117 valid responses were received from individual customers, 33 from corporate customers and 3 from commercial banks representing 78%, 66% and 60% response rate respectively.

A. Characteristics of response.

i. Gender distribution.
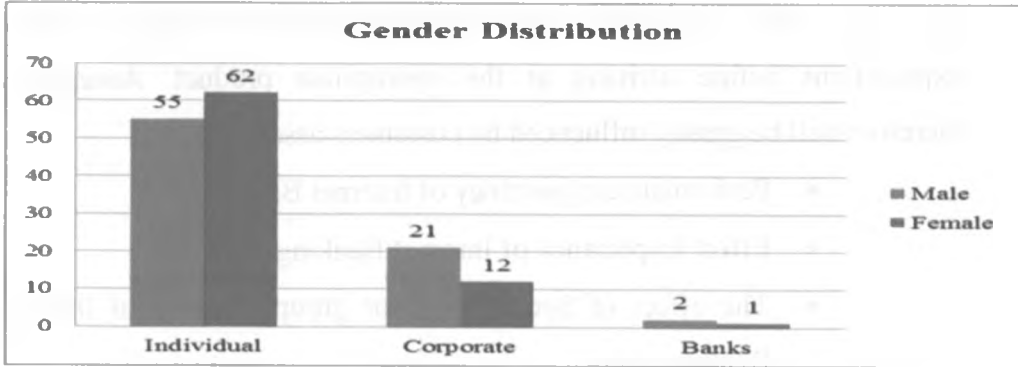
Fig. 6.1: Gender distribution for validated framework data

51% of the respondents were males while 49% of the repsondents were females as can be seen from the graph above.

ii. Reliability test.

We subjected the questionnaire to reliability test using Chronbach's alpha. The alpha was found to be 0.9061 which is above 0.7 which qualify the instrument as shown table 6.1 below:

```
****** Method 1 (space saver) will be used for this analysis ******

  R E L I A B I L I T Y   A N A L Y S I S   -   S C A L E   (A L P H
A)
Item-total Statistics
```

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Alpha if Item Deleted
IB_VALUE	40.1150	47.5313	.7640	.8921
IB_FAST	40.1770	47.2005	.7466	.8925
EFECTIVE	40.0973	48.1958	.7426	.8936
QUALITY	40.3009	46.5337	.7248	.8933
IBSIMPLE	40.3805	46.5414	.7609	.8914
IBSKILLS	40.3894	47.7220	.6901	.8954
IBEASY	40.4159	48.1915	.6881	.8958
TUNE_IB	40.7965	48.5028	.5614	.9025
FAMILY	41.0619	48.0408	.4750	.9104
FRIENDS	40.5133	48.6628	.5244	.9050
RESOURCE	40.3540	49.3736	.5764	.9013

```
Reliability Coefficients

N of Cases =    113.0                    N of Items = 11

Alpha =    .9061
```
Table 6.1: Chronbach's alpha for validated framework data.

iii.   Regression analysis of validation data

The validation of this framework was performed using regression analysis. Regression analysis is a statistical method to deal with formulation of mathematical model depicting relationship amongst variables which can be used for predicting values of dependent variable, given the value of independent variable (Kothari, 2008). Regression analysis is used to explore the relationship between one continuous dependent variable and a number of independent variables or predictors, usually continuous.

In this analysis, it is typical to use R^2 to describe the quality of the relationship between the actual response variable and the predicted response variable. Values for R^2 range between 0 and 1, with values closer to 1 indicating a better fit.

Our research model on element utilization when subjected to regression analysis yielded an R^2 value of 0.615 indicating a good research model as shown in table 6.2

Regression Model Summary for utilization

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.615(a)	.378	.261	11.60263

a Predictors: (Constant), USABLTY, INTNFRCS, EXTNFRCS

Table 6.2: Regression model summary for Internet banking Utilization.

Regression analysis allows for sophisticated exploration of the inter-relationships among a set of variables, making it ideal for the investigation of complex real life research questions (Kothari, 2008). It outlines how well a set of variables is able to predict a particular outcome.

The Sig value explains whether the variable is making a significant unique statistical contribution to the equation. If the Sig value is less than 0.05, then the variable is significantly contributing to the prediction of the dependent variable. If the value is greater than 0.05, then the variable is not making a significant unique contribution to the prediction of dependent variable.
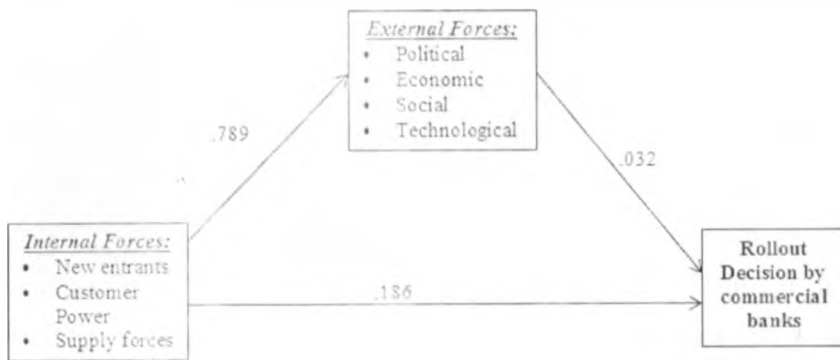
Fig. 6.2: Rollout validated model.

Fig. 6.2 above shows values for constructs based on their contribution to the banks'
decision to roll out of Internet banking. Table 5.136 below details the regression
coefficients under element rollout decision.

Construct	Dependent	Beta	Significant Value (Sig.)	Comments
New entrants	Rollout decision	0.078	0.75	There is no influence
Customer Power	Rollout decision	-0.641	0.01	There is influence
Supply Forces	Rollout decision	0.118	0.53	There is no influence
New entrants	POLTENV	-0.66	0.01	There is influence
New entrants	ECNMCENV	0.03	0.95	There is no influence
New entrants	SOCLENV	0.99	0.02	There is influence
New entrants	TECHENV	-0.20	0.35	There is no influence
Customer Power	POLTENV	-0.22	0.33	There is no influence
Customer Power	ECNMCENV	0.84	0.05	There is influence
Customer Power	SOCLENV	-1.28	0.00	There is influence
Customer Power	TECHENV	0.51	0.02	There is influence
Supply Forces	POLTENV	0.16	0.70	There is no influence
Supply Forces	ECNMCENV	-0.23	0.77	There is no influence
Supply Forces	SOCLENV	0.20	0.77	There is no influence
Supply Forces	TECHENV	-0.14	0.71	There is no influence
Rollout decision	POLTENV	-0.08	0.78	There is no influence
Rollout decision	ECNMCENV	-0.84	0.14	There is no influence
Rollout	SOCLENV	1.30	0.02	There is influence

decision				
Rollout decision	TECHENV	-0.25	0.36	There is no influence

Table 6.3: Regression Coefficients for constructs under Rollout

Each construct significantly influences the dependent variable if the resulting sig. value < 0.05.

Fear of competition and need to increase the number of channels of accessing banking services do not contribute significantly to banks decision to roll out Internet banking although it was greatly expected they would. However, customer demands for e-banking services significantly contribute towards banks rollout decisions. This confirms the transformation of banking from product-centered to customer-centered.

Interestingly, we establish some linkage between internal forces and external forces. For instance, we find that more banks rolling out Internet banking has an effect on the political and social environment. This could be so because, increased competition and staff turnover within the banking industry creates price-wars that find their way to the political class as we witnessed in the recent fall in costs in the mobile telephony in Kenya that ended up in parliament for debate. This would not affect the economic and technological environment in the country.

Customer power would shape the economic, social and technological environments towards Internet banking. When customers' demands for Internet banking service grows, they will be deemed to have the propensity to spend (economic power); interact and influence each other in their communities (social) and have the appropriate skills set for accessing and using the service (technological). However, these demands have no influence on the political environment.

Banks' need to increase channels of accessing banking services at lower costs (volatile supply forces) has no effect at all on the four environments. This was expected as it is purely a force within each player in the Internet banking market.

Similarly, many banks rolling out Internet banking will in turn have an effect on the social environment and not any other (political, economic and 'technological). Expectations here are that:

- Banks will customize products to target specific market niches
- Popularity of these services will in turn attract masses towards them owing to the social links within these groups hence be a source of profitability to the banks.

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iv. Regression test on utilization of Internet banking

Our research model on element Internet banking Use model when subjected to regression analysis yielded an R^2 value of 0.666 indicating a good research model as shown in table 6.4 below:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.816(a)	.666	.664	6.37833

a Predictors: (Constant), USE, AWARENS, ACCEPTNS

Table 6.4: Regression model summary for Internet banking Utilization
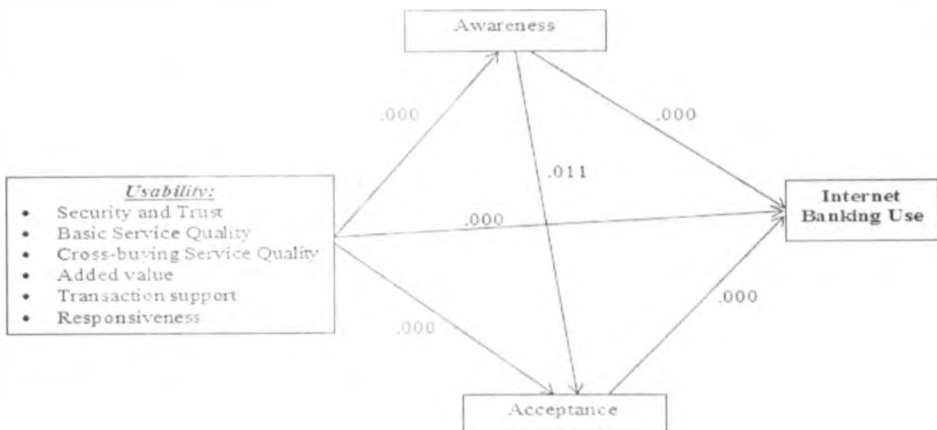
Fig. 6.3: Internet banking use validated model

v. Use validated Model.

We also tested whether usability influences Internet banking use.

Construct	Dependent	Beta	Significant Value (Sig.)	Comments
Security and Trust	Acceptance	0.83	0.00	There is significant influence
Basic Service Quality	Acceptance	0.90	0.00	There is significant influence
Cross-buying service quality	Acceptance	0.85	0.00	There is significant influence
Added value	Acceptance	0.84	0.00	There is significant influence
Transaction support	Acceptance	0.86	0.00	There is significant influence
Responsiveness	Acceptance	0.91	0.00	There is significant influence
Security and Trust	Awareness	-0.13	0.00	There is significant influence
Basic Service Quality	Awareness	-0.09	0.05	There is significant influence
Cross-buying service quality	Awareness	0.00	0.98	There is no significant influence

Added value	Awareness	0.13	0.01	There is significant influence
Transaction support	Awareness	-0.01	0.82	There is no significant influence
Responsiveness	Awareness	-0.13	0.01	There is significant influence
Security and Trust	Use	0.14	0.02	There is significant influence
Basic Service Quality	Use	0.01	0.88	There is no significant influence
Cross-buying service quality	Use	-0.06	0.40	There is no significant influence
Added value	Use	-0.15	0.02	There is significant influence
Transaction support	Use	0.02	0.77	There is no significant influence
Responsiveness	Use	0.00	0.99	There is no significant influence

Table 6.5: Effect of building a usable Internet banking system on its eventual acceptance and use

On awareness of Internet banking, we establish from the table above that Usability has significant influence in creating Internet banking awareness except transaction support and cross-buying service quality. This implies that banks have to carefully evaluate the build of security, basic service quality, added value and responsiveness into their Internet banking systems if the expected significance is to be realized in terms of creating awareness on their eventual Internet banking systems.

On acceptance, we find that all the usability constructs have significant influence. This means that if carefully built and tested, users are more likely to accept and the Internet banking system eventually rolled out.

We do not find direct influence of usability on use of Internet banking as all the constructs have no significant influence. However, as established earlier that behavioural Intention had direct effect on use behaviour, we can conclude that use behaviour will be significantly impacted by acceptance through usability.

6.4   Current state of Internet banking based on Framework Components

Dimension	Elements	Remarks on current state of Internet banking.
Forces	Threat of new entrants	- There is no significant threat in one commercial bank rolling out Internet banking ahead of another. - As such, each bank embarked or plans to start rollout at its most appropriate time.
	Increasing Customer Power	- Banking has changed from product-oriented to customer-oriented.

		- Banks have therefore realised that to remain in business, they have to deliver products that customers want. - A lot of research is on-going within the industry to identify these demands and implement them ahead of competition. - *'Electronic banking'* has been created as a department in many banks to spearhead these initiatives - Customer service departments have been beefed up to increase support for customers on bank products.
	Volatile Supply Forces	- Mere increase of number of customer touch points with bank products is not enough. - Quality of service and consistency of service level is key in bank-customer relationship.
	Political Environment	- Has no place in banks decision to roll out Internet banking system to its customers
	Economic Environment	- Has no place in banks decision to roll out Internet banking system to its customers
	Social Environment	- Banks talk to one another on similar products and services - This leads to Internet banking products that are nearly similar across all the banks - It is the service level that eventually differentiate the Internet banking products
	Technological Environment	- Banks are continuously reviewing the performance of their systems to meet customer expectations in forms of information capture, processing, storage and retrievals.
Usability	Security and Trust	- This is on-going in every bank that has Internet banking. - New security challenges are emerging and banks continuously strategize on how best to counter them.
	Basic Internet banking service quality	- Constant analysis is being performed on the utilization of various Internet banking products based on the transaction volumes generated from their use - Constant publicity is being done by banks to increase usage of certain products
	Cross-buying service quality	- This service has not picked up quite well within Internet banking. - Most banks prefer to have the customer present himself

		personally to subscribe for Internet banking services.
		- The forms are available for download from banks main website
	Added value	- This category of services does not feature at all within Internet banking
	Transaction support	- Straight through processing of transactions from Internet banking has proved a challenge to most banks
		- Enough downtime is experienced periodically especially during peak periods like end of month
		- Few banks have demos on Internet banking product usage
		- FAQ on Internet banking is featured but content is very static
		- An feedback email is available for customers to communicate their issues on Internet banking to the bank
		- No bank has an expressly stated SLA on the Internet banking site of turnaround time to deliver solution to customer
	Responsiveness	- Internet banking system availability is a challenge to most banks
		- Basic personalization of Interface is available on Internet banking but not used by customers
Acceptance and use	Awareness	- Generally customers are aware of the existence of Internet banking in the market.
		- Since transactions with banks are pegged to customer accounts, this tends to tie the customer to bank's Internet banking.
		- Where a customer is not satisfied, a switch will mean opening a new account with the competitor and starting the process of subscription afresh.
	Acceptance	- Customers are willing to use internet banking if banks address their CIA issues of the service.
	Use	- The level of use of Internet banking is pegged to how well the banks meet customers' expectations.

Table 6.6: Current state of Internet banking based on Framework Components

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 Chapter Overview

This chapter presents the findings of the research objectives as well as makes necessary recommendations.

7.2 Research Objectives

7.2.1 Value of Internet banking in Bank-customer Relationship

From the banks perspective, the value of Internet banking in bank-customer relationship is considered moderate as 70% of the banks that responded confirmed that it was important and only 30% responded that it was indeed very important. This was against the researcher's view of the subject.

From the banks, Internet banking being a technical solution is faced by a number of challenges and most of them expressed reservations to roll out Internet banking especially to retail customers. A number of reasons were given for the reservations with security topping the list. Overall, the technology has proved to be useful in bank-customer relationship and therefore should not be ignored in the channel delivery strategy of banks. As outlined in section 2.5.1 of the literature review, the business drivers of banks in scoping for Internet banking should strive to justify the cost of these systems in medium and long term as they command sizeable initial capital investment to acquire.

7.3 Technology considerations for Internet Banking

In order to recommend the key technology considerations for offering Internet banking, we base our recommendations on the response from usability assessment of Internet banking.

(a) Transaction Support.

Considerations for support of customer transactions over Internet banking which the technology should address are:

- Validation of transaction information. The system should support the customer while transacting through Internet banking. For instance, if the customer keys in an account number when making a transaction, the system should fetch

corresponding details e.g account name and display for the customer comfort that s/he is transacting on the right account. This would help customers eliminate fear of making mistakes over Internet banking use.

- Straight through processing of customers transactions. Banks should work on the online interfaces between Internet banking and the back-end systems and ensure high availability at the back end with minimal off-line interfaces.

- Interfacing between Internet banking systems and customers back-end applications. At the very least, information from Internet banking should be able to be downloaded in standard file formats that customers can then load into their back-end or third party systems for their own manipulations.

- Careful consideration of hardware and software based on projected transaction volumes should be done with appropriate traffic management component to ensure that Internet banking systems respond appropriately to customer requests and avert undue delays.

(b) System responsiveness.

Customers do not expect Internet banking system to be unavailable for any reasons. Hence banks have to ensure that Internet banking systems are up 24/7. This is a daunting task for banks especially considering that some of the outages are external to them and the customer may not know hence blame the bank for factors beyond the banks control. To be more responsive, Internet banking systems should be built with capability to send downtime alert SMSes to key bank personnel automatically. This would increase the banks' responsiveness to such systems downtime by triggering prompt follow-up which is expected to reduce the turnaround time from systems downtime.

The internet banking interface should also include 'favourites tab' that enable customers group most frequently accessed functions together for their convenience and ease of access.

(c) Security and trust.

This was expected to be the factor with the greatest impact on Internet banking operations and surprisingly it has emerged third with a mean response of 23.87. The banks should build security features that secure the customers payment data and details across the Internet combined with appropriate authentication. Where possible, this authentication should be invoked each time a transaction is being generated just to ensure the authenticated customer is accessing the service.

Since most of the security architecture is identified by the Internet banking software vendor in the system architecture documents as most banks buy Internet banking systems from vendors, banks should review these carefully and ensure they meet the required security standards.

Security should be treated as an on-going activity since new Internet-related threats emerge almost daily. Banks should further engage Internet security experts to perform penetration tests on their Internet banking systems periodically. This ensures that new vulnerabilities and pre-empted and remedial measures put in place.

Finally, feedback system should be in place to advice the customers of completion of a transaction. This calls for either an SMS service being part of the Internet banking system but most preferably, an interface with the bank's SMS system should be built such that on completing a transaction over Internet banking, an SMS is triggered to send details of concluded transaction to the customer's cell phone. This would raise alarm to the customer if the customer's account is accessed by unauthorised persons for immediate action.

(d) Support.

There should be continuous adequate support for Internet banking including an email option on the Internet banking system for customers to raise their issues directly with the bank. Since customer support is key to success of Internet banking, these complaints should be channelled through an automatic issue management (e.g customer relationship management) system that is able to log these calls and inform the customer by email or any appropriate contact when to expect feedback on the issue(s) raised. This will improve customer confidence in the system as well as keep the bank on toes to deliver solution to the customer within the service level.

7.4   Hindrances customers face in adopting Internet Banking

There are a number of issues customers face with regard to Internet banking notably:
- Security and reliability. Corporate customers are concerned about security and reliability of transactions via the Internet (Rotchanakitumnuai and Speece, 2003). Customers feel that the banks have not addressed security and reliability adequately over Internet banking. Banks therefore have to work on their obligations especially regarding customer indemnity for losses incurred as a result of the banks' fault if customers are to trust their Internet banking systems for increased usage. Unless the customers are convinced that the bank will indemnify them for losses arising out of

using Internet banking that are a result of the banks' fault, they will remain hesitant to use the service. Therefore this should be captured clearly in the disclaimer statement.

- Charges. Internet banking was touted to offer both cost and time saving benefits to customers. However, quite positive perception of benefits has not translated into heavy usage by customers. Users are mainly using Internet banking in trial mode, and primarily for information, not for much volume of transactions. Internet banking was not perceived in general as offering considerable cost-savings, but only the time-saving component of the cost benefit. Hence to realise the cost element of the benefit, banks ought to revise their internet banking related costs downwards to realise this benefit especially monthly subscription fees.

7.5   Limitations and Suggestions for Future Research

In the process of conducting this research study, a number of limitations were encountered. Lack of funds hindered the research to the extent that information from remote locations of the country were not collected fully and even the participants from these locations reported connectivity challenges while emailing their responses to an extent that some responses confirmed to have been emailed never reached the researcher. It would have been better if such information was collected by hand.

Rigidity of banking institutions was yet another challenge. Bureaucratic procedures pervaded obtaining information from these institutions as the researcher had to be referred to different staff, some of who were not knowledgeable enough on the subject matter. Others just declined to respond citing various reasons for the same.

The applicability of the constructs proposed in the framework for Internet banking business needs to be explored in future research. More so, future research on the subject needs to focus on the impact of Quality in Internet banking which includes much more variables than just usability alone as this is the core of customer acceptance of Internet banking in Kenya.

Further research should also investigate the impact of adoption and use of Internet banking on the broader areas of the corporate customer interaction with the bank. Gaining the benefits from use of Internet banking may help create better relationships between bank and corporate customer. Through these, the Internet banking channel may be able to indirectly contribute to greater customer loyalty, which is critical in the ever more competitive banking industry. Our results show that, like elsewhere, there seems to be strong potential for Internet banking. The results also demonstrate

that it is going to take some work to fully realize the potential. There is still quite a lot of work that needs to be done to understand customer response to Internet service channels well.

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Appendix 1 - Internet Banking Questionnaire for Personal Customers

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PART I: This part is to be answered by Personal account holders

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My name is Julius Mboya, a student at the University of Nairobi School of Computing and Informatics.

I am currently undertaking a research for my Masters of Science degree in Information Systems on Internet Banking entitled: Internet Banking; A Nascent Banking Delivery Channel in Kenya.

The focus of my research is to examine the strategic value of web-based internet banking (IBanking) to individual customers as well as any difficulties they face in their use of these systems.

The questions asked have been designed from an interdisciplinary literature review on the general field of internet banking.

This research is purely academic, confidential and will be solely used for that purpose. Your details or data provided will not be passed to any third party without your prior permission. I wish to communicate information about the survey results to you should you be interested. Please attach your email address or any other contact if you wish to receive a copy of the report.

I wish you take a moment of your time to answer the questions below. I will greatly appreciate your frank and critical response to this questionnaire. Should you need any clarification, please don't hesitate to contact me as follows:

Julius Mboya

Mobile: + 254- 721-827-384

Email: jomboya@gmail.com

Please Note:

- *Internet banking in this context refers to web-based banking where banks use the Internet (World Wide Web) to offer banking services to their customers. It DOES NOT include similar services like mobile banking, prone banking, SMS banking etc.*
- *For internal validity of the questionnaire, some items may appear as if they are repeated.*
- *To make your choices, check ☒ ONE option per question. Where opinion is sought, type i.e* abcdefghijkl *into the space provided.*

Section A: Demographic Information

1. Your name (optional)

2. Describe your level of education?

   Primary ☐   High School ☐   College ☐   Graduate ☐   Post   Graduate ☐

3. Nature of employment.

   Public Sector ☐   Private Sector ☐   Free lancing ☐   My   own business ☐

4. Gender.

   Male ☐   Female ☐

5. Select your age from the sets given below.

   18 – 24 yrs ☐   25 – 30 yrs ☐   31 – 35 yrs ☐   36 – 40 yrs ☐
   41 – 45 yrs ☐   46 – 50 yrs ☐   51 – 55 yrs ☐   > 55 yrs ☐

6. Marital status.

   Single ☐   Married ☐   Divorced / Separated ☐   Other ☐
   (specify):

7. How would you describe your computer knowledge?

   Not knowledgeable ☐   Moderate ☐   Good ☐   Excellent ☐

8. How would you describe your internet knowledge?

   Not knowledgeable ☐   Moderate ☐   Good ☐   Excellent ☐

9. How long have you been using the Internet?

   Don't use ☐   < 1 yr ☐   1 – 2 yrs ☐   > 2 yrs ☐

10. How many hours do you spend on the Internet on average in a day?

Don't use ☐   < 1 hr ☐   1 – 2 hrs ☐   > 2 hrs ☐

Section B: Value, Quality and Trust of Internet Banking

11. Do any of your banks offer personalized banking services to you over the internet?

  ☐   Yes   **(if yes, continue answering from question 12.)**

  ☐   No   **(if no, jump to question 14 onwards)**

12. Have you subscribed to internet banking service offered by your bank?

  ☐   Yes   **(if yes, jump to question 14.)**

  ☐   No   **(if no, answer questions 13 to 25)**

13. If your answer to question 12 is **no**, do you intend to subscribe to internet banking in the near future?

  ☐   Yes   **(if yes, continue from question 14 onwards)**

  ☐   No   **(if no, answer questions 14 to 27 only)**

  ☐   Undecided   **(if undecided, answer questions 14 to 27 only)**

14. If your answer to question 12 is **no**, do you plan to use to internet banking in the near future?

  ☐   Yes   **(if yes, continue from question 14 onwards)**

  ☐   No   **(if no, answer questions 14 to 27 only)**

  ☐   Undecided   **(if undecided, answer questions 14 to 27 only)**

Using a rating scale of 1 to 5 below, please <u>circle</u> the number that indicates your level of

disagreement/agreement with the following statements about internet banking.

SCALE:

1= Strongly disagree   2 = Disagree   3 = Neutral   4 = Agree   5 = Strongly agree

15. I find internet banking useful to me.

     1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

16. Using Internet banking enables me to accomplish banking tasks more quickly.

     1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

17. Using internet banking increases the effective use of my time in doing my banking tasks.

     1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

18. Using internet banking increases the quality of my banking services output at minimal efforts.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

19. My interaction with Internet banking is clear and understandable.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

20. I am skilful at using internet banking.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

21. Learning to use the Internet banking system is easy for me.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

22. I find it easy to get the Internet banking system to do what I want it to do.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

23. My family members think that I should use Internet banking.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

24. My friends / business associates think I should use Internet banking.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

25. My bank encourages and fully supports me in the use of Internet banking.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

26. I have the requisite resources necessary to do internet banking.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

26. Current insecurity in the country e.g abductions and carjackings make internet banking risky for me.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

27. I do not trust internet service providers with internet banking security.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

NB: If your answer to Question 13 was NO or UNDECIDED, What would you wish to see in place to stimulate your participation in it?

Otherwise, stop and submit the questionnaire. Thank you for your time and help in this research.

28.	*Would the following features be useful to you in using Internet banking? Please rate their usefulness based on the following Scale:*
	1 = Not useful 2 = Somewhat useful 3 = Indifferent 4 = Useful 5 = Very useful

	1	2	3	4	5
Visible security features e.g SSL certification	☐	☐	☐	☐	☐
Additional Authentication over and above initial user ID/password	☐	☐	☐	☐	☐
Security of payment and data transfer on Ibanking	☐	☐	☐	☐	☐
Assurance of the customer on how his/her privacy is guaranteed.	☐	☐	☐	☐	☐
IB offered on a reliable IT system	☐	☐	☐	☐	☐
Offering a broad and deep range of bank products.	☐	☐	☐	☐	☐
System that is easy to use	☐	☐	☐	☐	☐
Features options for different modes of payment	☐	☐	☐	☐	☐
Simple online loan applications/tracking	☐	☐	☐	☐	☐
Offering branded financial products	☐	☐	☐	☐	☐
Uses different multimedia features	☐	☐	☐	☐	☐
Offers a variety of non-bank products and services e.g online ticketing etc	☐	☐	☐	☐	☐
Straight through processing of transactions	☐	☐	☐	☐	☐
Features language or geographic options	☐	☐	☐	☐	☐
Explanations on proper usage e.g mouse-over texts on menus/buttons	☐	☐	☐	☐	☐
Current and timely information	☐	☐	☐	☐	☐
Provided information rich in detail	☐	☐	☐	☐	☐
Possibility of downloading information from IB to third.	☐	☐	☐	☐	☐

party applications					
Relevant FAQ to help customers solve problems by themselves	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Call-back/e-mail system tells the customer when to expect a response	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Services available (24/7) all the time	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Offers the possibility to personalize the interface to my preference	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Offers newsgroups/communities	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
The achievable service level is stated on the site	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
Inbound/outbound email system to deal with customer complains	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
List any other features you wish to see in an IBanking system that are likely to encourage you to use it:					

Thank you for your time and help.

Appendix 2 - Internet Banking Questionnaire for Corporate Customers

PART II: This part is to be answered by corporates and institutions

My name is Julius Mboya, a student at the University of Nairobi School of Computing and Informatics.

I am currently undertaking a research for my Masters of Science degree in Information Systems on Internet Banking entitled: Internet Banking; A Nascent Banking Delivery Channel in Kenya.

The focus of my research is to examine the strategic value of web-based internet banking (IBanking) to corporate and institutions as well as any barriers to their use of IBanking in Kenya. The questions asked have been designed from an interdisciplinary literature review on the general field of internet banking.

This research is purely academic, confidential and will be solely used for that purpose. The anonymity of your identity shall be preserved and upheld. Your details or data provided will not be passed to any third party without your prior permission. I wish to communicate information about the survey results to you should you be interested. Please attach your email address or any other contact if you wish to receive a copy of the report.

I wish you take a moment of your time to answer the questions below. I will greatly appreciate your frank and critical response to this questionnaire. Should you need any clarification, please don't hesitate to contact me as follows:

Julius Mboya

Mobile: + 254- 721-827-384

Email: jomboya@gmail.com

Please Note:

- *Internet banking in this context refers to web-based banking where banks use the Internet (World Wide Web) to offer banking services to their customers. It DOES NOT include similar services like mobile banking, prone banking, SMS banking etc.*
- *For internal validity of the questionnaire, some items may appear as if they are repeated.*
- *To make your choices, check ⊠ ONE option per question. Where opinion is sought, type i.e* abcdefghijkl *into the space provided.*

Section A: Demographic Information

1. Name of your organization (optional)

2. Your organization can be best described as?

   Sole proprietorship ☐   Partnership ☐   Limited Liability ☐

   Corporation ☐

3. What is your level of education?

   Primary ☐   High School ☐   College ☐   Graduate ☐   Post   Graduate ☐

4. In which sector are you employed?

   Public Sector ☐   Private Sector ☐

5. What is your position in your organization?

   Owner (proprietor) ☐   Employee ☐   Partner/Director ☐

6. Gender.

   Male ☐   Female ☐

7. Select your age from the sets given below.

   18 – 24 yrs ☐   25 – 30 yrs ☐   31 – 35 yrs ☐   36 – 40 yrs ☐

   41 – 45 yrs ☐   46 – 50 yrs ☐   51 – 55 yrs ☐   > 55 yrs ☐

Section B: Value, Quality and Trust of Internet Banking.

8. Indicate name(s) of your bank(s). This is optional:

9. Do any of your banks offer your organization personalized banking services over the internet?

   ☐ Yes **(if yes, answer question 10)**

☐ No **(if no, jump and answer questions 14 to 28 only)**

10. Has your organization subscribed to internet banking service offered by your bank?

    ☐   Yes   **(if yes, answer questions 11 to 31.)**

    ☐   No   **(if no, jump to question 14.)**

11. Describe the ownership of the bank(s) offering your organization Internet banking?

Foreign bank ☐   Local bank ☐   Both ☐

12. If your answer to question 9 is **yes**, how long has your organization used Internet banking?

Less than 1 year ☐   1 to 3 years ☐   More than 3 years ☐

13. How many banks provide internet banking services to your organization currently?

No Bank ☐   1 Bank ☐   2 Banks ☐   More than 2 Banks ☐

14. If your answer to question 9 is **no**, does your organization intend to use Internet banking in the near future?

    ☐   Yes   **(if yes, continue answering from question 15 – 28 only)**

    ☐   No   **(if no, answer questions 15 – 28 only.)**

Using a rating scale of 1 to 5 below, please tick the number that indicates your level of disagreement/agreement with the following statements about internet banking. SCALE:

1= Strongly disagree   2 = Disagree   3 = Neutral   4 = Agree   5 = Strongly agree

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15. I find internet banking useful to this organization.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

16. Using Internet banking enables me to accomplish banking tasks more quickly.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

17. Using internet banking increases the effective use of my time in handling my banking tasks.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

18. Using internet banking increases the quality of my banking services output at minimal efforts.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

19. My interaction with Internet banking is clear and understandable.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

20. I am skilful at using Internet banking.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

21. Learning to use an Internet banking system is easy for me.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

22. I find it easy to get the Internet banking system to do what I want it to do.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

23. Key customers of this organization think that we should use Internet banking.
    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

24. Key customers of this organization are already using Internet banking.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

25. Stakeholders of this organization think we should use the Internet banking.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

26. Our bank staffs are helpful to us in the use of Internet banking system.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

27. My organization has the requisite resources necessary to carry out internet banking.

1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

Internet Banking user Interface and Usability Assessment:

28.	*How useful are the following features of Internet banking website in enhancing your use of the service: Use the following Scale:* 1 = Not useful 2 = Somewhat useful 3 = Indifferent 4 = Useful 5 = Very useful					
	CSS1: Visible security features e.g SSL certification	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	CSS2: Additional Authentication over and above initial user ID/password	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	CSS3: Security of payment and data transfer on IBanking	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	CST1: Assurance of the customer on how his/her privacy is guaranteed.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	CST2:IB offered on a reliable IT system	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	CBC1: Offering a broad and deep range of bank products.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	CBC2:System that is easy to use	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	CBP1:Features options for different modes of payment	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	ACO1:Simple online loan applications/tracking	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	ACA1:Offering branded financial products	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	AAE1:Uses different multimedia features	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	AAN1:Offers a variety of non-bank products and services e.g online ticketing etc	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	PTC1:Straight through processing of transactions	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	PTI1:Features language or geographic options	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

PTI2:Explanations on proper usage e.g mouse-over texts on menus/buttons	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
PTP1:Current and timely information	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
PTP2:Provided information rich in detail	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
PTD1:Possibility of downloading information from IB to third party applications	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
PTC2:Relevant FAQ to help customers solve problems by themselves	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
PTC3: call-back/e-mail system tells the customer when to expect a response	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
PRA1:Services available (24/7) all the time	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
PRP1:Offers the possibility to personalize the interface to my preference	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
PRC1:Offers newsgroups/communities	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
List any other features you wish to see in an IBanking system to encourage your organization's use of the system:					

NB: Please STOP and submit the questionnaire if you have NEVER used Internet banking at your organization.

Thank you for your time and help in this research.

Section C: Usage of Internet Banking:

ANSWER THIS SECTION IF YOU HAVE ACTUALLY USED INTERNET BANKING AT YOUR URGANIZATION. DO NOT ANSWER IF YOU HAVE NEVER USED IT.

29. On weekly basis, how many times do you log on to Internet banking site at your organization?

Not at all ☐   1 – 3 times ☐   3-5 times ☐   More than 5 times ☐

30.   How frequently do you use Internet banking at your organization for the following banking activities? *(please tick the appropriate cell beside the service)*

Service	Never	1-3 Times	3-5 Times	> 5 Tim
View Products offered by the bank over the internet	☐	☐	☐	☐
Check foreign exchange rates	☐	☐	☐	☐
Check my organization's account balances	☐	☐	☐	☐
Filing various application forms online	☐	☐	☐	☐
Place requests for bank statements	☐	☐	☐	☐
Change my user id and password (Account Management)	☐	☐	☐	☐
Transfer funds between my organizations accounts held at the same branch or in different branch(es)	☐	☐	☐	☐
Make international funds transfers	☐	☐	☐	☐
Make transfers to third party accounts held in the same bank or at different banks in Kenya.	☐	☐	☐	☐
Make bill payments e.g. electricity, water, airtime, KRA	☐	☐	☐	☐
Repay my organizations loans and mortgages	☐	☐	☐	☐
Upload bulk payment file for processing e.g salaries etc	☐	☐	☐	☐
Make requests to place fixed deposits	☐	☐	☐	☐
Issue Standing order or direct debit instructions to my bank	☐	☐	☐	☐
Topping up my organizations credit cards	☐	☐	☐	☐
Pay for air tickets online	☐	☐	☐	☐
Place request to order cheque books	☐	☐	☐	☐
Apply for loans and mortgages	☐	☐	☐	☐
View my organization's past account activity (transactions)	☐	☐	☐	☐
Communicate to the bank via secure electronic mail	☐	☐	☐	☐
Download bank statements for use at the organization	☐	☐	☐	☐
Issue Stop cheque instructions to the bank	☐	☐	☐	☐
Apply for credit cards	☐	☐	☐	☐
Online loan repayment calculation	☐	☐	☐	☐
Track loan/mortgage applications	☐	☐	☐	☐

31. Any other services not listed above: (Please specify

Thank you for your time and help.

Appendix 3 - Internet Banking Questionnaire for Commercial Banks

PART III: This part is to be answered by commercial banks

My name is Julius Mboya, a student at the University of Nairobi School of Computing and Informatics.

I am currently undertaking a research for my Masters of Science degree in Information Systems on Internet Banking entitled: Internet Banking; A Nascent Banking Delivery Channel in Kenya.

The focus of my research is to examine the strategic value of web-based internet banking (IBanking), hindrances banks face in adopting internet banking and ultimately propose a framework for increasing internet banking business in the country. The questions asked have been designed from an interdisciplinary literature review on the general field of internet banking.

This research is purely academic, confidential and will be solely used for that purpose. The anonymity of your identity shall be preserved and upheld. Your details or data provided will not be passed to any third party without your prior permission. I wish to communicate information about the survey results to you should you be interested. Please include your email address or any other contact if you wish to receive a copy of the report.

I wish you take a moment of your time to answer the questions below. I will greatly appreciate your frank and critical response to this questionnaire. Should you need any clarification, please don't hesitate to contact me as follows:

Julius Mboya

Mobile: + 254- 721-827-384

Email: jomboya@gmail.com

Please Note:

- *Internet banking in this context refers to web-based banking where banks use the Internet (World Wide Web) to offer banking services to their customers. It DOES NOT include similar services like mobile banking, prone banking, SMS banking etc.*
- *For internal validity of the questionnaire, some items may appear as if they are repeated.*
- *To make your choices, check ☒ ONE option per question. Where opinion is sought, type i.e* abcdefghijkl *into the space provided.*

Section A: Demographic Information

1. Name of your bank (optional)

2. The ownership of your bank can be described as?

   Indigenous ☐   Foreign ☐   Private ☐   Government ☐

3. Gender.

   Male ☐   Female ☐

4. Select your age from the sets given below.

   18 – 24 yrs ☐   25 – 30 yrs ☐   31 – 35 yrs ☐   36 – 40 yrs ☐
   41 – 45 yrs ☐   46 – 50 yrs ☐   51 – 55 yrs ☐   > 55 yrs ☐

5. What level of management are you?

   Non-managerial ☐   Line Manager ☐   Middle Level Manager ☐
   Senior Manager ☐   Technical staff ☐

6. What is your level of education?

   High School ☐   College ☐   Graduate ☐   Post Graduate ☐

7. Do you hold any professional certifications?

   Yes ☐   No ☐

Section B: Forces affecting Banking Industry and Strategic value of Internet Banking.

8. Is your bank offering any personalized banking services to its customers over the Internet?

   ☐   Yes (**Answer question 9 and jump to question 11 going forward**)

   ☐   No (**skip qn. 9 and continue from question 10 going forward**)

9. If the answer to question (8) above is **yes**, for how long has your bank's internet banking product been in the market?

      Less than 1 year ☐   1 to 3 years ☐   More than 3 years ☐

10. If the answer to question (8) above is **no**, does your bank intend to offer internet banking in the near future?

Not at all ☐   In the next 1 to 3 years ☐   In the next 4 to 6   ☐

      In future ☐

Using a rating scale of 1 to 5 below, please <u>circle</u> the number that indicates your level of

disagreement/agreement with the following statements about internet banking.

SCALE:

1= Strongly disagree   2 = Disagree   3 = Neutral   4 = Agree   5 = Strongly agree

11. Internet banking is useful in my bank's relationship with its customers.

      1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

12. We can attract more customers by offering them internet banking services.

      1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

13. By offering internet banking, we are likely to retain our existing customers.

      1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

14. Through internet banking, it is possible to give services to customers at lower costs compared to other channels.

      1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

15. As more banks roll out internet banking, our customers are likely to switch to them.

      1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

16. Internet banking is a *'need-to-have'* banking service in the 21st century.

      1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

17. Key customers of this bank request for internet banking services.

      1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

18. The stable political climate in the country is essential for the growth of internet banking.

      1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

19. Regulatory initiatives of CBK and KBA towards electronic forms of business are essential to implementation of internet banking.

    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

20. The e-commerce and e-transactions bills recently passed by parliament are incentives for the growth of internet banking in Kenya.

    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

21. Internet banking would best serve customers who travel frequently.

                                              4 ☐   5 ☐

CBK = Central Bank of Kenya   KBA = Kenya Bankers Association

22. Internet banking is a *must-have* banking service in the 21st century.

    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

23. Widespread use of computers and internet by customers is key to growth of internet banking.

    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

24. Zero-rating ICT equipment has made it easier to acquire internet banking hardware.

    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

25. The penetration of mobile phones makes internet banking attractive if offered through these gargets.

    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

26. List any other factor(s) that you believe influenced/would influence your bank in deciding to implement internet banking:

Section C: Internet Banking System Quality and Barriers to implementation.

Using a rating scale of 1 to 5 below, please circle the number that indicates your level of

disagreement/agreement with the following statements about internet banking.

SCALE:

1= Strongly disagree   2 = Disagree   3 = Neutral   4 = Agree   5 = Strongly agree

27. My bank prefers buying IBanking system from a software vendor as opposed to developing one in-house.

    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

28. Quality is very important in internet banking.

    1 ☐   2 ☐   3 ☐   4 ☐   5 ☐

Quality Assessment

29.	*To achieve quality in internet banking, the system/website:*					
	(A) TECHNICAL QUALITY:					
	Should be secure for carrying out transactions	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should be easy to navigate with working links	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should have adequate search facilities	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should be customized easily to meet client needs	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should have many interactive features (e.g. online application for bank services)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should be easy to access with pages that load quickly	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	(B) GENERAL CONTENT QUALITY:					
	Content should be useful/relevant	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Content should be current and complete	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Content should be clear and understandable	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Content should include support for integration with mobile banking e.g M-Pesa, M-Kesho transactions etc	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	(C) SPECIFIC CONTENT QUALITY:					
	Should include useful contact information (e.g. email addresses and phone numbers of customer care etc.)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should include general bank information (e.g. goals, owners, mission, vision etc.)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should include detailed information on bank products	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should include information related to customer policies (e.g. privacy and dispute resolution details)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	(D) APPEARANCE QUALITY:					
	Should look attractive and organized	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should be readable with appropriate colours	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
	Should use multimedia features properly	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

	List any other quality consideration you believe would be necessary in rolling out a successful internet banking system for your bank:					
30.	Like any other banking systems, internet banking presents challenges to my bank.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

The following aspects are likely challenges to banks in implementing internet banking. To what extent do/would they apply/not apply to your bank?

31.	Providing security in internet banking	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
32.	Finding appropriate telecommunication, software, hardware and technical infrastructure for IBanking.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
33.	Customizing internet banking to support mobile banking activities e.g integrate with M-Pesa, M-Kesho etc.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
34.	Presenting a comprehensive internet banking website	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
35.	Getting educated and efficient staff in supporting internet banking	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
36.	Winning support of top management in IBanking.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
37.	Suitable regulations for IBanking	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
38.	Integrating IBanking with bank's legacy (core) systems.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
39.	Understanding IBanking quality in customer's terms	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
40.	Lack of support from IBanking vendors	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
41.	Language barriers with IBanking vendors	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
42.	List any other barriers you believe your bank would/had face(d) in implementing a successful internet banking:					

Thank you for your time & help

Appendix 4: Mergers and Acquisitions in the Kenyan BFI since 1994.

No.	Institution	Merged with	Current Name	Date approved
1	TransnationalFinance Ltd.	Transnational Bank Ltd.	Transnational Bank Ltd.	28.11.1994
2	Ken Baroda Finance Ltd.	Bank of Baroda (K) Ltd.	Bank of Baroda (K) Ltd.	02.12.1994
3	Stanbic Bank (K) Ltd.	Stanbic Finance (K) Ltd.	Stanbic Bank Kenya Ltd.	05.01.1996
4	CBA Financial Services	Commercial Bank of Africa ltd	Commercial Bank of Africa ltd	26.01.1996
5	National Industrial Credit Bank Ltd.	African Mercantile Banking Corp.	NIC Bank Ltd.	14.06.1997
6	Giro Bank Ltd.	Commerce Bank Ltd.	Giro Commercial Bank Ltd.	24.11.1998
7	Guardian Bank Ltd.	First National Finance Bank Ltd.	Guardian Bank Ltd.	24.11.1998
8	Diamond Trust Bank (K) Ltd.	Premier Savings & Finance Ltd.	Diamond Trust Bank (K) Ltd.	12.02.1999
9	National Bank of Kenya Ltd.	Kenya National Capital Corp.	National Bank of Kenya Ltd.	24.05.1999
10	Standard Chartered Bank (K) Ltd.	Standard Chartered Financial Services	Standard Chartered Bank (K) Ltd.	17.11.1999
11	Barclays Bank of Kenya Ltd.	Barclays Merchant Finance Ltd.	Barclays Bank of Kenya Ltd.	22.11.1999
12	Habib A.G. Zurich	Habib Africa Bank Ltd.	Habib Bank A.G. Zurich	30.11.1999
13	Guilders Inter. Bank Ltd.	Guardian Bank Ltd.	Guardian Bank Ltd.	03.12.1999
14	Universal Bank Ltd.	Paramount Bank Ltd.	Paramount Universal Bank	11.01.2000
15	Kenya Commercial Bank	Kenya Commercial Finance Co.	Kenya Commercial Bank Ltd.	21.03.2001
16	Bullion Bank Ltd.	Southern Credit Banking Corp. Ltd.	Southern Credit Banking Corp. Ltd.	07.12.2001
17	East African Building Society	Akiba Bank ltd	EABS Bank ltd	31.10.2005
18	First American Bank ltd	Commercial Bank of Africa ltd	Commercial Bank of Africa ltd	01.07.2005
19	Co-operative Merchant Bank ltd	Co-operative Bank ltd	Co-operative Bank of Kenya ltd	28.05.2002
20	ABN AMRO Bank	Citibank N.A	Citibank N.A	30.11.2005

			Appendix 5 - Portal Quality Assessment (Usability)
1	Core Services		
		Security & Trust	
			Security
			CSS1: Visible security features e.g SSL certification
			CSS2: Additional Uthentication over and above initial user ID/password
			CSS3: Security of payment and data transfer on Ibanking
			Trustworthiness
			CST1: Assurance of the customer on how his/her privacy is guaranteed.
			CST2:IB offered on a reliable IT system
		Basic service Quality	
			Choice
			CBC1: Offering a broad and deep range of bank products.
			Conditions of service
			CBC2:System that is easy to use
			Payment
			CBP1:Features options for different modes of payment
2	Additional Services		
		Cross Buying Service Quality	
			On-line loans
			ACO1:Simple online loan applications/tracking
			All-in Finance products
			ACA1:Offering branded financial products
		Added Value	
			Enjoyment & Entertainment
			AAE1:Uses different multimedia features
			Non-bank Services
			AAN1:Offers a veriety of non-bank products and services e.g online ticketing etc
3	Problem-solving Services		
		Transaction Support	
			Convenience of Transaction
			PTC1:Straight through processing of transactions
			Interactivity
			PTI1:Features language or geographic options
			PTI2:Explanations on proper usage e.g mouse-over texts on menus/buttons
			Information Provision
			PTP1A:Current and timely information
			PTP2:Provided information rich in detail
			Decision Support
			PTD1:Possibility of downloading information from IB to third party applications
			Customer Care
			PTC2:Relevant FAQ to help customers solve problems by themselves
			PTC3: callback/e-mail system tells the customer when to expect a response
		Responsiveness	

			Availability & Accessibility	
			PRA1:Services available (24/7) all the time	
			Personalization	
			PRP1:Offers the possibility to personalize the interface to my preference	
			Community	
			PRC1:Offers newsgroups/communities	
			Complaint Management	
			PRM1:The achevable service level is stated on the site	
			PRM2:Inbound/outbound email system to deal with customer complains	

	1
BANK NAME	
No. of Branches	
Have a web site?	
Have Online/Internet Banking?	
View Bank Products	
View Forex Rates	
Email Querry to Bank	
Make Online Applications	
Request Bank Statements	
Change User ID and Password	
Make Transfers (Own Accounts/Intrabank	
Make Transfers (Interbank)	
Make Transfers (International)	
Make Utility Payments	
Repay loans and mortgages	
Bulk payment processing (e.g Salaries)	
Fixed deposit placement	
Standing order or direct debit request	
Credit and debit card payment	
Online flight ticket payment	
Request to order cheque book	
Apply for loans and mortgages	
Transaction History Enquiry	
View statement and account balances	
Downloading bank statements	
Issue Stop cheque instructions	
Apply for credit and debit cards	
Online loan repayment calculation	
Tracking loan/mortgage applications	
Any Other Services Offered?	

SALIENT INTERNET BANKING SERVICES

APPENDIX 7: COMMERCIAL BANKS IN KENYA	
1	Kenya Commercial Bank Limited
2	Standard Chartered Bank Kenya
3	Barclays Bank of Kenya Limited
4	Bank of India
5	Bank of Baroda (Kenya) Limited
6	Commercial Bank of Africa Ltd
7	Habib Bank Limited
8	Prime Bank Limited
9	Co-operative Bank of Kenya Ltd
10	National Bank of Kenya Ltd
11	Oriental Commercial Bank Ltd
12	Citibank N.A
13	Habib Bank A.G Zurich
14	Middle East Bank Kenya Ltd
15	Bank of Africa Kenya Ltd
16	Dubai Bank Ltd
17	Consolidated Bank of Kenya Ltd
18	Credit Bank Limited
19	Trans-National Bank Limited
20	Chase Bank Limited
21	CfC Stanbic Bank Kenya Limited
22	African BankingCorporation Ltd
23	Imperial Bank Limited
24	NIC Bank Limited
25	Giro Commercial Bank Ltd
26	Ecobank Kenya Limited
27	Equatorial Commercial Bank Ltd
28	Paramount Universal Bank Ltd
29	City Finance Bank Ltd
30	Fina Bank Ltd
31	Victoria Commercial Bank Ltd
32	Guardian Bank Ltd
33	Investments&Mortgages Bank Ltd
34	Southern Credit B. Corp. Ltd
35	Development Bank of Kenya Ltd
36	Fidelity Commercial Bank Ltd
37	Diamond Trust Bank Ltd
38	K-Rep Bank limited
39	Equity Bank ltd
40	Family Bank Ltd
41	Gulf African Bank Ltd
42	First Community Bank Ltd
43	UBA Kenya Ltd