

**THE INFORMATION TECHNOLOGY AND
BANKING SERVICE DELIVERY
A CASE OF POPULAR BANK OF RWANDA
(BPR)**

**A DISERTATION SUBMITTED TO THE SCHOOL OF
POST GRADUATE STUDIES IN PARTIAL
FULFILLMENT FOR THE AWARD OF
MASTER DEGREE OF BUSINESS
ADMINISTRATION
(Banking and Finance)
OF KAMPALA INTERNATIONAL
UNIVERSITY**

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SEPT 2011

DECLARATION

I Bayingana Vincent I hereby declare that the work presented in is my original work and it has not been presented in any university or any higher learning institutions for similar award I however acknowledge authors whose work has referred in my research.

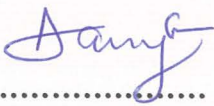
Signature B/V ,

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APPROVAL

This dissertation entitled as Information Technology and banking service delivery was done under my supervision and has been submitted to the Kampala International University for examination with my approval as supervisor.


SIGNATURE.....

24/09/2011.
DATE.....

PROJECT SUPERVISOR

DR. NYAMBANE DAVID

DEDICATION

I dedicate this project to Almighty God, the lovely family of mine, Jane and my young son Victor.

ACKNOWLEDGEMENT

I begin with the Immeasurable gratitude to Almighty God, who has sustained me, Gave me strength, talent, guided and spared my life to the present level of educational attainment. He made my existence unshakable, despite the difficulties I faced of studying at Kampala International University (KIU) and many multitasking activities.

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Finally, to all other people who have contributed directly or indirectly to ensure my academic, religious, social, ICT (information communication technology) part of life is today, I greatly appreciate your efforts, may God bless and reward you abundantly.

LIST OF ABBREVIATIONS

ATM	: Automatic Teller Machine
BPR	: Popular Bank of Rwanda
CD	: Compact Disc
DSS	: Decision Support system
DSTV	: Digital Secure Voice Terminal
DVD	: Digital Versatile Disc
EDPRS	: Economic Development and Poverty Reduction Strategy
EFT	: Electronic Fund Transfer
EWSA	: Energy Water and Sanitation Authority
GSM	: Group Special Mobile
ICT	: Information Communication Technology
IP	: Internet Protocol
IS	: Information Systems
ISO	: International Standard Organization
IT	: Information Technology
ITRS	: Information Technology Reporting Systems
KIU	: Kampala International University
MICR	: Magnetic Ink Character Reader
MIS	: Management Information systems

NBR	: National Bank of Rwanda
OIS	: Office Information Systems
PC	: Personal Computer
PDA	: Personal Digital Assistant
PEOU	: Perceived Ease of Use
PU	: Perceived Usefulness
RACS	: Rwanda Automated Clearing Systems
RDB	: Rwanda Development Board
RIBSS	: Rwanda Interbank Settlement Systems
ROM	: Read Only Memory
SMES	: Small and Medium Enterprises
SMS	: Short Messages
TAM	: Technology Acceptance Model
TBA	: Theory of Planned Behavior
TRA	: Theory of Reasoned Actions
TV	: Tel Vision
VLE	: Virtual Learning Environment
WAP	: Wireless Application Protocol

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ABSTRACT

The information technology is the modern and significant part in the banking sector, it is of great importance for the bank today to access the impact of information technology of its operational performance so as to justify if high cost invested on it is justifiable or not, analyze their problems and there propose solutions.

The objective of this study, was to assess how the information systems has influenced bank performance and growth of the bank as well as adoption of information systems has affected the growth and the development of the bank.

The main research instruments used are the questionnaires and the personal interview for the staff and the customers of the bank. The simple frequency percentages was used as statistical measure to analyze the data.

In conclusion the study revealed that, the information technology has extremely increased the development and the growth of Popular Bank of Rwanda (BPR) and other financial institutions in Rwanda, information technology has led to increased customer service delivery and satisfaction, improved operational efficiency, reduced transaction time, gave the bank to be competitive, reduced running cost.

The research recommends that The BPR bank should employ the physical equipments related to information technology such as Computer, ATM's, mobile banking, Internet banking, Telephone banking which results to effective service delivery that has a great influence on customer satisfaction improving sales and market share leading to bank success, the customer perception and preferences has a big impact on bank performance.

CHAPTER ONE

1.0. INTRODUCTION

This chapter covers the background, the problem statements, specific objectives, research questions, scope of study and significance.

1.1. BACKGROUND

1.1.1. HISTORICAL PERSPECTIVE

The popular Bank of Rwanda S.A (BPR) was formally established as a fully licensed commercial bank in January 2008 and supervised under a lighter regime by the National Bank of Rwanda (NBR), the Central Bank. With a vision of to be the leading retail bank in Rwanda.

The Coöperatieve Centrale Raiffeisen-Boerenleenbank B.A. (Rabobank Group) came in as strategic investor with a 35% minority stake. BPR now features 574,624 small shareholders and one major one — albeit a minority shareholder- in Rabobank.

The bank has a Shareholders Agreement as well as a Technical Assistance Agreement in place. As from mid 2008 a whole new management team was installed in Kigali and a start was made with the restructuring of all layers of management at Head Office and in the branch network. BPR was bought by Rabobank, a Dutch bank which acquired 35 per cent stake in BPR in June 2008. The bank invested heavily and it provides management services and extensive technical support. The Article in new times on BPR Banking (2008)

The Bank has a mission to offer a full range of financial services in the urban and rural areas in a market driven and financially sustainable way; based on cooperative characteristics with special attention given to farmers, agribusiness enterprises, private individuals and micro as well as small and medium enterprises. BPR Motto “Banki yacu Hafi yacu” meaning our neighborhood bank it has got 18 branches and 109 sub branches.

BPR Bank employed Business process re-engineering. Business process re-engineering is the analysis and design of workflows and processes within an organization. According to Davenport (1990) a business process is a set of logically related tasks performed to achieve a defined business outcome. Re-engineering is the basis for many recent developments in management.

Business process re-engineering (BPR) began as a private sector technique to help organizations fundamentally rethink how they do their work in order to dramatically improve customer service, cut operational costs, and become world-class competitors. A key stimulus for re-engineering has been the continuing development and deployment of sophisticated information systems and networks. Leading organizations are becoming bolder in using this technology to support innovative business processes, rather than refining current ways of doing work.

1.1.2. THEORITICAL PERSPECTIVE

Information is data that has been processed through the computer system. Information is processed/analyzed data that informs a recipient about a situation. It is the meaning assigned to data within some context for use of that data, Walters, (1992).

1.1.2.1 Information technology

According to Mejabi (2008), Information Technology is a general term that describes any technology that helps to produce, manipulate, store, communicate and/or disseminate information. Microsoft Encarta, (2009) defined information technology as the processing of data via computer: the use of technologies from computing, electronics, and telecommunications to process and distribute information in digital and other forms. Information technology combines the technology of computers and communications to provide information processing services throughout the office or around the world.

Information technology is basically an electronic device and it's based on integrated circuits or silicon chips. Hanson and Narula (1990) further identified two major forms of information technology, namely information technology as Telematics, meaning "Big media" and Ethnotronic, meaning "Small media". Telematics are to be identified with such technologies as computers, telephone, satellites, television, radio, video and those that rely on large scale

infrastructures. Ethnotronics includes technologies such as typewriters, audio cassette records, fax machines, paper copies, calculators, digital watches and other more personal types of technologies.

Information technology is a term which generally covers the harnessing of electronic technology for the information needs of businesses at all levels, Anderson, (1990). In addition, Longley and Shain, (1992), defines information technology as the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a micro-electronic based combination for computing and telecommunication. While an information system (IS) is a group of formal process that together collects, retrieve, process, store and disseminate information for the purpose of facilitating planning, control, coordination and decision making in organizations. Information technology on the other hand provides the technical solutions identified in the (IS) information system; including the networks, hardware and software Grainger-Smith and Oppenheim, (1994) Porter and Miler, (1985) conceive of information technology to broadly encompass the information that business creates and use as well as a wide spectrum of increasingly convergent and linked technologies that process the information. In addition to computers, the data recognition equipment, communication technologies, factory automation and other hardware services are involved. Traditionally, telephone, radio and television were referred to as media technology, Hanson and Narula, (1990).

Irechukwu, (2000) lists some banking services that have been revolutionized through the use of ICT as including account opening, customer account mandate, and transaction processing and recording. Information and Communication Technology has provided self-service facilities (automated customer service machines) from where prospective customers can complete their account opening documents directly online. It assists customers to validate their account numbers and receive instruction on when and how to receive their cheque books, credit and debit cards. Communication.

1.1.3. CONCEPTUAL PERSPECTIVE:

The dependent variable here in the study, was service delivery Luthans, (2002), he stated to this by that the text compatibilities of the cell-phones have also enabled formal and informal

communications amongst individuals of the same organization with several distances apart. The truth is that information and deployment of information technology has changed the nature of work, approach to work and service delivery; this has resulted in various outcomes for the individual employee and the organization at large. For instance the mobile phones have allowed managers to stay in touch with their field personnel no matter how far the distance is.

The independent variable in the study is information technology, Information technology is a term which generally covers the harnessing of electronic technology for the information needs of businesses at all levels, Anderson (1990). In addition, Longley and Shain, (1992), defines information technology as the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a micro-electronic based combination for computing and telecommunication. While an information system (IS) is a group of formal process that together collects, retrieve, process, store and disseminate information for the purpose of facilitating planning, control, coordination and decision making in organizations. Information technology on the other hand provides the technical solutions identified in the (IS) information system; including the networks, hardware and software Grainger-Smith.

Oppenheim (1994). Porter and Miler (1985) conceive of information technology to broadly encompass the information that business creates and use as well as a wide spectrum of increasingly convergent and linked technologies that process the information. In addition to computers, the data recognition equipment, communication technologies, factory automation and other hardware services are involved. Traditionally, telephone, radio and television were referred to as media technology, Hanson and Narula, (1990).

1.1.4. CONTEXTUAL PERSPECTIVE

This study was taken at Popular Bank of Rwanda (BPR). Where there is a problem of insufficient information technology that has affected the issue of service delivery. The information technology will be used as a remedy to solve the problem. The respondent will be drawn covering the customer of the bank and the staff

1.2. STATEMENT OF THE PROBLEMS

Service delivery in banks is simply an output of the customer expects from his/her banks. The bank faced with difficulties of delivering effective services which can satisfy the customer. The bank embarked to use information technology as an approach to deliver effective services. Information technology is a medium that has transformed banking and everyday operations at the click of button thus enabling sophistication of product development, implement reliable techniques for control of risk, enhanced market infrastructure and reach on geographically distant. In spite of the banking sector in using information technology, we notice the complexity of long queues and poor banking systems, lack of accessibility of banking services and high bank charges a customer pays to the bank, therefore this study will find out the link between the information technology use and effectual service delivery and customer satisfaction in the bank.

1.3. PURPOSE

This study focused on the impact of information technology in banking service delivery case study (BPR)

1.4. OBJECTIVES OF THE STUDY

- (i). To Access how information technology has affected the customer base of the bank
- (ii). To Assess how the introduction of information technology has influenced bank performance as well as adoption of information system has influenced on the growth and development of the bank.
- (iii). To Access how the information technology helps in reduction of costs and benefits in increasing revenue profit of the bank.

1.5. RESEARCH QUESTIONS

- (i). How does the information technology affect the customers base of the bank?
- (ii). How does information technology influence bank performance as well as adoption of information systems influence the growth and development of the bank?

(iii). How does information technology helps in reduction of costs and benefits in increasing revenue profit of the bank?

1.6. SCOPE OF THE STUDY

The focus of this study was the adoption of information technology in banking service delivery in Popular bank of Rwanda(BPR) Kigali headquarter. The information on this research is limited to BPR, The researcher examined the electronic banking system in Popular bank of Rwanda. This study covered the period since the introduction of information technology in popular bank to date. The period of the study was focused on 2008-2011. All various information technologies related schemes introduced since this period to date was examined in the course of the study.

1.7. SIGNIFICANCE/JUSTIFICATION OF THE STUDY

The banking system is required as a catalyst for a rapid macro-economic development of other sectors of the economy; hence, its stability should be the priority of the government most especially during the democratic priority by the government. Going by the recent distress/sufferings in banking sectors in Rwanda, the level of public confidence in the sector has declined and this has led to the instability syndrome/pattern in the sector and as such the public assurance and confidence on efficiency in the private sector in decaying.

The quest for globalization and commercialization has brought about innovations in technology. The digital age and the potential threat posed by non-traditional competition which necessitates innovation has made it inevitable for Rwandan commercial banks to improve upon their operation as they face evolving revolution are being confronted with increasingly sophisticated customer base compelling them to offer today what their customers would be expecting tomorrow. Banks have to deviate from just being a profit making bank to a more conscious customer centered institution.

This research will enable banks to identify ways of remaining competitive in the global and domestic financial sectors. It also helps prepare banks repositioning towards meeting the challenges imposed by global banking.

It is expected that the work will contribute to the bank's future projections on strategies to be used in attracting depositor's funds, reduce queues in the banking hall, the bank's management policies.

Finally the research work will also be a contribution to knowledge in academic field and serve as a source of reference to researchers who would carry out research on similar study in the future.

CHAPTER TWO:

LITERATURE REVIEW

2.0. INTRODUCTION

This chapter covers the theoretical reviews, Conceptual frame work and related literature of the relevance of the study.

2.1. THEORITICAL REVIEW

In this study the researcher intended to establish the impact of information technology in banking service delivery. The study is based on The truth is that information and deployment of information technology has changed the nature of work, approach to work and service delivery; this has resulted in various outcomes for the individual employee and the organization at large. For instance the mobile phones have allowed managers to stay in touch with their field personnel no matter how far the distance is. Luthans, (2002), corroborated to this by stating that the text compatibilities of the cell-phones have also enabled formal and informal communications amongst individuals of the same organization with several distances apart.

Information technology (IT), also known as information and communication(s) technology (ICT), is a term that describes the combination of computer technology which is hardware and software with telecommunications technology such as data, image and voice networks. According to Henry C. Lucas JR, (1997) Information technology refers to all forms of technology applied to processing, storing and transmitting information in electronic form. The physical equipment used for this purpose includes computers, communications equipment and networks. Joseph and Stone, (2003) point out that, effective service delivery is important and has a great influence on customer satisfaction, improving sales and market share. Retail banking is at a stage where customer perceptions and preferences have a very important impact on a bank's success. Customer satisfaction.

2.1. CONCENTUAL FRAME WORK

The study focused on how information technology can further be employed to improve the delivery of services thus leading to customer satisfaction in the banking sector. For this particular

research, the researcher looked at the link between information technology, effective service delivery and customer satisfaction.

Figure 1.

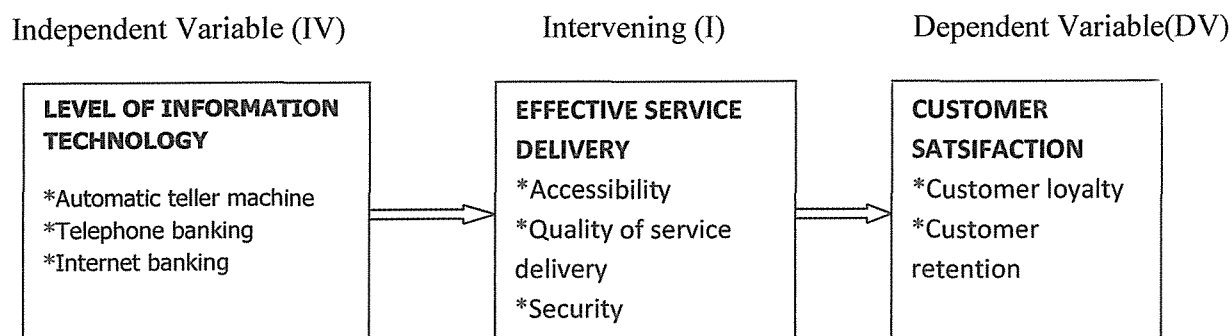


Figure 1.7: Source as modified from: (Henry C. Lucas, JR., 1997) *Information Technology*; (Joseph and Stone, 2003) *Effective service delivery & Customer satisfaction*.

The level of information technology especially the use of ATM's, telephone banking and internet banking undertaken by the banking sector do influence and have an impact on customers which the sector directly or indirectly serves. The level of information technology implemented by the banking sector has links to customer loyalty and customer retention which consequently leads to customer satisfaction. However, the services the banking sector delivers intervenes on the influence information technology has on customer satisfaction because of the internal and external aspects of the bank such as accessibility, quality of service and security.

2.1.1 Effective service delivery

Without usage of technology the banking sector cannot provide customers with effective services Patricio *et al.*, (2003). Effective service delivery is a new or significantly improved service concept that is taken into practice Drake, (2001). The changes, materializing both from within and external to the financial services industry, result from increasing customer demands for better service response P. Kemp, (2006). Customer expectations concerning service encounter experiences and service delivery mechanisms of understanding in using the service can also be hindered without the presence of other consumers Patricio *et al.*, (2003). According to Den Hertog, P, (2000) effective service delivery can be new solutions in the customer interface, new distribution methods, novel application of technology in the service process, innovation in service delivery systems, new forms of operation with the supply chain or new ways to organize and manage services. Many service innovations involve fairly intangible characteristics of the service, and others involve new ways of organizing solutions to problems such as new types of bank account or information service Mitchell, (2000). Clients are often highly involved in

service production, and changes in the way in which they play their roles and are related to suppliers can be major innovations for many services. Information technology is especially important to services Durkin and Bennet, (1999), it allows for greater efficiency and effectiveness in the information-processing elements that are, prevalent to a great extent in the banking sectors Tapp, (2000).

2.2 Definition of concept

2.2.1 Information

Information is data that has been processed through the computer system. Information is processed/analyzed data that informs a recipient about a situation. It is the meaning assigned to data within some context for use of that data, Walters, (1992).

2.2.2 Data

Data are raw, unanalyzed facts, figures, events from which information can be developed. A data is a basic raw fact that can be processed and converted to a meaning output called information. It is the encoded representation of facts, ideas and instructions such that the representations can be processed, communicated and interpreted by computers and/or people, Walter (1992)

2.2.3 Computer

A computer is a programmable, multi-purpose use machine that accepts (raw facts and figures) and processes or manipulates it into information that we can understand and utilize. It's an electronic data processor and device that accepts processes, stores, and outputs data at high speeds according to programmed instructions, Microsoft Encarta (2009).

2.2.4 Telecommunications

Communication often called telecommunication allows data and information to be transmitted from one point to another electronically. It is the transfer of idea or information from data

processing system to ultimate users. The ultimate purpose of communicating is to inform the receiver.

2.2.5 Disk storage

This is data storage on optical or magnetic disc in memory system. It is characterized by low cost and relatively fast access to data stored on it Longley and Shain (1989). External memories such as C.D. ROMS, DVD ROMS, flash drives, external hard drive etc are capable of storing and retrieving billions of information in a small portable device.

2.2.6 Online

It is a term used for a direct or immediate communication link between two devices. Online links are contrasted with offline links, in which only direct communication is possible. Thus, a telephone link is online, whereas, a telegram link is offline. The terms online and offline are further used to denote the difference in time between when data is input into a system and when it is processed. A computer works online if input data is processed immediately (real-time processing operating mode) and offline if there is a significant time period between input and processing time, Clems and Sachwill, (1992)

2.2.7 Internet:

The internet also known as the net is a massive connection of networks linking millions of computers via protocols, hardware and communication channels. It has enabled the automation of several tasks which have been carried out manually in the past. Internet is a term used to describe the collection of national and international computer networks which form a vast global network of computer network based communication Fisher (1995). Those who have access to the internet can send messages to other internet connected people at any part of the world within the twinkle of an eye. Some of the services available on the net include e-mail, bulletin boards, electronic journal, mailing lists and many more.

2.2.8 Electronic Mailing .

It permits the transmission of letters, memos and other documents from one terminal or computer to another in a different office, city, state or country Fuori and Gioia, (1991). Email uses a central switching centre which is responsible for renting mailboxes to subscribers and acting as the public telephone network link. Anderson (1990), when a message is created on the sender's system, it is addressed to a remote mailbox and it's transmitted by telephone line or wireless network to the mailbox services operator and forwarded to the receiver. The receiver enters a personalized code (password) via the keyboard in the terminal/computer-which allows him to read the messages on a visual screen. The transmitted messages are stored in an electronic mailbox on the receiving computer until the recipient is ready to read them and /or print as a hard copy on paper. The advantage of this is that, it is fast and saves time difference problems.

2.2.9 Voice Mail

This is a system in which a caller sends a voice message to a recipient who is unable to receive the message at the time of call. The audible message is converted into digital data and stored in the computer memory. Voice mail is closely related to e-mail except that voice messages are spoken into a telephone, digitalized, recorded and transmitted. They may be played back when the intended receiver accesses his or her "mailbox". Once received, a message can be sent to any number of recipients, Fuori and Gioia, (1991)

2.2.10 Bibliographic Service

These are essentially electronic libraries. They are sources of information which can be accessed through the internet on the computers. Unlike a physical library that is situated in a particular location. The e-library or virtual library is accessible anywhere and at anytime you find a computer, internet connection and other necessary login details (where necessary).

2.2.11 Teleconference

This is possible when a group of people decides to meet without having to come together in a single location. Teleconferencing is done electronically by various media including the

computer. This service is relatively inexpensive, there is no travel cost and the times spent outside office for meeting are grossly minimized.

2.2.12 Video conference

These system permits group of people in different geographical locations to see as well as hear one another. The technology utilizes satellite links for transmission

Harold and Jeff, (1995) contend that financial service providers should modify their traditional operating practices to remain viable in the 1990s and the decades that follow. They claim that the most significant shortcoming in the banking industry today is a wide spread failure on the part of senior management in banks to grasp the importance of technology and incorporate it into their strategic plans accordingly.

2.3 RELATED LITERATURE:

In this chapter the researcher discussed the literature on the information technology in banking service delivery. The chapter review various documents deemed relevant to the study which included with automated processes. It has also modified the way in which a customer has access to a bank's services and products, mainly through the use of automated processes such as remote banking cash and James T, (1994). There are several competitive advantages associated with the adoption of technology in the banking sector, including the creation of entry barriers, enhancement of productivity, and increased revenue generation from new services Fitzsimmons and Fitzsimmons, (1997).

'E-channels' refer to the methods of delivering service products using electronic media such as the telephone, internet and automated teller machines (ATMs) as noted by, Boon and Yu, (2000). These delivery methods have become an increasingly important technique to retain customers in today's dynamic banking environment since customers can make withdrawals, deposits and access balances at their own convenience Tanzi, (1997).

2.3.1 Automatic Teller Machine (ATM)

An **automated teller machine (ATM)**, commonly called a **cash point** and a **hole in the wall** in UK English after the trademark of the same name, is a computerized telecommunications device that provides the clients of a financial institution with access to financial transactions in a public space without the need for a cashier, human clerk or bank teller. ATMs are known by various other names including *automatic banking machine*, *cash machine*, and various regional variants derived from trademarks on ATM systems held by particular banks.

According to John Mc Gill, (2004), an automated teller machine (ATM) is a computerized telecommunications device that provides the customers of a financial institution with access to financial transactions in a public space without the need for a human clerk or bank teller. ATMs are known by various casual terms including automated banking machine, money machine, bank machine, cash machine, hole-in-the-wall and cash point Lockett and Littler, (1999). ATMs typically connect directly to their ATM Controller via either a dial-up modem over a telephone line or directly via a leased line. Leased lines are preferable because they require less time to establish a connection John Wiley, (1997). Jane Blake, (2000) observes that, on most modern ATMs, the customer is identified by inserting a plastic ATM card with a magnetic stripe or a plastic smartcard with a chip, that contains a unique card number and some security information, such as an expiration date. Security is provided by the customer transactions over the telephone. In telephone banking, the telephone is used as a message carrier to enable person to person or voice activated automated communication between the bank and the customer Jun and Cai, (2001). Acceptance of new automated channels of service delivery in banks has brought a dramatic change in the way retail banks build and maintain close relationships with their customers Mols, (2000). The introduction of new automated channels of service delivery has made customer participation more widely possible Dabholkar, (1994) and therefore there is need to adopt new ways to conceptualize automated service quality, taking into consideration the attributes of all electronic delivery channels Szymanski and Hise, (2000).

2.3.2 . ATM Financial net work

Most ATMs are connected to interbank networks, enabling people to withdraw and deposit money from machines not belonging to the bank where they have their account or in the country

where their accounts are held (enabling cash withdrawals in local currency). Some examples of interbank networks include PULSE, PLUS, Cirrus, Interac, Interswitch, STAR, and LINK.

ATMs rely on authorization of a financial transaction by the card issuer or other authorizing institution via the communications network. This is often performed through an ISO 8583 messaging system.

Many banks charge ATM usage fees. In some cases, these fees are charged solely to users who are not customers of the bank where the ATM is installed; in other cases, they apply to all users.

In order to allow a more diverse range of devices to attach to their networks, some interbank networks have passed rules expanding the definition of an ATM to be a terminal that either has the vault within its footprint or utilizes the vault or cash drawer within the merchant establishment, which allows for the use of a scrip cash dispenser.

2.3.2.1 Internet banking

As technology reshapes the banking services industry, new products and services are offered through the Internet Ndubisi et al., (2003). The banking sector has little choice but to implement some form of internet technology in order to remain both innovative and on the cutting edge of competitive advantage. According to John Wiley (1997), Internet banking is the newest delivery channel to be offered by retail banks in many developed countries. It allows customers to conduct financial transactions on a secure website operated by their retail or virtual bank. In this case, the internet is used as a message carrier where the customer uses a PC and a modem or local area network to connect to the bank using its online website or software provided by the bank Porter, (2001). Features commonly unique to Internet banking are the personal financial management support, such as importing data into a personal finance program Lustsik, (2003). Also, some online banking platforms support account aggregation to allow Kelley *et al.* (1990), as well as the entire concept of what constitutes quality service are therefore key issues that need to be considered prior to the implementation of any structural change.

According to, Patricio *et al.*, (2003) effective service delivery is a service product or service process that is based on some technology or systematic method. It can be a new customer

interaction channel Kelley *et al*, (1990), a distribution system or a technological concept or a combination of them. A service delivery always includes replicable elements that can be identified and systematically reproduced in other cases or environments. The replicable element can be the service outcome or the service process as such or a part of them as noted by P. Kemp (2006).

Definitions of service, often consider the outcome of a service encounter as part of its measurement Den Hertog, P, (2000). Since service is generally measured in terms of the degree of satisfaction rendered Haynes and Duval, (1992), repeat customer patronage allows researchers the opportunity to focus on the outcome rather than the process. Service provision varies between organizations and individuals, and yet, little is understood about the reasons why certain goods and services are valued more highly than others Gabbott and Hogg, (1998). An effective service benefits both the service producer and customers and it improves its developer's competitive edge.

2.3.2.2 Mobile banking

Also known as M-Banking, mbanking, SMS Banking) is a term used for performing balance checks, account transactions, payments, credit applications and other banking transactions through a mobile device such as a mobile phone or Personal Digital Assistant (PDA). The earliest mobile banking services were offered over SMS. With the introduction of the first primitive smart phones with WAP support enabling the use of the mobile web in 1999, the first European banks started to offer mobile banking on this platform to their customers. Mobile Banking is a service that allows you to do banking transactions on your mobile phone without making a call , using the SMS facility.

Mobile banking has until recently 2010 most often been performed via SMS or the Mobile Web. Apple's initial success with iPhone and the rapid growth of phones based on Google's Android (operating system) have led to increasing use of special client programs, called apps, downloaded to the mobile device.

Mobile Banking refers to provision and availment of banking- and financial services with the help of mobile telecommunication devices. The scope of offered services may include facilities to conduct bank and stock market transactions, to administer accounts and to access customised information."

2.3.2.3 Telephone banking

According to Cronin, Mary J, (1997) telephone banking is a service provided by a financial institution which allows its customers to perform different tasks.

According to this model Mobile Banking can be said to consist of three inter-related concepts:

- Mobile Accounting
- Mobile Brokerage
- Mobile Financial Information Services

Most services in the categories designated *Accounting* and *Brokerage* are transaction-based. The non-transaction-based services of an informational nature are however essential for conducting transactions - for instance, balance inquiries might be needed before committing a money remittance. The accounting and brokerage services are therefore offered invariably in combination with information services. Information services, on the other hand, may be offered as an independent module.

The following transactions are currently available -

- Balance Inquiry of all accounts linked to your Customer Identification Number (maximum up to five accounts) , Checking the last 3 transactions in your primary account for Mobile Banking , Placing a Stop Payment on a cheque ,Requesting a cheque book, Requesting an Account Statement ,Cheque Status inquiry, Bill Presentment , Fixed Deposit Inquiry, A Help menu, which gives you the transaction codes for the various transactions, IPIN registration request (Only for customers who have registered for HDFC Bank Net Banking)

2.3.2.4 Security

-A big concern about information technology on service delivery channels is security. According to Buchanan and Gilles (1990), security is the condition of being protected against danger, loss, and criminals. In the general sense, security is a concept similar to safety. It is a condition that results from the establishment and maintenance of implications of this change includes an intense battle for market share, the emergence of new distribution channels such as remote banking De Moubray, (1991), increases in corporate advertising and generic "image building" programmes, increased product proliferation and fragmentation of markets, and a growing potential for niche marketing opportunities Ennew *et al.*, (1989). Krishnan, Ramaswamy, Meyer & Damien (1999) point out that, the banking industry strives to succeed by putting the topic of rapid and changing customers needs to their agenda. This is achieved in form of good customer care and offering attractive services or products that other competitors may not offer Dabholkar, (1994). Therefore, customer satisfaction is seen as a key performance indicator within business Meuter *et al.*, (2000).

2.3.2.5 Customer loyalty

Relationship development is important hence it is not complete without the use of technology Zineldin, (2001). According to, Blodgett, Hill and Tax, (1997) loyalty is a combination of intentional repurchase behaviour and psychological attachments of a customer to a particular service provider. Company resources are employed so as to increase the loyalty of customers and other stakeholders in the expectation that corporate objectives will be met or surpassed Kapoulas *et al*, (2002). The quality of product or service leads to customer satisfaction, which leads to customer loyalty, which leads to profitability.

The fundamental assumption of all the loyalty models is that keeping existing customers is less expensive than acquiring new ones. Schlesinger and Heskett, (1991) added employee loyalty to the basic customer loyalty model. They developed the concepts of "cycle of success" and "cycle of failure". In the cycle of success, an investment in your employees' ability to provide superior service to customers can be seen as a virtuous circle. Effort spent in selecting and training employees and creating a corporate culture in which they are empowered can lead to increased employee satisfaction and employee competence Aladwani, (2001). This is likely to result in

effective service delivery and customer satisfaction. This in turn will create customer loyalty, improved sales levels, and higher profit margins Lariviere & Poel (2004). Some of these profits can be reinvested in employee development thereby initiating another iteration of a virtuous cycle Blodgett, Hill and Tax, (1997).

Accessibility-One of the key factors in determining competitive advantage in such a turbulent banking environment, is the method of distribution of banking services the banking sector chooses Delvin, (1995). Convenient and value driven distribution channels add worth to the service offered. According to, Mountinho *et al.* (1997) new-age banks operate with minimal number of physical branches and use remote banking for the bulk of their operations. The remote channels are used to provide basic services while more sophisticated services are provided on a face to face basis Mitchell, (2000). Customers have needs and the expectations of the user. Whereas according to Juran as quoted by Dale (1999), quality of a service is fitness of that service for use. Consumers view quality of a service in terms of certain dimensions. The determinants of service quality include the ability of a service to fulfill consumer needs or problems, ability to use the service without any danger, risk or doubt, ability of a service to be easily accessible to the service users and ability of the service to be offered today and thereafter whenever a consumer needs it. Clark and Johnson, (2000).

Whereas according to Ronald *et al.*, (1999) sometimes service quality is just perceived, in which the consumer assumes an impression about a service and that the services are judged by their brand names and advertising to mention but a few. The quality issues of automated services in the banking context are becoming important because of their potential influence on attractiveness, customer retention, profitability, positive word-of-mouth, and maximum competitive advantages Moutinho and Smith, (2000). According to Chaudhary, (1999), quality service delivery by an organization has the advantage of creating a company reputation. A good company reputation is an asset for the company because every organization has a reputation for quality, be it good or bad. Quality service delivery increases market share because satisfied customers will buy more and recommend the service to another consumer Santos, (2003). Improved quality can lead to improved market share and cost saving, which both affect profitability as it improves the reliability, performance, fewer defects and consequently lower costs of business operation Nguyen and Leblanc, (1998).

Hanna (2002) notes that, the lack of face-to-face customer's relation through the use of information technology such as automated teller machine (ATM) increases the risk for money laundering. There should be protection from hackers and fraudsters Cronin, Mary J, (1997). Customers need to be sure that their passwords are secure and that information and transactions are kept confidential. Banks should use appropriate techniques to mitigate both external and internal threats to their electronic banking systems Buchanan and Gilles, (1990). These include virus scanning software, detection software and other security assessment tools, all of which should be reviewed periodically.

A series of transactions between customer and bank transforms into relationship step by step, being a result of social exchange between the client and bank (Giese and Cote, (2000). The relationships of both buyer and seller in banking sector are valuable and create dimension of power Oliver, (1981), co-operation, commitment and trust much higher than in consumer goods market Spreng *et al.*, (1996). The seller in the banking sector could benefit more from knowing about his buyer's habits, behaviour and visions, therefore, the offering of banking services could be better suited to the market and the demand of particular products could be projected Parasuraman *et al.*, (1991). Achieving customer satisfaction is a vital target for most service firms today Jones and Sasser, (1995).

and costs less to serve than new customers because transactions are routine. Factors that determine customer loyalty are relationship strength, perceived alternatives and critical episodes Lariviere & Poel, (2004). To build and maintain a relationship with a customer that lacks the physical presence of bank personnel "trust" must be central in "fostering customer loyalty" Mukherjee and Nath, (2003). Central to building and maintaining trust is communication, bi-directional communication between the customer and the service provider (bank) Aladwani, (2001).

2.3.3 Evolution of information technology

There are few aspects of life nowadays which are unaffected by information technology, whether in the office, factory or home, the bank, supermarket, fuel station and in many other places. Lucey (1987) noted that it is used to carry out transactions, provide information, record data, make decisions and perform an ever increasing range of tasks. It not only affects how individual activities are performed, but through new information flows it also greatly enhances a company's

ability to exploit linkages between activities both within and outside the company as Porter and Miller (1985) noted.

Information technology embraces data processing system and decision making, based on the fact that it's communicated by the control systems. A highly organized data processing system is essential for connecting and converting data into machine readable language (in some instance) prior to processing the data. Such activities require a well defined system which emanates from efficient system design. It should be a system that would produce information for management as a by-product of processing data rather than a primary point in its own right, hence it gives birth to management information technology system (MIS), Afolabi, (2009).

The objectives of management information system (MIS) includes: the provision of information on staff, finance, production and so on. Such information is used in the decision making process for modifying the state of systems, fosters taking appropriate steps which involves an acceptable level of accuracy and at an economical cost. Feedback mechanism is an essential requirement of information system.

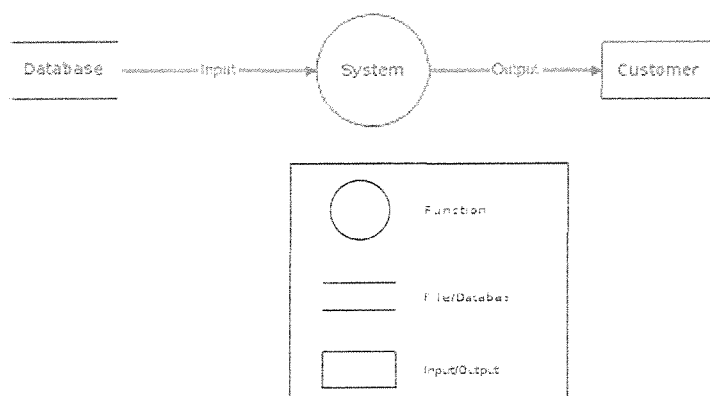
The introduction of Information Technology Reporting System (ITRS) is used for management planning and control functions as it focuses effectively as against focusing purely on data and efficiency which characterize transaction processing system. During the course of this research, it was discovered that National Bank of Rwanda as other Banks which were now being computerized.

The stage of development of office automatic application is gradual until the extent it gets to today. Some of these are stated by Olawepo (1999:82), includes Word processing, voice mail, audio conferencing, electronic mail/commerce, e-banking/ticketing, video conferencing and facsimile Transmission (Fax).

Technology has reached a level of artificial intelligence where machines such as computers have the ability to behave and display close to human intelligence or human like behavior. This artificial intelligence was carried out by John Mc Carthy at a conference at Dartmouth College, USA in 1956. Some of the areas where artificial intelligence is developed are expert systems, vision systems, as hardware, natural language, robotics and learning Afolabi, (2009).

In modern day business and banking operation, a database is necessary to take care of the changing complexity, most nature of businesses and organizations use a computer to do some modern applications such as customers accounts, stock control, payroll system among others, although there is bound to be a large degree of overlap of data between the files for the various applications.

A database collects datas, process and reports it into information. Sometimes the database simplifies large complex data into small logical form.



Source : John Azzolini, (2000). Introduction to Systems Engineering Practices. July 2000.

Conversely, information technology revolution has brought about economic and social development in Rwanda and the world at large. According to Isoun, (2002), Technology is power, technology is super power.

Information technology provides unique investment opportunities for small and medium enterprises (SMES) as it is an opportunity leveler. Also, information technology overcomes geographical, cultural barriers, promotes social integrity, unity and peace in Rwanda and thus improve investment climate.

Government is taking urgent actions to bridge the digital gap and build digital opportunities using the information technology tool. This is carried out by National information technology and communication, Rwanda Development Board (RDB). Rwanda information technology readiness index is increasing steadily; this can be confirmed through the e-banking services available to banks and organizations alike. For instance, an arm of Rwanda Inter Bank Settlement System (RIBSS) which is known as the Rwanda Automated Clearing System (RACS)

introduced the automations from the comfort of their offices and can confirm pay and settle each other for all transactions between themselves or their customers, this also puts an end to manual instruments which has been the practice in the industry's 120 years history of banking in our country.

2.3.4 . Development of Information technology in Banking industry

The first stage of information technology in banking industry started with an attempt to automate the process of banking services, which was done through mechanization. It was a mere process of simple electro-mechanical devices such as note counters and accounting calculators, to effect speed on basic transactions such as computation and counting of money. another stage of information technology was in routine data processing especially in information storage and retrieval. During the late 1950s and throughout the 1960s, business data was processed through punched card equipment and massive mainframe computers with far lower capabilities with far lower capabilities than today's microcomputers. The 1970s saw the advent of the primitive user networks as terminals got connected to the massive mainframes as a result of the challenges posed by large volumes of business data. This was the foundation era of information system (IT) management system (MIS) and decision support system (DSS). The 1980s witnessed the fusion of telecommunications and networking technologies for business deployment. Then was the emergence of data processing, office information system (OIS) and personal computers (PC). The 1990s till date, advances technology which transforms the way bank do business and how the emerging global information infrastructure has levered to shape and support potential networking technology to enhance corporate performance and competitiveness.

2.3.5 Computer technology in banking Industry

Opinions are divided on the use of computer technology in banking industry in spite of the undoubted accuracy, speed, storage and glamour which has characterized its use. Adewunmi, (1988) on the status of computer applications in Rwanda banks, his emphasis was on commercial and merchant banks. He concluded that the attention given to computerization in Rwandan banking industry dates back 20 years ago and majority of the banks have automated their operations leaving only a few unfortunate, large indigenous banks to catch up with others. Although his work revealed a lot on operations handled by computers, the bank's products of

computer facilitates the type of information produced by Rwanda banks and computer facilities. Adebawale, (1990) states what computers can do to make it more valuable to the banking industry, he said the introduction of magnetic ink character readers (MICR) cheques will help in quick clearing-by eliminating errors due to wrong sorting. He added that if all the branches of a bank are linked together within a state, it will be possible for a customer of a branch in one area to issue instruction for the transfer of funds into the account of another customer in another area of the branch within the use of Electronic Fund Transfer (EFT). In addition, he added that the computer system increases profitability and efficiency and also reduces the long waiting queue of the customer in the banking hall.

Ajogabde, (1992) expressed the view that computer is the latest craze in the banks today and it will continue to be relevant as the country develops. Computers have gained acceptance in all sectors of the economy ranging from education, banking, health and so on. These fact increases the popularity of the computer nowadays but with the success and advancement in computer development and even numerous advantages it has, it has been argued that computer creates unemployment, this can be brought about by re-organization and restructuring which accompany the use of computer; but one will disagree with this statement because the interest of the staff are usually given consideration before a system is computerized. Though it cannot be overlooked that some organizations have been damaged by computerization, but on the other hand, man have been greatly enhanced. Ariyo, (1991) also does not agree totally with Ajogbade, he said there are many practical ways by which management can ensure the acceptability of computer technology. First of all, management staff must be convinced or needs to be educated that the essence of computerization is to enhance the efficiency of operations. It is anticipated that through this enhanced efficiency, the growth and expansion of operation of the company will be assured. Hence in the long run, computerization will enhance employment generation. Though the personnel normally believes that computerization will throw as many as possible in the unemployment queue, there is usually the erroneous believe that automation entails replacement of human beings with machines, he further said that there must be constant and adequate information flow to all the sundry that the essence of computerization is to create jobs on the long run and not meant to send as many people to the unemployment market.

Folade, (1992) highlights many advantages of computer in banking industry that is, it is useful interest calculation which when performed manually requires many staff and much time, he also said, computerization in banking increases profitability of the bank as a result of the improvement in the services rendered to the computers which brings down the cost of doing business. He further stated that computer reduces fraud in banking industry because of lots of control mechanisms put in place to secure banking operation and services by default. He observed that there is no business that involves manual system that is fraud free. He also said that the high cost of computer is due to some middlemen elements and that there are no fluctuations or increase in computer price.

Raheem, (1992) observed that in today's environment, many accountants and bankers use computer in accounting, system auditing, and internal control of business. He said that the advantage of speed, reliability and storage capacity makes computer desirable and a useful tool for accountants and bankers. It also enables more information to be produced from a given amount of data.

The importance of computerized system cannot be over emphasized; it eliminates or reduces data duplication. In some departments, data are recorded in both payroll and budgeting system, but this data need only to be recorded once. Conclusively, the computer is very useful in all aspect of managerial decision and efficient and increases services of the customers.

Electronic business is the process which uses Internet technology to simplify certain company processes, improve productivity and increase efficiency. Podlogar, (2006) points some facts about process reengineering that are strongly connected to the process simplification, including: awareness of technology opportunities, ability to achieve process effectiveness, readiness for e-procurement collaboration, satisfaction and positive e-procurement experiences sharing and environment changing response. The groups of factors discussed above explore simplicity of business data processing with regard to processes that are necessary for the execution of the entire procurement process. These processes may capture : possible suppliers requisition request, replacement of supplier, bidding, Access to suppliers goods or catalogs, Access to suppliers inventory data, Suppliers access to your inventory, Ordering from supplier, Payment to supplier, Order tracking, Search for transporters, Transport ordering,

Receiving of delivery data announcement, Delivery receiving, Declaration solving and inventory management.

2.3.6 Information technology in growing Rwandan Financial market

In positioning the Rwandan financial market for competitiveness in the 21st century, the deployment of information technology will play a dominant catalytic role in growing the market. This view is consistent with Bill Gates powerful statement on the direction of digital economy. According to Gates, “The successful companies of the next decades will be the ones that use digital tools to re-invent the way they work. These companies will make decisions quickly, act efficiently and directly touch their customers in positive ways. Going digital will put you on the leading edge of a shock wave of change that will shatter the old ways of doing business.” Gates, (1999).

Learning from the above remarks, it is obvious that financial institutions worldwide are compelled by the emergence of information and communication technology (ICT) to fast forward to a more radical transformation of business systems and models. The hype of e-banking, e-commerce and everything is gradually being embraced by Rwandan financial institutions that are poised to be in the vanguard of narrowing the digital divide. The power of information is best understood in the context of how economies of nations are being influenced and propelled by information revolution. The following popular comment by Noah Samara, founder for Worldspace; clearly attributes the success or failure of nations to how you find information; look behind the poverty of nations and you find lack of information”. We can now further appreciate why countries are beginning to compete and fight over control of information, not natural resources. In the past few years, banking activities in Rwanda had depended heavily on the deployment of information technology.

The objective of the IT Sub-sector is to promote investment in, and the growth of the Information and Communications Technology industry. Efforts will be made to widen access to IT among the population, and to promote IT for e-Governance, education and capacity-building, and for use by the private sector. To this end, the number of tele centers will be increased substantially and the cost of connecting to a telecommunications network will have by 2011. It is hoped that the number of additional jobs created each year in the IT sector will rise from 7,000 in

2008 to 20,000 in 2012. This ambitious program will be overseen by the regulatory authority whose institutional capacity will need strengthening over the period of the EDPRS (Economic Development and poverty reduction strategy 2008-2012.)

The Policy objective is —*To integrate Science, Technology, Scientific Research and Innovation in a framework that shall include capability building, technical transfer initiatives, and the promotion of innovation, in the context of the issues facing Rwanda. Science, Technology and Scientific Research shall be catalyst to underpin all public and private sector activities to enable Rwanda's Vision 2020 to be realized.*” (p.9) *ICT in education policy Dec (2008)*

2.3.7 Globalization, information technology and Rwandan commercial Bank

The inter co-operation and integration of various financial system of the world via international trade, investment and distribution of vital information aimed towards the creation of synergy in the world market, production processes and general economic development is called Globalization Sheikh, (1999).

Babatunde, (2002), on the other hand defined globalization as the process of rapid economic integration driven by the liberalization of trade investment and capital flows as well as rapid technological changes in the information revolution.

The forces of globalization have continued to advance while the competition in banking industries across the world has become more intense by the day. Rwandan banking industry has not been spared from the growing competition as the banks continue quest to open up and develop more market. These competition pressures make it increasingly necessary for Rwandan banks to diversify their income base through increased efficiency as well as seek to grow their volume of business; this led to the adoption of a global outlook and strategy. It can therefore be easily understood that now is the time to examine globalization as it affects Rwandan bank.

Global network according to Sheikh (1999) have dismantled national boundaries and barriers and created a global village where one can access information from any part of the world by mere touch of a button—“A growing global village”. This global village has availed the Rwandan

banking industry to offer the general public cheaper and better service of genuine international standard. He further stated that for the local banks, positive response in some of the below listed areas will ensure their survival and relevance:

Consistent manpower development program will provide staffs with the competency to deliver efficient and courteous service, Product innovation, improved quality of service and efficient internal control system, Acquisition of functional and appropriate technology to support the chosen system operations.

2.3.8 .Benefits of applying information technology

Banking has come of age. Competition has allowed banks to start looking for innovation that will keep their customers and even win more. In recent years, the financial sector has been an interesting case for service innovation as it moves towards using the web for commercial purpose through internet banking and I.T. Adeyemi et. Al, (2008).

Accad, (2000) stated that the impact of price clarity and consumer empowerment afforded by information technology eventually led to product and price competition. According to him, in the future, customers would not be offered what is convenient to produce; banks will be faced with increasingly demanding customers that would compel them to offer today what they should have offered tomorrow. There is in effect a paradigm shift from just being profit-centric banks to that of differentiating oneself as in identify conscious customer-centric institution.

Odubanji, (2002) identified access to various branches with ease is enabling management to effectively use the bank resources as one of the in-house advantages that online facilities gives commercial banks. He further stated that with the aid of information technology, banks are closer to their customers to find out what they really need and deliver such needs as melt as other range of services in a customized manner and at the lowest cost.

Information technology has made it possible for customers to access their account balance, buy recharge cards and pay bills (TV subscription, water rate, electricity) using their handset (GSM) without stress; right inside their living room.

Awe, (2006) opined that online banking allows customers to get their current account balance at any time. Customers do not need to wonder either a cheque has been cleared or the status of their deposits in savings account. He also identified the ability of banks to provide immediate account enquiries or statements online for customers and so do not have to wait till month end for historical dual mail statement.

Accad, (2000) also proffered that information technology enables financial information to be presented to customers in a customized user friendly fashion allowing them to conveniently track data in the form that is best suited to their purpose.

Another major area where the application of information technology has tremendously assisted the banking sector is the provision of various financial services. Many financial services providers are seizing the opportunity offered by the internet to create entirely new business and smart banks are using information technology to reinvest their roles and the way they deliver values. The information technology driven bank have leveraged on the new technology innovating and delivering quality services.

Money transfer locally and internationally are made possible by information technology. Money gram and Western Union money are run internationally. Odubanjo, (2002) identified the Western Union Money Transfer as a common information technology protected that has clotted the banking landscape and has enjoyed a level of co-operation among banks. A significant advantage of this is that it has proved as a veritable source of foreign exchange for banking system.

Awe (2006) observed that online banking gives the ability to pay bill electronically. Utility bills are such as EWSA(electricity company) bill, DSTV bills, revenue bill can all be paid electronically. Such electronic payment can be credited the same day or the next day. Customers can also download account transaction online in their home or office without necessarily entering the banking hall.

Pedro, (2003) asserted that traffic in banking hall will be greatly reduced without necessarily compromising transaction profit if information technology is optimally utilised. Pedro said that the internet is recognized and acclaimed all over the world as the leading vehicle and engine of growth for commonest, business education and development is opened which indeed is a trade blazing issue in the banking terrain. Banks now enjoy a lower cost structure and even wider

reach. He further stated that the internet as a delivery channel is cheaper than other traditional delivery channels and banks are advised to increase operating efficiencies by distributing their products through the internet. In addition, while the market for a traditional bank and immortal bank branch is limited to the number of potential customers located in its vicinity, the market size of internet users around the world's figure is currently estimated at over 300 million.

This innovation brought about reduction in customers waiting time. Customer that want to collect 100,000frw and below can make use of the ATM machine in most Rwandan banks with high customer base. This in turn de-congests the counter in the banking hall.

Ovia, (2005) proffered that introduction of smart card is the ultimate in sampling money and how money is used. According to him, the introduction of plastic money inform of ATM debit/credit cards further extended human ingenuity and imagination at sampling how money could be handled and spent. He further postulated that information technology will lead to a reduction of cash transaction with long prospect of minimal cash handling will also assist in the reduction of risk exposure robbery and such other vices.

He further stated that fund transaction will be faster, more accurate and cheaper to promote all time available financial services.

Electronic banking offers benefits to both banks and customers. Pikkarainen et al, (2004) mentioned two fundamental reasons underlying online banking development and penetration. First, that banks get significant cost savings in their operation through e-Banking services. It has been proved that online banking channel is the cheapest delivery channel for banking products once established. Second, that banks have reduced their branch networks and downsized the number of service staff, which has paved the way to self-service channels as quite many customers felt that branch banking took too much time and effort.

On the other hand, customers enjoy self-service, freedom from time and place constraint, and reduced stress of queuing in banking hall. Therefore, time and cost savings and freedom from place have been found the main reasons underlying online banking acceptance. It was indicated that electronic banking services delivery are the cheapest, the most profitable and wealthiest delivery channel for banking products Pikkarainen et al, (2004).

multiple reasons for this. First, customers need to have an access to the Internet in order to utilize some e-Banking facilities such as Internet and Mobile banking facilities. Furthermore, most new online users need first to learn how to use the service. Second, nonusers often complain that online banking is incomprehensible, difficult to use and has no social dimension, i.e. the lack of face-to-face situation at branch Karjaluoto, (2001); Mattila et al, (2003). Third, customers are afraid of security issues Ezeoha, (2005).

Speed and Accuracy in information Processing, With the use of IT more work can be done by individuals, businesses, services and government organisations. Function enhancement programs such as word processors, database programs and spreadsheets can get work done in less time with increased accuracy and efficiency.

Global Social Interaction , IT has made global social and cultural interaction very simple. This is evident with the emergence and success of social networking websites, such as Facebook and Twitter. More so, the use of information technology has eliminated language barriers with technologies such as language translators.

Entertainment, The introduction and use of high tech applications and gadgets such as iTunes, iPod and iPhone has been revolutionary. Downloading, buying, playing and organising, music, videos, movies and TV shows has been made super easy and accessible. The gallant advancement of information technology through history puts the world in your palm with technologies such as iPad and Amazon Kindle.

Communication, The effect of information technology on universal communication is phenomenal. Telecommunication has gone beyond the use of basic technologies. With the advancement of the Internet and technologies such as VoIP (Voice over IP), organizations, businesses and individuals can communicate any time from different parts of the world through video and voice calls, web conferencing, seminars and virtual meetings.

Economic Advancement, A major step to global economic advancement is the removal of distance and time barriers brought about by the application of information technology to buying and selling of goods and services (e-commerce). E-commerce gave room for tiny, small and big business players to emerge. Interconnection of businesses is made painless. Thousands of local,

national and international businesses and enterprises now have what is referred to as 'web presence' and can now reach wider audience. Communication, The effect of information technology on universal communication is phenomenal. Telecommunication has gone beyond the use of basic technologies. With the advancement of the Internet and technologies such as VoIP (Voice over IP), organizations, businesses and individuals can communicate any time from different parts of the world through video and voice calls, web conferencing, seminars and virtual meetings.

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Education, Education has gone far beyond the use of bricks and mortal classrooms or traditional blackboards. The world is now in the era of e-learning, using technologies such as VLEs (Virtual Learning Environments). Students can have access to all teaching materials and resources online; engage in virtual classrooms real time or asynchronously -*by lola adgabulu jan march 2008 benefits of IT inbanks*

Banks and financial institutions are relying increasingly on information technology to support growth and expansion into the global marketplace. The major technologies which are used nowadays include Internet banking, mobile banking, telephone banking, smart cards, credit cards, and automated teller machines (ATM's). These methods allow customers to carry out many routine transactions without going into a branch. However, with all of the benefits that technology brings to the banking industry, it also brings increased risks and threats. Many banks are faced with a growing concern over the impact of dissatisfied employees, unauthorized users, industrial spies and hackers exploiting and compromising their information systems and networks. As technology becomes more sophisticated, so do those who would like to enter the world of information, such as these professional hackers. That is why banks should not only invest in providing new I.T. based services but they should also invest in a good security system



to protect themselves and their customers against viruses, spyware, keystroke loggers and eavesdropping programs. Information technology does not always mean fewer costs for banks to operate, but it has become a necessity in today's competitive market. This showed very clearly when visiting both the leading bank branches in Kigali. They seem to be competing by offering new I.T. bank services. For example BPR started using mobile banking in 2009 with local radio, promotional teams, nation wide brand awareness campaign, and cooperation of all 198 branches. Many thousands are actually opening new bank accounts to access the service. BPR constructed a promotional campaign Promo team support program for local branches, hand books in multiple languages, pro active out bound calling campaigns using their newly designed call center to help people in setting up and using the services. Mobile and wireless technology enable banks to satisfy clients who demand real-time information and mobile payment accessibility for example buying top-up cards for your mobile. To access mobile banking you will need a WAP-enabled mobile phone. Through a mobile phone, an individual can access his or her account information, effect transfers to third parties, request banking services as well as other information and pay bills. There may be times when it is not possible to access a personal computer. It is in these particular situations that one can use mobile and telephone banking.

2.3.9 .Technology Acceptance Model (TAM)

The **Technology Acceptance Model (TAM)** is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably:

Perceived usefulness (PU) - This was defined by Fred Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance".

Perceived ease-of-use (PEOU) - Davis defined this as "the degree to which a person believes that using a particular system would be free from effort" Davis, (1989).

TAM is one of the most influential extensions of Ajzen and Fishbein's theory of reasoned action (TRA) in the literature. It was developed by Fred Davis and Richard Bagozzi Davis 1989, Bagozzi & Warshaw, (1992). TAM replaces many of TRA's attitude measures with the two

technology acceptance measures— *ease of use*, and *usefulness*. TRA and TAM, both of which have strong behavioural elements, assume that when someone forms an intention to act, that they will be free to act without limitation. In the real world there will be many constraints, such as limit the freedom to act (Bagozzi & Warshaw 1992).

Bagozzi, Davis and Warshaw say:

Because new technologies such as personal computers are complex and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at using. Attitudes towards usage and intentions to use may be ill-formed or lacking in conviction or else may occur only after preliminary strivings to learn to use the technology evolve. Thus, actual usage may not be a direct or immediate consequence of such attitudes and intentions. Bagozzi & Warshaw, (1992)

Based on the theory of reasoned Action, Davis, (1986) developed the Technology Acceptance Model which deals more specifically with the prediction of the acceptability of an information system. The purpose of this model is to predict the acceptability of a tool and to identify the modifications which must be brought to the system in order to make it acceptable to users. This model suggests that the acceptability of an information system is determined by two main factors: perceived usefulness and perceived ease of use.

Perceived usefulness is defined as being the degree to which a person believes that the use of a system will improve his performance. Perceived ease of use refers to the degree to which a person believes that the use of a system will be effortless. Several factorial analyses demonstrated that perceived usefulness and perceived ease of use can be considered as two different dimensions Hauser et Shugan, (1980) ; Larcker et Lessig, (1980) ; Swanson, (1987).

As demonstrated in the theory of reasoned Action, the Technology Acceptance Model postulates that the use of an information system is determined by the behavioral intention, but on the other hand, that the behavioral intention is determined by the person's attitude towards the use of the system and also by his perception of its utility. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is also based on the impact which it

may have on his performance. Therefore, even if an employee does not welcome an information system, the probability that he will use it is high if he perceives that the system will improve his performance at work. Besides, the Technology Acceptance Model hypothesizes a direct link between perceived usefulness and perceived ease of use. With two systems offering the same features, a user will find more useful the one that he finds easier to use (Dillon and Morris, on 1996).

According to Davis, (1986) perceived ease of use also influences in a significant way the attitude of an individual through two main mechanisms: self-efficacy and instrumentality. Self-efficacy is a concept developed by Bandura, (1982) which explains that the more a system is easy to use, the greater should be the user's sense of efficacy. Moreover, a tool that is easy to use will make the user feel that he has a control over what he is doing Lepper on (1985). Efficacy is one of the main factors underlying intrinsic motivation Bandura on (1982); Lepper on (1985) and it is what illustrates here the direct link between perceived ease of use and attitude. Perceived ease of use can also contribute in an instrumental way in improving a person's performance. Due to the fact that the user will have to deploy less efforts with a tool that is easy to use, he will be able to spare efforts to accomplish other tasks.Davis, on (1986).

It is however interesting to note that the research presented by Davis, (1989) to validate his model, demonstrates that the link between the intention to use an information system and perceived usefulness is stronger than perceived ease of use. According to this model, we can therefore expect that the factor which influences the most a user is the perceived usefulness of a tool.

User's attitude towards and acceptance of a new information system is important on successful adoption of the information system Davis, (1989). The quality and effectiveness of a system can only be validated with its level of users' acceptance. A system that satisfies users' needs boosts satisfaction with the system and is an indicator of the system's success Pikkarainen et al, (2004). To improve the delivery of efficient and effective system by designers and developers, it is important to study the reasons why people decide to use or not to use an information system. Technology Acceptance Model (TAM) is an information system theory that models how users come to accept and use a technology. TAM proposed by Davis, (1989) is an extension of Theory

of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB). The Technology Acceptance Model explained the relationship between beliefs (perceived usefulness and perceived ease of an information system) and users' attitude, intentions, and actual usage of the system. The TAM posits these two theoretical constructs; perceived usefulness (PU) and perceived ease of use (PEOU) as fundamental determinants of user's acceptance of an information system.

TAM posits that user's acceptance of a new information system is determined by his intention to use the system which is determined by users' attitude. Users' attitude in turn is determined by the two behavioral beliefs; perceived usefulness and perceived ease of use Davis, (1989). Much research had been conducted using TAM and it has become the most widely accepted model among information system researchers Muniruddeen, (2007).

Many research works had been conducted using TAM and introducing other variables which are validated as having impact on usefulness, ease of use, attitude, users' acceptance and intention Hanudin (2007); Muniruddeen (2007); Pikkarainen et al, (2004). Davis sited that future research on technology acceptance should address the impact of other variables on usefulness, ease of use and user acceptance and intention. Validity of TAM can be increased by exploring the nature and specific influences of technological and usage-context factors that may affect user's acceptance. For instance, Hanudin (2007) concluded that credibility is the heart of Internet banking system and found computer self-efficacy as a major influence on perceived ease of use.

In the context of electronic banking, Muniruddeen, (2007) employed the extended TAM to examine individual's perceived security and privacy of Internet banking in Malaysia. Siu-Cheung and Ming-te, (2004) also extended the model with Subjective Norm and Social Cognitive Theory (self-efficacy) by Bandura, (1982) to explain the intention to use Internet banking in Hong Kong. Jahangir and Begum, (2008) also employed the extended TAM with attitude as defined by Theory of Reasoned Action to determine the customer adaptation of e-Banking. Therefore, perceived ease of use and perceived usefulness alone may not fully determine the user's intention to adopt electronic banking, thus the need to examine additional factors that may better predict the acceptance of electronic banking. Computer self-efficacy, perceived credibility (security and privacy), perceived risk, quality of Internet connection, and

perceived enjoyment among others are external variables that have been introduced into TAM in extending its validity on examining user's acceptance of online banking, Internet banking, e-Commerce and Internet usage.

2.3.10 Challenges facing the application of information technology in Rwandan banks

Information technology foster relationship as it provides for instantaneous online exchange of information dialogue. This will enable faster resolution of conflict and quicker determination of a customer need. Globalization implies that many Rwandans now know about the internet, competition will no longer be the bank down the street or in the next town. It, Rwandan banks face a Several challenges.

One of the major bottleneck or the challenges is the lack of access to electric power, equipment and trained teachers, and lack of awareness of ICT (Rwanda Education Sector Policy, 2003, p. 15).

Rwanda's inadequate infrastructures as another challenge, Electricity supply is sporadic and inefficient. Most importantly, Rwanda has low internet penetration where all areas are inaccessible to the net .

Low internet connectivity:

Though there is a reflection of growing dependence on internet technology, there has hitherto been low supply, slow in terms of connection speed and expensive but with the expected development of recently faced wireless there is hope of better service.

Low Tele-density:

Rwanda has one of the lowest tele-densities in the world in the world Pre-GSM roll out. Teledensity is the number of landline telephones in use for every 100 individuals living within an area. A teledensity greater than 100 means there are more telephones than people. Third-world countries may have a teledensity of less than 10. It is practically impossible to grow and expand the Rwandan financial market without adequate telecommunication infrastructure.

2.3.10. 1 Other challenges (General challenges)

Low private sector participation. The private sector has played minimal, though increasing, role in the investment in the telecommunication sector in Africa. The bulk of investments have come from self-financing and from bilateral and multilateral sources. Compared to other developing countries, the level of self-financing by local operators is high, indicative of the lack of capital from other sources. T.W.Oshikoya and M.Nulredin Hussain, (2003)

Low investment efficiency and high installation costs. Installation costs per line in Africa are extremely high relative to the industry average, reflecting the state of investment inefficiency in the sector. It is estimated that the average cost per line in the region is over US\$4,500, more than three times the industry average of US\$1,500. Thus, if the industrial average prevailed in the region, the investment made could have financed three times more lines with the same amount of funds. The huge installation costs are partly due to the large rural areas that have to be covered.

Foreign exchange imbalances of public operators. International telecommunications tariffs in developed countries have fallen, as a result of which payments for traffic from outside have increased in Africa. These payments are often made in hard currency, although the public telecommunications authorities have noted that funds so received are absorbed by other public agencies. On the other hand owing to the high international tariffs charged by local public telecommunications networks, they are increasingly being pushed aside by "parallel" networks. This tended to reduce the import capacity of local public operators to renew and service equipment, resulting in quality deterioration and poor service.

High population growth rates. Population growth rate in Africa is the highest in the developing world, and is estimated at around 3 percent since the 1990s. Although the number of telephone lines has been increasing in absolute terms, the growth rate has to be much higher in order to impact positively on the level and growth rate of tele-density.

The challenges facing commercial banks in their attempt to ensure a smooth exchange of electronic data and information are:

The need to build a better and more optional infrastructure that will serve as a back bone for communication within the banks. T.W.Oshikoya and M.Nulredin Hussain, (2003)

The need for banks to come together to collaborate in sourcing for new and common technological equipments to provide common standards for credit and electronic wallet cards.

The need to professionalize information technology system development and use by management in Rwandan banks.

The need to impress the government and the public, the importance of improving the present telecommunications infrastructure. for example in Rwanda, the study showed that telephone voice traffic growth slowed sharply in recent years to 10 per cent. When the fiber cable is set up, Rwanda will have about 600 base stations that will cost government about \$15m. It is also envisaged that Internet usage would triple in 10 years time. This will also benefit the banking Institutions. *Rwanda national backbone for fiber optic cable set*, (2009)

The need to establish independent private radio and satellite networks.

To combat these challenges, the following are to be preferred:

A reduction in import duties, tax and the time it takes information technology equipment to be cleared is needed.

The government should be sensitized about the need to formulate policies that would allow for long term investments in the telecommunication industry.

Emphasis should be placed on the importance of maintaining existing infrastructure and equipment.

The awareness of banks and indeed the general public on the advantages of information technology and communication should be increased by way of enlighten campaign and through any other productive means.

CHAPTER THREE:

METHODOLOGY

3.0. INTRODUCTION

This chapter covers the proposed design, population, sampling strategies, data collections methods, data collection instruments, data quality control, procedures and data analysis.

3.1.DESIGN:

The researcher used quantitative, co relational, cross sectional survey. The quantintative paradigm was used as techniques and measurements that produce numerical or quantifiable data and statistical tools used for analysis. The study was correlation in order to determine or describe in quantintative terms the degree to which the variables are related. That is the degree to which information technology is linked with service delivery in banks. *Henry C. Lucas, JR., (1997)*. The study used survey in order to obtain description of particular group of individual and cross sectional survey to gather data from sample of the population at a particular time.

3.2. POPULATION

In this study, the population involved 20 staffs and 80 customers of BPR bank Kigali Head quarter (2008-2011). All these classes of people got involved in the sense that both have an attachment with the bank.

	Staff(employees)	Customers	Total
	20	80	100

3.3. SAMPLING STRATEGIES

The study was based on sampling because of the large number of the target population. The 20 bank staff and 80 customers enabled the use of the simple random sampling in the study. Amin,(2009) .Each category of the respondent was stratified according to the classes of staff and customers.

3.4. DATA COLLECTION METHODS

Primarily, self administered Questionnaire were used because of their nature of the use one time data collective device on the variables of interests in the study Amin, (2005). each item in the questionnaire was developed to cover the specific objectives and the research questions.

3.5. DATA COLLECTION INSTRUMENT

The self administered Questionnaire was composed of 2 parts of Questions; one part goes to Customers of the bank. Another set of questionnaire goes to the Staff. Each questionnaire consist of tittles, and introduction. All questionnaires have a classification items which helped to identify the respondents from various sides either customers or the staff of the bank. There are both open ended questions to obtain feelings of the respondents and close ended questions for easily administration. The data was collected using primary and secondary data and interview.

3.6. DATA QAULITY CONTROL

The researcher ensured the content validity of the instruments, by ensuring that the questions or item corresponds to the conceptual frame work. The respondents judged and evaluated the relevance wording and the clarity of the questions or items. The questionnaires were structured and directed to some employees and customers of the bank to ensure that all questions and instruction are clear and could give in data that can used.

3.7. PROCEDURES

After the proposal Viva voce defense, the researcher sought permission from the school of post graduate studies to continue with the study. After obtaining of the letter of introduction as students carrying out research for academic purposes from the school of post graduate studies,

the researcher went ahead to nominate the research assistant who will help distribution of the questionnaire to the various staff and customers of the bank.

3.8. DATA ANALYSIS

The self administered Questionnaire(SAC) which will have complete data will be edited, categorized and entered in the computer to summarize them using the simple and complex frequency table or cross tabulation. The computation of relative frequencies, means and percentages and other relevant statistics will be done using the excel program

CHAPTER FOUR:

DATA ANALYSIS INTERPRETATION AND PRESENTATIONS

4.0 INTRODUCTION

This chapter includes the summary of all data collected during the research. the purpose of this study was to find out the impact of Information technology in banking service delivery case study (BPR). The chapter deals with presentation, and discussion of major findings of the study and their interpretation. Percentages are used as means of analyzing and interpretation of data.

The analysis is presented in two sections: **section A** deals with analyzing the impact of Information technology on Bank staffs and **section B** deals with presentation, discussion, and interpretation of data from (bank customer) of BPR.

SECTION A

This section analyzes the Bank staff opinion (view) on the impact of Information technology in banking services. This analysis uses responses of 20 respondents out of 20 questionnaires distributed. So the response is 100%, of the intended sample size of bank staffs and then looks for the sufficient of the analysis of this study.

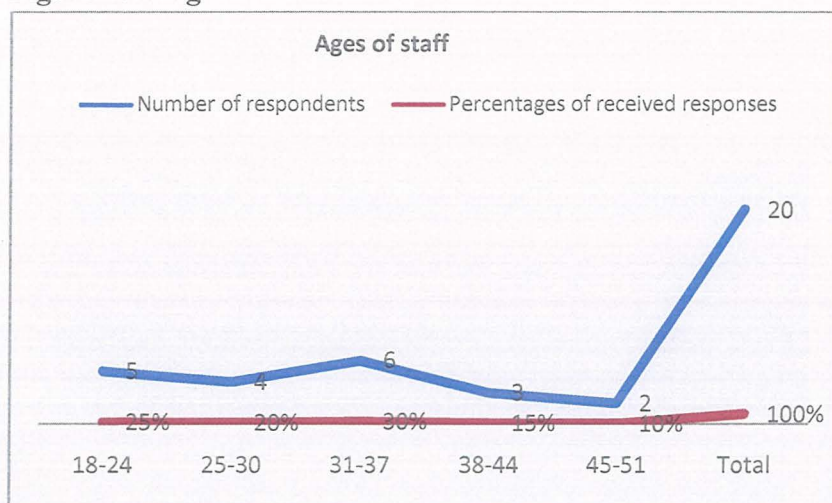
A.STAFF PERSONNEL DATA:

Table 4.1. Ages of staffs (employees)

Responses	Number of respondents	Percentages of received responses
18-24	5	25%
25-30	4	20%
31-37	6	30%
38-44	3	15%
45-51	2	10%
Total	20	100%

Source; primary data. (Self administered questionnaire 2011)

Figure 4.1: Ages of staff



Source: primary data, (self administered questionnaire 2011)

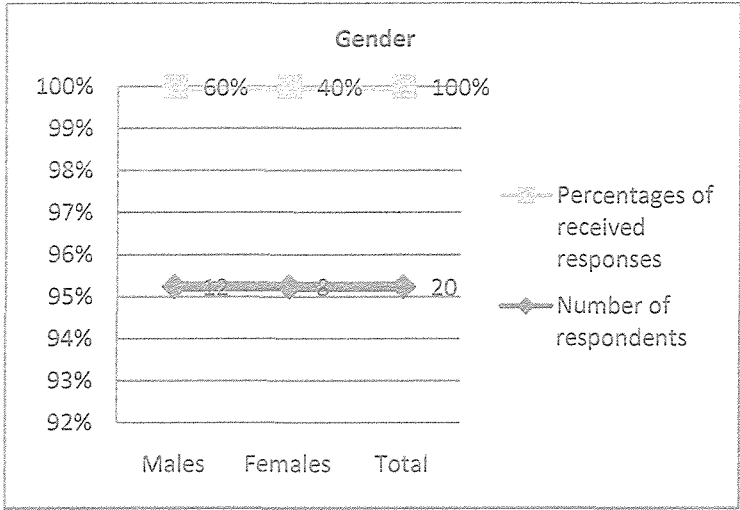
From the above responses, the 25% is the responses of employees of between 18-25, 20% is from those of 25-30, 30% is from those of 31-37, 15% from 38-44 and 10% those between 45-51. The analysis here is that the bigger percentage of responses of the staff falls under the age of 31-37. Meaning the BPR bank employees majority falls in between the age of 31-37. It means that banker's employees are young dynamic and still energetic to work for it.

Table 4.2. Gender.

Responses	Number of respondents	Percentages of received responses
Males	12	60%
Females	8	40%
Total	20	100%

Source: primary data. Self administered questionnaire 2011)

Figures 4.2. Gender



Source: primary data

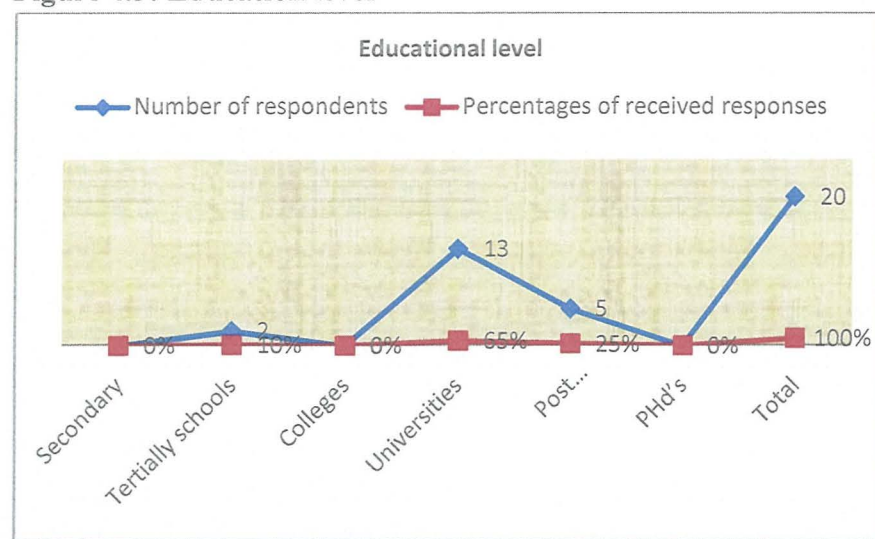
The table 4.2. shows the gender sensitive staffs in BPR. In all responses females responses were 40% and males 60%. All totaling to 100%. The fact here is that, the bank employs based on merits. From the observations made, they both understand the information systems used by the banks.

Table 4.3. Levels of education.

Responses	Number of respondents	Percentages of received responses
Secondary	0	0%
Tertially schools	2	10%
Colleges	0	0%
Universities	13	65%
Post graduates(masters)	5	25%
PHd's	0	0%
Total	20	100%

Source: primary data(self administered questionnaire 2011)

Figure 4.3: Education level



Source: primary data (self administered questionnaire 2011)

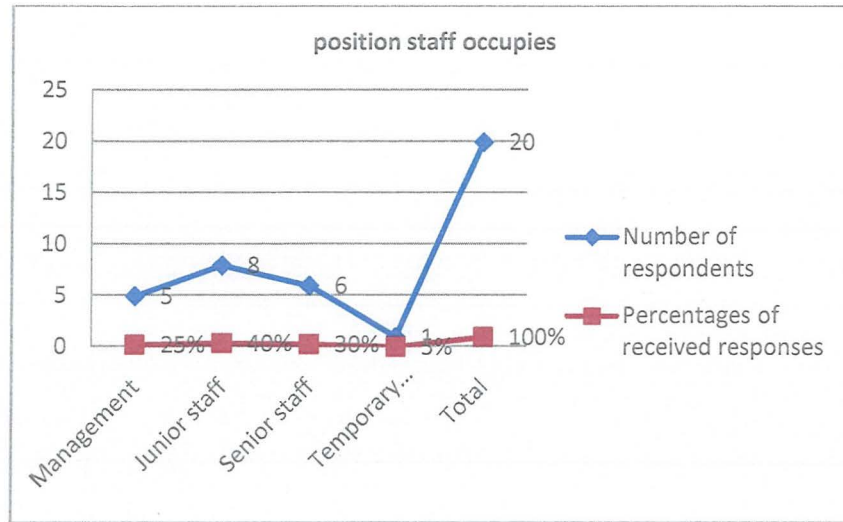
The table 4.3. Shows the various qualifications of BPR staffs (employees) in Kigali city. it shows that the 65% of staff of the bank holds university level, 25% masters levels, 10% tertiary schools, secondary and PhD's indicated 0%. These indicate that the higher percentage of staff in bank is degree holders followed by master holder and those in tertiary schools. The implication here is that, their levels of education permits them to understand the banking system and use and bank would spend less on building capacity of the staff and there realize growth and development

Table 4.4. position occupied

Responses	Number of respondents	Percentages of received responses
Management	5	25%
Junior staff	8	40%
Senior staff	6	30%
Temporary contractual staff	1	5%
Total	20	100%

Source; primary data (self administered questionnaire 2011)

Figure 4.4: position staff occupies



Source: primary data (self administered questionnaire 2011)

The table 4.4 shows the percentages of responses of bank staffs per position occupied. It indicates that, 40% were the Junior staffs, 30% were the senior employees, 25% were the management staff followed by 5% of temporary contractual staff. Following their responses, all classes of staff (employees) articulate and recognize the information technology and the role of it in fostering their work. under these classes, the management includes finance and the HR staffs, the junior staff include the bank teller or clerk, the senior staff their take account of credit and risk manager and temporary staff includes those engaged in assisting the clients to register in ATM's and mobile banking services.

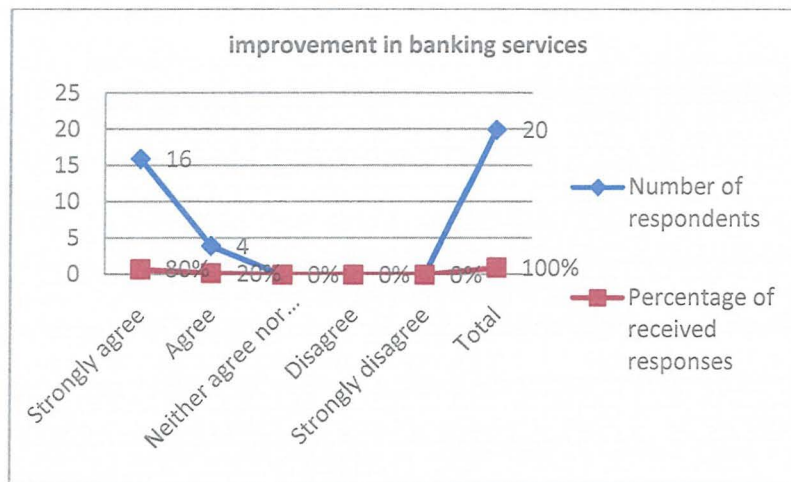
PART: B INFORMATION TECHNOLOGY DATA.

Table 4.5.Improvement (progress) in banking services

Decision	Number of respondents	Percentage of received responses
Strongly agree	16	80%
Agree	4	20%
Neither agree nor disagree	0	0%
Disagree	0	0%
Strongly disagree	0	0%
Total	20	100%

Source: primary data (*self administered questionnaire 2011*)

Figure 4.5: Improvement in banking services



Source; primary data (*self administered questionnaire 2011*)

Out of 20 respondents used in this research, 16 which represents 80% of respondents strongly agrees that there is major improvement in banking services (BPR) as consequence of availability of information technology services and products. 4 which stands for 20% agrees to this reality. The rest of the responses were 0% meaning there were no respondents.

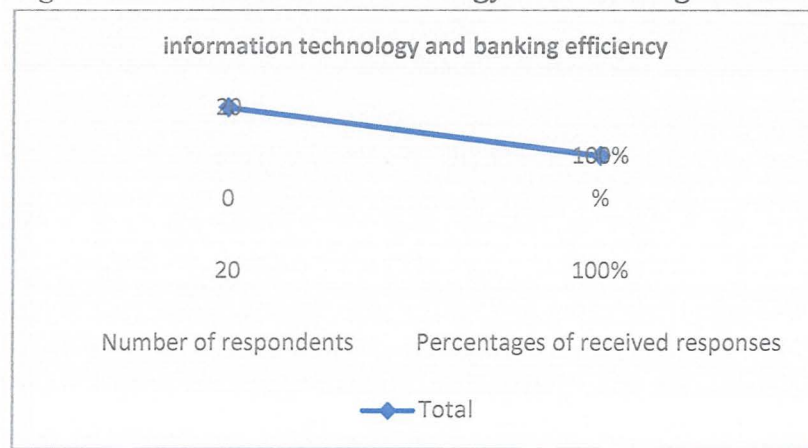
From the above analysis, it figures out that, there are strong improvements in banking services; there comes faster service delivery, reduction in the number of customers in banking halls due to the presence of other packages of product of services of (IT) like ATM's cards, mobile banking, systems use computers software's to mention but few. The majority of staff responded to this because they see the more role in facilitating them to perform their tasks.

Table.4.6. Information technology and banking services.

Decisions	Number of respondents	Percentages of received responses
Yes	20	100%
NO	0	%
Total	20	100%

Source : primary data (*self administered questionnaire 2011*)

Figure 4.6: information technology and banking efficiency



Source a primary data (*self administered questionnaire 2011*)

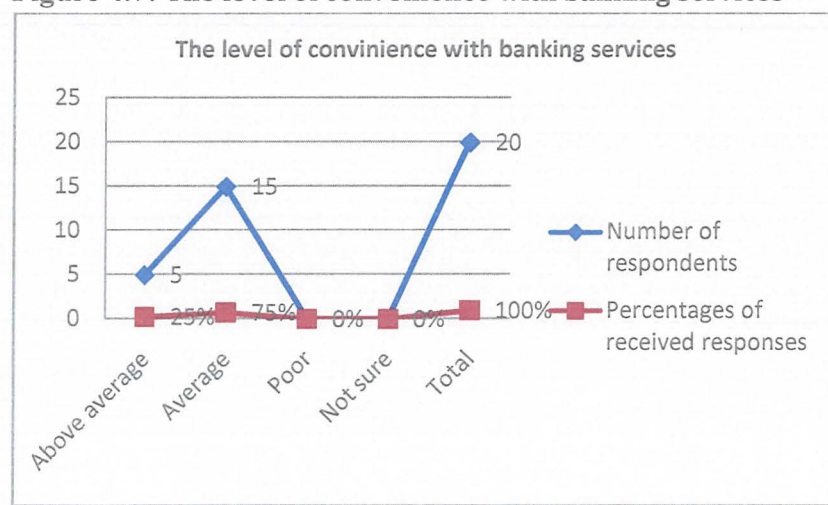
Out of 20% of the respondents, of this research 100 which represents 100% respondents clearly agrees that the bank (IT) Information technology increases the bank efficiency. All responded with yes on (IT) in boosting efficiency of the bank. From the analysis above, the Information technology increases the bank efficiency.

Table. 4.7.the level of convenience with bank service delivery

Decisions	Number of respondents	Percentages of received responses
Above average	5	25%
Average	15	75%
Poor	0	0%
Not sure	0	%
Total	20	100%

Source primary data (self administered questionnaire 2011)

Figure 4.7: The level of convenience with banking services



Source primary data (self administered questionnaire 2011)

Out of 20 respondents used in this research, 15 which represents 75% of respondents agrees that the information technology improves the level of convenience in banking service delivery, 5 which represents 25% of respondents were of strongly average opinion that information technology improves the level of convenience within the banking services. The rest no decision.

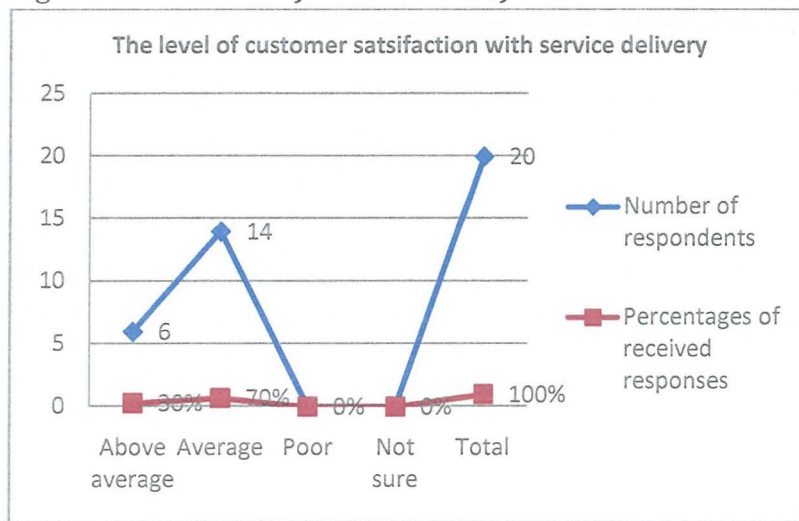
The analysis is that, the information technology improved the level of convenience in banking service delivery like the internet banking opens up new horizons for them and moves them from local to global frontiers.

Table.4.8. Level of customer satisfaction with service delivery

Responses	Number of respondents	Percentages of received responses
Above average	6	30%
Average	14	70%
Poor	0	0%
Not sure	0	0%
Total	20	100%

Source primary data (self administered questionnaire 2011)

Figure 4.8: The level of customer satisfaction with service delivery



Source primary data (self administered questionnaire 2011)

Out of 20 respondents, used for this research 14 which represents the 70% agrees that (IT) the information technology increases the level of customers' satisfaction with service delivery. 6 which represent the 30% strongly went over average in as far as the information technology facilitates the customer satisfaction in service delivery. The rest of the response is 0.

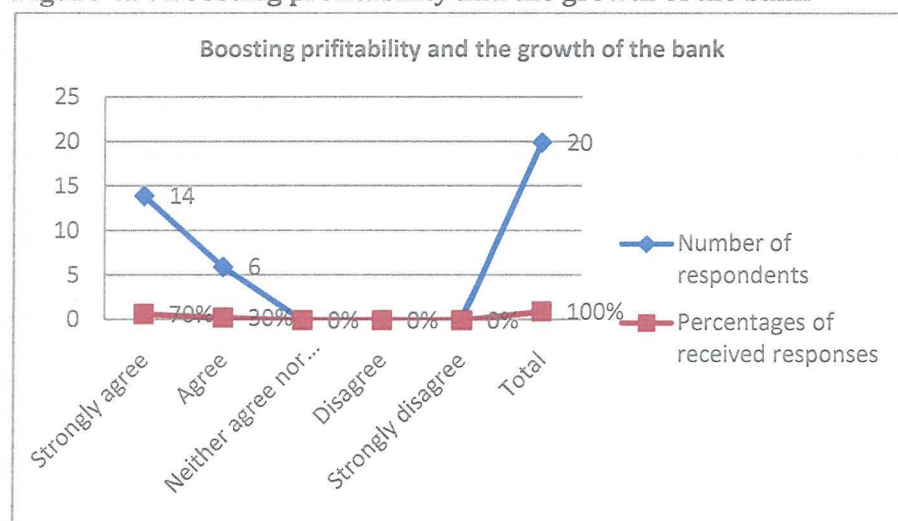
The customer of every business organization to a bigger extent determines the survival of the business of the failure of it. This directly goes to the banks where the customer is the king. It is from this point of view, where the (BPR) the popular bank of Rwanda puts more efforts in marketing facilities and introducing new technologies all focusing on improving and maintaining the customer relations.

Table 4.9. Boosting profitability and growth of the bank

Responses	Number of respondents	Percentages of received responses
Strongly agree	14	70%
Agree	6	30%
Neither agree nor disagree	0	0%
Disagree	0	0%
Strongly disagree	0	0%
Total	20	100%

Source primary data (*self administered questionnaire 2011*)

Figure 4.9: Boosting profitability and the growth of the bank



Source primary data (*self administered questionnaire 2011*)

Out of 20 respondents, used for this research 14 responses which represents 70% of respondents strongly agrees that the information technology increases the profitability and the growth of the bank. 6 which represents 30% of respondents agrees to this facts. The rest were 0% responses to neither agree nor disagrees. From the above analysis, 14 which represents 70% of BPR popular bank of Rwanda staffs confirms the facts that, information technology has led to increase in the growth and the profitability of the bank. The BPR management has invested a lot into

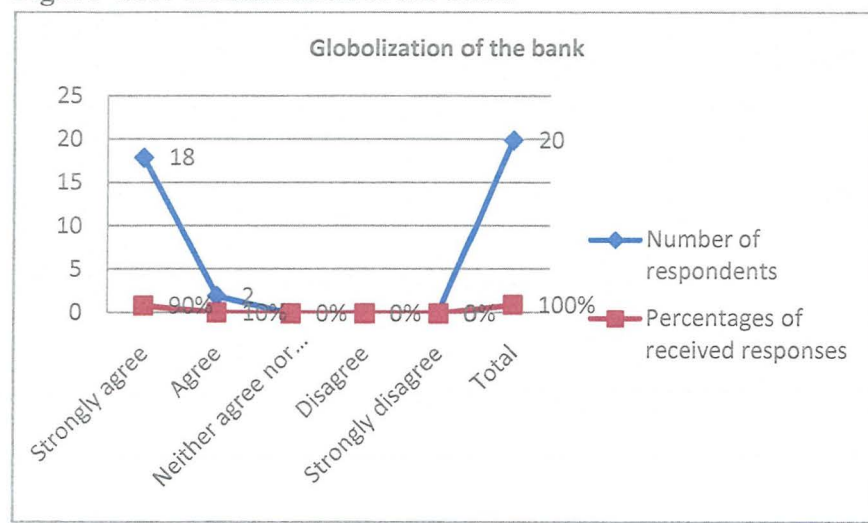
information technology to increase the number of the customers without compromising their interests, this increased to the profitability of the bank like increasing the number of ATM's and BPR Mobile banking for customers to easily access the services

Table 4.10. Globalization of the bank.

Responses	Number of respondents	Percentages of received responses
Strongly agree	18	90%
Agree	2	10%
Neither agree nor disagree	0	0%
Disagree	0	0%
Strongly disagree	0	0%
Total	20	100%

Source primary data (self administered questionnaire 2011)

Figure 4.10: Globalisation of the bank



Source primary data (self administered questionnaire 2011)

Considering the 20 respondents or questionnaires distributed, 18 responses which represents 90% of respondents strongly agrees that the information technology has increased the globalization the (BPR) the popular Bank of Rwanda.² which stands for 10% respondents agrees to the truth

and facts. 0 which represents 0% were indifferent, and 0 which represents 0% again Disagree to the facts and 0 which represents 0% finally completely strongly disagreed to the facts.

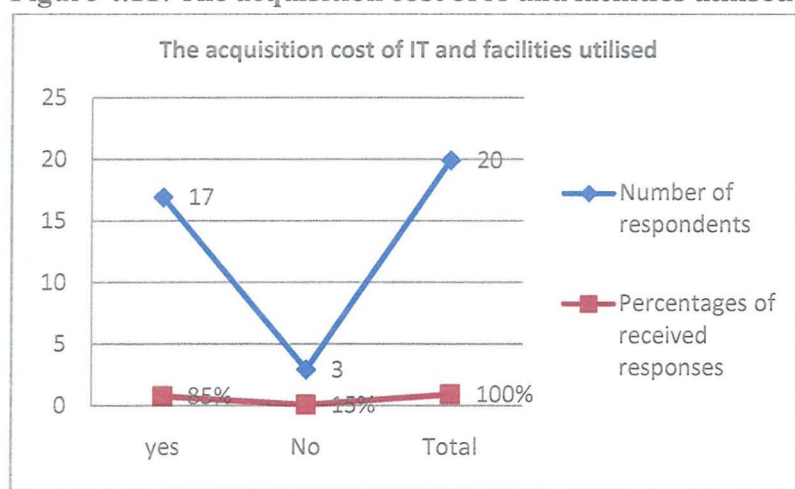
The analysis here from the global point of view, it is clear that the information technology has increased the globalization of the bank(BPR) it brought about the provision of facilities like the money grams, like western union money transfers, Visa and the master cards international debit and the credit cards, to mention but few. These has made the customers to receive money from and to Rwanda in any other parts of the world. This fastly increased the globalization of the BPR Bank.

Table 4.11. The acquisition cost of IT equipments and facilities utilized.

Decisions	Number of respondents	Percentages of received responses
yes	17	85%
No	3	15%
Total	20	100%

Source primary data (*self administered questionnaire 2011*)

Figure 4.11: The acquisition cost of IT and facilities utilised



Source primary data (*self administered questionnaire 2011*)

Out of 20 respondents used in the research, 17 which represents 85% of the respondents agrees to the facts that the benefits of information technology justified the costs involved in utilizing the facility. While 3 which represents 15% of the sampled population disagreed to the facts. This

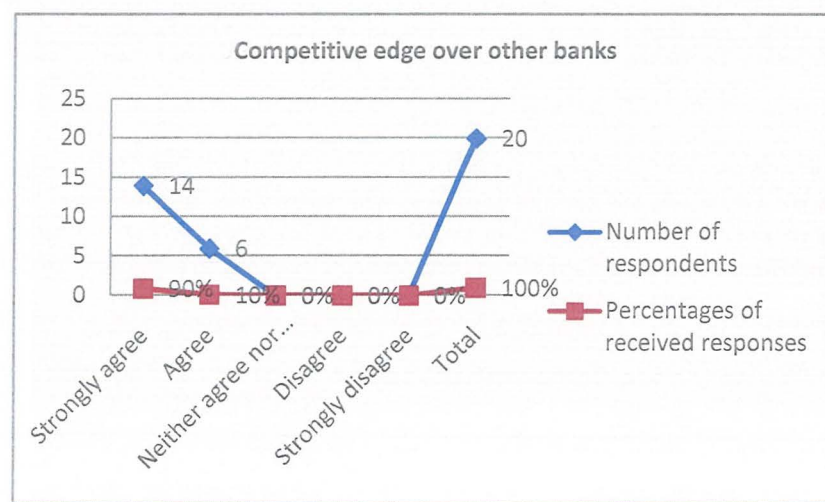
goes to enhancement of productivity, increased revenue from new services, creation of entry barriers and use of all automated processes (remote banking) the benefits outweigh the costs of acquiring the IT.

Table 4.12. Competitive edge over other Banks.

Responses	Number of respondents	Percentages of received responses
Strongly agree	14	90%
Agree	6	10%
Neither agree nor disagree	0	0%
Disagree	0	0%
Strongly disagree	0	0%
Total	20	100%

Source primary data (self administered questionnaire 2011)

Figure 4.12: Competitive edge over other banks



Source primary data (self administered questionnaire 2011)

Out of 20 respondents to this, 14 which represent 90% of respondents strongly agreed that the information technology give a competitive edge in the industry. 6 which represents 10% respondents agreed to the facts, 0 which represents 0% respondents were indifferent, 0 which

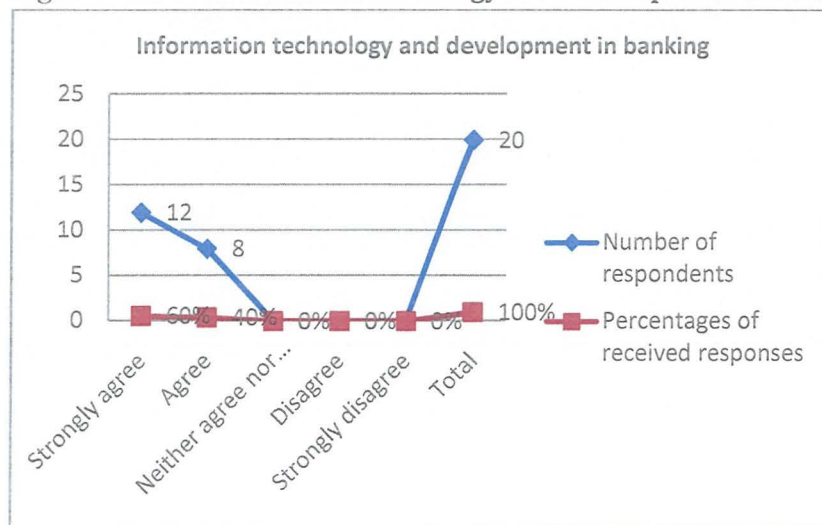
represents 0% respondent were Disagrees and finally 0 which represents 0% respondents strongly disagreed to the reality. From the above analysis is that, the impact of information technology has given BPR bank to come to the best performing institutions in Rwandan banking industry.

Table 4.13. Information technology and development in banking

Responses	Number of respondents	Percentages of received responses
Strongly agree	12	60%
Agree	8	40%
Neither agree nor disagree	0	0%
Disagree	0	0%
Strongly disagree	0	0%
Total	20	100%

Source primary data. (Self administered questionnaire 2011)

Figure 4.13 : Information technology and development in banking



Source primary data. (Self administered questionnaire 2011)

Of the 20 questionnaire distributed to the staffs, 12 which represents 60% of respondents strongly agree that the information technology has brought the welcome development in the

banking (BPR) bank, 8 which represents the 40% of the respondents agrees to the facts, 0 which represents 0% of respondents were indifferent to the facts, 0 which represents 0% respondents disagree to the information, and finally 0 which represents 0% strongly disagrees to the facts.

It from this point of view that, the information technology is the welcome development in the banking industry, here it makes the bank services and tasks done more easier and cumbersome by allowing the bank staff to browse the accounts, to view the customer information, easily classifying of documents in the computer and manage networking with other banks.

SECTION B

This section analyzes the customer of the bank's (view) on the impact of Information technology in banking services. This analysis uses responses of 80 respondents out of 80 questionnaires distributed. So the response is 100%, of the intended sample size of bank customer and then looks for the sufficient of the analysis of this study.

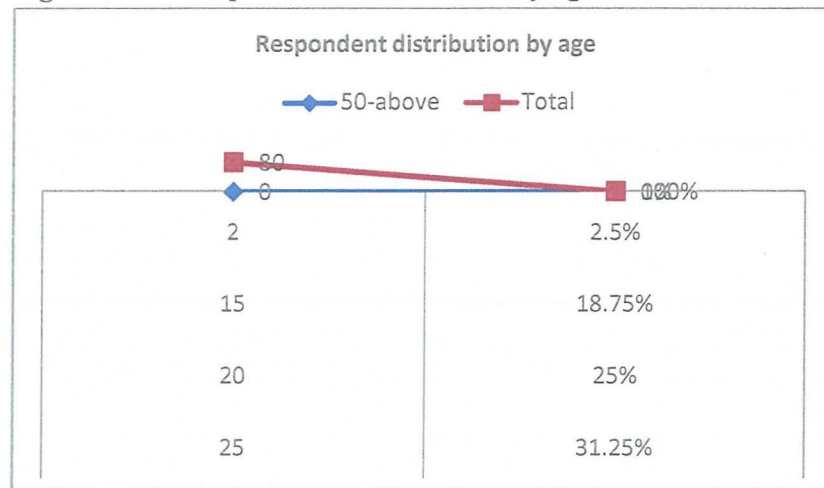
PART B: CUSTOMER PERSONAL DATA.

Table 4.14. Respondents distribution by age.

Age	Number of respondents	Percentages of received responses
18-22	6	7.5%
23-27	12	15%
28-34	25	31.25%
35-39	20	25%
40-44	15	18.75%
45-49	2	2.5%
50-above	0	0%
Total	80	100%

Source primary data. *Self administered questionnaire 2011*

Figure 4.14: Respondent distribution by age



Source primary data. (Self administered questionnaire 2011)

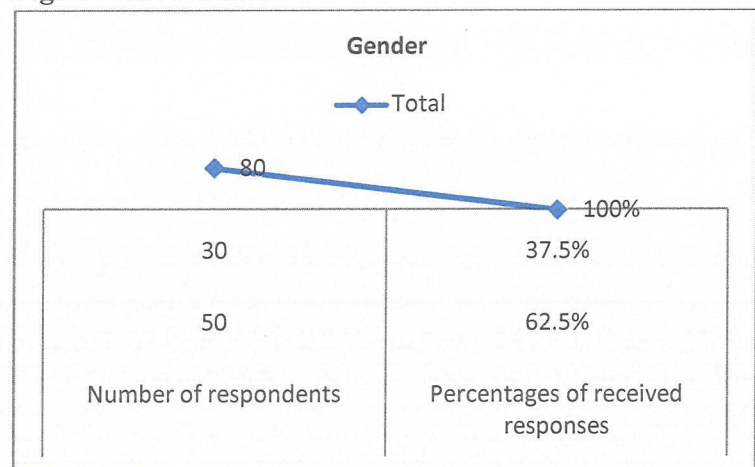
The 25 which represents the 31.25% of the respondents of the customers are young, supportive and dynamic, following the 20 which represents 25% of the respondents who are also young. And 6 which represent the 7.5% of the respondents are very young and dynamic. This actually shows the facts that the banks still have a customer who are energetic and who can still be trustworthy in the bank. Non of the customer is above 50 years and 2 which represents 2.5% customer is between 45-49.

Table 4.15. Gender

Sex	Number of respondents	Percentages of received responses
Males	50	62.5%
Females	30	37.5%
Total	80	100%

Source of data self administered questionnaire 2011

Figure 4.15 : Gender



Source primary data self administered questionnaire 2011

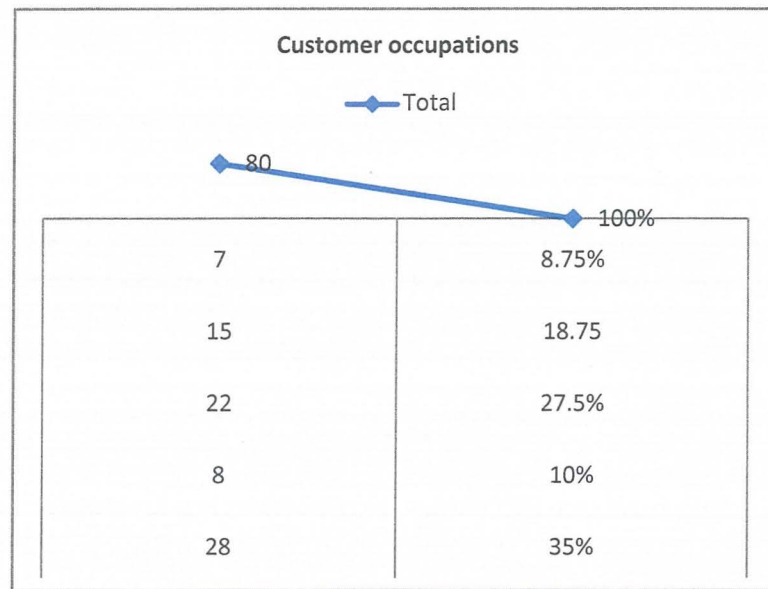
Out of 80 Questionnaires distributed to the customers, 50 which represent 62.5% of respondents were males and 30 which represents 37.5% were the females. This implies that there are more males customers than female customers.

Table 4.16. Customer occupation

Occupations	Number of respondents	Percentages of received responses
Teacher	28	35%
Lecturer	8	10%
Self employed	22	27.5%
Civil servants	15	18.75
Others	7	8.75%
Total	80	100%

Source. Primary data (self administered questionnaire 2011)

Figure 4.16: Customer occupations



Source of data. (*Self administered questionnaire 2011*)

The data above shows that, 28 represents 35% of the respondents are teachers, 22 represents 27.5% of the respondents are the self employed people, 15 represents 18.75% of the respondents are the civil servants, 8 represents the 10% of the lecturers, and 7 represents the 8.75% of the others.

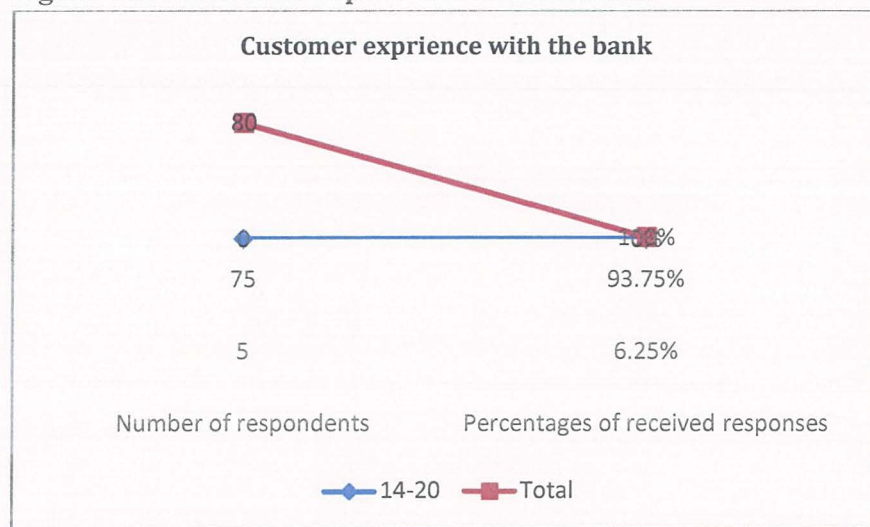
This implies the fact that, the bigger percentage of the bank's customers are the teachers of both primary and secondary followed by the self employed then the civil servants, the lecturers and the others, here the bank's customers will always be informed about the any new introductory technology systems that will be coming in, hence they will not resist to technological change because they are the literate class, again they are the class of the potential customers hence the bank expect high growth potential as their Jobs are stable so they are the steady clients for the bank.

Table.4.17. Customer banking experience with BPR

Years	Number of respondents	Percentages of received responses
1-6	5	6.25%
7-13	75	93.75%
14-20	0	0%
Total	80	100%

Source primary data (self administered questionnaire 2011)

Figure 4.17: Customer experience with the bank



Source primary data self administered questionnaire 2011

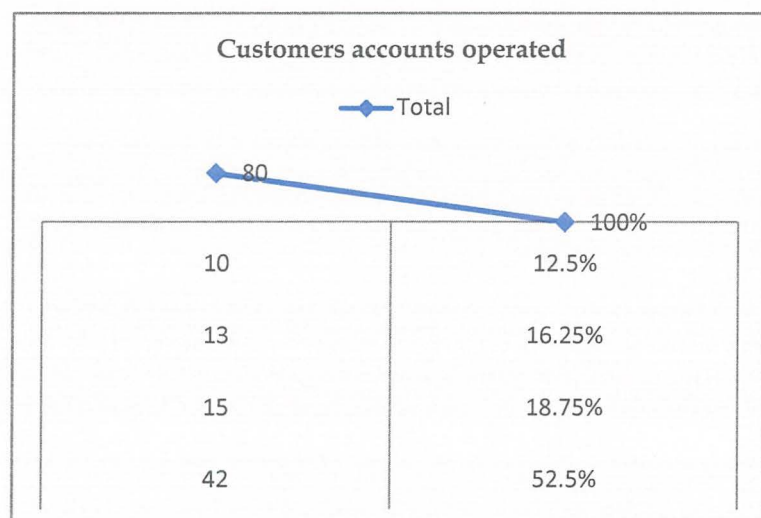
The above data shows that, the bigger percentage 93.75% of the respondents were banking for 7-13 years, and the rest for 6.25%. this implies that, the majority of the respondents have been with the bank for quiet long time, hence they can make some nice decisions on the banks technology.

Table 4.18. Customers accounts operated

Type of accounts	Number of respondents	Percentages of received responses
Saving accounts	42	52.5%
Current accounts	15	18.75%
Business accounts	13	16.25%
Gov't Accounts	10	12.5%
Total	80	100%

Source primary data, (self administered questionnaire 2011)

Figure 4.18 : Customers accounts operated



Source primary data, (self administered questionnaire 2011)

From the above presentation, it shows that 42 which represents 52.5% of respondents own a saving accounts, 15 which represents 18.75% respondents possess current accounts, 13 representing 16.25% respondents hold business accounts, and finally 10 with 12.5% respondents hold government accounts. The analysis here is that, the bigger percentage is the owner of the saving accounts followed by holders of current accounts here the bank can make

some reasonable number savings and current accounts operators. An account called GWIZA saving accounts “save and watch your money grow” on this account there is no withdraw made except with notice period of 91days. It not enough to put money in you bank put it where it grow.

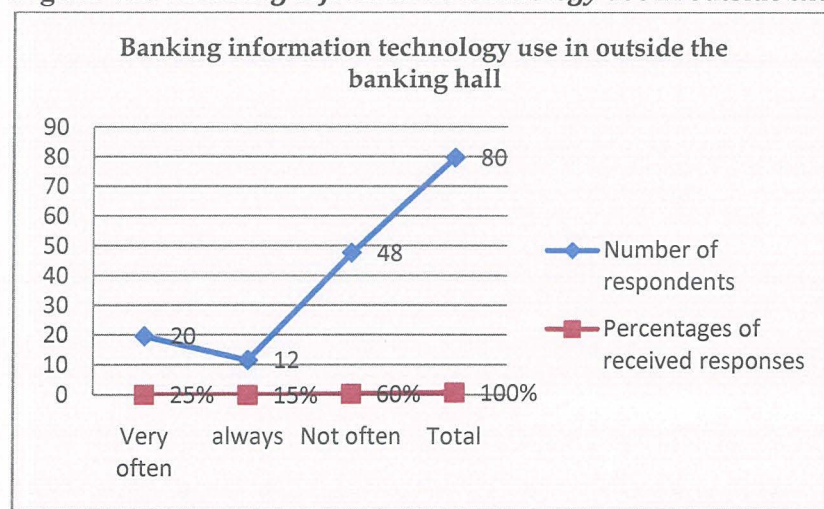
PARTB: INFORMATION TECHNOLOGY

Table.4.19. Banking information technology use outside the banking hall.

Choice	Number of respondents	Percentages of received responses
Very often	20	25%
Always	12	15%
Not often	48	60%
Total	80	100%

Source primary data, self administered questionnaire 2011

Figure 4.19: Banking information technology use in outside the banking hall



Source primary data (self administered questionnaire 2011)

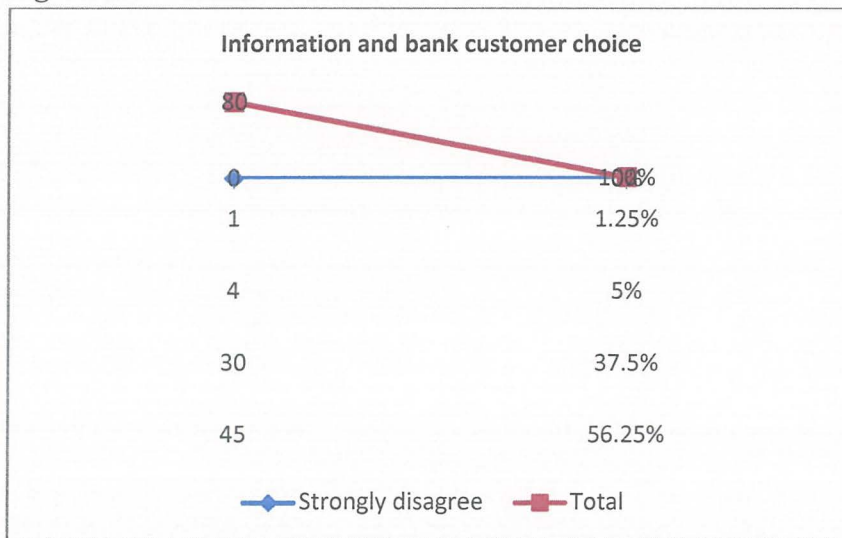
From the above presentations, 20 representing the 25% of the respondents very often use the information technology outside the banking services, 12 who represents 15% of the respondents always use information technology outside the bank, and 48 representing 60% of the respondents not often use the information technology outside the banking hall.

Table 4.20. Information technology and bank's customers choice

Responses	Number of respondents	Percentages of received responses
Strongly agree	45	56.25%
Agree	30	37.5%
Neither agree nor disagree	4	5%
Disagree	1	1.25%
Strongly disagree	0	0%
Total	80	100%

Source primary data, self administered questionnaire 2011

Figure 4.20: Information and bank customer choice



Source primary data (self administered questionnaire 2011)

The 45 which represents 56.25% of respondents strongly agrees to the fact that information technology has resulted the significant of the service delivery in the BPR Bank, while the 26 representing 37.5% agree to the facts, 4 representing 5% was undecided, 1 disagree representing and 0 strongly disagreed representing 0%. The results in the table above indicates that the information technology impact the customer's choice of the bank. Here the customers choice is based on the information technology products and services the bank uses including the ATM's

machines, internet banking, mobile banking, money transfers to mention but few this will result for more rooms of improvements.

Table 4.21. Level of customer satisfaction in relation to IT.

Decisions	Number of respondents	Percentages of received responses
Excellent	12	15%
Very Good	18	22.5%
Good	35	43.75%
Fair	10	12.5%
Poor	5	6.25%
Total	80	100%

Source primary data (self administered questionnaire 2011)

Figure 4.21 : Level of customer satisfaction in relation to IT



Source primary data (self administered questionnaire 2011)

Out of 80 respondents used in the research, 12 representing the 15% of the respondents excellently agree that the information technology boosts the customer service delivery and satisfactions , 18 which represents 22.5% say that the service is very good, 35 representing 43.75% affirms that it is Good, 10 representing 12.5% is fair, and 5 representing 6.25% say it is poor. The results revealed that, the information technology has increased the bank's service delivery leading to customer satisfaction it is from this technological point of view that, the bank

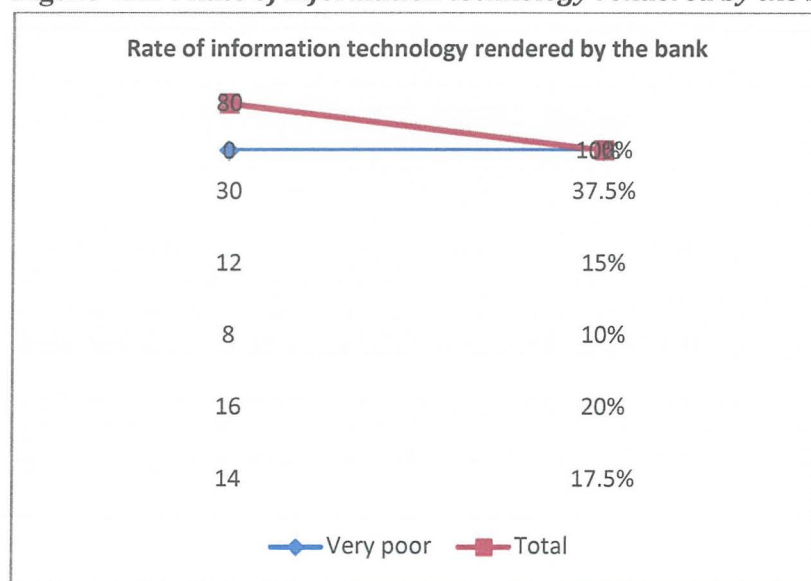
introduces email customer services, toll free telephone customer services , BPR mobile banking , home life banking, among others to deal with customers concerns, this made the banking with Popular bank of Rwanda(BPR) more significant and of value.

Table 4.22. Rate of the information technology services rendered by the bank

Decisions	Number of respondents	Percentages of received responses
Excellent	14	17.5%
Very good	16	20%
Good	30	37.5%
Fair	12	15%
Poor	8	10%
Very poor	0	0%
Total	80	100%

Source primary data (self administered questionnaire 2011)

Figure 4.22 : Rate of information technology rendered by the bank



Source of data primary data (self administered questionnaire 2011)

Out of 80 respondents used in this research, 14 which represents 17.5% agrees that the bank's information technology is excellent, 16 which represents 20% of respondents that the services are very good, 30 which represents 37.5% that the service renders is good, 12 which represents

15% of the respondents are fair, 8 representing 10% of respondents are poor, 0 of 0% is no response.

From the above analysis, the customer rating on the information technology used by the bank is good, according to the majority of responses, this is based on the fact that banking in BPR bank is easier, the 14 representing 17.5% is a lesser, because it not yet to reach at a level of services very faster and free from the stress.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

Rwandan financial institutions are transforming their banking operations through the use of computers they have come to recognize that, the computerized bank benefit from working faster, have accurate accounting systems, well organized data management, more facilities utilized to mention but few. In light of the pointed out above, this study was set up to identify the impact of information technology in bank service delivery of Popular Bank of Rwanda(BPR) and looking at how the computerized systems has affected the bank and the customers.

This made the researcher to design the set of questionnaires administered to the customers and the staff. More to these personnel interviews were also granted to customers and management staff, senior staff and others to extract further information. Among other things the major findings of the study depicts that, the computerization has advantaged the service delivery and reduced customer queue (lineups),stress free, and hence the customers enjoys the services. The basis of the satisfaction can easily be traced from reduced waiting time, globalization of the bank, continuous innovation of new products and services, quicker and more effective and efficient services all are the benefits that mount up to computer application in bank of BPR.

Not only to the customers, were staff needs met with easy way of performing their Jobs all this is a result of information technologies applies in the bank. Computer system is seen as the most high benefits to the customers and the staff of the Popular Bank of Rwanda and the entire organization at large.

The following conclusions could be drawn with regard to the summary made, the study has depicted that the information technology is of extremely (enormously) in the present and in the future banking operations. Though it can be extremely harmful when the data falls in wrong hands. but the fact still remains that the pay offs in adopting information technology obviously

surpass the shortcomings, Rwanda is behind the advanced countries in employing the information technology to solve the operational and management problems however it may not be too long to cover the gap taking into accounts of the initiatives and attitude of Rwandan bank management to computerized systems. we should try to move faster than the present pace and make full use of available technology to solve our numerous operational problems in the banks so that in the end, the management of the bank and the customers will get contented with the premium received in the form of customer satisfaction and on the other prospective contributions to the profitability of the banking industry in Rwanda.

Consequently become important that technology changes such as the introduction of computer in organization should carefully be evaluated so that the gains in technical efficiency are not made at the expense of the well being integration of the employees.

The development of information and communication technology has changed the landscape of Rwandan financial market and has become the strategic resource for achieving competitive advantage in 21st century of the digital economy. Information technology is designed for the orderly and systematic procurement, transfer, storage and conversions of data which will reduce time, effort, cost and increase the utility of information for decision makers. This information reduces the cost of decision making because relevant information is not lacking. Information technology has increased ability to make sound decisions involving complex combinations of factors and doing so rapidly. It makes available reliable, concise and routine information in an organization which in turn leads to such benefits as good decision and confidence of the decision maker. It also assures good judgment since the judgments are based on facts and figures.

It is relevant that information technology has affected and will continue to have impact on decision making in every field of human endeavour most especially with the increase in use and development of various information technology.

To sum up, this study has been able to identify a Goodview points for information technology in Rwandan financial sector. Some of the information technology impact on on the operations of commercial banks includes:

Information technology has increased the operational efficiency of commercial banks as less time is required to carry out more transaction

It eases and provides various sources of acquiring information in the bank.

The application of information technology has impacted positively on the customer base of the bank and by so doing gives the bank a competitive edge over its competitors.

It has drastically reduced the running cost and expenses incurred by the banks. This leads to a resultant increase in the banks revenue.

RECOMMENDATIONS

In light of fore mentioned findings and recommendations, it is recommended that bank should ensure that they have efficient information technology systems and IT department which is strongly functional. They could outsource the services of reliable IT firms which should be responsible for the maintenance of the information technology unit like Automatic teller machines (ATM's) and computer net works this helps the bank enhance productivity and profitability.

The BPR bank should employ the physical equipments related to information technology such as Computer, ATM's, mobile banking, Internet banking, Telephone banking which results to effective service delivery that has a great influence on customer satisfaction improving sales and market share leading to bank success, the customer perception and preferences has a big impact on bank performance.

The Popular Bank of Rwanda (BPR), should improve on the issues of Automated services in order achieve customer attractiveness influence, positive word of mouth, cost saving, market share which both affect profitability as it improves reliability, few defect and bank performance.

Customer Loyalty, retention and attractiveness to new clients should be taken into consideration, the bank resources should be employed so as to increase the number of clients, retention and loyalty and other stake holders, and this in turn improves the sales level and profits.

The Popular Bank of Rwanda (BPR), should increase and improve on seminars and workshops to enlighten the employees on the potential impact of service delivery and quality to customers in bank. These workshops should detail what employees should do to ensure that the customer needs are met.

It is from this point of view that, the information technology and service delivery (quality service) affects the customer satisfaction. It is of the essence that, the bank recruits the right person for the right position this will help increase the service quality level.



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APPENDIX

YINGANA Vincent

MPALA INTERNATIONAL UNIVERSITY(KIU)

PARTMENT OF BANKING AND FINANCE

CULTY OF BUSINESS AND MANAGEMENT

ASTER OF BUSINESS ADMINISTRATION

mail: bayinganavic@yahoo.com

b1vx11@gmail.com

Tel. 0788820230

0722820230

ar Respondents,

indly request you to take your precious time to answer the following questionnaire for
stomers so that I can have your ideas and insight on this topic of research.

e research is under the project title **"the information technology and banking service
livery"** .case study BPR

e Research is purely academics and your answer will be treated secretly confidentiality. You
ve to respond by ticking an appropriate box.

ank you for your corporations, greatly appreciate your contributions.

urs faithfully

.YINGANA Vincent.

QUESTIONNAIRE:

PART A: PERSONAL INFORMATION ABOUT THE CUSTOMERS :

Instructions: please tick as appropriate.

Qn1.Age

18-22	☐
23-27	☐
28-34	☐
35-39	☐
40-44	☐
45-49	☐
50-above	☐

Qn2.Gender

Male	☐
Female	☐

Qn3. Occupation.

Teacher	☐
Lecturers	☐
Self employed	☐
Civil servants	☐
Others	☐

Qn4. How long have you been banking with BPR

-6 ☐

-13 ☐

4-20 ☐

Qn 5.Types of account operated.

Saving accounts ☐

Current accounts ☐

Business Accounts ☐

Government Accounts ☐

PART B: INFORMATION TECHNOLOGY:

Qn6. How often do you use information technology outside the bank

Very often ☐ Always ☐ not often ☐

Qn7. Does the choice of information technology have an important consideration in the choice of your bank

Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree ☐

Qn8. How would you rate the level of your satisfaction in relation to information technology

Excellent ☐ Very good ☐ Good ☐ Fair ☐ Poor ☐

Qn9. How would you rate the level of information technology service rendered by the bank

Excellent ☐ Very good ☐ Good ☐ Fair ☐ Poor ☐ very poor ☐

BAYINGANA Vincent

KAMPALA INTERNATIONAL UNIVERSITY(KIU)

ABALE WESTERN CAMPUS

DEPARTMENT OF BANKING AND FINANCE

SCHOOL OF BUSINESS AND MANAGEMENT

email: bayinganavic@yahoo.com

blvx11@gmail.com

Tel. 0788820230

0722820230

Dear Respondents,

I kindly request you to take your precious time to answer the following questionnaire for the staff(employees) so that I can have your ideas and insight on this topic of research.

The research is under the project title "**the information technology and banking service delivery**" case study BPR.

The Research is purely academics and your answer will be treated secretly confidentiality. You have to respond by ticking an appropriate box.

Thank you for your corporations, greatly appreciate your contributions.

Yours faithfully

BAYINGANA Vincent.

AFF QUESTIONNAIRE

Personnel data:

1. Age

-24 ☐

-30 ☐

-37 ☐

-44 ☐

-51 ☐

2. Gender

Male ☐

Female ☐

3. Levels of education

Secondary ☐

Partially school ☐

Colleges ☐

University ☐

Post graduate (Masters) ☐

Post graduate (PhD's) ☐

4. Working experience with in the bank.

0-5 ☐

6-10 ☐

11-15 ☐

16-20 ☐

21 and above ☐

In5. Positions occupied.

Management ☐

Junior staff ☐

Senior staff ☐

Temporary contractual staff ☐

PARTB: INFORMATION TECHNOLOGY

Qn1. Has there been a radical improvement in banking services as a result of the availability of Information Technology products and services?

Strongly agree ☐ Agree ☐ neither agree nor disagree ☐ Strongly agree nor Disagree ☐

Qn2. Does Information Technology increase the bank efficiency?

Yes ☐ No ☐

Qn3. How would you rate the level of convenience with which you deliver banking services

Above average ☐ Average ☐ Poor ☐ Not sure ☐

Qn4. How would you rate the customer satisfaction with service delivery?

Above average ☐ Average ☐ Poor ☐ sure ☐ Not sure ☐

Qn5. Has Information Technology increased the profitability and growth of the bank?

Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly agree ☐

Qn6. Information Technology increased the globalization of the bank?

Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly agree ☐

Qn7. Does the benefit Information Technology justify the cost involved in utilizing the facility?

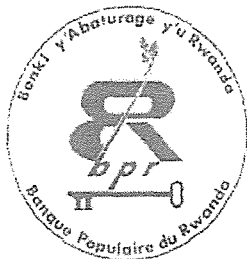
Yes ☐ No ☐

18. Do the Information Technology given the bank a competitive edge in the industry?

Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly agree ☐

19. Is Information Technology a welcome development in the banking industry?

Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly agree ☐



August 2, 2011

Vincent Bayingana
Student at Kampala International University (KIU)
Master of Business Administration
Kigali,
Rwanda

Tel: 07 88 82 0230

RE: CONFIRMATION TO PROVISION OF RELEVANT DATA

Following your request for education research data, we are pleased to inform you that you have been accepted to collect the relevant data where possible, from Banque Populaire du Rwanda Ltd.

“ THE INFORMATION TECHNOLOGY AND BANKING SERVICE DELIVERY.”

Please do not hesitate to contact us for further information on 250 5038 47 (HUMAN RESOURCE

Betty Sayinzoga
Head of Human Resource



Isabelle Mutezinka
Coordinator, Training & Development

DIRECTORATE OF FINANCE & ADMINISTRATION

P.O. Box 20000, Kampala Uganda, Tel +256-773-335490 or +256-772889017 or Fax 256-41-501974
Email: admin@kiu.ac.ug or website: www.kiu.ac.ug

16th July, 2011

RE: MR. BAYINGANA VINCENT

Reg. Number: MBA/28783/82/DF-KBL.

This is to confirm and introduce to you the above referenced as a bona fide Distance Learning student of KAMPALA INTERNATIONAL UNIVERSITY (KIU) KABALE STUDY CENTRE pursuing **MASTER OF BUSINESS ADMINISTRATION** (Banking & Finance)

He has completed all the necessary **class work /Assignments** and **Examinations** for his two year(s) course of study and he is progressing normally with Research project on: **THE INFORMATION TECHNOLOGY AND BANKING SERVICE DELIVERY**
Case Study of: **POPULAR BANK OF RWANDA.**

As part of his studies (research work) he has to collect relevant information through Questionnaires, Interviews and Reading materials respectively from your place.

In this regard, the Management of Kampala International University request that you kindly assist him by availing/furnish him with the required information or data that he might need for his research project, and appreciates your full commitment and support rendered to him throughout his stay with you.

Yours in Service


16 JUL 2011
AHIMBISIBWE ROGERS
REGIONAL COORDINATOR
(Finance & Administration) +256-752264444
KIU - KABALE STUDY CENTRE