KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ART AND SOCIAL SCIENCES,

SCHOOL OF BUSINESS

EVALUATION OF THE STRATEGIC USE OF INFORMATION TECHNOLOGY IN THE RURAL BANKING SECTOR IN GHANA (A CASE STUDY OF NWABIAGYA RURAL BANK)

BY

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A THESIS SUBMITTED TO THE DEPATMENT OF INFORMATION SYSTEMS AND DECISION SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTER OF PHILOSOPHY (MPHIL) IN BUSINESS INFORMATION TECHNOLOGY

AUGUST, 2008

DECLARATION

I hereby declare that this submission is my own work towards the Mphil in Business Administration – Business Information Technology option and that, to the best of my knowlędge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

This thesis is dedicated to my father, Mr. George Kwadzo. Aziale, my wife, Regina Asante-Aziale (Mrs.), and my children, Prince and Princess.

ACKNOWLEDGEMENTS

This work could not have been accomplished without the assistance of many personalities whose contributions I would like to acknowledge. To begin with, I owe a special debt of gratitude to my principal supervisor, Dr. Francis T. Oduro, and co-supervisor, Mr. Obiri Yeboah, whose enthusiasm, creativity, constructive criticisms and commitment to excellence have made this thesis possible.

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ABSTRACT

This study uses a case study approach to evaluate the strategic use of Information Technology in the rural banking sector in Ghana. The study covers a scope of nine years, from 1997 – 2005. That is, three years before the bank deployed ICT into its operations, the year of deployment and five years after the deployment. A combination of probability and non-probability sampling techniques were applied in selecting a total of 180 sample respondents made up of 8 management staff of the bank, 48 other members of staff of the bank and 124 customers for the study. The analysis revealed that rural banks in Ghana lack the desired innovative technologies to support their operations and to survive the current competitive wave in the banking industry in the country. However, these banks especially the case study bank was able to strategically employ the very limited technologies that it has in place to gain some advantages in the sector. This it did by using the ICT tools of the bank to shorten customers waiting time, cut down on its operating costs, provide convenient banking services to its customers and attracts a large customer base thereby increasing its sales volume and experience sharp increases in its profit level since the deployment of ICT into its systems. Two major factors were found to be militating against the accelerated deployment of innovative technologies in the sector namely: lack of funds and a restrictive ICT policy by supervisory bodies like the Bank of Ghana and the ARB Apex Bank. The study concludes that, ICT has a strong positive impact on the banks operations and therefore serves as a tool to attain competitive advantage in the banking industry.

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LIST OF ABREVIATIONS

ICT	Information Communication Technology
IT	Information Technology
RBs	Rural Banks
PNDC	Provisional National Defence Council
BOG	Bank of Ghana
GDP	Gross Domestic Product
VEs	Virtual Enterprises
IS	Information System
ATM	Automated Teller Machine
PIN	Personal Identification Number
AVR	Automated Voice Response
PC	Personal Computer
PCB	Personal Computer Banking
OCC	Office of the Controller of Currency
EN	Enterprise Network
POS	Point of Sale
GH	Ghana
MPLs	Multiprotocol Label Switching
ROI	Return on Investment
SIS	Strategic Information System
MIS	Management Information System
SCB	Standard Chartered Bank
NRB	Nwabiagya Rural Bank
GM	General Manager

MGT	**Management**
LAN	**Local Area Network**
WAN	**Wide Area Network**
SWOT	**Strengths, Weaknesses, Opportunities and Threats**

CHAPTER ONE

GENERAL INTRODUCTION

1.0 Introduction

The quest for business to acquire strategic tools, skills and other resources in order to remain competitive, profitable and grow has never been witnessed in the Ghanaian business environment than in contemporary times. Many industries in the economy, especially the telecommunication and the banking industries are seen to be engaging in full scale competitive war leading to sharp price reductions in their services yet, posing a great threat for survival for

1.1 Background of the study – the Rural Banking Concept

Rural banks (RBs), like any banking institution in Ghana, is a formal sector financial institution established as public limited liability Company and operate under the **Banking Law 1989 (PNDC Decree 225).** The mandate of RBs among other things is to mobilize savings from residents in the rural communities; accept cash and cheques for credit on current and saving accounts; assist customers in respect of their activities with a view to consolidate, extend and develop their undertakings and engage in any economic activity that will promote the social and economic development of the community within which they operate.

These banks were basically supposed to function as deposit-taking unit banks so as to enhance the ability to tailor their operations and services to reflect peculiar circumstances in their catchments areas. Having to depend on mobilized deposits was also seen as essential for avoiding excessive transactions and default costs associated with government credit-delivery systems. The RBs were to be owned and managed by the community in which they are located. This was not only to promote community identity but also ease information flow on and to customers so as to facilitate the processing of requests for loans and loan related facilities. In short, the rural banks have similar mandates as any commercial bank in Ghana. **(Anin, 2000)**

1.1.1 Principal differences between Rural and other Commercial banks

The principal difference between the rural and commercial banks is in the management and reporting/supervisory systems to and from the Bank of Ghana (BOG). Whereas other banks in the country report to and are directly supervised by BOG, rural banks report to and are

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supervised through the Apex Bank – an institution established to take over the responsibilities for overseeing the RBs, which used to be under BOG's own Rural Finance Inspection and Supervision and Research Departments. The Bank of Ghana is also known to have preference shares holding in each rural bank in Ghana (which is not the case with other banks).

1.1.2 Rural bank as a strategic economic institution in Ghana

The concept of rural banking evolved in Ghana in the mid 1970s in response to the needs of the rural and agriculture sector for institutional finance. Though the rural and agricultural sector were the largest contributor to the nation's Gross Domestic Product (GDP) contributing 40% to GDP, 60% of foreign exchange earning and provide employment to over 70% of the Ghanaian populace and remains a priority sector, it is characterised by low productivity due mainly to inefficient production technology and post-harvest bottlenecks. It is recognised, though, that growth in the sector could be accelerated if there is increased investment in more modern production technology, infrastructure and enterprises involved in storage, processing and marketing (MiDA, 2008).

Attempts in the past to encourage commercial banks to extend their rural networks and advance credit to the agricultural sector failed to achieve the desired results since most of these banks tend to concentrate on financing international trade and urban commerce and industry. Not even the creation of specialized banking institutions like the agricultural development bank and the investment banks to service the sector yielded any better results as they also tend to gravitate towards the traditional banking activities which were more profitable and less risky. There was, thus, a gap in the provision of institutional finance to the rural/agricultural

sector, which is the 'backbone' of the nation's economy and, thus, the rural banks were expected to fill this gap.

Due to the strategic role that the rural banking sector plays in the economic development of the nation, it is imperative that these banks remain competitive, profitable and grow. In the past decade however, changes in the global economy have entirely redefined industrial competitiveness. The core business of various entities, for instance, in the manufacturing industry, is no longer confined to the making of things but lies in the systematic processing of knowledge through the use of IT to create value for customers.

The view of strategic importance of IT either in manufacturing or service industry was highlighted by **Lau (2001)** when he intimates that:

> Manufacturing-related business services that capitalize on the Internet and Information Technologies are expanding fast, and in fact, the availability of digital tools and equipment in the marketplace provide a major opportunity for enterprises to build stronger relationships with customers and partners which is the key to build a successful business.

It is needless to say that, for any business enterprise to compete in this ever-changing global marketplace, individual companies can hardly survive in isolation from their business partners, suppliers and other service providers. As a matter of fact, the internet provides a powerful tool to link up manufacturers/service providers, suppliers and business counterparts, thereby creating a dispersed business network which is conducive to the formation of virtual enterprises (VEs) **(Davidow and Malone, 1993).**

The place of IT in the banking industry is made much clearer by **Agboola (2007)** when he posits that:

> Today's business environment is very dynamic and undergoes rapid changes as a result of technological innovation, increased awareness and demands from customers. Business organisations, especially the banking industry in the 21st Century operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate. Information and Communication Technology (ICT) is at the centre of this global change curve.

Laudon and Laudon (1991) contend that managers can no longer ignore information systems because they play critical roles in contemporary organisation. They point out that, the entire cash flow of most fortune 500 companies is linked to information systems.

The application of information and communication technology concepts, techniques, policies and implementation strategies to banking services has become a subject of fundamental importance and concern to all banks and indeed a prerequisite for local and global competitiveness. **(Agboola, 2007)**. This view was shared by **Harold and Jeff (1995)** as cited in **Agboola (2007)** who contend that, financial service providers should modify their traditional operating practices to remain viable in the 1990s and the decades that follow. They claimed further that, the most significant short- coming in the banking industry today is the wide spread failure on the part of senior management in banks to grasp the importance of technology and incorporate it into their strategic plan accordingly.

Woherem (2000) also shared this same line of thought that, only banks that overhaul the whole of their payment and delivery systems and apply IT to their operations are likely to survive and prosper in the new millennium. He advised banks to re-examine their service

delivery systems in order to properly position themselves within the framework of the dictates of the dynamism of information and communication technology.

1.2 Statement of the Problem

The banking industry in Ghana has witnessed tremendous changes linked with the developments in ICT over the years. The quest for survival, global relevance, maintenance of existing market share and sustainable development has made exploitation of the many advantages of ICT through the use of automated devices imperative in the industry.

Yet, the rural banking sector, which is a key strategic sector in the banking industry in Ghana aimed at accelerating rural and agricultural development, appears to have a blurred picture in the adoption of IT in its operations in the country. This situation coupled with the continuous influx of foreign and multinational banks into the country, with their determination to compete in all fronts in the industry poses a big threat to the competitiveness, profitability, survival and growth of the rural banks in the country. The situation has created a source of concern for the researcher, particularly when it is well known that the competitive position and the ability to maintain market share and growth in the banking industry is mainly dependent on the degree of diversified services provided by banks in the industry facilitated by the adoption of various ICT facilities (Agboola 2007). The implication is that, if the RBs failed to remain competitive or are kicked out of the banking industry, the agricultural sector which is the major contributor to our nation's GDP will greatly suffer as none of the other commercial banks that are leading the competition in the industry is willing to advance funding to the sector.

This study therefore seeks to evaluate how Ghanaian Rural Banks are utilising ICT as a competitive tool in the banking industry, examine the extent to which they have adopted and deployed innovative technologies and analyse the resultant effects of these technologies on their operations.

1.3 General Objective of the Study

The primary objective of this study is to carry out an in-depth evaluation of the IT/ICT systems and their impacts on the operations of the rural banks in Ghana using Nwabiagya Rural Bank as a case.

1.3.1 Specific Objectives

The study aims in specific terms to:

- Identify the various innovative technologies adopted by the rural banks in Ghana.
- Evaluate how rural banks in Ghana are using ICT as a competitive tool in the banking industry.
- Analyse the impact that IT/ICT innovative technologies are having on the operations of the bank
- Explore the extent to which IT tools deployed by the bank are meeting customers' satisfaction.
- Assess factors that are militating against the accelerated adoption of new technologies to the Rural Banking Sector.
- Suggest useful recommendations that will assist the bank to use ICT as a strategic tool for competitive service delivery.

1.4 Justification

The rural banking sector plays a significant role in the economic development of Ghana. The concept of rural banking as mentioned earlier, evolved in Ghana in the mid 1970s as a response to the needs for the rural and agricultural sector of the economy to access institutional finance. This sector of the Ghanaian economy was noted as the largest contributor to Gross Domestic Product (GDP) contributing 40% of GDP, 60% of foreign exchange earning, and providing employment to over 70% of the populace and has always been a priority sector in the economy, yet, characterised by low productivity due mainly to backward production technology and post-harvest bottleneck.

It is recognised, though, that growth in the sector could be significantly accelerated if there was increased investment in more modern production technology, infrastructure, storage facilities and marketing. It was in recognition of this that the government introduced the Rural Banking concept as an interventionary measure to help the rural and agricultural sector growth. However, the institution (RBs) which is seen as a panacea for the provision of institutional funding to the rural and agricultural and ensure growth in the sector itself appears to be under threat of competitiveness, survival and growth due mainly to lack of technological capacity or inappropriate use of it, to compete effectively in the industry. This therefore presents the basis for an analysis into how the bank is utilising innovative tools (ICT), which have scaled up the operations of other players in the industry so as to unearth how to better align this strategic institution (rural banks) to stand the current wave of competition in that industry to safe-guard the agricultural sector, which is the 'backbone' of the nation's economy.

One other key justification of the study to the researcher is also to fill the gap of non existent literature especially in Ghana to support the case that IT deployment in the banking industry does or does not indeed provide strategic advantage to the deploying entity.

1.5 Methodology

The study is case type carried out using both primary and secondary data. Tools such as questionnaire, interviews, and interactions with staff, management and customers of the case organisation and observation were used to obtain the primary data while various journals, books and periodicals were explored for the secondary data. Data gathered was analysed using descriptive statistics. The findings of the study were presented using appropriate tables and charts.

1.6 Scope of the Study

The study with respect to historical analysis covers nine years period (1997 - 2005) of operations of the bank. Three years before, the year of deploying ICT into the system and five years after deploying ICT into the operations of the bank were examined to paint a clearer picture of ICT effects on the operations of the bank. A sample size of 183 respondents made up of 8 management personnel, 51 other members of staff and 124 customers of the bank were used.

1.7 Hypothesis of the Study

The information and communication technology (ICT) model developed was based on the qualitative and quantitative system dynamics approach **(Coyle, 1996; Wolstenholme, 1994)**

1.7.1 Technology deployment and company competitive position

Technology generally has positive relationship with the competitive position of the adopting institution. The fortune made by a number of successful world organisation is tied to technology deployment into their facilities **(Agboola, 2007; Banks, 2007; Abor, 2008; Kucthta-Helbling, 2003; Laudon and Laudon, 1991).** Factors such as timesaving, error reduction, quality management decisions, speed of transactions, enhanced market share, and customer satisfaction with service quality, customer loyalty, and improved revenues among others were assigned for the competitive impact that technology deployment brings to bear on the deploying institutions. The hypothesis couched out and verified relating to IT/organisation's competitive position therefore is of the form:

H_0: Technology deployment is not related to an organization's competitive position

H_1: Technology deployment is related to an organization's competitive position

1.7.2 *Extent of economic gains from investment in new technology*

In general, a positive relationship between relative advantages and technological adoption has been found **(Quaddus et al., 2006; Weill and Aral, 2006; Kwon & Zmud, 1987; Rogers, 1983).** However, economic gains from technological investment cannot be obtained synchronously. First, when new technologies are introduced, their potential may not be exploited fully because quite a few technologies are implemented on a trial and error basis

(**Ganon & Toulouse 1996**). Second, during the initial stages, advantages of technologies cannot be obtained or even precisely determined whereas short-term costs are readily available (**Gerwin, 1988**). Third, technological investment requires an adaptation and learning process to combine environment, organization, team, task and technology for gains. Once the misalignments of these factors are corrected and end users eventually adapted, economic returns then will turn out fruitfully (**Applegate, 1992**). Consequently, technologies have to be substantially invested together with minimum sufficient usage then advantages from technology can be harvested. The hypothesis relating to economic gains from IT investment therefore is:

H_0: Economic gains cannot be obtained after a new technology has been substantially invested into.

H_1: Economic gains can be obtained after a new technology has been substantially invested into.

1.7.3 Training support impact on technology diffusion

Apart from technical features, important factors influencing on the success or failure of technological implementation are organizational aspects such as training, top management support, interactions during implementation, user involvement, and motivated and capable users' attitude (**Quaddus et al 2006; Kwon & Zumud, 1987; Manross and Rice, 1986**). Since innovation can succeed only if end users have a full understanding of the technology, training is considered as vital policy to provide knowledge, reduce levels of resistance, create skilled human resources and increase managerial potential (**Madu, 1989) as cited in (Quaddus et al. 2006**). Generally, technology diffusion changes positively with level of training support. When technology is diffused, it creates learning environment that convince

more end users to attend training and more trained staff and active staff enhance diffusion rate (**Quaddus, 1996**). Therefore, the hypotheses regarding training support are:

H_0: Training support cannot increase the rate of technology usage, relative advantage and sales.

H_1: Training support increases the rate of technology usage, relative advantage and sales

1.8 Limitation of the Study

Key limitations to the study were among others:

- Difficulty to have access to relevant documents that could provide useful information on the operations of the bank. Documents such as bank profit records, product document that spells out clearly the banks products with corresponding terms and conditions and clearly documented management information system policy manual and technology impact analysis records were woefully non-existence. Closely associated with this were limited studies in Ghana on the subject matter makes most of the literature used to be from foreign sources.
- The above problems created a limitation on the depth of data and information that were required from the bank. However, the researcher used best efforts to secure needed information from the case study bank. These were generally in the form of interviews and interactions with the management of the banks. It is therefore important to note that the outcome of the study was based on the information and assumption offered by the management, staff and customers of the bank during the interactions.

- Other limitations which hindered the study include time given to the student to present the completed study. This has led the study to be restricted to only one banking sector (the rural banking sector) making results of the study not generalizable to the banking industry as a whole. This limitation has also made it impossible for the researcher to undertake a deeper comparison of the effects of ICT from both those banks that are noted to be more successful in deploying ICT into their operations and those that are seen to be lagging behind on the ICT train.

- Financial constraints in terms of funds needed to travel to various branches of the case study bank to gather information is yet another limitation as the researcher has no source of funding not even the meagre thesis grant from the government has been disbursed to students during the year of this study .

Given the above constraints, the study may lack the desired impact that it should have. The researcher however employ means such as utilising personal pocket money, spending unorthodox hours sitting to carry out the study and expand the scope of the study to include periods before and after adopting IT into the operations of the case bank for purposes of comparison to ensure that the best possible output is obtained.

1.9 Organisation of the chapters

The entire study is organised in five chapters:

Chapter one covers a brief introduction, the rural banking concept, a background information on the usefulness/place of ICT as a competitive tool in the banking industry, statement of the

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problem, objectives of the study, justification for the study, a brief methodology, limitation impacting the output of the study and the organization of the chapters.

Chapter two encompasses the literature review, which covers various sub themes such as: conceptual and operational definitions of related terms, state of ICT in the business environment in Sub-Saharan Africa, Forms of ICT Innovations (Electronic Delivery Channels) in the banking industry, Technological trend in the banking industry in Ghana, General usefulness of ICT in Commerce and Industry, Measuring Return on investment (ROI) in ICT projects, Gustomer's constructs of ICT as a competitive tool in quality service delivery and Information Technology and competitive position of an organization.

Chapter three constitutes the methodology and covers issues as background of the case organisation, sampling methods, scope of the study, sources of data employed and methods of data analysis. This chapter also takes care of testing the various hypothesis of the study.

Chapter four covers the analysis of data gathered from both the primary and secondary sources and findings of the study.

The fifth 'chapter, which is the last chapter covers summary of the findings, conclusions, recommendation and areas of future research.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter discusses the review of existing literature on the subject matter from a general perspective. A lot of studies have been conducted on the subject - ICT in the banking industry in the international circles, but on the local level, little has been done. Consequently, most of the literatures on this study are predominantly those conducted by foreign researchers and authors on the topic.

2.1 Conceptual Definition of ICT/IT

Information and Communication Technology (ICT) and Information Technology (IT) received diverse definitions in literature. To **Lucas, (1992)** Information Technology (IT) includes various types of computers, software, communications, facsimiles transmission and electronic conferencing.

IT is further defined as the modern handling of information by electronic means, which involves its access, storage, processing, transportation or transfer and delivery (**Ige, 1995**) as cited in **Abor (2008)**.

Whitten et al (2001) define Information System (IS) as an arrangement of people, data, processes, information presentation, and information technology that interact to support the problem solving and decision-making needs of management and users.

They went ahead to define Information Technology (IT) as a contemporary term that describes the combinations of computer technology (hardware and software) with telecommunications technology (data, image and voice networks).

The **Dictionary of Computing and Communication** (2000) on the other hand defines Information Technology to mean "The collection of technologies that deal specifically with processing, storing and communicating information, including all types of computer and communications systems as well as reprographic methodologies.

Laudon and Laudon (2006) looks at Information and Communication Technology as one of the many tools managers use to cope with change, which includes computer hardware, computer software, data management technology, networking and telecommunications technology, the internet, intranets and the extranets.

2.2 Operational Definition

The researcher employs the term Information and Communication Technology(ICT) and Information Technology (IT) in this study as synonymous terms to mean any tool including computer hardware, software, network and telecommunication technologies used in business organisation in accessing given services or storing, processing and sharing data and information aimed at the attainment of business competitiveness and efficient service delivery.

2.3 The state of ICT in the business environment in Sub-Saharan Africa

In Sub-Saharan Africa, developments in information and communication technology (ICT) are radically changing the way business is done. Electronic commerce is now thought to hold the promise of a new commercial revolution by offering an inexpensive and direct way to exchange information and to sell or buy products and services. This revolution in the market place has set in motion a revolution in the banking sector for the provision of a payment system that is compatible with the demands of the electronic marketplace **(Abor, 2008; Balachandher *et al., 2001).***

Innovations in information processing, telecommunications, and related technologies known collectively as "information technology" (IT) - are often credited with helping fuel strong growth in many economies (**Coombs *et al.*, 1987**) as cited in **Abor (2008)**. It seems apparent then that, technological innovation affects not just banking and financial services, but also the direction of an economy and its capacity for continued growth.

According to **Abor (2008)** and **Alu (2002)**, IT affects financial institutions by easing enquiry, saving time, and improving service delivery. In recent decades, investment in IT by commercial banks has served to streamline operations, improve competitiveness, and increase the variety and quality of services provided. **Yasuharu (2003)**, also intimates that implementation of information technology and communication networking has brought a revolution in the functioning of banks and the financial institutions. It is argued that dramatic structural changes are in store for financial services industry in the sub-region as a result of the Internet revolution.

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Many banks in South Saharan Africa are making what seem like huge investments in technology to maintain and upgrade their infrastructure, in order not only to provide new electronic information-based services, but also to manage their risk positions and pricing. At the same time, new off-the-shelf electronic services such as online retail banking are making it possible for very small institutions to take advantage of new technologies at quite reasonable costs. These developments may ultimately change the competitive landscape in the financial services **(Abor, 2008)**.

A number of studies have concluded that IT has appreciable positive effects on bank productivity, cashiers' work, banking transaction, bank patronage, bank services delivery, customers' services and bank services. They concluded that, these have positive effects on the growth of banking **(Yasuharu, 2003; Idowu *et al.*, 2002; Balachandher *et al.*, 2001; Whaling, 1995; Hunter, 1991)** as cited in **Abor (2008)**.

2.4 Forms of IT/ICT Innovations (Electronic Delivery Channels) in the banking industry

Technological innovations have been identified to contribute to the distribution channels of Banks. The electronic delivery channels are collectively referred to as Electronic Banking. Electronic Banking is really not one technology, but an attempt to merge several different technologies. Each of these evolved in different ways, but in recent years different groups and industries have recognized the importance of working together. Bankers now see a kind of evolution in their business, partly, because the world has taken a quantum leap in the use of technologies in the last several years **(Abor, 2008; Liao and Cheung, 2008; Shi et al., 2008;**

Jahangir and Begun 2007; Hwag-Boon and Ming Yu, 2003). The various electronic delivery channels are discussed below:

2.4.1 Automated Teller Machines (ATMs)

Rose (1999), describes ATMs as follows: "an ATM combines a computer terminal, record-keeping system and cash vault in one unit, permitting customers to enter the bank's book keeping system with a plastic card containing a Personal Identification Number (PIN) or by punching a special code number into the computer terminal linked to the bank's computerized records 24 hours a day". Once access is gained, it offers several retail banking services to customers. They are mostly located outside of banks, and are also found at airports, malls, and places far away from the home bank of customers. They were introduced first to function as cash dispensing machines. However, due to advancements in technology, ATMs are able to provide a wide range of services, such as making deposits, funds transfer between two or more accounts and bill payments. Banks tend to utilize this electronic banking device, as all others for competitive advantage.

The combined services of both the Automated and human tellers imply more productivity for the bank during banking hours. Also, as it saves customers time in service delivery as alternative to queuing in bank halls, customers can invest such time saved into other productive activities. ATMs are a cost-efficient way of yielding higher productivity as they achieve higher productivity per period of time than human tellers (an average of about 6,400 transactions per month for ATMs compared to 4,300 for human tellers **(Rose, 1999)** as cited in

Abor, 2008. Furthermore, as the ATMs continue when human tellers stop, there is continual productivity for the banks even after banking hours.

2.4.2 Telephone Banking

"Telebanking (telephone banking) can be considered as a form of remote or virtual banking, which is essentially the delivery of branch financial services via telecommunication devices where the bank customers can perform retail banking transactions by dialing a touch-tone telephone or mobile communication unit, which is connected to an automated system of the bank by utilizing Automated Voice Response (AVR) technology" **(Balachandher *et, 2001).***

According to **Leow (1999)**, telebanking has numerous benefits for both customers and banks. As far as the customers are concerned, it provides increased convenience, expanded access and significant time saving. On the other hand, from the banks' perspective, the costs of delivering telephone-based services are substantially lower than those of branch based services. It has almost all the impact on productivity of ATMs, except that it lacks the productivity generated from cash dispensing by the ATMs. For, as a delivery conduit that provides retail banking services even after banking hours (24 hours a day) it accrues continual productivity for the bank. It offers retail banking services to customers at their offices/homes as an alternative to going to the bank branch/ATM. This saves customers time, and gives more convenience for higher productivity.

2.4.3 Personal Computer Banking

"PC-Banking is a service which allows the bank's customers to access information about their accounts via a proprietary network, usually with the help of proprietary software installed on their personal computer". Once access is gained, the customer can perform a lot of retail banking functions. The increasing awareness of the importance of computer literacy has resulted in,increasing the use of personal computers. This certainly supports the growth of PC banking which virtually establishes a branch in the customers' home or office, and offers 24-hour service, seven days a week. It also has the benefits of Telephone Banking and ATMs. **(Abor 2008)**

2.4.4 Internet Banking

The idea of Internet banking according to **Essinger (1999)** is: "to give customers access to their bank accounts via a web site and to enable them to enact certain transactions on their account, given compliance with stringent security checks". To the Federal Reserve Board of Chicago's Office of the Comptroller of the Currency (OCC) Internet Banking Handbook (2001), Internet Banking is described as "the provision of traditional (banking) services over the internet".

Internet banking by its nature offers more convenience and flexibility to customers coupled with a virtually absolute control over their banking. Service delivery is informational (informing customers on bank's products, etc) and transactional (conducting retail banking services).

As an alternative delivery conduit for retail banking, it has all the impact on productivity imputed to Telebanking and PC-Banking. Aside that it is the most cost-efficient technological means of yielding higher productivity. Furthermore, it eliminates the barriers of distance/time and provides continual productivity for the bank to unimaginable distant customers.

2.4.5 Branch Networking

Networking of branches is the computerization and inter-connecting of geographically scattered stand-alone bank branches, into one unified system in the form of a Wide Area Network (WAN) or Enterprise Network (EN); for the creating and sharing of consolidated customer information/records **(Laudon and Laudon, 2006).**

It offers quicker rate of inter-branch transactions as the consequence of distance and time being eliminated. Hence, there is more productivity per time period. Also, with the several networked branches serving the customer populace as one system, there is simulated division of labour among bank branches with its associated positive impact on productivity among the branches. Furthermore, as it curtails customer travel distance to bank branches it offers more time for customers' productive activities **(Abor, 2008).**

2.4.6 Electronic Funds Transfer at Point of Sale (EFTPoS)

An Electronic Funds Transfer at the Point of Sale is an on-line system that allows customers to transfer funds instantaneously from their bank accounts to merchant accounts when making purchases (at purchase points). A PoS uses a debit card to activate an Electronic Fund Transfer Process **(Chorafas, 1988).**

Increased banking productivity results from the use of EFTPoS to service customers shopping payment requirements instead of clerical duties in handling cheques and cash withdrawals for shopping. Furthermore, the system continues after banking hours, hence continual productivity for the bank even after banking hours. It also saves customers time and energy in getting to bank branches or ATMs for cash withdrawals which can be harnessed into other productive activities.

2.5 Technological trend in the banking industry in Ghana

Over time, technology has increased in importance in Ghanaian banks. Traditionally, banks have always sought media through which they would serve their clients more cost effectively as well as increase the utility to their clientele. Their main concern has been to serve clients more conveniently, and in the process increase profits and competitiveness. Electronic and communications technologies have been used extensively in banking for many years to advance the agenda of banks **(Abor, 2008)**.

In Ghana, the earliest forms of electronic and communications technologies used were mainly office automation devices. Telephones, telex and facsimile were employed to speed up and make more efficient, the process of servicing clients. For decades, they remained the main information and communication technologies tools used for transacting bank business (ibid).

Later in the 1980s, as competition intensified and personal computers (PC) got proletarian, Ghanaian banks begun to use them in back-office operations and later tellers used them to service clients. Advancements in computer technology saw the banks networking their branches and operations thereby making the one-branch philosophy a reality. Barclays Bank

Gh. Ltd. and Standard Chartered Bank Gh. Ltd. pioneered this very important electronic novelty, which changed the banking landscape in the country (ibid).

Arguably, the most revolutionary electronic innovation in this country and the world over has been the ATM. In Ghana, banks with ATM offerings have them networked and this has increased their utility to customers. The Trust Bank Ghana, in 1995 installed the first ATM. Not long after, most of the major banks began their ATM networks at competitive positions. Ghana Commercial Bank started its ATM offering in 2001 in collaboration with Agricultural Development Bank. Five (5) banks currently operate ATMs in Ghana. The ATM has been the most successful delivery medium for consumer banking in this county. Customers consider it as important in their choice of banks, and banks that delayed the implementation of their ATM systems, have suffered irreparably. ATMs have been able to entrench the one-branch philosophy in this country, by being networked, so people do not necessarily have to go to their branch to do banking business (ibid, 2008).

Another technological innovation in Ghanaian banking is the various electronic cards, which the banks have developed over the years. The first major cash card is a product of Social Security Bank, now Societe Generale SSB, introduced in May 1997. Their card, 'Sika Card, is a value card, onto which a cash amount is electronically loaded. In the earlier part of year 2001 Standard Chartered Bank launched the first ever debit card in this country. Its functions have recently been integrated with the customers' ATM cards, which have increased its availability to the public since a separate application process is not needed to access it. A consortium of three (3) banks (Ecobank, Cal Merchant Bank and The Trust Bank) introduced a further

development in electronic cards in November 2001, called 'E-Card'. This card is online in real time, so anytime a client uses the card, or changes occur in their account balance, their card automatically reflects the change. Though ATMs have enjoyed great success because of their great utility, it has been recognized that it is possible for banks to improve their competitive stance and profitability by providing their clients with even more convenience. Once again ICT was what saved the day, making it possible for home and office banking services to become a reality. In Ghana, some banks started to offer PC banking services, mainly to corporate clients. The banks provide the customers with the proprietary software, which they use to access their bank accounts, sometimes via the World Wide Web (WWW). This is on a more limited scale though, as it has been targeted largely at corporate clients. Ghana Commercial Bank, Ecobank Gh. Ltd, Standard Chartered Bank Gh. Ltd., Barclays Bank Gh. Ltd and Stanbic Bank Gh. Ltd. are the main banks known to offer PC banking services **(Abor, 2008)**

Banks have recognized the internet as representing an opportunity to increase profits and their competitiveness. Currently, is only Ecobank Gh. Ltd which is offering internet banking in Ghana, but some others have well laid plans to start. Standard Chartered Bank Gh. Ltd. and Barclays Bank Gh. Ltd, also have plans for doing so in the not-too-distant future.

Telephone banking, has also taken a big leap with its convenience and time. Barclays Bank (Gh.) launched its telephone banking services in August 28, 2002. SSB Bank also launched its "Sikatel" or "SSB Call Centre" (telephone banking) on September 19, 2002. The services available with this system are ascertaining credible information about the bank's products, the

customers' complaints, bank statements and cheque book request and any other complaints and inquiry (Ab 2008).

2.6 General usefulness of ICT in Commerce and Industry

Over the past two decades, the scope and quality of telecommunications technology (ICT) has exceeded just about everything anyone could have imagined. As stated by **Bruno-Britz (2007)** that "From the introduction of the internet to the masses to the explosion in mobile handheld devices, banks realize that telecom is about more than just getting a dial tone… it can provide a business an extra edge in a very competitive environment. Accordingly, banks are thinking more strategically about their telecom deployments" **(Bruno-Britz, 2007).**

Banks (20 also shared this view and intimated that "the world's appetite for telecom services has become nearly insatiable. He stated further that "the technology has evolved to where people greatly depend on telecom services to manage their everyday lives and for businesses to gain competitive advantage in some cases and gain efficiencies in others".

Mattox (2) says banks could not do much without carefully developing their telecom plans by stating that "Telecom components have always been key elements to doing business for financial institutions", he asserts "Due to the technology enhancements we've seen in recent years, there is a greater dependency on telecom the functions of the networks. As a result, companies are looking at their investments and platforms here more strategically".

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Mattox adds that the network element increasingly is relied upon to deliver business solutions at the banks. "We work very closely with other areas of the IT organization and the business to see how network can facilitate better delivery of business", he explains.

The SunTrust Bank of USA however contended that in order to derive the gains of network technology one need to be conscious of the cost elements. The bank held that the cost associated with leveraging ICT can erode the profitability and in fact gains that the system ought to offer. **Banks (2007)** pointed this out and indicated how his bank is addressing the cost issue by stating that "for us, this is being accomplished through leveraging newer network technologies, such as MPLs [multiprotocol label switching], which offer more capabilities but at a lower cost".

Roshan (2007) as cited by Bruno-Britz contributed to this assertion by stating that:

> "I know one bank that rolled out mobile devise to its branch workforce. It worked great because, they were able to respond to customer issues faster and they were more productive. The problem for them was that the average cell plan is 500 minutes a month. This is fine if the phone is being used as a convenience. However, when you rely on the phone as a primary device, this becomes costly. This gave the bank pause and they eventually pulled the phones out of the branches".

Despite the above focus on cost as a factor that it determines loss from technology deployment, most banks seemed to be making more gains as technology provides the industry with diverse opportunities especially in remaining competitive. As posited by **Wireless (2007)** "in today's highly commoditized banking industry, completive differentiation is achieved through customer service excellence… by having a 360 degree view of your customer's

relationship with the bank and this is attainable only through the deployment of appropriate technologies".

Kwapong (2007) commenting on the usefulness of ICT to the banking industry in Ghana said:

> "banks whether in towns or in rural areas cannot afford to remain on the fringe. They owe their customers obligation to shorten time spent on transacting business within the banking halls. Besides, he said, "the emergence of Automated Teller Machines (ATMS) has made banking services to be more customer-friendly and convenient".

2.7 Measuring Return on investment (ROI) in ICT projects.

Viewing ICT as a strategic tool for competitiveness and profitability, one stands to wonder whether the huge investment that both commerce, industry and indeed the public sector is making in order to deploy ICT into their systems is yielding the desired returns.

This question has received mixed findings from various researchers. While some researchers held that ICT investment does not appear to yield the right ROI, others are of the view that the system is indeed producing the desired ROI. Other researchers also held that what is projected as ROI from ICT investment depends on the variables of analysis used by the individual concerned.

Creaswell (2007) undertook a study on "Advancing Return on Investment Analysis for Government IT and come out with the following findings:

> "every investment decision requires a leap of faith, sometimes a large one-into an uncertain future. However, after decades of investments in information technology (IT), running into billions of dollars, governments worldwide are largely unable to convincingly demonstrate a return on

investment (ROI) that is widely understood or based upon well grounded measures".

He intimated further that "while most can agree that governance has been dramatically changed by IT, and many programmes and services are more effective and less expensive as a result, government agencies are finding it increasingly difficult to communicate to the public about the exact benefits of these investments".

Creaswell's findings further point out that "for past investments in government information technology, the article of faith seemed to be 'if some is good, more will be better'". He contended against this view of faith by stating that "those days, however, are rapidly coming to a close. Instead, those currently holding the government purse strings have much more critical and skeptical perception that "if we scrutinize IT investment more closely, we will get better returns".

This view is becoming more apparent, as evidenced in the July 2007 report of the US Senate Appropriation Committee, which recommended Zero funding for the administration's 2007 E-government initiative. The report says, "...the committee has no confidence that the amounts being assessed have any relationship to the benefits anticipated to be returned".

Mike Hettinger (staff director at the House Government Reform Committee's Government Management, Finance and Accountability Sub-committee) commenting in the Appropriation Bill said in a Federal Computer Week article that, "the language speaks for itself and reiterates what the sub-committee has been saying for the past year, that in order for this e-government

initiative to be successful, we need to have a better understanding of the costs and benefits and a clearer guidance for the agencies to follow".

Cresswell concluded his study by stating that the quest for closer scrutiny of IT investment does not mean that such investments do not yield the desired ROI. Instead he indicated, "the full value of government IT investments can be found by looking for both the internal value to government operations and improving the government itself as an asset to society and the broader eternal value - political and social returns to the public at large".

He pointed out further that value creation from IT investment can therefore come as much from increase integrity, transparency of government as from reducing costs through activities such as online tax processing, license application and renewals, obtaining information, filing forms etc. The public value propositions for these investments go beyond the important but obvious cost and time savings to include attention to service quality, access and equity etc.

Cresswell's study therefore provides a framework on which any institution which is investing in IT needs to seriously consider in measuring the returns from such investment.

a) Return on Investment to the internal operations of the organization (internal customers') value.

b) Return on investment to the broader receivers of the organizations products or services (external customers).

This framework proposition has been supported by **Fowler (2007)** (Director, project delivery for SNB-Service New Brunswick-Canada) by stating that "without the concept of 'public value' as return on investment, it would be difficult to gauge how much benefit a decision to invest in IT initiative can have".

2.8 Customer's constructs of IT as a competitive tool in quality service delivery

One fundamental tool for any service provider to remain competitive in today's global competitive market environment is quality of service. This tool affords service providers the opportunity to curve for themselves a positive reputation and image, which serves as bait to attract and retain customers thereby gaining a considerable market share in any given industry. As **Bolten (1995)** puts it "the impact of quality on reputation is nowhere more marked than in the service industry. Indeed, reputation is the most important marketable good of every service industry".

Tulane University, (1989) [an educational service provider] puts it more aptly by stating that "ours is a reputational business – **an enterprise whose revenues are driven by the perception and substance of its reputation for quality** and the skills with which that reputation is marketed".

If quality is of so much importance to drive the revenue (competitive position) of an enterprise, the question that needs to be addressed is what constitutes service quality? In other words, how do we measure service quality? Or what variables delineate service quality? These questions have received enormous attentions in literature. Researchers such as **Lehtinen and Lehtinen (1982), Garvin (1984), Gronroos (1984), Parasuraman et al. (1985), Bitner**

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et al. (1990) and many others provide useful dimensions or variables that constitute criterion on which one can measure service quality.

According to **Gronroos (1984)** service quality could be divided into technical quality and functional quality. While technical quality answers "what" the consumer obtains, functional quality answers "how" the consumer obtains it. **Technical quality** is the practical result of service and **functional quality** indicates the process of carrying out the service. Service quality make-up does not just involve "the results" but includes the "methods and procedures used to convey the service.

Parasuraman et al. (1985) mention three factors for evaluating service quality: accessibility, communication, and understanding the customer. These factors were simplified and revised into five factors, i.e. tangibles, reliability, responsiveness, assurance, and empathy **(Parasuraman et al., 1988).**

Bitner et al., (1990) stressed the importance of the human interaction component on customer's evaluation of service quality. **Lehtinen and Lehtinen (1982)** state that service quality has three dimensions: physical quality, corporate quality and interactive quality. Interactive quality is based on the relationship between the organization's personnel and the customer, as well at the interaction between customers. This is similar to what has been proposed by **Heskett (1987) and Surprenant and Solomon (1987)**, who consider the performance of contact personnel and the personnel-customer interaction that takes place during service delivery as important indicators of quality.

Brady and Cronin (2001) provide evidence that customers form their service quality perceptions on the basis of an evaluation of performance at multiple levels and ultimately combine these evaluations to arrive at an overall service quality perception.

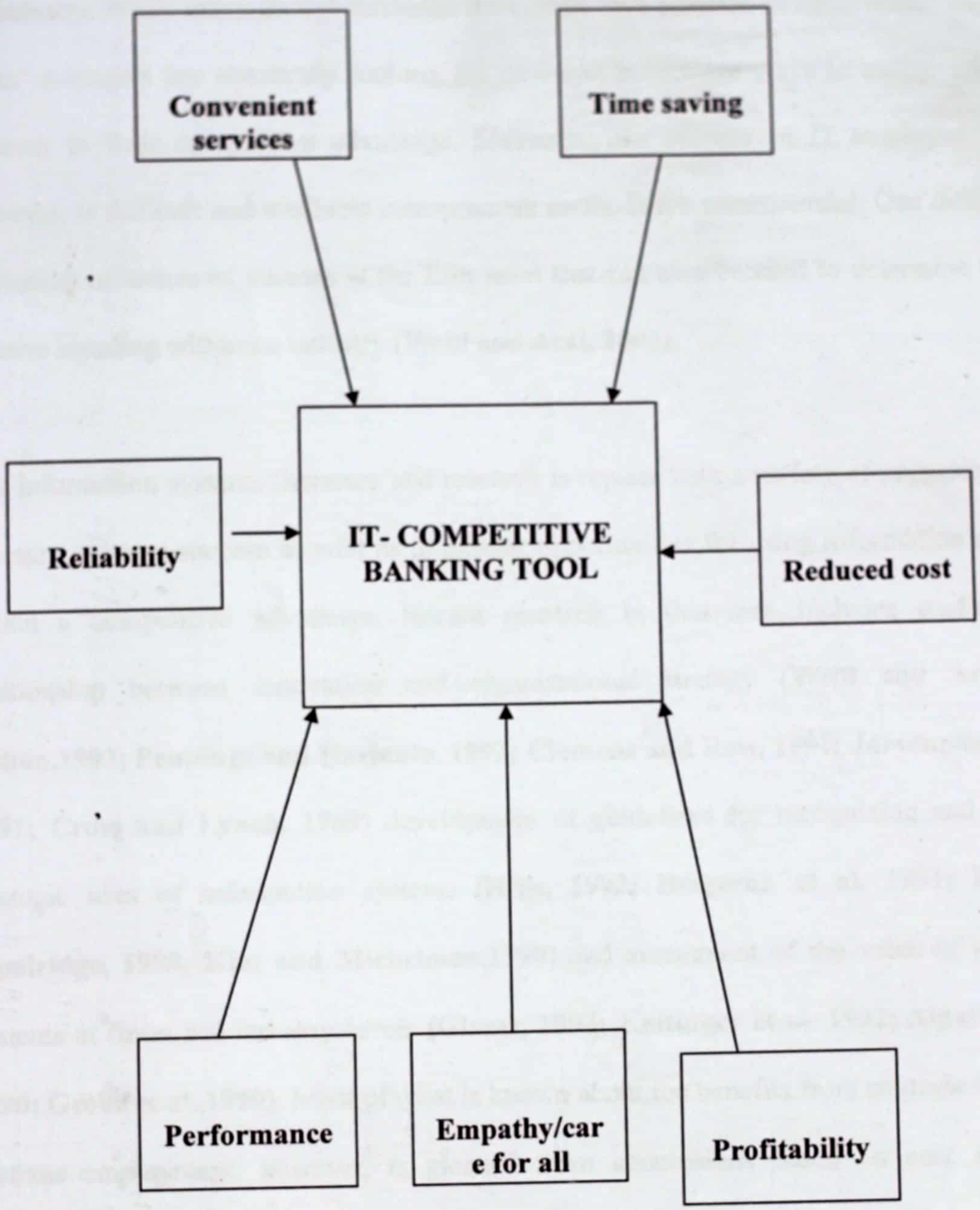
The above views on quality variables could be summarised in what is termed 'Garvin's dimensions of quality' and which has become an acceptable measure of quality in many circles. Theses are:

- Performance – the main characteristics of a product or service
- Aesthetics – appearance, feel, smell, taste
- Special features – extra characteristics
- Conformance – how well a product or service correspond to the customer's expectations
- Safety – risk of injury or harm
- Reliability – consistency of performance
- Durability – the useful life of the product or service

Given that there is so much views as to what constitute a measure of service quality, this research used a moderation of the Garvin dimensions and the five factors of quality propounded by **Parasuraman et al., (1985)** as a framework to measure how customers of the case bank perceive the quality of service rendered to them by the bank facilitated by the ICT tools which the bank has in place. The choice of this framework is based on the wide acceptability by the academia and industry as well as commerce on the use of those

dimensions to measure service quality. This framework is therefore illustrated diagrammatically below:

Figure 3: Conceptual model: IT – A Competitive Banking tool



2.9 Empirical literature

Successful employment of strategic information systems (SIS) and the innovative use of information technology are viewed by many as key to obtaining a leadership position within an industry. While many factors influence the competitive position of firms within an industry, firms' managers are constantly looking for new and innovative ways to utilize information systems to their competitive advantage. Measuring the success of IT employed in firms, however, is difficult and available measurement methods are controversial. One difficulty lies in finding measures of success at the firm level that can also be used to determine the firm's relative standing within an industry **(Weill and Aral, 2006).**

The information systems literature and research is replete with a variety of suggested ways to measure systems success as well as to exploit opportunities for using information systems to obtain a competitive advantage. Recent research in this area includes studies on the relationship between innovation and organizational strategy **(Weill and Aral, 2006; Bolton,1993; Pennings and Harianto, 1992; Clemons and Row, 1991; Jarvenpaa and Ives, 1991; Cross and Lynch, 1989)** development of guidelines for recognizing and exploiting strategic uses of information systems **(Hills, 1992; Bergeron et al. 1991; Floyd and Woolridge, 1990; Kim and Michelman,1990)** and assessment of the value of information systems at firms and industry levels **(Glazer, 1993; Kettinger et al. 1992; Alpar and Kim, 1990; Grove et al.,1990)**. Most of what is known about the benefits from strategic information systems employment, however, is gleaned from conclusions based on case studies and anecdotal evidence **(Brown et al., 1995).**

Theoretically, a company achieves a competitive advantage by being able to "earn returns on investment persistently above the average for the industry" **(Clemon and Row, 1991; Oliva, 1991). However, as Crowston and Treacy, (1986)** state, "Most of what we do in MIS is based on the belief that information technology has an impact on 'the bottom line' of the business. Surprisingly, we rarely know if this is true". Economic benefits of IT are and continue to be difficult to demonstrate **(Strassman, 1990)** due to the fact that information system success is so intertwined with other aspects of how a business is conducted **(Clemons and Row, 1991)**. Clemons and Row assert further that IT "can lead to sustainable competitive advantage when it is used to leverage differences in strategic resources". They further assert that in using IT for competitive advantage, managers need to look at the totality of the firm and build what they termed 'IT savvy'. For example, "Horizontal interactions are important, often overlooked opportunities for IT" **(Weill and Aral, 2006; Clemons and Row, 1991)**. If managers need to look at the totality of the firm in implementing IT for competitive advantage, then investigation of the success of investments made in SIS should likewise be made from a "totality of the firm" perspective.

Given the, definition of competitive advantage and the belief that firms can obtain a competitive advantage through employment of IT, this research is motivated by the lack of empirical research conducted to support such beliefs, to undertaken this study in the rural banking sector in Ghana where very little studies if any at all, does exist on the impact of IT on the operations of these banks.

2.10 Conceptual Development

Numerous, authors advocate the use of information systems for strategic advantage, competitiveness, profitability and growth. However, little empirical research uses comprehensive and audited data to support claims of competitive advantage gained from IT employment. Previous relevant research and the theoretical developments that led to this study are discussed in this section.

2.11 Information Technology and competitive position of an organization

Since the early 1980s, the topic of investment in IT for obtaining a competitive advantage has popularly appeared in the information systems literature. The earliest works linking investment in information technology to competitive advantage are primarily descriptions of the specific technologies employed by various companies for strategic purposes (e.g., American Airlines' SABRE system, Merrill Lynch's CMA, McKeeson Drug Company's Economost, etc.) **(Brown et al., 1995)**

A large portion of subsequent research in this area has been dedicated to theory development and refinement of how firms may identify and exploit opportunities to use technology as a competitive weapon **(Wiseman, 1988; Porter and Miller, 1985; McFarlan, 1984)**. Frequently, authors use case materials or consulting experiences in conjunction with previously developed theory from reference disciplines in an effort to develop an integrated theory of SIS employment for competitive advantage **(Brown et al., 2006)**. A plethora of strategic management studies examine the relationship between innovation and organizational strategy. These studies provide a good basis for developing theory about the impact of

investment in innovative (strategic) information systems on organizations. Theory in the marketing literature on developing a market niche is relevant to understanding how to utilize resources to exploit market opportunities. Finally, literature in accounting and finance on measurement of firm value provides a valuable resource for developing economic measures of information system success.

Beyond theory development, numerous attempts have been made to relate information technology (IT) expenditures, computational intensity, MIS budget, or other particular strategies to firm performance **(Alpar and Kim, 1990; Floyd and Woolridge, 1990; Grove et al., 1990). Mahmood and Mann (1993)** provide a good summary of this type of research for 1982-92. These studies have typically used only one measure of firms' performance for one year. Exceptions to this rule are **Alpar and Kim (1990)** who looked at one measure of performance but used an eight-year period, and **Kettinger et al. (1994)** who looked at multiple performance measures for multiple years, but years prior and subsequent to the investment year were aggregated into single measures. Studies employing single measures in single years are the most problematic because it is unclear when economic benefits from investment in IT materialize **(Quaddus et al., 2008)**. For example, while economic measures of efficiency may indicate performance improvements in the year of investment, measures of profitability may indicate poorer performance in the year of investment due to the large capital outlays required. However, in subsequent years, there may be strong improvements in profitability and very small improvements in measures of efficiency **(Quaddus et al., 2008; Brown et al., 1995).**

A related problem is that even if a competitive advantage is obtained, it may not be sustainable if the innovation is easily copied by competitors. Thus, a firm that has an economically measurable advantage in one year may not have an advantage in the next year. In fact, if the SIS technology is easily copied, the innovating firm may actually be at an economic disadvantage due to the high costs involved in pioneering the system innovation. **Kettinger et al., (1994)** as cited in **Brown et al., (1995)** found, among other things, correlations between sustainability of competitive advantage and high scores on cash flow and investment intensity along with low scores on industry competitiveness. These, findings indicate that fewer firms are likely to be able to sustain a competitive advantage than previously believed in most of the literature disseminated throughout the 1980s. If firms with an unsustainable advantage are included in a study of the relationship between investment in IT and firm performance and only one year is investigated, selecting the wrong year could produce misleading results.

Finally, there are problems with previous studies trying to link investment in SIS with firms performance since the level of specificity of the measures used (e.g., IT expenditures, MIS budget) ignores the interactive nature of information systems in the business environment. For instance, large IT expenditures may reflect an inefficient IT operation or poor planning instead of reflecting a high level of innovation. For example, **Grove et al., (1990)** found that greater MIS expenditures are associated with relative reductions in firms' excess values rather than the expected relative increases. This is contrary to what one would expect if investments in IT truly provided a competitive advantage.

2.12 Empirical Testing of Theories

It is questionable that a firm has sustained a competitive advantage from employment of IT if evidence of this advantage does not eventually show up in the "bottom line." For example, a company may develop a state-of the-art order-processing system, but without an increase in orders to process, a decrease in time or cost to process existing orders, and/or some other financially measurable benefit, it is hard to say that a competitive advantage from the investment exists. Similarly, a firm may have markets for its products, but without a system for processing orders the firms is unable to turn these markets into profits. Both orders and the superior order-processing system have to come together to form a measurable competitive advantage as indicated by **Weill and Aral (2006)**. The interactive nature of IT with other aspects of a company's business is such that it is difficult to isolate an individual IT effect.

The primary approach adopted by this study is to compare the performance of the case bank three years before, the year of adoption, and five years after deploying IT into its operations using such tools as profitability, number of customers, average service delivery/waiting time etc.

In his 1988 book, Wiseman identifies firms that he and others believe have successfully employed SIS for competitive advantages. This study is patterned along previously developed cases and theories on SIS employment for competitive advantage. Wiseman's approach to identifying SIS companies was to identify firms that he believed had "developed a vision of information systems to guide their strategic course". Thus, Wiseman's approach by its nature

considers the interactive nature of IT with other elements of an organization in recognizing a firms SIS leadership. He identified companies as investing in IT to differentiate their products, reduce the cost of their products or services, provide innovative products or services, support growth or form alliances with suppliers or customers. Wiseman identified these strategies as strategic thrusts. This identification method is different for example from the approach used by *Computerworld* to develop its list of "Premier 100" firms as reported by **Brown et al., (1995)**. *Computerworld* relies primarily on IT expenditures to arrive at a numeric ranking and ignores the interactive nature of IT.

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter highlights the methodology of the study, and touches on the following: the type of study undertaken, the research approach, sources and method of data collection and instrument used for the study, sample size determination, population of the study, sampling techniques and method of data presentation.

3.1 Research methodology

3.1.1 Study design

This research is case study conducted to evaluate how the organization was strategically using IT/ICT in its operations to gain competitive advantage in the banking industry in Ghana. The researcher chose this approach because many researchers namely **Heggade (2000)** used the case approach to studied bank customer relationship in India. **Sharma and Singh (1993)** used the case study approach to analyze the impact of Information Technology on quality of customer services provided by Standard Chartered Bank (SCB), and **Shastri (2001)** analyzed the effect and challenges of new technology for banks using a case study approach. The researcher was therefore guided by the wide use of this approach in literature in his choice of design.

The researcher also chose Nwabiagya Rural Bank (NRB) as a specific case since the bank is the only bank amenable to the researcher in the rural banking sector in the area, willing to

provide the researcher with the needed data to undertake the study. Also, the researcher observed that the features of this bank and its stage in technology diffusion are not significantly different from other banks in the rural banking sector which is the focus of the study. There is therefore a high likelihood that the results from this case may not be in any way different from those of any other rural bank if chosen for the same study.

3.1.1 Research approach

Two basic approaches were used to accomplish the purpose of this study. In the first approach, the researcher analyzed several performance measures of the bank. These measures were broken into periods before, during and after adoption of ICT into the bank's operations. The study adopts a more overall performance perspective to see if successfully implementing ICT does, in fact, have any impact on overall firm performance and competitiveness.

The second approach is to examine customers' reactions to and patronage of the bank before and after the deployment of ICT by the bank. Measures such as the rate of increase in customers' number, profit levels of the bank before and after ICT deployment were used in this approach.

3.1.2 Sources and method of data collection and instrument used for the study

Data for the study was collected from two sources: primary and secondary. The primary data was collected from the case organization using structured questionnaires and interviews which were administered to the management, staff and customers of the bank (sample respondents). The secondary data was obtained through a review of other operational manuals of the bank.

The researcher found the primary data very necessary for the study because it gave him first-hand information on the subject under study. The secondary data was also very useful and necessary as it provides a deeper orientation to the researcher and broadens his horizon on the topic.

3.1.3 Sample size determination

3.1.3.1 Population of the study

The population of the study is made up of 15 management staff of the bank, 101 other members of staff of the bank and 40,573 customers as at 2005. The customers of the bank were made up of those who held various accounts with the bank before and after the deployment of ICT into its operations. The bank has two broad categories of customers: those in the formal sector made up of salaried workers were approximately 13,524 and those in the informal sector made up of petty traders and craft men approximated at 27,049.

3.1.3.2 Sample size

The researcher used a total of 183 samples made up of 8 management personnel, 51 other members of staff of the bank and 124 customers as sample for the study. However, the researcher was able to retrieve only 48 questionnaires out of the 51 sent to the members of staff of the bank. The total sample employed in the analysis was therefore 180. Also, from the records of the bank, the researcher realised that formal sector customers were approximately one third of the total customers' population of the bank for the period under review. The researcher therefore used a ratio of 1:3 (formal sector customers: informal sector customers) for the selection of sample customers for inclusion in the study. The selection of the above

sample was to provide representative views from the management, other members of staff and the various customer groups of the bank on the effect of ICT on the bank's performance.

3.1.4 Sampling Techniques

The researcher employed both probability and non probability techniques to select sample respondents for inclusion in the sample for the study. The researcher used purposive sampling technique to select 8 out of the 15 management staff of the bank. The researcher applied this technique because of the expert views of this category of the sample on the subject of the study. It came to light during interactions with the management of the bank that some management staff of the bank joined the bank after the diffusion of ICT into the bank's operations. However the researcher was interested in the views of those management staff who were with the bank before, during and after the deployment of ICT into the system since they are in a better position to tell what effects ICT has brought to bear on the bank's operations based on their experience before and after the deployment of the technology into the bank's operations. The technique also made it possible for the head of ICT unit of the bank to be included in the study since he has an in-depth view on the use of ICT in service delivery of the bank. For the selection of the sample from the bank's members of staff, the researcher used systematic random sampling technique. A list of names of members of staff was obtained and a sampling fraction of ½ was chosen. The list of the names of members of staff of the bank therefore constitutes the sampling frame of respondents for the bank's staff. The sample fraction for the bank's staff therefore is:

$$\textbf{Sampling fraction} = \frac{\textbf{actual sample size}}{\textbf{Total population}}$$

$$= \frac{50.5}{101} = \frac{1}{2}$$

The researcher used systematic random sampling to select 51 persons from the list of staff members of the bank as sample for the study.

For the selection of customers as sample for the study the researcher employed a combination of stratified, quota and accidental sampling techniques. The customers of the bank were grouped into various strata (branches) and a quota consisting of a sample of approximately 24 persons was taken from each of the five out of the seven branches of the bank randomly selected. The assigned quota samples were then interviewed for inclusion into the study using accidental sampling.

Observation of the work processes of the bank was also done by the researcher to verify issues such as type of ICT tools that the bank has in place and time spent by customers in the banking hall.

3.1.5 Data Presentation

Data gathered were analysed using descriptive statistics. The findings of the study were presented using appropriate tables and charts to ensure easy interpretation.

3.1.6 Hypothesis Testing

The hypothesis couched out for the study is tested using chi square and the P – value of test statistic. This test of statistical hypothesis is chosen due to its wide application and acceptability by researchers for hypothesis testing. The test also provides an efficient measure of how much statistical evidence exists in a given variable so that it can be weighed in relation

to other factors. The P-value is further important to the researcher because it measures the amount of statistical evidence that supports the alternative hypothesis that, there is more evidence that exists to reject the null hypothesis in favour of the alternative. The greater the test statistics, the smaller the P-value. Further interpretations of the P-value states that if the P-value is less than:

- 0.10 we have some evidence that the null hypothesis is not true
- 0.05 we have strong evidence that the null hypothesis is not true
- 0.01 we have very strong evidence that the null hypothesis is not true and
- 0.001 we have extremely strong evidence that the null hypothesis is not true

The test therefore clearly spelt out at which level the null or alternate hypothesis should be rejected without further arguments. **(Keller, 1991)**

3.2.0 Organisational Profile

3.2.1 Legal Structure

Nwabiagya Rural Bank Limited (NRB) was incorporated as a company limited by shares in 1987 under the Ghana Companies Code 1963 (Act 179). The Bank was issued a certificate to commence business in same year and subsequently a banking license to operate as a rural bank.

3.2.1.1 Development of NRB branches

The first branch to be operated by NRB is the Head Office branch which was opened on 24th July 1987 at Barekese. This was followed by the Bohyen branch opened on 12th June 1989, Offiso branch 8th September 1990, Mazagin branch 18th December 1992, Zagoe lane branch at

Adum opened on 26th May 1997, Abuakwa branch 14thth July 2000 and Anwiam opened on 1st November 2007. Currently the bank operates seven branches in all.

3.2.2 Mission

To provide efficient and effective financial services by adopting appropriate technology, increase market share, enhance optimal realisation of stakeholders' interest, human resource development and product innovations.

3.2.3 Vision

By the next ten (10) years, NWABIAGYA RURAL BANK LIMITED wants to become the best managed and leading rural bank in the country and be recognised as a commercial bank.

3.2.4 Shareholders and Board Structure

It was registered with 50,000,000 shares of no par value of which 6,807,000 have been issued for a total cash consideration of ¢ 1,117,434 million as at December 31, 2006.

NRB has an eleven-member Board of Directors of which two (2) are women. Currently, one of the board members is indisposed and the zonal area which he represents is planning a replacement. With the exception of the legal representative who was co-opted, the members represent the various operational areas of the bank. The Board of Directors is the highest decision making organ of the bank.

3.2.5 Executive Management

The day-to-day administration of the bank is entrusted into the hands of its management team. The General Manager (GM) heads the team and he is directly supported by a deputy with the title "Manager". Under the Manager, NRB has deputy managers for Audit, Finance & Administration, Operations, and Credit & Marketing. The GM is well qualified. He is currently pursuing the final stages of the Chartered Institute of Bankers course and has over twelve years banking experience.

3.2.6 Management Information System

The bank has computerized its management information system. The current software that it is using is not meeting the bank's expectation. The management of the bank has immediate intention to replace it with the prescribed Temenos eMerge software. Also with the intention of expanding micro finance operations, the challenge is to acquire software that could effectively cater for both the microfinance and SME operations. The consultant believe that Temenos eMerge could do the job.

3.2.7 Environmental Scan - Internal Strength

- The bank is able to maintain primary and secondary reserves significantly above statutory requirements.
- The bank is able to generate adequate funds which are invested to improve profitability.
- There is a personal touch and fast service to customers especially in processing of credits.
- Special attention is given to illiterate and semi-illiterate customers who feel

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comfortable in our bank compared to the traditional banks.

- The existence of an effective clearing system through the Apex Bank facilitates the operations of our bank.
- Committed and efficient board of directors.
- Tax concession from the government.
- Most of our branch networks are located in sub-urban areas and this enhances deposit mobilization.
- Free from board and community interference.
- Quality board of directors with high skilled and motivated staff.
- Computerisation of our operations and improved technology.
- Improved internal control systems.

3.2.8 Weaknesses

- The bank's potential for mobilisation of funds has not been fully achieved due to poor mobilisation drive
  - Lack of effective marketing, research and product development departments
  - Skewed community assistance toward Nwabiagya area which adversely affects our corporate image.

TABLE 3.2.1 SWOT ANALYSIS

	ENVIRONMENTAL FACTORS	THREATS	OPPORTUNITIES
1.	CHANGES IN FUNDING PATIERNS	Funding Agencies restrict their credits to specific segments of society which are risky areas making recovery difficult	Availability of the funds enable the bank to give credit to large number of customers Satisfying the environmental and community demands
	LOANABLE FUNDS	Conditionalities attached to the funds do not give opportunities to assess profitable areas	Provides a very good avenue for poverty reduction
2.	UNFAVOURABLE ECONOMIC INDICATORS	Fluctuating inflation, exchange and interest rates coupled with low per capita income and high unemployment levels affect the banks ability to mobilise funds and give out credits	Interest rates on government borrowing enable the bank to invest excess funds in government bonds, T/bills, loans and advances
3.	POLITICAL LEGISLATION	Restrictions on opening of agencies by the bank of Ghana (BOG) affects the general operations of the bank.	Lower corporate tax enables the bank to get excess funds for investment
		Section (38)(a) of the banking Act with the clause "Not fit and proper" is a disincentive to proper decision making Apex compulsory 5% deposit placement requirement affects the banks ability to lend Corruption of data can halt the operations of the bank	Decisions are taken with caution Good infrastructural facilities facilitates the operations of the bank It enhances the primary reserve of the bank and make funds available when faced with liquidity problems
4.	TECHNOLOGY	Corruption of data can halt the operations of the bank. Computer fraud can collapse the whole organisation.	Introduction of computers and information and communication technology has greatly improved the bank's service delivery.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION OF THE FINDINGS

4.0 Introduction

This chapter deals with the analysis of both the primary and secondary data gathered by the researcher, from the field. The analysis focused on identifying the types of innovative technologies being used in the Rural Banking sector in Ghana, how the rural banks are using ICT as a strategic tool, the impact that ICT is having on the operations of the bank, explore the extent to which ICT tools deployed by the bank is meeting customers' satisfaction and examine factors responsible for the slow rate of ICT deployment in Rural Banks in Ghana.

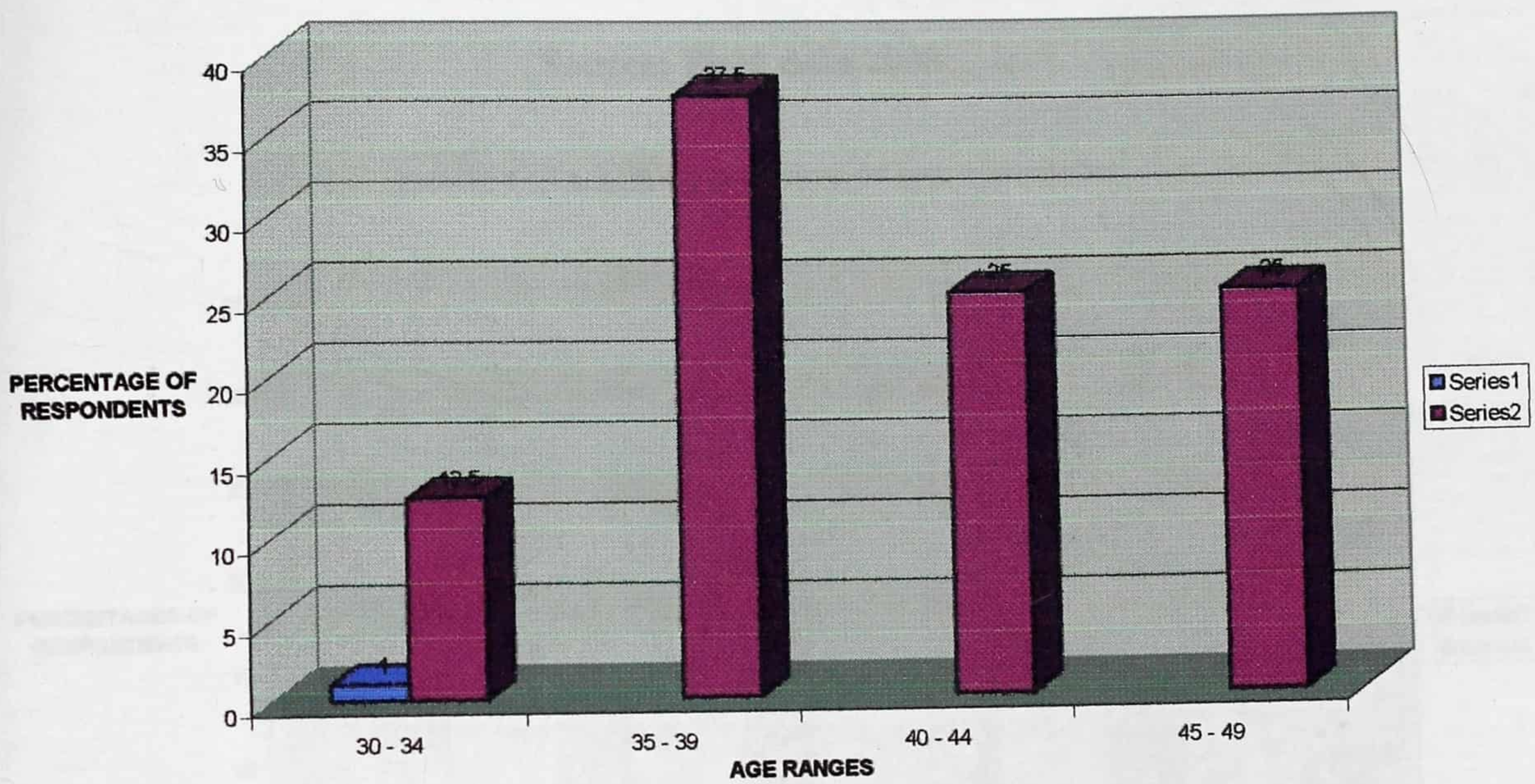
4.1 Analysis of the demographic data

The key elements in the demographic data collected from the three sample groups namely: Management, staff and customers, which are of prime significance to the study include: age and length of service/date customers join the bank and position/job occupation of the respondents. This is so because there is general perception that there is a relationship between age and technology use. The length of service or date customer join the bank is also of paramount importance to the researcher given that the study covers a certain time scope. Views of staff and customers who were therefore part of the bank during the time scope of the study were very important in providing an evaluation of what the operations of the bank has been before and after ICT was deployed by the bank. Other variables such as education level and job position of the respondents were also captured in the demographic data. For the customers, the concentration of demographic data covers age, occupation and date of becoming customer of the bank.

4.1.1 Age of respondents

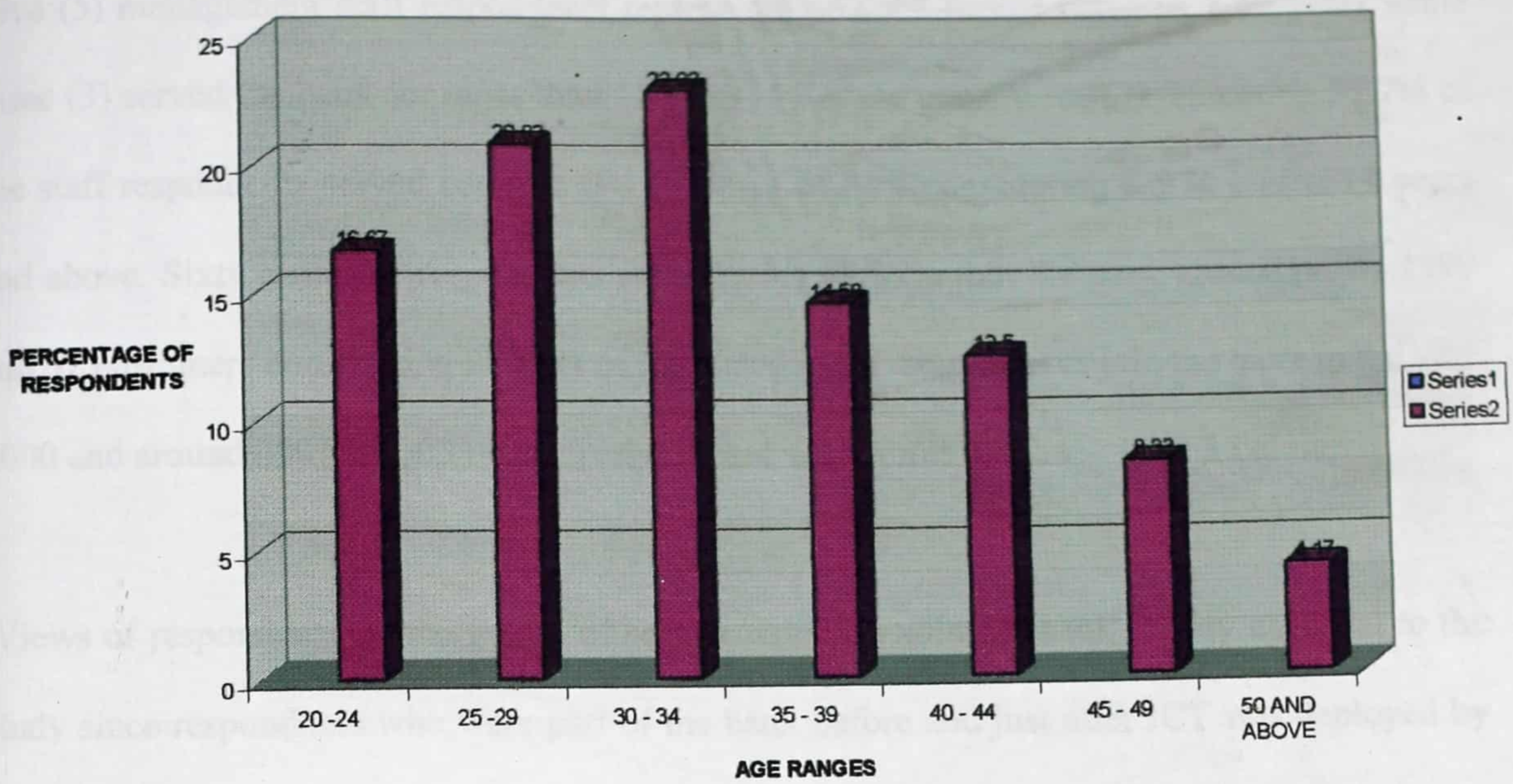
Twelve point five percent (12.5%) of the management staff were within the age group of 30 – 34 years, 37.5% were within 35 – 39 years and 25.0% represented the ages 40 – 44 and 45 – 49years respectively. For the general staff members of the bank, 95.8% were aged between 20 – 49 years. Only 4.2% of the staff was aged above 50 years. 79.8% of the customers of the bank were aged below 40 years and 20.2% were above 40 years. Please see figures 4.1.1.1 - 4.1.1.3 below and tables 4.1.1.1 - 4.1.1.3 of appendix 1 respectively.

FIGURE 4.1.1.1: AGE DISTRIBUTION OF MANAGEMENT STAFF OF NRB



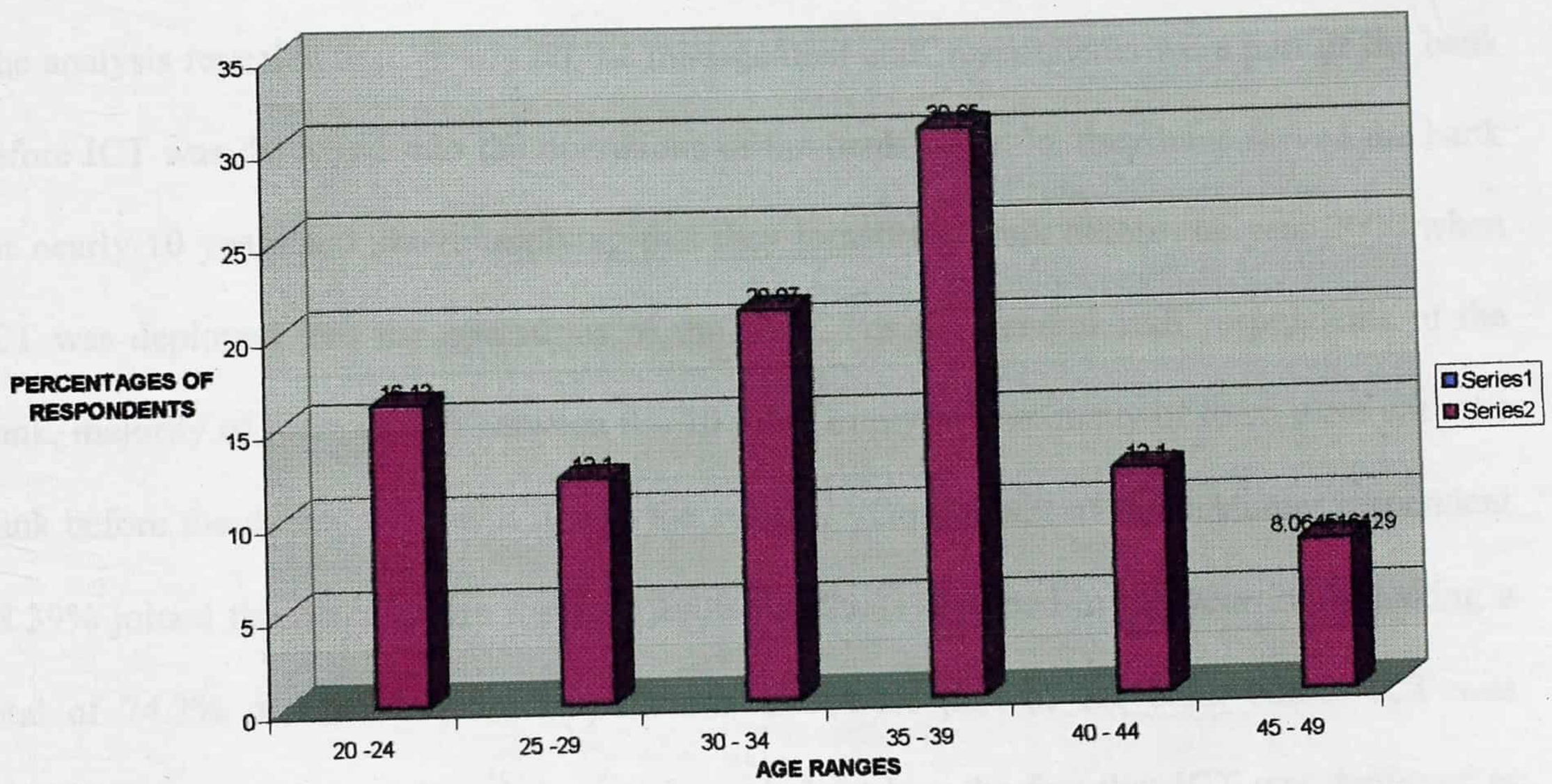
Source: Field data 2008

FIGURE 4.1.1.2: AGE DISTRIBUTION OF NRB MEMBERS OF STAFF



Source: Field data 2008

FIGURE 4.1.1.3: AGE DISTRIBUTION OF NRB CUSTOMERS



Source: Field data 2008

4.1.2 Length of service of respondents/date of becoming a customer of the bank

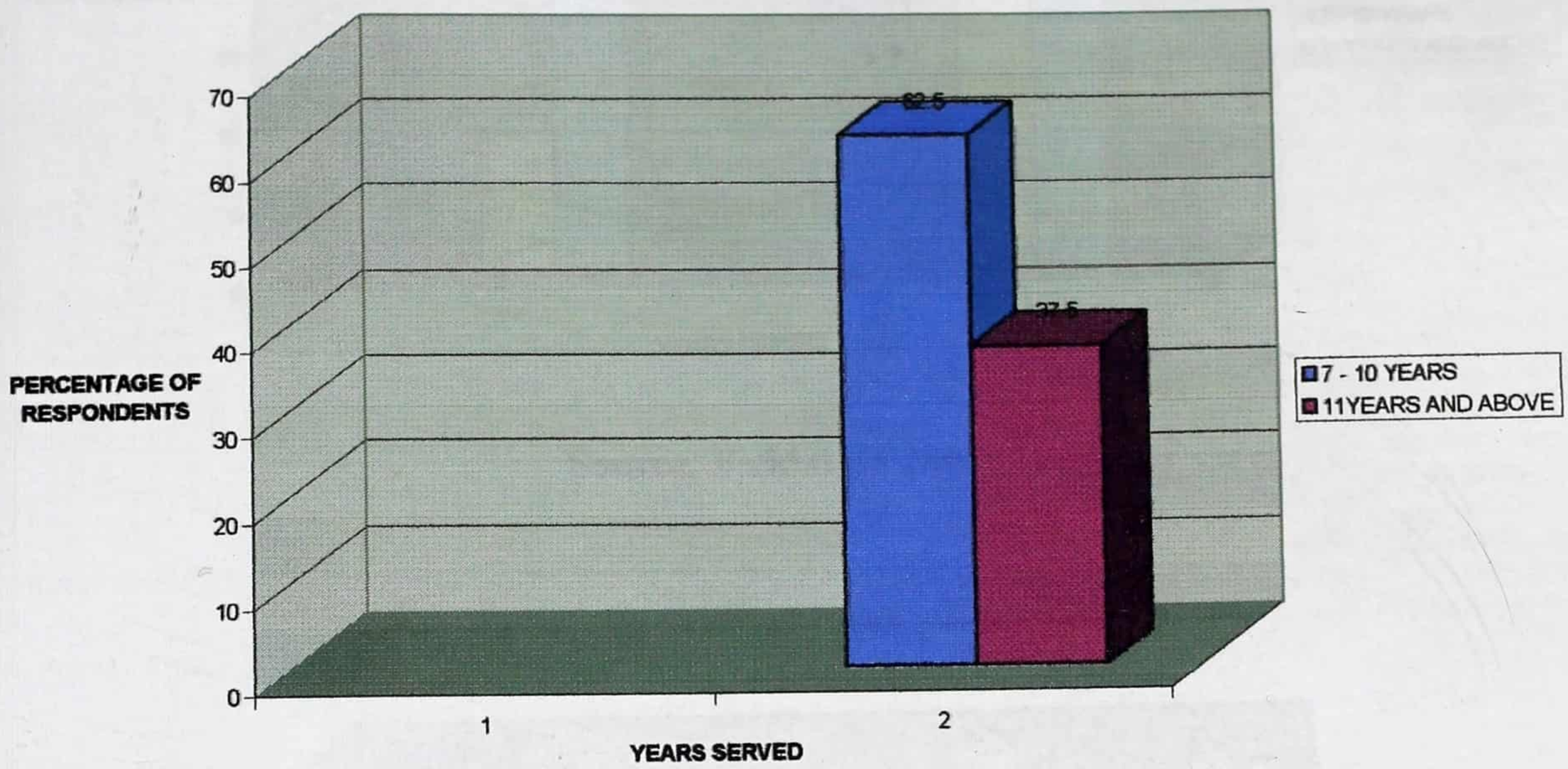
Five (5) management staff respondents representing 62.5% served between 7-10 years while three (3) served the bank for more than 11 years. 44 of the general staff representing 91.7% of the staff respondents served between 0 – 10 years while 4 constituting 8.3 % served 11 years and above. Sixty customer respondents representing 48.39% join the bank around1997 - 1999 and 32 customers constituting 25.81% of this category of respondents join the bank in the year 2000 and around 2001 – 2005 respectively. Please see figures 4.1.2.1 – 4.1.2.3 below.

Views of respondents on the length of service/date they join the bank is very essential to the study since respondents who were part of the bank before and just after ICT was deployed by the bank are in a better position to assess the effects that ICT is having on the operations on the bank and to tell how NRB is using ICT as a competitive tool in its operations.

The analysis revealed that, nearly all the management staff respondents were part of the bank before ICT was deployed into the operations of the bank. That is, they have served the bank for nearly 10 years and above implying that they joined the bank before the year 2000 when ICT was deployed into the operations of the bank. For the general staff respondents of the bank, majority of them served between 0 – 10 years implying that many of them were with the bank before the deployment of ICT into the system. On the part of the customer respondent 48.39% joined the bank before the year 2000 and 25.81% joined in the year 2000 making a total of 74.2% of the customer respondents who were part of the bank before ICT was deployed into the system. This inference is made based on the fact that ICT was deployed in 2000 and so those who joined the bank in that year might have experienced the old state of the

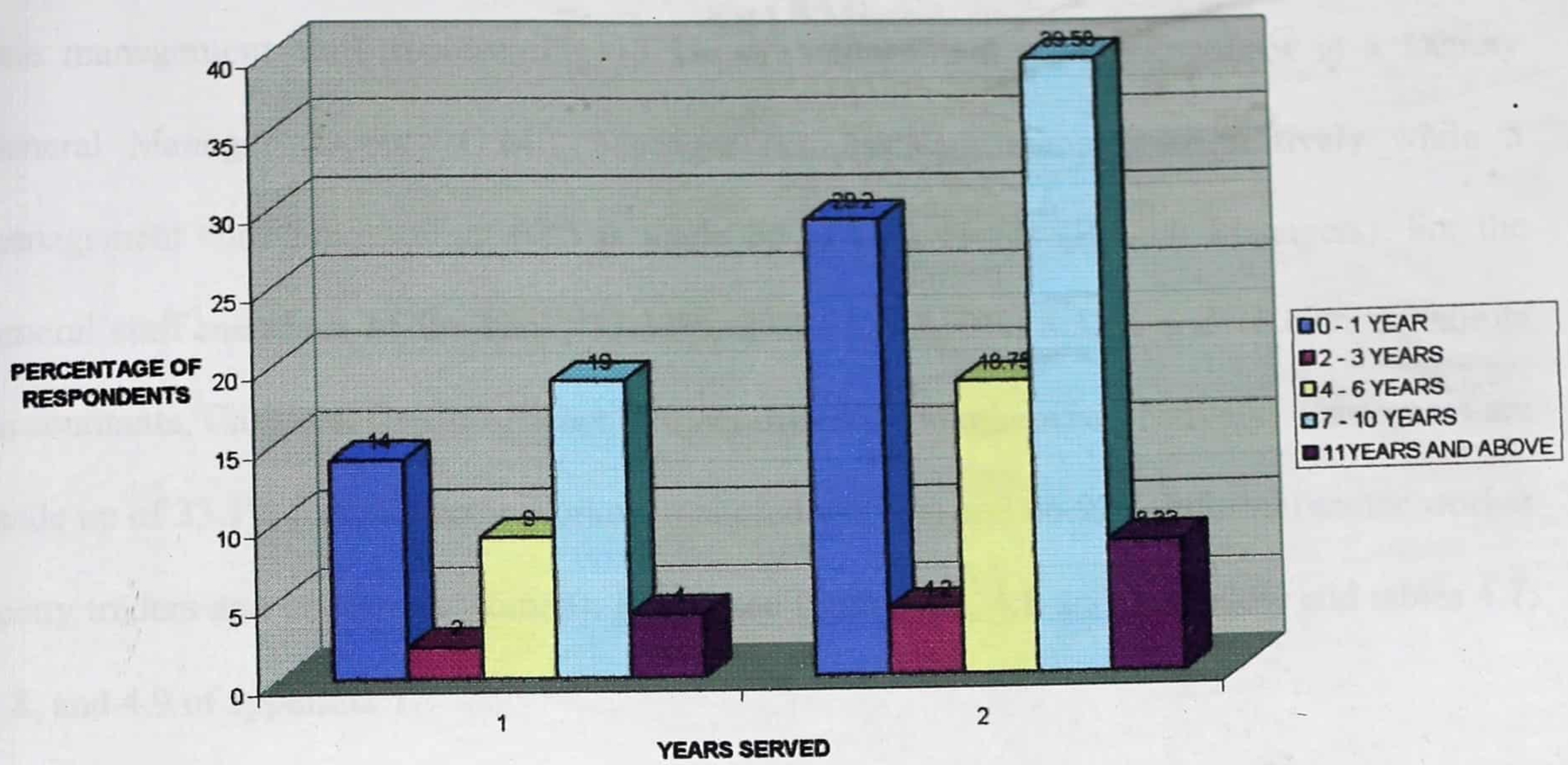
performance of the bank before full benefit could be harvested from the new technology. The sample groups are therefore deemed to be significant in providing a sufficient insight into the situation under study.

FIGURE 4.1.2.1: LENGTH OF SERVICE BY MANAGEMENT STAFF OF NRB



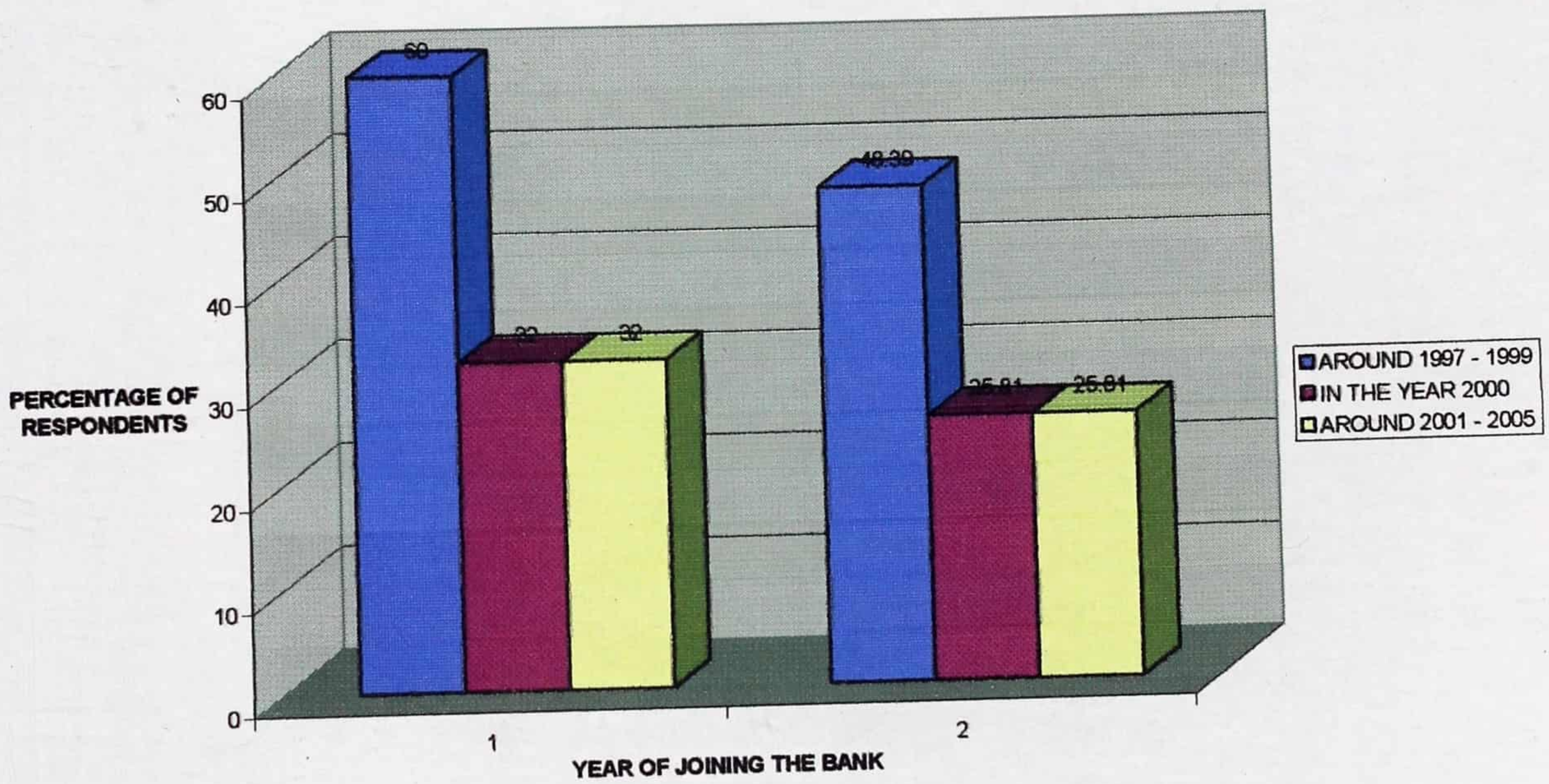
Source: Field data 2008

FIGURE 4.1.2.2: LENGTH OF SERVICE BY NRB MEMBERS OF STAFF



Source: Field data 2008

FIGURE 4.1.2.3: TIME CUSTOMER JOIN THE BANK



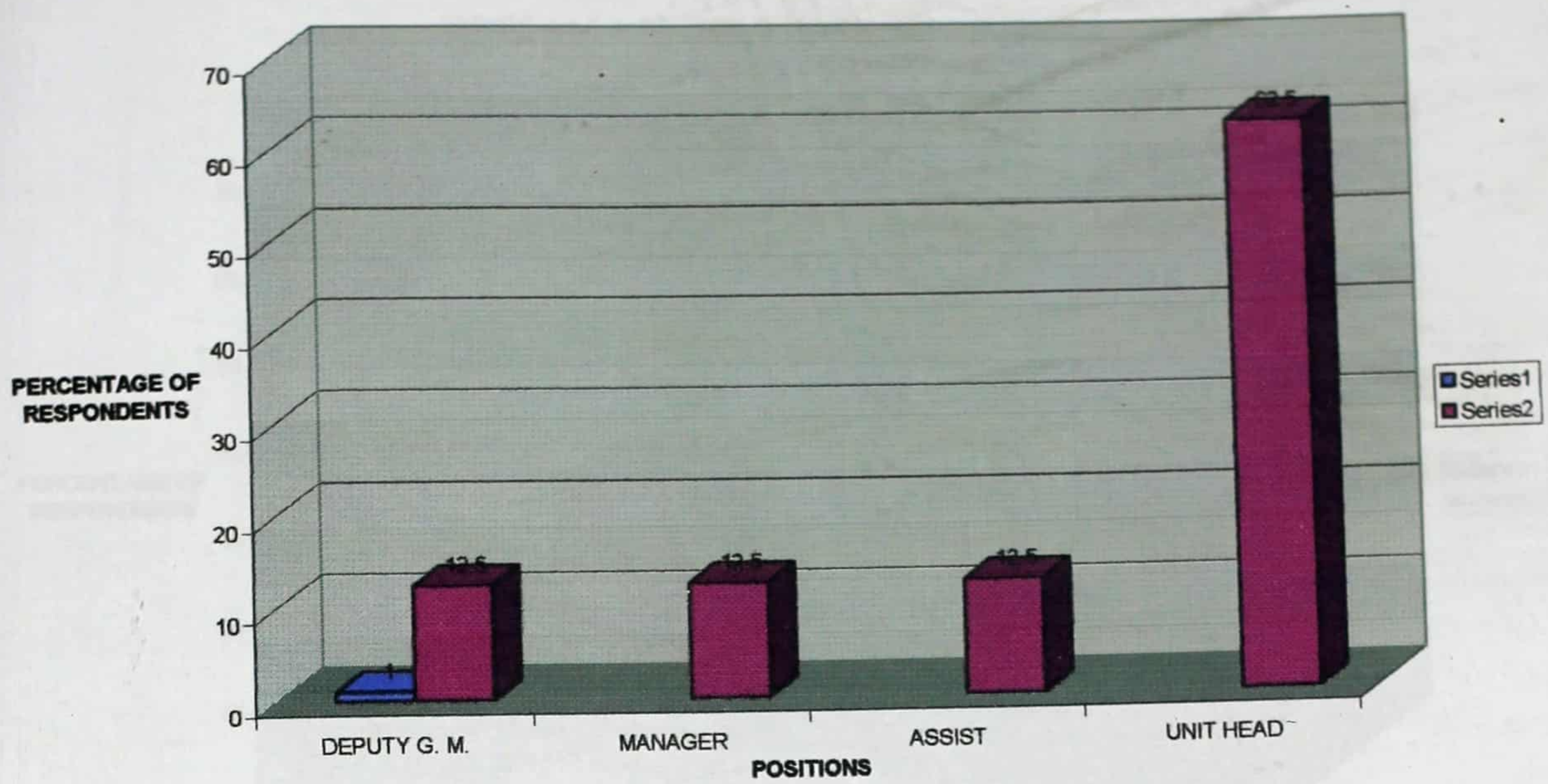
Source: Field data 2008

4.1.3 Job position/occupation of respondents

One management staff representing 12.5% of management staff respondent is a Deputy General Manager (Deputy G.M.), Manager and assistant manager respectively while 5 management staff representing 62.5 is made up of Unit Heads (Branch Managers). For the general staff members of the bank, 33.33%, 29.17%, 12.50%, 8.33% and 16.67% constitute Accountants, Cashiers, Credit officers, Project officers and others respectively. Customers are made up of 33.1% formal sector workers (salaried worker) and 66.92% informal sector worker (petty traders and craftsmen/women). Please see figures 4.7, 4.8 and 4.8 below and tables 4.7, 4.8, and 4.9 of appendix 1.

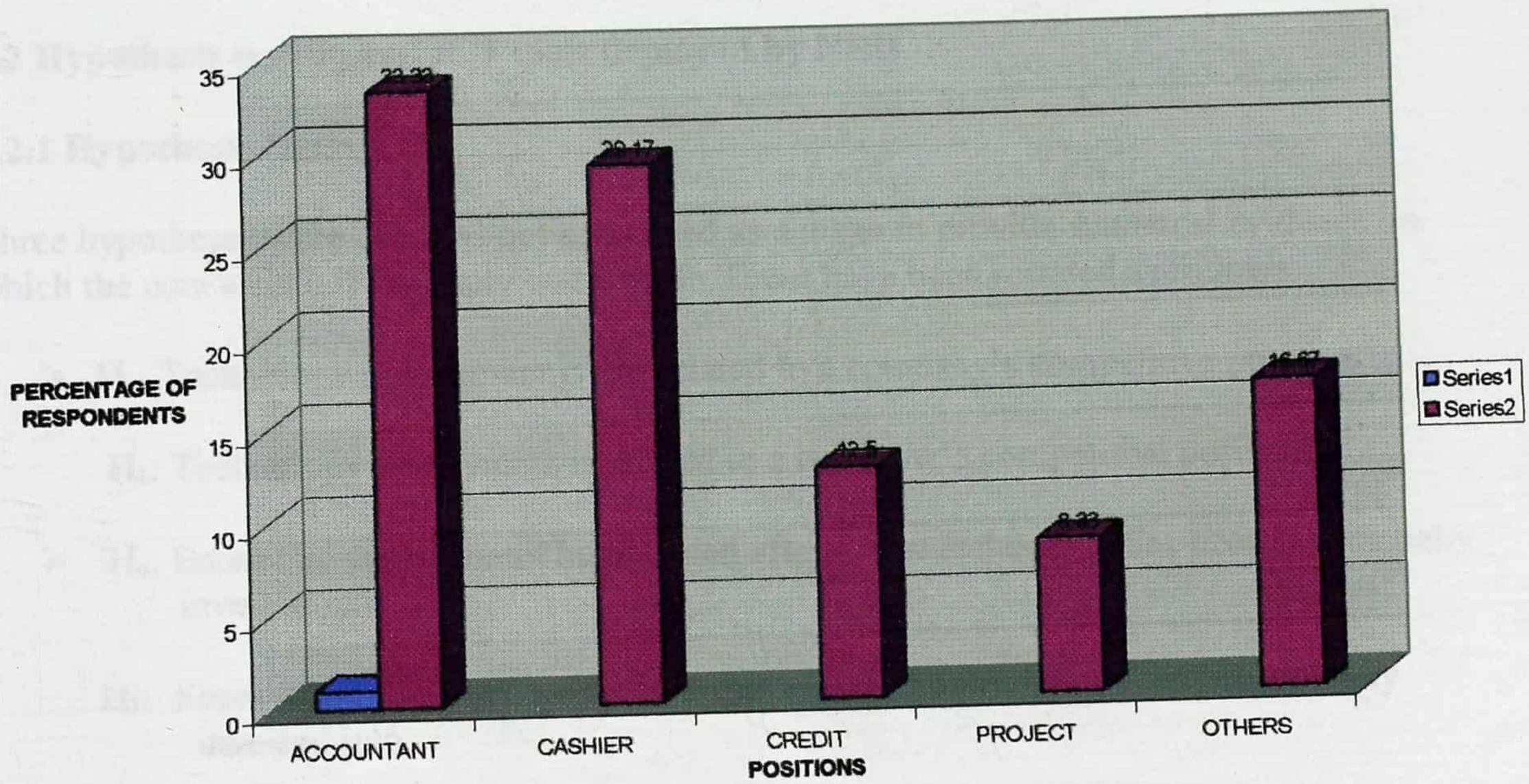
The researcher found the position of respondents necessary as this indicates how closely the respondent is with reference to the use of ICT in the operations of the bank. Views from management staff for instance provide insight into policy issue relating to ICT to which neither the general staff nor customers may be privy.

FIGURE 4.1.3.1: JOB POSITION OF NRB MANAGEMENT STAFF



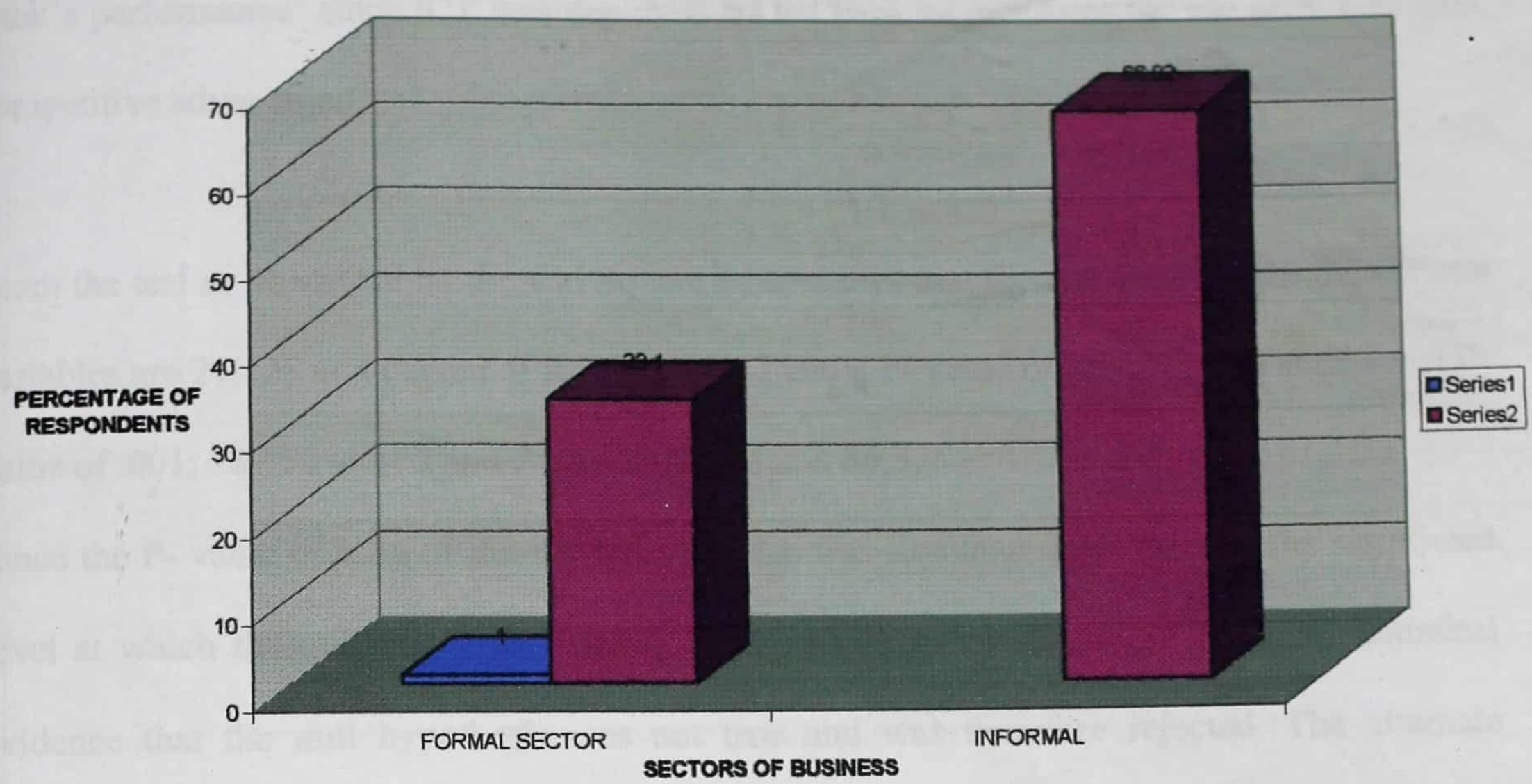
Source: Field data 2008

FIGURE 4.1.3.2: JOB POSITION OF NRB MEMBERS OF STAFF



Source: Field data 2008

FIGURE 4.1.3.3: SECTOR OF CUSTOMERS' BUSINESS



Source: Field data 2008

4.2 Hypothesis testing and ICT tools deployed by NRB

4.2.1 Hypothesis testing

Three hypotheses were couched out and tested as a mean to provide statistical evidence on which the conclusion of the study was based. These have been restated as follows:

- H_o: Technology deployment is not related to a company's competitive position

  H_1: Technology deployment is related to a company's competitive position

- H_o: Economic gains cannot be obtained after a new technology has been substantially invested into

  H_1: Economic gains can be obtained after new technology has been substantially invested into

- H_o: Training support does not increase the rate of technology diffusion, use and sales

  H_1: Training support does increase the rate of technology diffusion, usage and sales

To test the first hypothesis the researcher used such variables as 'cut down in operation cost, increase productivity, short waiting time and a general assessment from respondents on the bank's performance' since ICT was deployed by the bank as measures for use of ICT to gain competitive advantage.

From the test as illustrated by the Chi Square table shows that the test statistics for the various variables are 21.125 at a degree of freedom (df) 7 and a P- value of .000; 12.000 at df 7 and P-value of .001; 18.750 at df 7 and P- value of .000 and 36.375 at df 7 and P- value of .000. Since the P- value of each of the various variables was less than 0.05 which is the significant level at which the null hypothesis should be rejected or accepted, there is strong statistical evidence that the null hypothesis was not true and was therefore rejected. The alternate hypothesis was thus, accepted that technology diffusion is related to a company's competitive position. (Please see table 4.2.1.1 below):

TABLE 4.2.1.1: Test Statistics of ICT on Company competitive position

	ICT DOES NOT HEPLS CUT DOWN BANK'S OPERATING COST	ICT DOES NOT INCREASES THE PRODUCTIVITY OF NRB	ICT DOES NOT HELPS REDUCED CUSTOMER WAITING TIME	EVALUATING THE PERFORMANCE OF BANK SINCE ICT WAS DEPLOYED
Chi-Square	21.125[a]	12.000[b]	18.750[b]	36.375[a]
Df	7	7	7	7
P-value	.000	.001	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 16.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 24.0.

Source: field data 2008

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KUMASI-GHANA

For the second hypothesis the researcher tested the view of respondents as to what time in the deployment of a new technology could the investing institution expect economic gain from the investment since it was evident in literature that economic gains cannot be made synchronously as new technology is being deployed. The result of the test as show in the Chi - Square distribution table 4.2.1.2 below indicates that the test statistics of each of the views tested are 32.087 at df 7 and a P- value of 0.000; 19.500 at df 7 and a P- value of 0.000 and 26.375 at df 7 and a P- value of 0.000. From the test results all the P- values were less than 0.05 significant levels. This shows therefore that there is strong statistical evidence that the null hypothesis is not true and was therefore rejected. As result, the study supports the position of Ganon & Toulouse (1996); Applegate (1992) and Gerwin (1988) that gains from new technologies may not be fully exploited as the system is being deployed due to such factors as misalignment of the technology with the organization's environment, team, task and structure as well as the skill of staff, and the need for the staff to go through an adaptation and learning process to have the system well align for the necessary gains to be harvested.

TABLE 4.2.1.2: Test Statistics showing level at which gains from new technology occurs

	BENEFITS FROM ICT ARE NOT FULLY MADE AFTER END USERS BECOME USED TO IT	MUCH GAINS FROM ICT CANNOT BE MADE IN THE FIRST YEAR OF DEPLOYMENT	FOR GAINS TO BE MADE FROM ICT THE TECHNOLOGY MUST NOT ALIGN THE STRUCTURE OF THE ORGANIZATION
Chi-Square	32.087[a]	19.500[b]	28.375[b]
Df	7	7	7
P-value	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 11.5.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12.0.

With regards to the third hypothesis, the researcher tested the views of respondents on the effects of training support on technology diffusion, increased usage and increased sales volume using such variables as general training, top management training, end-users' training and banks with high ICT skilled personnel against those that do not have such skilled human resources. The test as shown in the Chi Square distribution table 4.2.1.3 below indicates that the test statistics for each of the variables are 27.00 at df 7 and P- value of .000; 57.333 at df 7 and a P- value of .000; 19.500 at df 7 and P- value of .000 and 34.833 at df 7 and a P- value of .000. Since the P- values were less than 0.05, it means that there is strong statistical evidence that the null hypothesis should be rejected and the alternate accepted. Thus, training support does appear to increase technology diffusion, rate of usage and sales. (Please see table 4.2.1.3 below)

TABLE 4.2.1.3: Test Statistics showing training effect on rate of technology diffusion, usage and sales

	TRAINING SUPPORT DOES NOT AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION	MGT TRAINING IN ICT SKILLS WILL NOT ACCELERATE TECHNOLOGY DIFFUSION IN THE SECTOR	TRAINING OF END USERS DOES ENSURE HIGHER PERFORMANCE	BANKS WITH HIGHT ICT SKILLED PERSONNEL HAVE NO RELATIVE ADVANTAGE OVER OTHERS WHICH DO NOT
Chi-Square	27.000[a]	57.333[b]	19.500[c]	34.833[b]
Df	7	7	7	7
P-value	.000	.000	.000	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 24.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12.0.

c. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 16.0.

4.2.2 ICT tools deployed by NRB

Nwabiagya Rural Bank (NRB) has a number of innovative technologies which supports its operations. The bank has 56 computers, 54 ups, 7 servers, 13 printers, 6 line phones and one fax machines. All the computers were hooked onto the local area networked (LAN) in the various branches with 3 of the branches (Magazin, Sagoe lane and Bohyen) integrated into wide area network (WAN) enabling customers of those branches to access their accounts with any of the three branches. Please see table 4.2.2.1 below.

TABLE 4.2.2.1: TYPES OF INNOVATIVE TECHNOLOGIES AT NRB

TYPES OF ICT TOOLS	NUMBER OF ICT TOOLS
Computers	56
UPS	54
Server Computers	7
Printers	13
Telephones	6
Fax machines	1

Source: Field data 2008

4.3 Use of ICT as competitive tool in the Rural Banking sector in Ghana

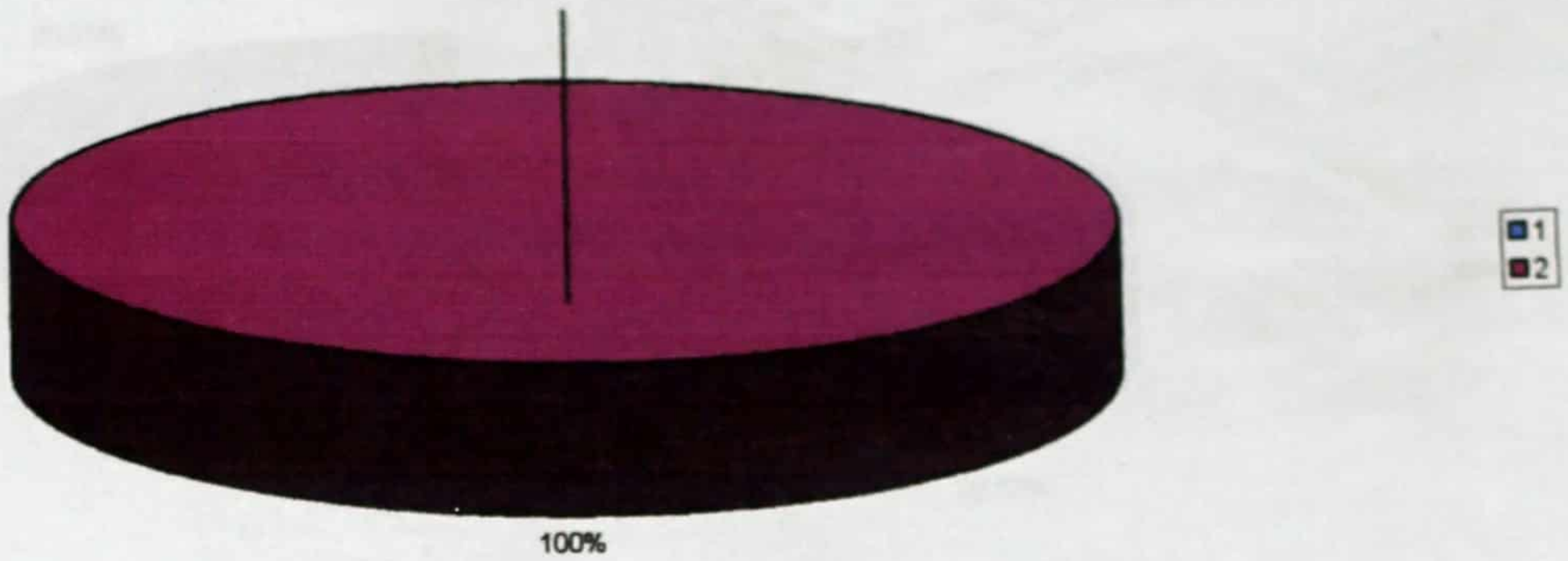
Reacting to how the bank was strategically using ICT in its operations, 100% of the management staff respondents said they apply ICT to shorten customers' waiting time. 62.5% strongly agreed that they used ICT to transact fast business while 37.5% said the slightly agreed to same view. 87.5% of management staff respondents strongly agreed that ICT tools helped the bank to provide convenient banking to their customer while a further 37.5 strongly held that ICT aided the bank to undertake efficient management decisions. On the issue of using technology as tool to track credit standing of customers, 75% strongly agreed that ICT tools that the bank has deployed helped the bank track the credit status of customers of the bank with 25% slightly agreed to the same view. 50% of the management respondents also strongly agreed that ICT assisted the bank track the performance of the various products of the bank. Please see tables 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6 of appendix 1.

The analysis brought to light two key strategic uses of ICT in the banking industry: time saving and improved service delivery as posited by Abor (2008) and Alu (2002).

Addressing the same objective, the researcher further asked staff of the bank to indicate operations that innovative technologies deployed by the bank support. One hundred percent (100) of these respondents said the bank use these technologies to provide cashiering services to customers. A further 95.8% said they used technology to check customers' accounts status with 4.2% saying no to the issue, and 79.2% of bank staff respondents said the bank used technology to check customers' credit status with 20.8% responding no to the issue. 91.7% said they use technology to undertake postings into their various books of account which they hitherto prepared manually. 66.7%, 70.8%, 79.2%, 89.6% and 18.8% of the respondents intimated that the bank uses ICT technologies to: generate management reports, check the performance of products of the bank, undertake audit of accounts, provide uniform records on all customers and to enable customers' access their accounts with any branch of the bank. Figures 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.7 and 4.3.8 below and tables 4.3.7, 4.3.8, 4.3.9, 4.3.10, 4.3.11, 4.3.12, 4.3.13, 4.3.14 of appendix 1 illustrate the operations that ICT technologies supports at NRB.

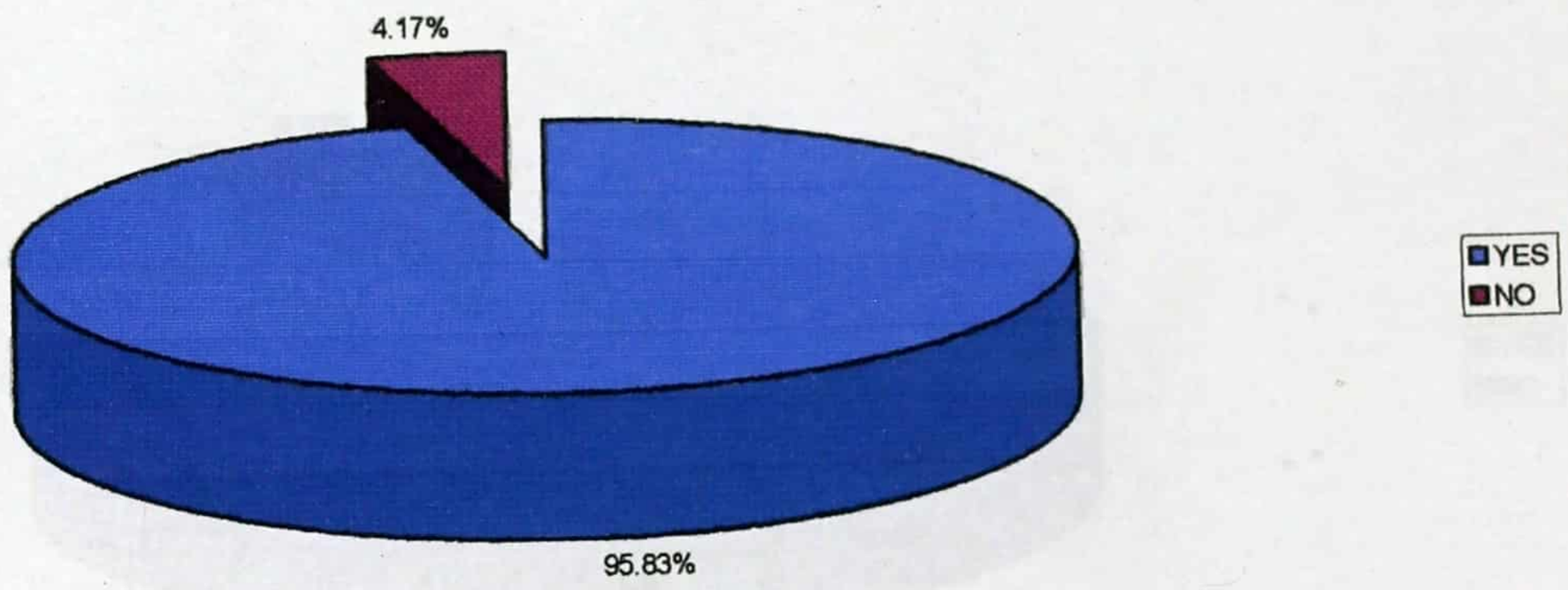
The above analysis supports the views of Yasuharu, 2003; Idowu et al., 2002; Balachandher et al 2001; Whaling, 1995 and Hunter, 1991 who undertook a number of studies on the strategic use of ICT in the financial sector and concluded that ICT has appreciable positive effects on bank productivity, cahiers' services, banking transaction, bank patronage and fast bank service delivery.

FIGURE 4.3.1: OPERATIONS SUPPORTED BY ICT AT NRB (CASHIERING SERVICES)



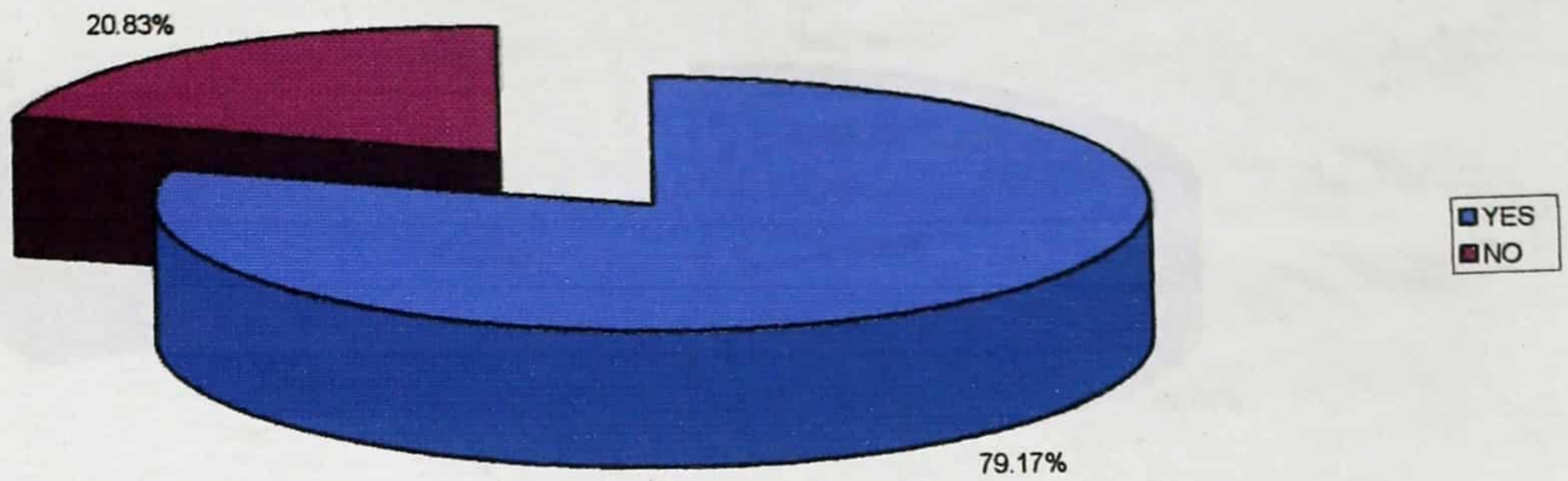
Source: Field data 2008

FIGURE 4.3.2: OPERATIONS SUPPORTED BY ICT AT NRB (CHECK ACCOUNTS)



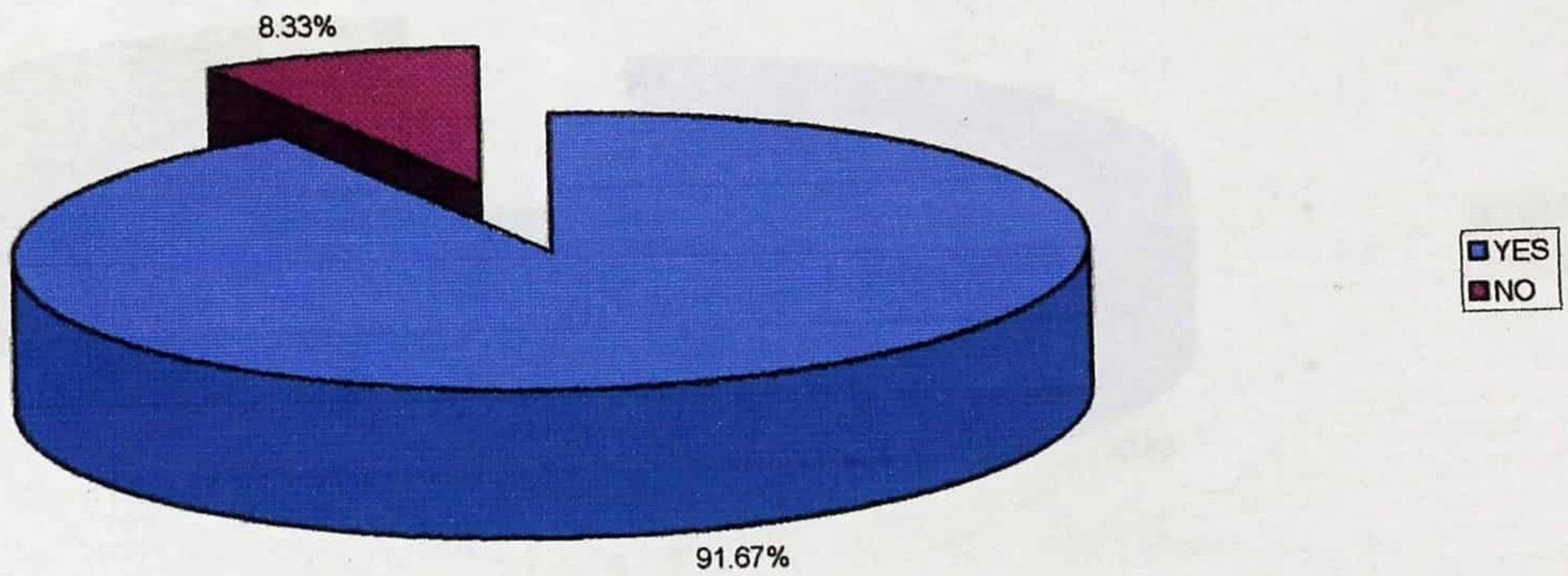
Source: Field data 2008

FIGURE 4.3.3: OPERATIONS SUPPORTED BY ICT AT NRB (CHECK CREDIT STATUS)



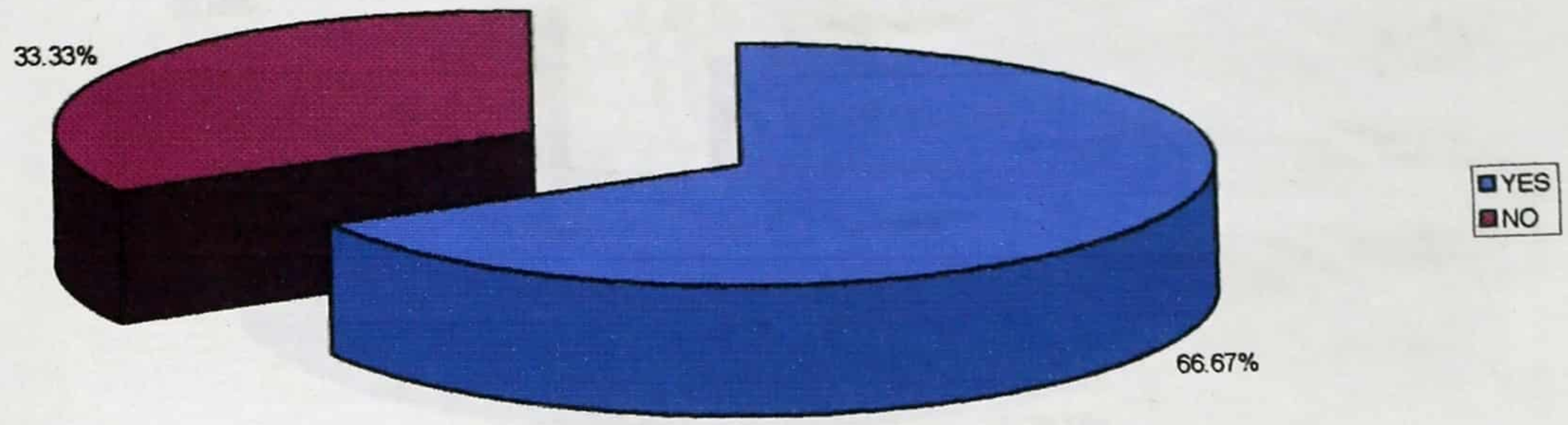
Source: Field data 2008

FIGURE 4.3.4: OPREATIOS SUPPORTED BY ICT (POSTING OF BOOKS OF ACCOUNTS)



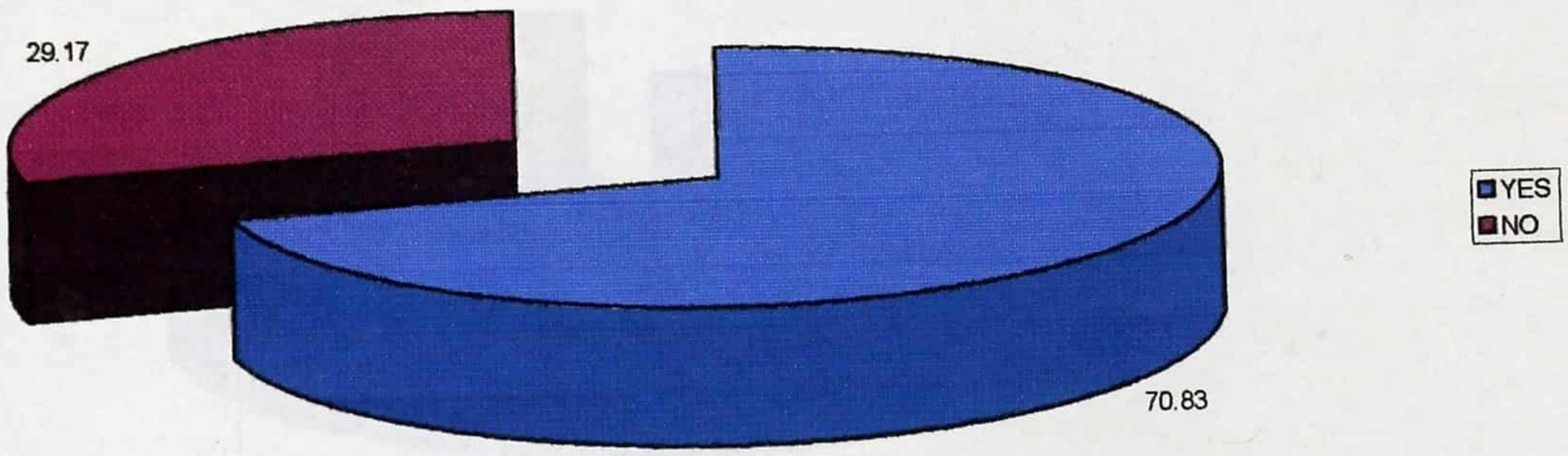
Source: Field data 2008

FIGURE 4.3.5: OPERATIONS SUPPORTED BY ICT AT NRB (GENERATE MANAGEMENT REPORT)



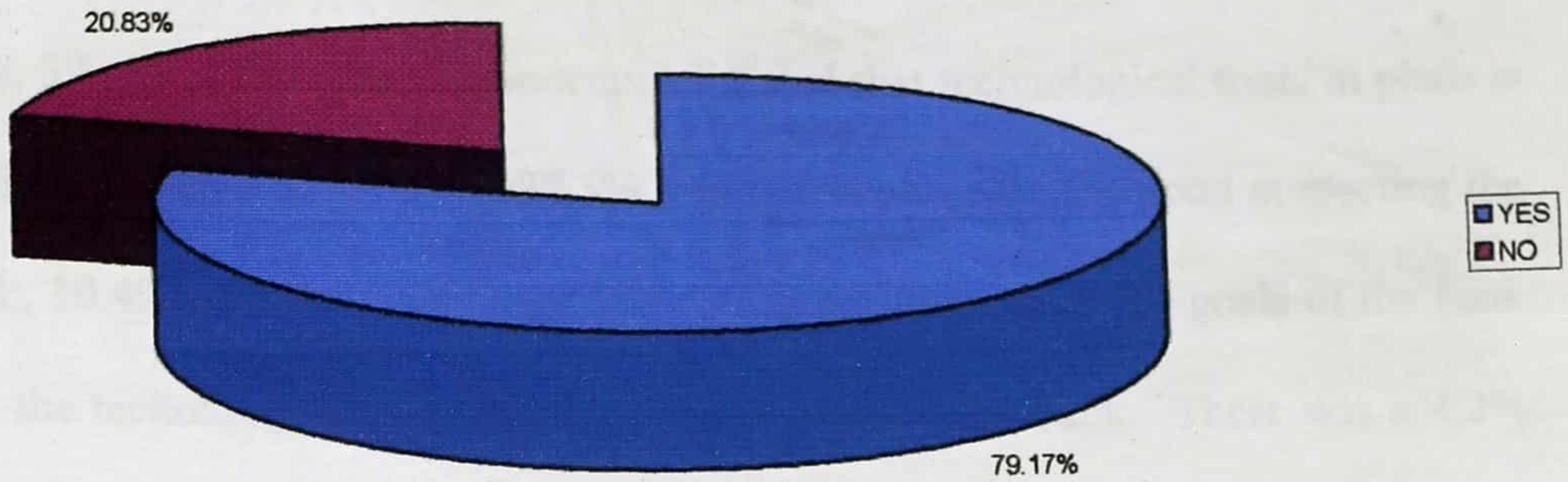
Source: Field data 2008

FIGURE 4.3.6: OPERATIONS SUPPORTED BT ICT AT NRB (CHECK PRODUCTS' PERFOMANCE)



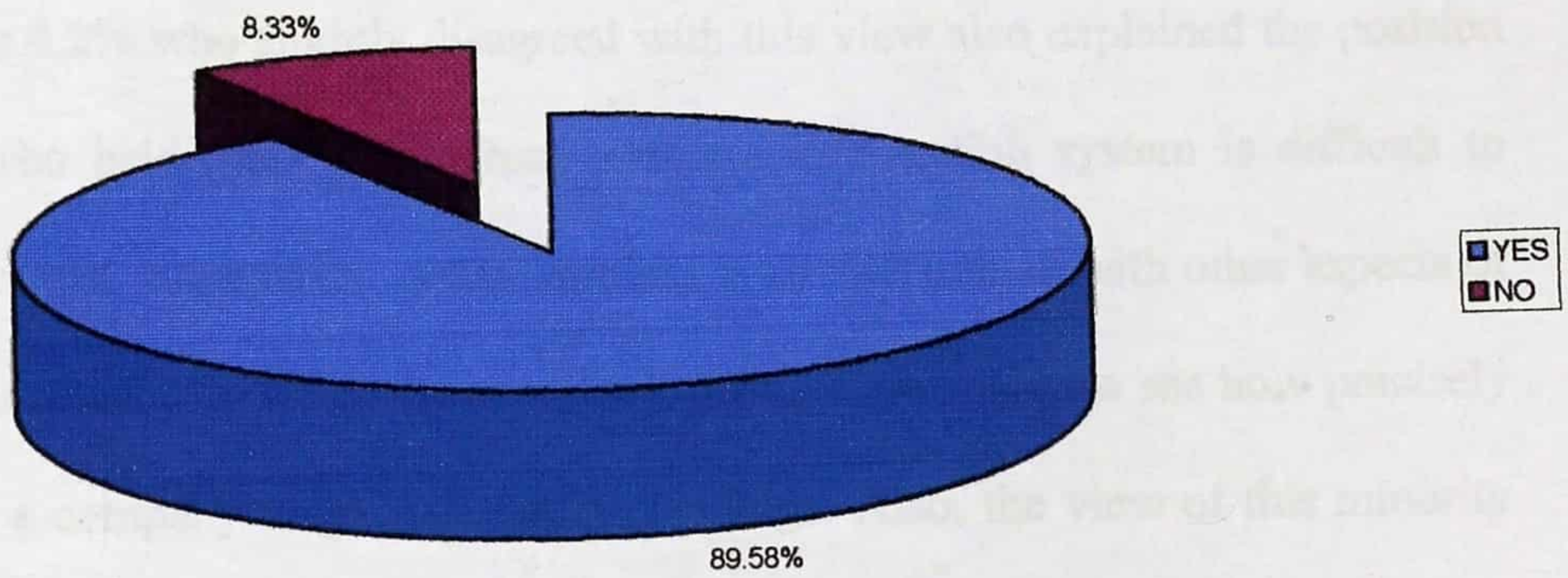
Source: Field data 2008

FIGURE 4.3.7: OPERATIONS SUPPORTED BY ICT AT NRB (AUDIT ACCOUNTS)



Source: Field data 2008

FIGURE 4.3.8: OPERATIONS SUPPORT BY ICT AT NRB (UNIFORMED CUSTOMER RECORDS)



Source: Field data 2008

The researcher further sought to find out whether technology could be a tool for competitive advantage, 79.2% of the bank's staff respondents strongly agreed, 16.7% slightly agreed to this view and 4.2% slightly disagreed with the view that technology is a tool for competitive advantage. Assessing the degree to which the technology that the bank has in place was meeting its goals, 39.6% of the staff respondents intimated that technological tools in place is excellently meeting the goals of the bank, 37.5% said the technology was good at meeting the goals of the bank, 10.4% said the technology was satisfactorily meeting the goals of the bank while 8.3% said the technology was fairly meeting the goals of the bank. There was a 4.2% missing value or non response rate to the question as indicated in tables 4.3.16 and 4.3.17 of appendix 1.

This analysis brought to light a finding which supports the views of Bruno-Britz (2007) which held that 'the introduction of ICT tools can provide a business that extra edge of competitiveness'. The analysis pointed out that 79.2% of the respondents strongly agreed that technology could be a tool for competitive advantage which was in line with what Bruno-Britz posited. However, the 4.2% who slightly disagreed with this view also explained the position of Strassman, 1990 who held that, 'gains from strategic information system is difficult to measure due to the fact that information system success is so intertwined with other aspects of how a business is conducted'. This therefore makes it difficult for many to see how precisely technology is leading a company to gain a competitive edge. Also, the view of this minority group of staff respondents further reflects what Kettinger et al. (1994) as cited in Brown et al.,(1995) intimated that if competitive advantage is gained from innovative technologies, it may not be sustained as innovation is easily copied by competitors as we are witnessing in the

banking industry in contemporary time when the banks are doing all things possible to deploy any technology that their competitors deployed. Kettinger et al therefore concluded that if the technology is easily copied then the deploying institution may rather be at an economic disadvantage due to the high cost involved in pioneering the system innovation. This therefore has the tendency for critiques to hold the view that technology is not a factor in gaining competitive advantage.

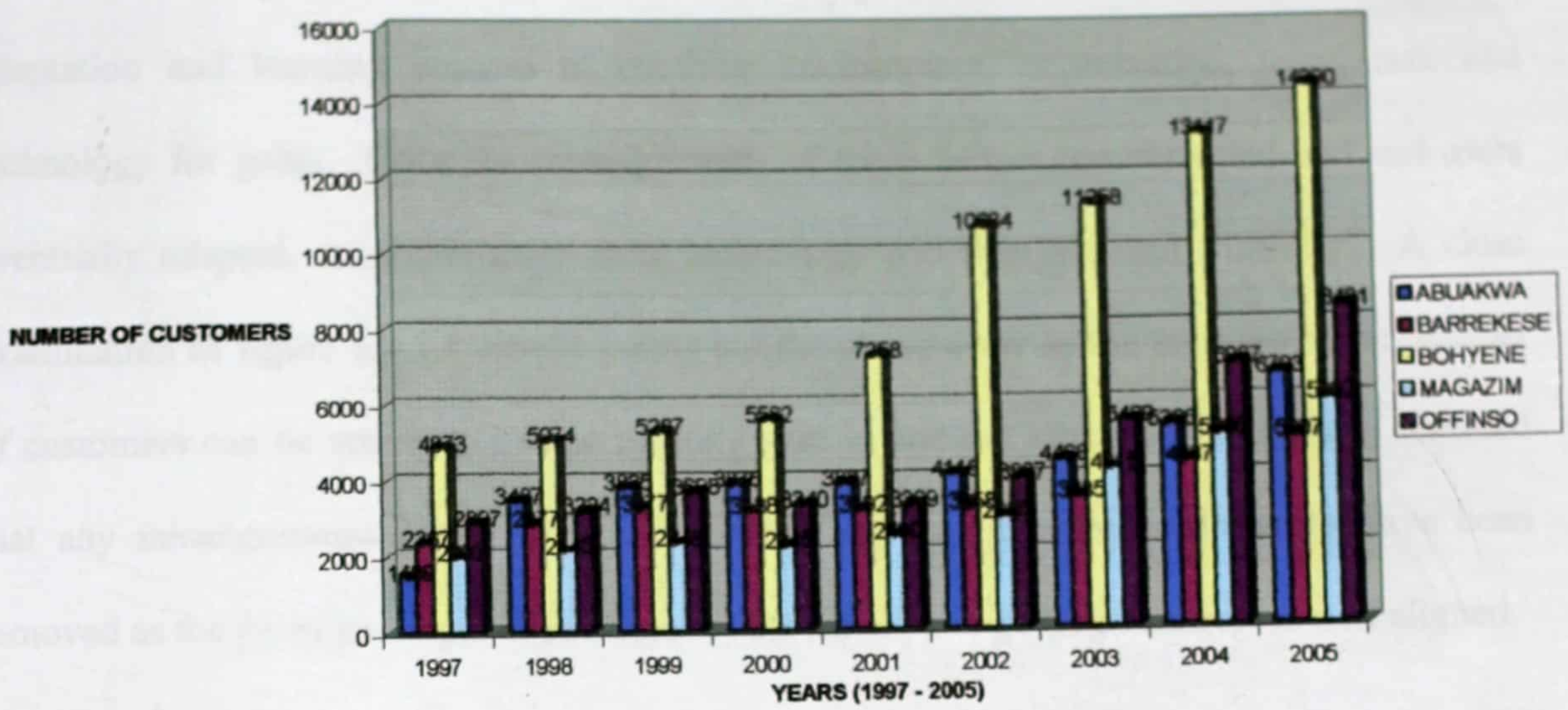
4.4 Impacts of ICT on the operations of NRB

4.4.1 Impact on waiting time and attraction of the bank to customers

Reacting to a question on the effects that ICT have on the operations of NRB in terms of time spent by customers in the banking hall, 91.7% of staff respondents strongly agree that ICT facilitate timely service delivery to the customers while 8.3% slightly agree to the view. Also, 81.2% of staff respondents stated that ICT helps the bank cut down on customers waiting time. A further 77.1% of the staff respondents strongly held that the technology deployed by the bank helped the bank to attract and maintain customers. 18.8% slightly agreed that the technology aided in attracting and maintaining customers while 4.2% slightly disagreed with this view. These views were shared by management staff respondents 62.5% of whom strongly held that fast transactions between the bank and its customers facilitated by ICT formed the bases for efficient management and profitability of the bank. Additionally, 95.2% of customer respondents said shorter waiting time forms the basis for their satisfaction with the bank's services while another 77.4% of these respondents said shorter waiting time makes the bank attractive to them. The position of the customers was further supported by the secondary data on the customer strength of the bank. It was observed that the number of customers that the

bank attracted saw an astronomical increase from the year 2000 and beyond when the bank deployed ICT into its operations which explains the position of customers that ICT made the bank attractive to them. Please see figure 4.4.1.1 below and tables 4.4.1.1 - 4.4.1.4 of appendix 1.

FIGURE 4.4.1.1: ICT IMPACT ON BANK'S ATTRACTION TO CUSTOMERS



This analysis, corroborated by the secondary data from the bank on its customers strength as illustrated in figure 4.4.1.1 above revealed that the number of customers saw a sharp increase from 2001 and in branches which were hooked into a wide area network (WAN). Bohyen branch which according to management experienced continuous and uninterrupted signal from the network in place enabling customers from other branches that were part of the network access their accounts from this branch experienced the most increase. This therefore explains the extent to which ICT serves as factor to attract large customer base and increased sales

volume. Also, the increase in the number of customer from 2001 explained a point in literature by Ganon & Toulouse (1996) who posit that when new technology is introduced, its potential may not be exploited fully because technologies are implemented on a trial and error basis. The year 2000 in this study represents the trial and error period of the technology. Much gain (increased number of customers as result of the bank's attraction) could therefore not be experienced in that year from the new technology. The finding of this analysis also supports the views of Applegate (1992) who held that, 'technological investments requires an adaptation and learning process to combine environment, organization, team, task and technology for gains. Once the misalignments of these factors are corrected and end-users eventually adapted, economic gains from technology will then turn out fruitfully'. A close examination of figure 4.4.1.1 clearly points out the above view as the increase in the number of customers can be seeing to be appreciating year in and out after 2001 when it is assumed that any misalignments between the new technology and the banks structures have been removed as the years pass by and end-users of the facility are getting themselves well aligned.

4.4.2 Impact on reliability of services and general operations

Evaluating the effects that ICT had on the operations of NRB, 52.1% of the staff respondents strongly agree that ICT tools deployed by the bank ensure reliable services by the bank while 12.5% slightly disagree. Another 64.6% strongly agreed that ICT has brought about good internal control system to the bank. 35.4% of the staff respondents further intimate that ICT was very important in reducing human errors in various entries of the bank. However 6.2% of these respondents stated that ICT was not at all important in reducing human errors in the operations of the bank. Again on the issue of the impact that ICT had on the operations of the bank, 72.9% of staff respondent indicated that ICT was very important in helping the bank to

monitor the various loan portfolios that the bank operates. 4.2% however said ICT was not at all important in monitoring the various loan portfolios of the bank. Also, 100% of the management respondents strongly agreed that ICT aided in the efficient management of the bank. A further 62.5% of management staff respondents held that the operations of NRB were far more efficient after the year 2000 when ICT was deployed to the bank than before the year 2000. There were no dissenting views on this issue. Please see tables 4.4.2.1 – 4.4.2.6

4.4.3 Impact on cost

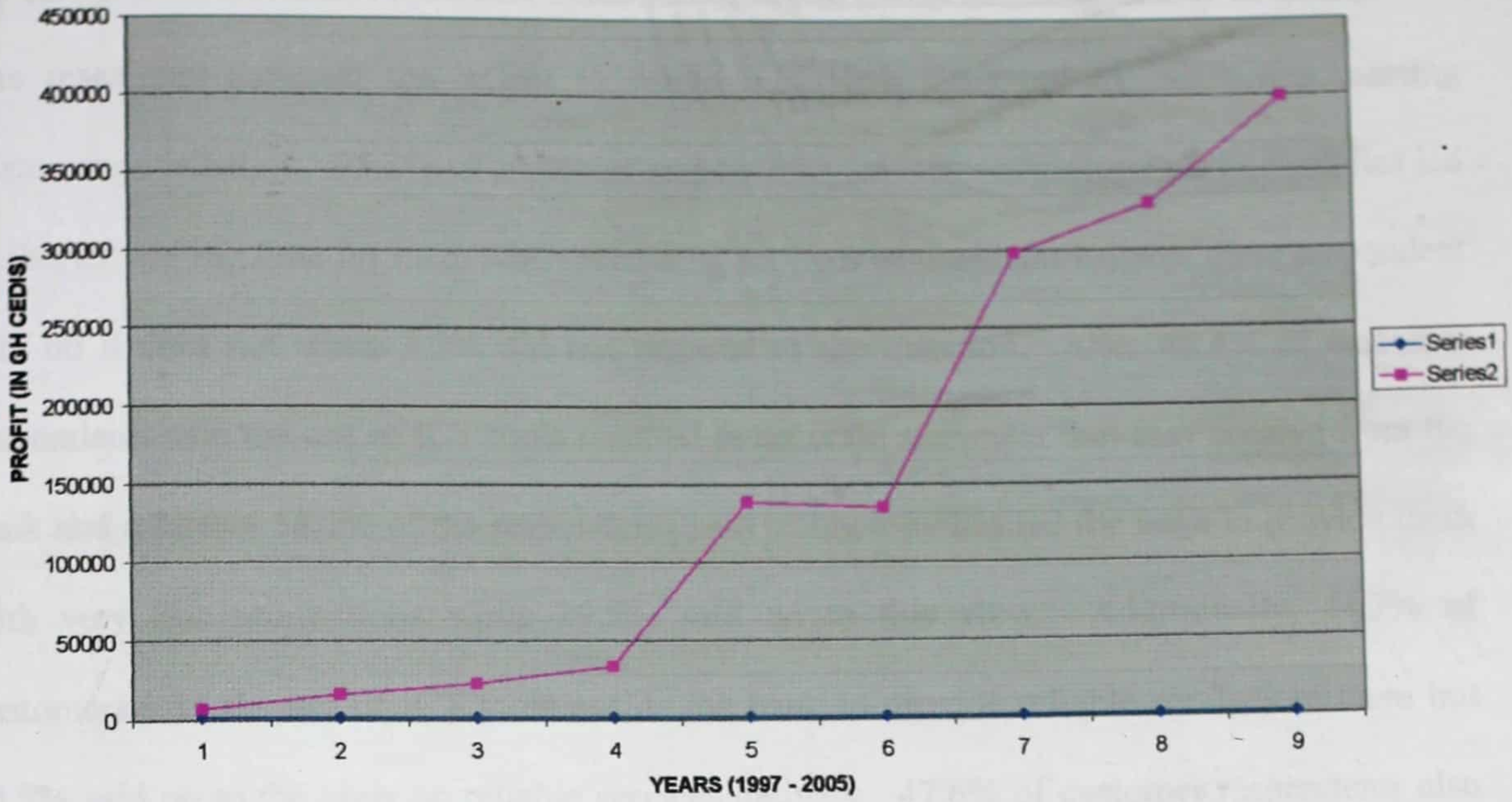
Reacting to cost dimension impact of ICT on the operation of the bank, 50% of the staff respondents strongly agreed that ICT helped the bank cut down on its labour cost while the other 50% also held that ICT was somewhat important in cutting down labour of the bank. 93.7% of these respondents state that ICT has helped the bank to cut down on its general operating cost with 6.2% stating that they do not share the view that ICT was responsible for a reduction in the operating cost of the bank. However, views from the management staff respondents pointed out that since the bank has networked its operations in the year 2000, the closing time of staff has drastically reduced from 7.00pm and beyond to between 4.00 – 5.00pm. In fact 100% of management staff respondents of the bank shared this view and intimated that this has led to a great reduction in such costs as overtime expenses. Please see tables 4.4.3.1 – 4.4.3.5 of appendix 1.

4.4.4 Impact on profitability

Addressing the question as to whether ICT had any effects on the profitability of the bank, 75% of management staff respondents strongly agreed that the introduction of ICT has brought

about efficient management of the bank. This they argued has made the bank more attractive to customers thereby attracting a large customer base and large sales volume by the bank resulting in the profitability of the bank. The management staff respondents further strongly held that the introduction of ICT in the year 2000 has tremendously improved the transaction of the bank which again forms the bases of the bank's attraction to customers thereby resulting in the bottom-line of the bank's profitability. Also, 75% of the bank's staff respondents strongly agree that ICT has greatly increased the productivity of the bank. A further 41.7% and 52.1% respectively said ICT was very important and somewhat important in facilitating easy introduction of new products by the bank. This ultimately results in the profitability of the bank. Further more, addressing the issue of ICT and the profitability of the bank, secondary data collected from the bank on the profit levels of the bank over the periods covered by the study shows that the bank has recorded a continuous increase in profit far above the years before 2000 when ICT was deployed to the bank. Please see figure 4.4.4.1 below and tables 4.4.4.1 – 4.4.4.6 of appendix 1

FIGURE 4.4.4.1: ICT IMPACT ON NRB'S PROFITABILITY



Evidence from the ICT effects on the bank's profitability analysis revealed that the bank's profit level went up sharply in the year 2001 after ICT was deployed into the system. There was however a nearly constant profit level in 2002 as against the 2001 figure and picked up again strongly in 2003 and sustained the upward trend through out the rest of the period. What was significant in this analysis was that, the rate of increase in the profit of the bank was higher from the time ICT was employed into the system than the situation in the years before ICT was deployed into the system indicating that ICT deployment has a significant effect on the profitability of the bank. However, the sharp increase in the year 2000 defeat the argument by Gerwin (1988) that 'during the initial stage of the introduction of technology into a system, advantages of the technology cannot be obtained'. This therefore calls for future research into what accounts for this.

4.5 ICT as a tool to meet customer satisfaction in the Rural Banking Sector in Ghana

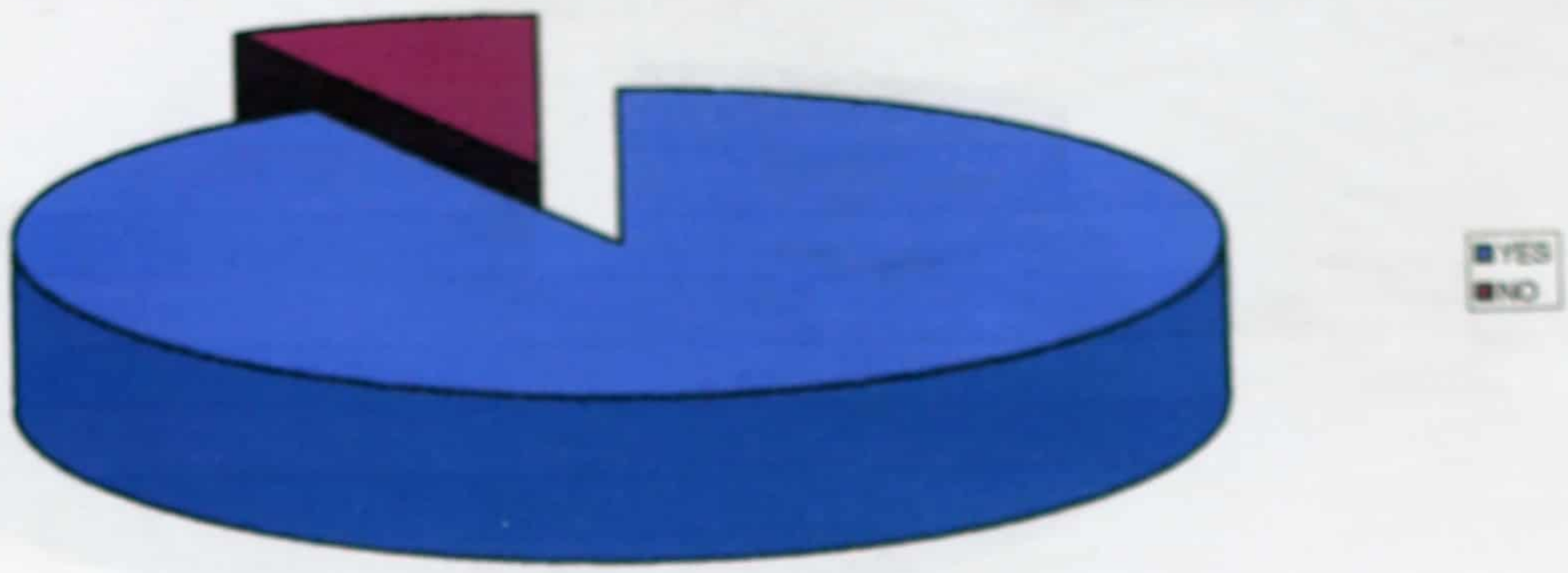
The researcher assessed the extent to which ICT tools deployed by NRB was meeting customer satisfaction. 95.2% of customer respondents said the technology of the bank has led to shorter waiting time for them when accessing services of the bank. 1.6% of these respondent said no it does not while 3.2% did not respond to the question. Also, 48.4% of customer respondents said the use of ICT tools resulted in accurate statement that they receive from the bank and a further 58.1% of the respondents said technology has led the bank to provide them with very fast transactions while 39.5% said no to this view. Additionally, 44.7% of customers said the use of ICT tools enable the bank to provide reliable services to them but 54.8% said no to the view on reliable services delivery. 47.6% of customer respondents also said the bank uses ICT tools to deliver efficient services to them but 49.2% responded in the negative. The view on ICT meeting customer satisfaction was collaborated by 87.5% of management staff respondents who indicated that the bank strategically used ICT tools to provide convenient services to customers. Please see tables 4.5.1 – 4.5.7 of appendix 1.

The analysis brought to light that ICT tool put in place by the bank is meeting customers' satisfaction in areas like shorter waiting time, fast transaction with customers and the provision of convenient services to customers. The analysis further brought to light that ICT does not necessarily lead to efficient and reliable service delivery as 49.2% and 54.8% of the customer respondents respectively said no to the question as to whether ICT tools that the bank has in place is helping the bank to provide efficient and reliable services to customers. This revelation is contrary to the general view that ICT is synonymous to efficiency.

4.6 Factors responsible for the slow rate of ICT deployment in the Rural Banking sector in Ghana

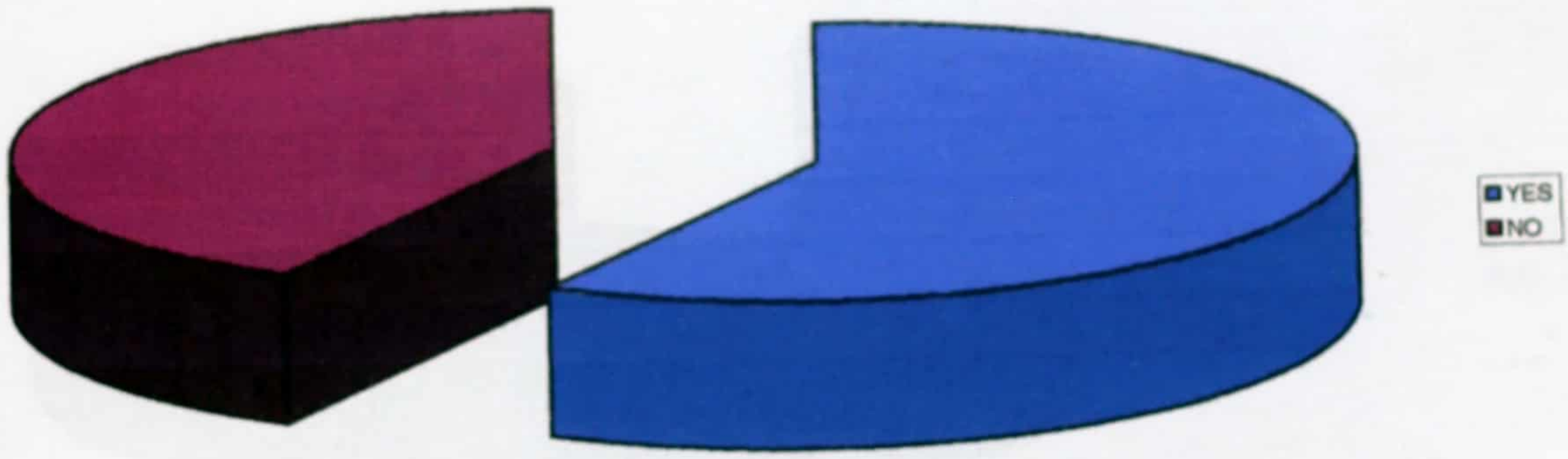
In an attempt to find out what accounts for the slow rate of ICT deployment in the rural banking sector, 100% of the management staff respondents strongly agree that lack of fund by the rural bank was responsible for the slow deployment rate. This position was shared by 91.7% of the bank's staff respondents. Also, 62.5% of the management staff respondents and 58.3% of the bank's staff respondents attribute the problem of slow rate of technology deployment in the sector to lack of skilled IT personnel and another 37.5% the management staff respondents and 12.5% of the bank's staff respondents attributed the problem to lack of interest by the banks themselves. 25% of the management respondents slightly agreed that lack of management support is the cause of the slow rate of diffusion while another 25% slightly disagree with that view and 50% strongly disagreed with the view that lack of management support was responsible for the slow rate of technology deployment in the sector. Further, 75% of the management respondents and 72.9% of the bank's staff respondents strongly held that lack of appropriate policy was responsible for the slow rate of diffusion with 25% slightly agreeing to this assertion. Figures 4.6.1 – 4.6.5 below and tables 4.6.1 – 4.6.5 of appendix 1 illustrate these positions on the slow rate of technology diffusion in the rural banking sector in Ghana

FIGURE 4.6.1: LACK OF FUNDS AS CAUSE OF SLOW TECHNOLOGY DIFFUSION RATE AT RURAL BANKS IN GHANA



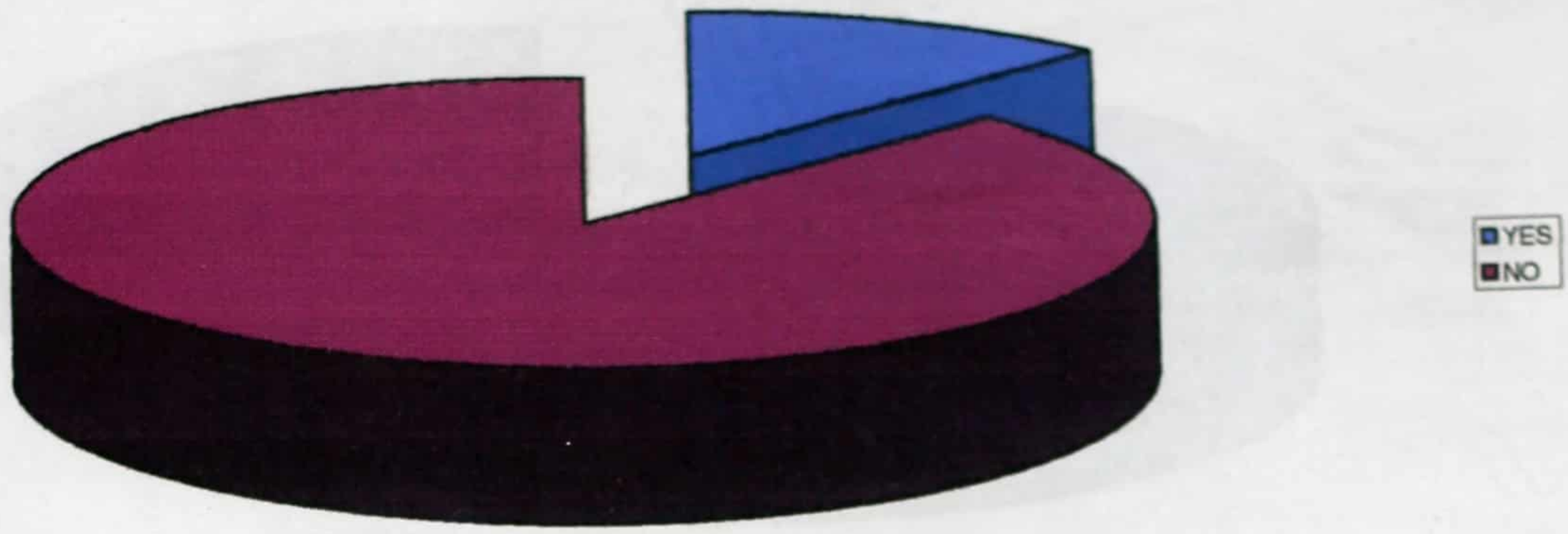
Source: Field data 2008 (bank's staff respondents)

FIGURE 4.6.2: LACK OF SKILLED PERSONNEL AS CAUSE OF SLOW RATE OF TECHNOLOGICAL DIFFUSION RATE AT RBs IN GHANA



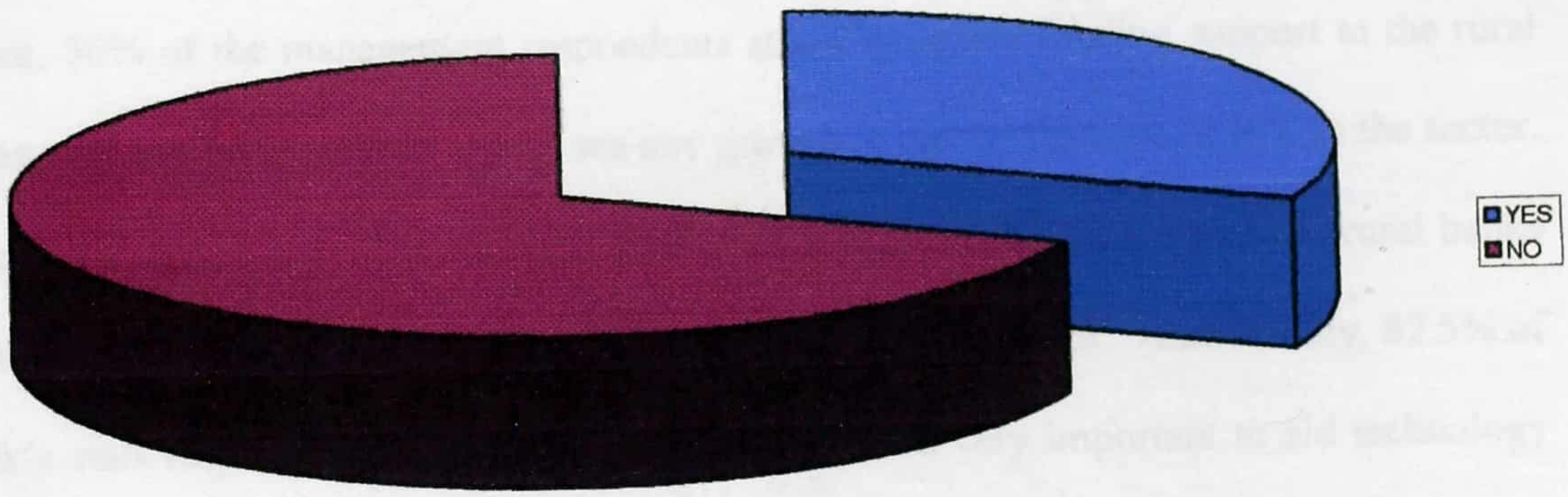
Source: Field data 2008(bank's staff respondents)

FIGURE 4.6.3: LACK OF INTEREST BY RBs AS CAUSE OF SLOW RATE OF TECHNOLOGICAL DIFFUSION AT RBs IN GHANA



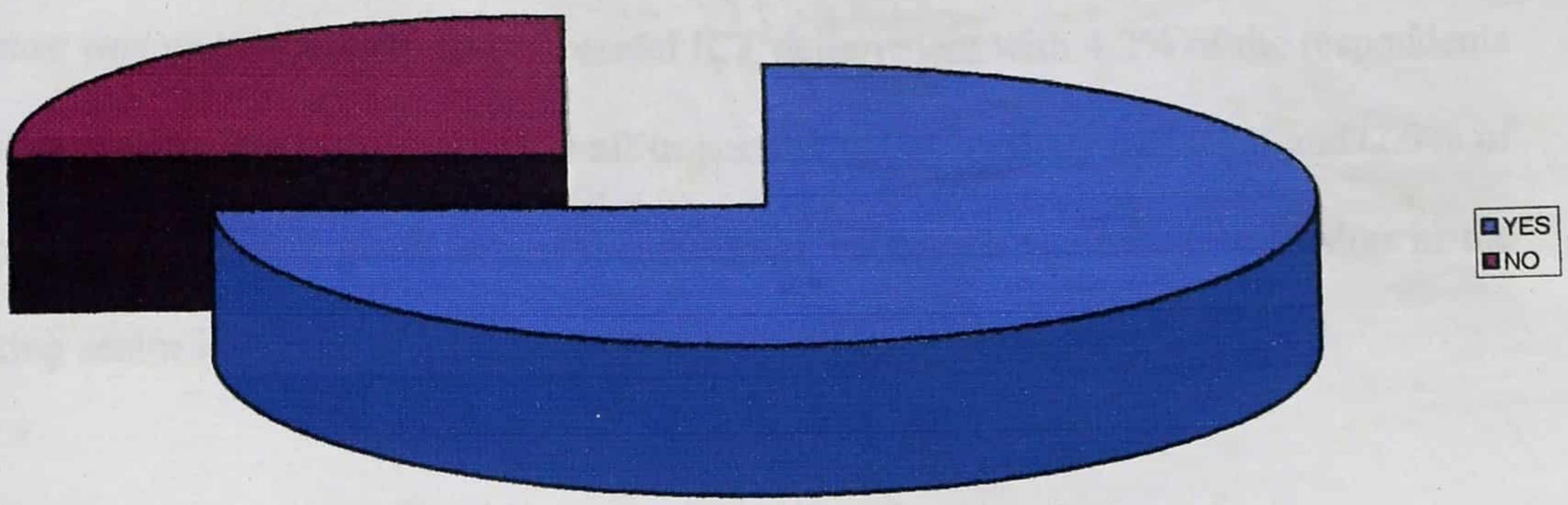
Source: Field data 2008 (bank's staff respondents)

FIGURE 4.6.4: LACK OF MANAGEMENT SUPPORT AS CAUSE OF SLOW RATE OF TECHNOLOGICAL DIFFUSION IN GHANA



Source: Field data 2008 (bank's staff respondents)

FIGURE 4.6.5: LACK OF APPROPRIATE POLICIES AS CAUSE OF SLOW RATE OF TECHNOLOGICAL DIFFUSION AT RBs IN GHANA



Source: Field data 2008 (bank's staff respondents)

4.7 Means to accelerate technology deployment in the rural banking sector in Ghana

When asked of what could be done to ensure accelerated deployment of technological tools in the sector, 50% of the management respondents stated adequate funding support to the rural bank was necessary if the sector was to see any growth in the deployment of ICT in the sector. 28.6% said there was a need to train the staff in ICT skills while 12.5% said the rural banks should develop a strong interest in deploying technology in the sector. Additionally, 87.5% of the bank's staff respondents held that training support was very important to aid technology diffusion in the sector. 66.7% of them further intimated that top management support could bring about accelerated deployment in the sector. Also, 75% of these respondents said a clear understanding of ICT functions leads to accelerated ICT diffusion while another 58.3%

assigned end-users involvement in ICT diffusion to successful deployment of technology. Further more, 62.5% of these respondents said motivated staff was required for successful deployment of technology in the sector. Yet, another 43.8% said reduced level of resistance aids technology diffusion. A further 81.2% of the staff respondents held that skilled human resource base was very important for successful ICT deployment with 4.2% of the respondents saying skilled human resource was not at all important for technology diffusion and72.9% of these respondent assigning good returns o investment as key to technology diffusion in the rural banking sector in Ghana. Please see table 4.7.1 – 4.7.9 of appendix 1.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.0 Introduction

This chapter brought up summary of the findings made in the analysis of the field data, conclusion of the study and suggested recommendations on identified problems.

5.1 Summary of the findings

The study came up with the following findings:

First, the study brought to light that NRB like other rural banks in Ghana lacks the required innovative technologies to enable them keep up with the present competitive environment in the banking sector. Apart from the local area network (LAN) which was being run by the bank and almost all rural banks in the country, the sector has no such technologies as ATM, Telephone banking, internet banking and the likes. NRB operates the Wide Area Network (WAN) to a very limited state. At present this facility is limited to only three out of the seven branches currently being operated by the bank.

It is worth noting however that, NRB like other rural banks has in place such technologies as computers, servers, fax machines and telephones and also applies both LAN and WAN in its operations.

Second, NRB uses the ICT tools that it has in place to shorten customer waiting time, transact fast business with customers, reduce errors in its entries, provide convenient services to its customers, support management decision making process and strategically used the system to attract large customers to the bank. However, the analysis revealed that the WAN technology

that the bank has in place was not very functional especially in two out of the three branches which are currently on this platform as a result of radio waves that affect signal connections from sister branches. This was therefore negatively affecting the operations of those branches and has impacted not very positively on the competitiveness of those branches as the number of customers attracted by those banks were relatively low as compared to the one that has continues connectivity.

Third, the study found that NRB has succeeded in employing ICT to cut down on its operating cost, reduced customers waiting time as well shorten the bank's working hours from between 8.00 am - 7.00pm and beyond, to between 8.00am - 4.00pm and on rare occasions to 5.00pm. Also, the profit of the bank saw great improvement as the bank experienced a sharp increase in its profit level from the year it has deployed ICT in its operations through out the periods.

Fourth, the study revealed that, ICT tools deployed by NRB met customers' satisfaction in areas like shorter waiting time, fast transactions and convenient services to customers. However, the findings showed that the bank was unable to use the technology to deliver efficient and reliable services to customers due mainly to the frequent break down in connectivity and inadequate skilled personnel to quickly handle these problems.

Fifth, the findings of the study brought to light that, a number of factors contributed to the slow rate of technology diffusion in the rural banking sector in Ghana but two factors came out prominently: lack of fund and lack of appropriate ICT policy by supervising bodies like the ARB Apex bank and the bank of Ghana. It came to light that Apex bank wants all rural banks

in the country to roll out same technology platform (eMerge). Whereas this technology may be affordable to some of these banks, the cost might be beyond the reach of others in the sector. The inflexibility therefore prevents these banks to roll out on other affordable platform which could as well serve their purpose.

5.2 Conclusion

The study concludes that though NRB has limited technological tools in place, the bank was able to use the very few technologies it has as a strong competitive tool to attract customers, deliver fast and convenient transactions, cut down operation cost, support efficient management decision making process, increase its productivity and profit levels since the deployment of ICT into its operation.

On these bases, the study concludes that ICT has a strong positive impact on the bank's operations and therefore serves as a tool to attain a competitive advantage in the banking industry in Ghana.

5.3 Recommendations

Based on the findings and conclusion of the study the researcher recommends as follows:

First, since the results of the study indicate that NRB like other rural banks in the country has a very limited innovative technologies in place, against the background that the banks' operations have seen much improvement as result of the few ICT tools it has deployed, the management of NRB should endeavour to bring on board more innovative technologies to help the bank survive the current wave of competition in the banking industry so as to contribute its roles to the economic development of the nation.

Second, the results of the study further indicate that though NRB has succeeded in strategically employing the few ICT tools it has deployed, the technology is not very functional resulting in intermittent brake down in service delivery to customers. It is therefore recommended that the bank should take steps to consult experts on powerful tools that can support its technology to ensure efficient service delivery.

Third, with the finding that lack of fund and inappropriate policies were the principal causes of the slow rate of technology diffusion in the rural banking sector, the study recommend that government should assist these banks with adequate funding to assist them acquire the necessary technologies to support their operations and remain competitive. This is imperative as the continuous existence of these banks is very crucial for the growth of the rural economy especially the agricultural sector which continues to be the back bone of the nation's economy.

Forth, it further recommended that the Bank of Ghana and the Apex Bank should formulate policies that gives the rural banks free hand to decide their own faith on technology deployment issues since it was revealed that these bodies wants all rural banks to roll out same technological platform which might be unsuitable for some or too expensive for them to afford.

Fifth, management of the rural banks should ensure that they involve their workers (end users) in any technology deployment discussion to ensure system ownership by all those who are to ensure that the system works. Training support, top management commitment, and staff motivation should also be looked at to ensure that the rural banking sector sees in the near

5.4 Areas for future research

The study came up with a finding which indicates that NRB profit went up very sharply in the year of ICT deployment by the bank. This contradicts what has been documented in literature that gains could not be recorded from technology investment in the initial stage of the investment. This development suggests that certain factors if in place could assist investors to actually reap gains from technology even in the year of investment as NRB's case has shown in real profit terms. One should therefore investigate into this so as to come out with those factors which were responsible for ensuring that return on such investment is harvested very quickly.

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APPENDIX ONE: TABLES USED IN THE ANALYSIS

TABLE 4.1.1 AGE OF MANAGEMENT STAFF OF NRB

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	30 – 34	1	12.5	12.5	12.5
	35 – 39	3	37.5	37.5	50.0
	40 – 44	2	25.0	25.0	75.0
	45 – 49	2	25.0	25.0	100.0
	Total	**8**	**100.0**	**100.0**	

Source: Field data 2008

TABLE 4.1.2: AGE OF STAFF OF NRB

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 -24	8	16.7	16.7	16.7
	25 -29	10	20.8	20.8	37.5
	30 – 34	11	22.9	22.9	60.4
	35 – 39	7	14.6	14.6	75.0
	40 – 44	6	12.5	12.5	87.5
	45 – 49	4	8.3	8.3	95.8
	50 AND ABOVE	2	4.2	4.2	100.0
	Total	**48**	**100.0**	**100.0**	

Source: Field data 2008

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	45 – 49	2	25.0	25.0	100.0
	Total	**8**	**100.0**	**100.0**	

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	25 -29	10	20.8	20.8	37.5
	30 – 34	11	22.9	22.9	60.4
	35 – 39	7	14.6	14.6	75.0
	40 – 44	6	12.5	12.5	87.5
	45 – 49	4	8.3	8.3	95.8
	50 AND ABOVE	2	4.2	4.2	100.0
	Total	**48**	**100.0**	**100.0**	

Source: Field data 2008

TABLE 4.1.3: AGE OF CUSTOMERS OF NRB

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 -24	20	16.1	16.1	16.1
	25 -29	15	12.1	12.1	28.2
	30 - 34	26	21.0	21.0	49.2
	35 - 39	38	30.6	30.6	79.8
	40 - 44	15	12.1	12.1	91.9
	45 - 49	10	8.1	8.1	100.0
	Total	124	100.0	100.0	

Source: Field data 2008

TABLE 4.1.4: LENGTH OF SERVICE BY MANAGEMENT STAFF OF NRB

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	7 – 10 YEARS	5	62.5	62.5	62.5
	11YEARS AND ABOVE	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.1.5: LENGTH OF SERVICE BY STAFF OF NRB

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 – 1 YEAR	14	29.2	29.2	29.2
	2 – 3 YEARS	2	4.2	4.2	33.3
	4 – 6 YEARS	9	18.8	18.8	52.1
	7 – 10 YEARS	19	39.6	39.6	91.7
	11YEARS AND ABOVE	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.1.6: DATE CUSTOMER JOIN THE BANK

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	AROUND 1997 - 1999	60	48.4	48.4	48.4
	IN THE YEAR 2000	30	24.2	24.2	74.2
	AROUND 2001 - 2005	34	27.4	27.4	100.0
	Total	124	100.0	100.0	

Source: Field data 2008

TABLE 4.1.7: JOB POSITION OF NRB MANAGEMENT STAFF

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	DEPUTY GENERAL MANAGER	1	12.5	12.5	12.5
	MANAGER	1	12.5	12.5	25.0
	ASSISTANT MANAGER	1	12.5	12.5	37.5
	UNIT HEAD (BRANCH MANAGER)	5	62.5	62.5	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.1.8: JOB POSITION OF NRB MEMBERS OF STAFF

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ACCOUNTANT	16	33.3	33.3	33.3
	CASHIER	14	29.2	29.2	62.5
	CREDIT OFFICER	6	12.5	12.5	75.0
	PROJECT OFFICER	4	8.3	8.3	83.3
	OTHERS	8	16.7	16.7	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.1.9: SECTOR OF CUSTOMERS' BUSINESS OCCUPATION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	FORMAL SECTOR	41	33.1	33.1	33.1
	INFORMAL SECTOR	83	66.9	66.9	100.0
	Total	124	100.0	100.0	

Source: Field data 2008

TABLE 4.3.1: STRATEGIC USE OF ICT BY NRB (TO SHORTEN CUSTOMERS' WAITING TIME)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	8	100.0	100.0	100.0

Source: Field data 2008

TABLE 4.3.2: STRATEGIC USE OF ICT BY NRB (FAST CUSTRANSACTION)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	5	62.5	62.5	62.5
	SLIGHTLY AGREE	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.3.3: STRATEGIC USE OF ICT BY NRB (CONVENIENT SERVICES TO CUSTOMER)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	7	87.5	87.5	87.5
	SLIGHTLY AGREE	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.3.4: STRATEGIC USE OF ICT BY NRB (UNDERTAKE EFFICIENT MGT DECISIONS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	3	37.5	42.9	42.9
	SLIGHTLY AGREE	4	50.0	57.1	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
Total		8	100.0		

Source: Field data 2008

TABLE 4.3.5: STRATEGIC USE OF ICT BY NRB(TRACK CUSTOMER CREDIT RECORDS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	6	75.0	75.0	75.0
	SLIGHTLY AGREE	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.3.6: STRATEGIC USE OF ICT BY NRB (TACK PERFORMANCE OF PRODUCTS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	4	50.0	50.0	50.0
	SLIGHTLY AGREE	4	50.0	50.0	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.3.7: OPERATIONS SUPPORTE D BY ICT AT NRB (CASHIERING SERVICES)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	48	100.0	100.0	100.0

Source: Field data 2008

TABLE 4.3.8: OPERATIONS SUPPORTE D BY ICT AT NRB (CHECK CREDIT STATUS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	38	79.2	79.2	79.2
	NO	10	20.8	20.8	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.3.9: OPERATIONS SUPPORTE D BY ICT AT NRB (POSTING OF BOOKS AF ACCOUNTS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	44	91.7	91.7	91.7
	NO	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.3.10: OPERATIONS SUPPORTE D BY ICT AT NRB (GENERATE MGT REPORTS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	32	66.7	66.7	66.7
	NO	16	33.3	33.3	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.3.11: OPERATIONS SUPPORTED BY ICT AT NRB (CHEK PERFORMANCE OF PRODUCTS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	34	70.8	70.8	70.8
	NO	14	29.2	29.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.3.12: OPERATIONS SUPPORTE D BY ICT AT NRB (AUDIT OF ACCOUTS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	38	79.2	79.2	79.2
	NO	10	20.8	20.8	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.3.13: OPERATIONS SUPPORTE D BY ICT AT NRB (UNIFORM RECORDS ON CUSTOMERS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	43	89.6	91.5	91.5
	NO	4	8.3	8.5	100.0
	Total	47	97.9	100.0	
Missing	System	1	2.1		
Total		48	100.0		

Source: Field data 2008

TABLE 4.3.14: OPERATIONS SUPPORTE D BY ICT AT NRB (WITH ACCESS ACCOUNT ANY BRANCH)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	9	18.8	18.8	18.8
	NO	39	81.2	81.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.3.15: TECHNOLOGY - ATOOL FOR COMPETITIVE ADVANTAGE

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	38	79.2	79.2	79.2
	SLIGHTLY AGREE	8	16.7	16.7	95.8
	SLIGHTLY DISAGREE	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.3.16: ASSESSING TECHNOLOGY IN TERMS OF MEETING ORGANIZATIONAL GOALS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	EXCELLENT	19	39.6	39.6	39.6
	GOOD	18	37.5	37.5	77.1
	SATISFACTORY	5	10.4	10.4	87.5
	FAIR	4	8.3	8.3	95.8
	12	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.1.1: ICT AS A TOOL TO ATTRACT AND MAINTAIN CUSTOMERS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	37	77.1	77.1	77.1
	SLIGHTLY AGREE	9	18.8	18.8	95.8
	SLIGHTLY DISAGREE	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.1.2: YEARLY ATTRACTION OF NRB TO CUSTOMERS

BRANCHES	NUMBER OF CUSTOMERS								
YEARS	1997	1998	1999	2000	2001	2002	2003	2004	2005
ABUAKWA	1489	3487	3835	3876	3887	4116	4468	5366	6703
BARREKESE	2367	2877	3277	3188	3192	3258	3485	4387	5007
BOHYENE	4873	5074	5287	5582	7258	10684	11258	13117	14390
MAGAZIM	2003	2145	2348	2248	2480	2985	4215	5098	5992
OFFINSO	2897	3224	3698	3340	3309	3987	5489	6987	8481
TOTAL	**13629**	**16807**	**18445**	**18234**	**20126**	**25030**	**28915**	**34955**	**40573**

Source: Field data 2008

TABLE 4.4.1.3: ICT FACILITATE TIMELY SERVICE TO CUSTOMERS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	44	91.7	91.7	91.7
	SLIGHTLY AGREE	4	8.3	8.3	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.1.4: ICT BROUGHT ABOUT GOOD INTERNAL CONTROL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	31	64.6	64.6	64.6
	SLIGHTLY AGREE	17	35.4	35.4	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.1.5: ICT REDUCES HUMAN ERROR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	17	35.4	35.4	35.4
	SOME WHAT IMPORTANT	28	58.3	58.3	93.8
	NOT AT ALL IMPORTANT	3	6.2	6.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.1.6: ICT HELPS EASILY MONITOR VARIOUS LOAN PORTFOLIOS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	35	72.9	72.9	72.9
	SOME WHAT IMPORTANT	11	22.9	22.9	95.8
	NOT AT ALL IMPORTANT	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.1.7: ICT HELPS CUT DOWN LABOUR COST

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	24	50.0	50.0	50.0
	SOME WHAT IMPORTANT	24	50.0	50.0	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.1.8: ICT HELPS REDUCED CUSTOMER WAITING TIME

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	39	81.2	81.2	81.2
	SOME WHAT IMPORTANT	9	18.8	18.8	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.1.9: BASES FOR EFFICIENT MGT & PROFITABILITY (FAST TRANSACTIONS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	5	62.5	71.4	71.4
	SLIGHTLY AGREE	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
	Total	8	100.0		

Source: Field data 2008

TABLE 4.4.1.10: BASE S FOR CUSTOMERS SATISFACTION (SHORTER WAITING TIME)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	118	95.2	98.3	98.3
	NO	2	1.6	1.7	100.0
	Total	120	96.8	100.0	
Missing	System	4	3.2		
Total		124	100.0		

Source: Field data 2008

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TABLE 4.4.1.11: LESS WAITING TIME AS BASES FOR BANK ATTRACTION TO CUSTOMERS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	96	77.4	77.4	77.4
	AGREE	28	22.6	22.6	100.0
	Total	124	100.0	100.0	

Source: Field data 2008

TABLE 4.4.2.1: ICT ENSURES RELIABLE SERVICES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	25	52.1	52.1	52.1
	SLIGHTLY AGREE	17	35.4	35.4	87.5
	SLIGHTLY DISAGREE	6	12.5	12.5	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.2.2: ICT BROUGHT ABOUT GOOD INTERNAL CONTROL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	31	64.6	64.6	64.6
	SLIGHTLY AGREE	17	35.4	35.4	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.2.3: ICT REDUCES HUMAN ERROR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	17	35.4	35.4	35.4
	SOME WHAT IMPORTANT	28	58.3	58.3	93.8
	NOT AT ALL IMPORTANT	3	6.2	6.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.2.4: ICT HELPS EASILY MONITOR VARIOUS LOAN PORTFOLIOS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	35	72.9	72.9	72.9
	SOME WHAT IMPORTANT	11	22.9	22.9	95.8
	NOT AT ALL IMPORTANT	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.2.5: ICT AS AN AID TO EFFECIENT MGT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	8	100.0	100.0	100.0

Source: Field data 2008

TABLE 4.4.2.6: NRB MGT BEFORE 2000 AS AGAINST AFTER 2000

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	FAR MORE EFFICIENT IN 2001 AND BEYOND THAN BEFORE 2000	5	62.5	62.5	62.5
	SLIGHTLY MORE EFFICIENT IN 2001 AND BEYOND THAN BEFORE 2000	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.4.3.1: ICT HEPLS CUT DOWN BANK'S OPERATING COST

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	16	33.3	33.3	33.3
	SQME WHAT IMPORTANT	29	60.4	60.4	93.8
	NOT AT ALL IMPORTANT	3	6.2	6.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.3.2: ICT HELPS CUT DOWN LABOUR COST

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	24	50.0	50.0	50.0
	SOME WHAT IMPORTANT	24	50.0	50.0	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.3.3: CLOSING TIME BEFORE 2000

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BETWEEN 7.00 - 8.00PM	5	62.5	62.5	62.5
	8.00PM AND BEYOND	3	37.5	37.5	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.4.3.4: CLOSING TIME IN 2000

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BETWEEN 5.00 - 6.00PM	3	37.5	37.5	37.5
	BETWEEN 6.00 - 7.00PM	1	12.5	12.5	50.0
	BETWEEN 7.00 - 8.00PM	4	50.0	50.0	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.4.3.5: CLOSING TIME AFTER 2000

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BETWEEN 4.00 - 5.00PM	8	100.0	100.0	100.0

Source: Field data 2008

TABLE 4.4.4.1: BASES FOR EFFICIENT MGT & PROFITABILITY (INTRODUCTION OF ICT)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	6	75.0	75.0	75.0
	SLIGHTLY AGREE	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.4.4.2: BASES FOR EFFICIENT MGT & PROFITABILITY (LARGE CUSTOMER BASE)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	5	62.5	62.5	62.5
	SLIGHTLY AGREE	2	25.0	25.0	87.5
	SLIGHTLY DISAGREE	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.4.4.3: BASES FOR EFFICIENT MGT & PROFITABILITY (FAST TRANSACTIONS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	5	62.5	71.4	71.4
	SLIGHTLY AGREE	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
	Total	8	100.0		

Source: Field data 2008

TABLE 4.4.4.4: ICT INCREASES THE PRODUCTIVITY OF NRB

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	36	75.0	75.0	75.0
	SOME WHAT IMPORTANT	12	25.0	25.0	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.4.5: ICT FACILITATES EASY INTRODUCTION OF NEW PRODUCTS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	20	41.7	41.7	41.7
	SOME WHAT IMPORTANT	25	52.1	52.1	93.8
	NOT AT ALL IMPORTANT	3	6.2	6.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.4.4.6: PROFIT OF NRB OVER THE YEARS

YEARS	1997	1998	1999	2000	2001	2002	2003	2004	2005
PROFIT	7259	16637	23467	34575	139073	135728	298717	330622	399243

Source: Field data 2008

TABLE 4.4.4.7 ICT IMPACTS ON NRB PROFITABILITY

YEAR	PROFIT AMOUNT (GH¢)	RATE OF CHANGE IN PROFIT (GH¢)	PERCENTAGE RATE OF CHANGE IN PROFIT
1997	7,259.00	9,378.00	56.37
1998	16,637.00	6,830.00	29.10
1999	23,467.00	11,108.00	32.13
2000	34,575.00	104,498.00	75.14
2001	139,073.00	3,345.00	-2.46
2002	135,728.00	162,989.00	54.56
2003	298,717.00	31,905.00	9.65
2004	330,622.00	68,621.00	17.19
2005	399,243.00	986,078.00	71.18
TOTAL	1,385,321.00		

Source: Field data 2008

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TABLE 4.5.1: BASE S FOR CUSTOMERS SATISFACTION (SHORTER WAITING TIME)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	118	95.2	98.3	98.3
	NO	2	1.6	1.7	100.0
	Total	120	96.8	100.0	
Missing	System	4	3.2		
Total		124	100.0		

Source: Field data 2008

TABLE 4.5.2: BASE S FOR CUSTOMERS' SATISFACTION (ACCURATE STATEMENT)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	60	48.4	49.6	49.6
	NO	61	49.2	50.4	100.0
	Total	121	97.6	100.0	
Missing	System	3	2.4		
Total		124	100.0		

Source: Field data 2008

TABLE 4.5.3: BASE S FOR CUSTOMERS' SATISFACTION (FAST TRANSACTIONS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	72	58.1	59.5	59.5
	NO	49	39.5	40.5	100.0
	Total	121	97.6	100.0	
Missing	System	3	2.4		
Total		124	100.0		

Source: Field data 2008

TABLE 4.5.4: BASE S FOR CUSTOMERS' SATISFACTION (RELIABLE SERVICES)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	55	44.4	44.7	44.7
	NO	68	54.8	55.3	100.0
	Total	123	99.2	100.0	
Missing	System	1	.8		
Total		124	100.0		

Source: Field data 2008

TABLE 4.5.5: BASE S FOR CUSTOMERS' SATISFACTION (CARE FOR ALL CUSTOMERS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	72	58.1	60.0	60.0
	NO	48	38.7	40.0	100.0
	Total	120	96.8	100.0	
Missing	System	4	3.2		
Total		124	100.0		

Source: Field data 2008

TABLE 4.5.6: BASE S FOR CUSTOMERS' SATISFACTION(USE OF ICT FOR EFFECIENT SERVICES)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	59	47.6	49.2	49.2
	NO	61	49.2	50.8	100.0
	Total	120	96.8	100.0	
Missing	System	4	3.2		
Total		124	100.0		

Source: Field data 2008

TABLE 4.5.7: STRATEGIC USE OF ICT BY NRB (CONVENIENT SERVICES TO CUSTOMER)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	7	87.5	87.5	87.5
	SLIGHTLY AGREE	1	12.5	12.5	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.6.1: CAUSES OF INADEQUATE TECHNOLOGY AT RBs (LACK OF FUNDS)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	8	100.0	100.0	100.0

Source: Field data 2008

TABLE 4.6.2: CAUSES OF INADEQUATE TECHNOLOGY AT RBs (lack OF SKILLED IT PERSONNEL)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	5	62.5	71.4	71.4
	SLIGHTLY AGREE	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
	Total	8	100.0		

Source: Field data 2008

TABLE 4.6.3: CAUSES OF INADEQUATE TECHNOLOGY AT RBs (LACK OF INTEREST BY RBs)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SLIGHTLY AGREE	3	37.5	42.9	42.9
	SLIGHTLY DISAGREE	2	25.0	28.6	71.4
	STRONGLY DISAGREE	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
	Total	8	100.0		

Source: Field data 2008

TABLE 4.6.4: CAUSES OF INADEQUATE TECHNOLOGY AT RBs (LACK OF MGT SUPPORT)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SLIGHTLY AGREE	2	25.0	25.0	25.0
	SLIGHTLY DISAGREE	2	25.0	25.0	50.0
	STRONGLY DISAGREE	4	50.0	50.0	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

TABLE 4.6.5: CAUSES OF INADEQUATE TECHNOLOGY AT RBs (LACK OF APPROPRIATE POLICY)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	STRONGLY AGREE	6	75.0	75.0	75.0
	SLIGHTLY AGREE	2	25.0	25.0	100.0
	Total	8	100.0	100.0	

Source: Field data 2008

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TABLE 4.7.1: MEANS TO ACCELERATE ICT DEPLOYMENT BY RBs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ADEQUATE FUNDINGS	4	50.0	57.1	57.1
	STRONG INTEREST BY MGT	1	12.5	14.3	71.4
	TRAINING OF BANK STAFF IN ICT SKILLS	2	25.0	28.6	100.0
	Total	7	87.5	100.0	
Missing	System	1	12.5		
	Total	8	100.0		

Source: Field data 2008

TABLE 4.7.2: TRAINING SUPPORT AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	42	87.5	87.5	87.5
	SOME WHAT IMPORTANT	6	12.5	12.5	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

TABLE 4.7.3: TOP MGT SUPPORT AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	32	66.7	69.6	69.6
	SOME WHAT IMPORTANT	7	14.6	15.2	84.8
	NOT AT ALL IMPORTANT	7	14.6	15.2	100.0
	Total	46	95.8	100.0	
Missing	System	2	4.2		
	Total	48	100.0		

Source: Field data 2008

TABLE 4.7.4: A CLEAR UNDERSTANDING OF ICT FUNCTIONS AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	36	75.0	80.0	80.0
	SOME WHAT IMPORTANT	9	18.8	20.0	100.0
	Total	45	93.8	100.0	
Missing	System	3	6.2		
	Total	48	100.0		

Source: Field data 2008

TABLE 4.7.5: END USER INVOLVEMENT AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	28	58.3	62.2	62.2
	SOME WHAT IMPORTANT	17	35.4	37.8	100.0
	Total	45	93.8	100.0	
Missing	System	3	6.2		
	Total	48	100.0		

Source: Field data 2008

TABLE 4.7.6: MOTIVATED STAFF AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	30	62.5	66.7	66.7
	SOME WHAT IMPORTANT	15	31.2	33.3	100.0
	Total	45	93.8	100.0	
Missing	System	3	6.2		
	Total	48	100.0		

Source: Field data 2008

TABLE 4.7.7: REDUCE LEVEL OF RESISTANCE AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	21	43.8	44.7	44.7
	SOME WHAT IMPORTANT	20	41.7	42.6	87.2
	NOT AT ALL IMPORTANT	6	12.5	12.8	100.0
	Total	47	97.9	100.0	
Missing	System	1	2.1		
	Total	48	100.0		

Source: Field data 2008

TABLE 4.7.8: SKILLED HUMAN RESOURCE BASE AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	39	81.2	83.0	83.0
	SOME WHAT IMPORTANT	6	12.5	12.8	95.7
	NOT AT ALL IMPORTANT	2	4.2	4.3	100.0
	Total	47	97.9	100.0	
Missing	System	1	2.1		
	Total	48	100.0		

Source: Field data 2008

TABLE 4.7.9: GOOD RETURNS ON INVESTMENT AIDS SUCCESSFUL TECHNOLOGY DIFFUSSION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	VERY IMPORTANT	35	72.9	72.9	72.9
	SOME WHAT IMPORTANT	11	22.9	22.9	95.8
	NOT AT ALL IMPORTANT	2	4.2	4.2	100.0
	Total	48	100.0	100.0	

Source: Field data 2008

APPENDIX TWO

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BUSINESS

QUESTIONNAIRE FOR MANAGEMENT

CANDITATE: LAWRENCE KWAMI AZIALE
PROGRAMME: MPHIL BUSINESS ADMINISTRATION (BUSINESS INFORMATION TECHNOLOGYOPTION)
TOPIC: EVALUATION OF THE STRATEGIC USE OF ICT IN THE RURAL BANKING SECTOR IN GHANA (CASE STUDY OF NWABIAGYA RURAL BANK - NRB)
SUPERVISORS: DR. ODURO, MR OBIRI YEBOAH

Dear Respondent,

Your participation in this survey is considered to be very important, since you're the target of the survey. Below are answers to some general questions that might be bordering your mind.

What is the Purpose of this Survey?

The Study is purely an academic requirement for the awards of Mphil in Business Information Technology. However its findings may provide the management of the Rural Banking Sector with information and analysis to assist them in formulating policies and implementing innovative technologies that will lead to competitive performance of this sector in the banking industry. The study is concerned with key issues related to attracting and retaining of loyal customers which will ensure the profitability, competitiveness, survival and growth of the Rural Banks (RBs) as a strategic institution in the Ghanaian economy.

Why should I participate in this Survey?

Policymakers in the banking industry may rely on data from this survey to inform their decisions concerning the sustainability of the Rural Banking sector which is a strategic institution charged with the responsibility to provide institutional funding for the Rural and Agricultural sector in the country. This research has the backing of the Kwame Nkrumah University of Science and Technology, School of Business, Kumasi, Ghana the permission of the Management BOD of your bank.

Will my Responses be kept Confidential?

Your responses to all items will be treated confidential. All responses that relate to or describe identifiable characteristics of individuals may be used only for statistical purposes and will not be disclosed, or used in identifiable form for any other purposes.

How will my Information be reported?

The information you will provide will be combined with the information provided by others in statistical reports. No individual responses will be included in the statistical report.

Feedback

Copy of the final research report will be presented to your bank or at a seminar in your institution. This will highlight the findings and recommendations or proposals for implementation by management of NRB.

Thanks for your participation

Instruction(s)

Please read through the questions below and endeavour to answer all questions as best as you can. Tick [√] where appropriate and supply any other needed information where necessary.

Background Characteristics

Please tick [√] or comment where applicable

I. What is your gender?

a. Male [ ]
b. Female [ ]

II. Age

a. 20 – 24 [ ]
b. 25 – 29 [ ]
c. 30 – 34 [ ]
d. 35 – 39 [ ]
e. 40 – 44 [ ]
f. 45 – 49 [ ]
g. 51+ [ ]

III. Department

a. Operations [ ]
b. Finance [ ]
c. Credit and Marketing [ ]
d. Audit [ ]
e. Administration [ ]

IV. Employment status

a. Full-time contract [ ]
b Part-time contract [ ]
c. Fixed term contract [ ]
d. Permanent [ ]
e. Temporal contract [ ]

V. Length of service in NRB

a. 0 – 1year [ ]
b. 2 – 3 years [ ]
c. 4 – 6 years [ ]
d. 7 – 10 years [ ]
e. 11+ [ ]

VI. Highest educational qualification

a. PhD [ ]
b. Master [ ]
c. Bachelor [ ]
d. HND [ ]
e. Professional (specify).....
.....

VII. Job position at NRB

a. General Manager (GM) [ ]

b. Deputy. GM [ ]
c. Manager [ ]
d. Asst. Manager [ ]
e. Unit Head (Branch Manager) [ ]
f. others (please specify) .....

Q1.Please indicate the average closing time from work by staff members of your bank between 1998 and 2000

a. between 4.00 - 5.00 pm [ ]
b. between 5.00 – 6.00 pm [ ]
c. between 6.00 – 7.00 pm [ ]
d. between 7.00 – 8.00 pm [ ]
e. 8.00 pm and beyond [ ]

Q2. Please indicate the average closing time from work by staff members of your bank in the year 2000

a. between 4.00 - 5.00 pm [ ]
b. between 5.00 – 6.00 pm [ ]
c. between 6.00 – 7.00 pm [ ]
d. between 7.00 – 8.00 pm [ ]
e. 8.00 pm and beyond [ ]

Q3. Please indicate the average closing time from work by staff members of your bank between 2001 and 2005

a. between 4.00 - 5.00 pm [ ]
b. between 5.00 – 6.00 pm [ ]
c. between 6.00 – 7.00 pm [ ]
d. between 7.00 – 8.00 pm [ ]
e. 8.00 pm and beyond [ ]

Q4. Briefly explain what in your opinion accounts for variations in the number of customers of the bank from year to year

.....
.....
.....
.....
.....

Q5. Will you say that the variations in the number of customers were due to the attraction of the bank to customers?

a. Yes [ ]
b. No [ ]

UNIVERSITY OF TECHNOLOGY

Q6. If you answer yes to the Question 5 above, what in your opinion accounts for this attraction of your bank?

a. Shorter time spent in the banking hall [ ]
b. Accurate statement on accounts [ ]
c. Fast transactions with the bank [ ]
d. Customers always have reliable services [ ]
e. There is care for all customers [ ]

Q7. To what extent will you agree that the deployment of ICT tools by your bank aided these processes in Q7 above?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

Q8. To what extent will you say that changes in the profitability of your bank are due to the efficient management of the operations of your bank?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

Q9. What in your opinion accounts for the level of operations currently chalked by your bank?

a. Introduction of ICT into the system [ ]
b. Shorter waiting time by customers [ ]
c. Fast transactions with the bank [ ]
d. large customer base [ ]
e. There is care for all customers [ ]

Q10. How will you assess the management of the operations of your bank before 2000 as against 2001 and beyond?

a. Far more efficient in 2001 and beyond than before 2000 [ ]
b. Slightly more efficient in 2001 and beyond than before 2000 [ ]
c. There has been no change between the tow periods [ ]
d. Far poorer in 2001 and beyond than before 2000 [ ]

11. To what extent will you agree that the deployment of ICT tools by your bank in the year 2000 and beyond aided the efficient management of the various products of the bank?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

12. What in your opinion is the cause of NRB not having as adequate innovative technologies as do other commercial banks in Ghana?

a. Lack of funds [ ]
b. Lack of skilled IT personnel [ ]
c. Lack of interest from the rural banks [ ]
d. Lack of management support [ ]
e. Lack of appropriate policies by supervisory authorities (e.g. Bank of Ghana, Apex Bank) [ ]

13. What will you suggest as means by which rural banks in Ghana could get fast deployment of technology into the system?

a.....
b.....
c.....
d.....

Thank you for your supports

APPENDIX THREE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCOOL OF BUSINESS

QUESTIONNAIRE FOR BANK'S MEMBERS OF STAFF

CANDIDATE: LAWRENCE KWAMI AZIALE
PROGRAMME: MPHIL BUSINESS ADMINISTRATION (BUSINESS INFORMATION TECHNOLOGY OPTION)
TOPIC: EVALUATION OF THE STRATEGIC USE OF ICT IN THE RURAL BANKING SECTOR IN GHANA
SUPERVISORS: DR. F. T. ODURO, MR. OBIRI YEBOAH

Dear Respondent,

Your participation in this survey is considered to be very important, since you're the target of the survey. Below are answers to some general questions that might be bordering your mind.

What is the Purpose of this Survey?

This study is purely an academic requirement for the award of Mphil in Business Information Technology. However findings of the study may provide the management of the Rural Banking Sector with information and analysis to assist them in formulating policies and implementing innovative technologies that will lead to competitive performance of this sector in the banking industry. The study is concerned with key issues related to attracting and retaining of loyal customers which will ensure the profitability, competitiveness, survival and growth of the Rural Banks (RBs) as a strategic institution in the Ghanaian economy.

Why should I participate in this Survey?

Policymakers in the banking industry may rely on data from this survey to inform their decisions concerning the sustainability of the Rural Banking sector which is a strategic institution charged with providing institutional funding for the Rural and Agricultural sector in the country. This research has the backing of the Kwame Nkrumah University of Science and Technology, School of Business, Kumasi, Ghana and the permission of the Management of your bank.

Will my Responses be kept Confidential?

Your responses to all items will be treated confidential. All responses that relate to or describe identifiable characteristics of individuals may be used only for statistical purposes and will not be disclosed, or used in identifiable form for any other purposes.

How will my Information be reported?

The information you will provide will be combined with the information provided by others in statistical reports. No individual responses will be included in the statistical report.

Feedback

a. Accountant [ ]
b. Cashier [ ]
c. Credit officer [ ]
d. Project officer [ ]
e. Mobile banker [ ]
f. others (please specify) .....
.....

ICT usage in the Rural Banking sector
Please tick [√] in the appropriate box and comment where necessary

1. Which of the following operations do the innovative technologies you identify in Q1 above support at NRB?

a. Provide customer services by cashiers [ ]
b. Check customers' account status [ ]
c. Check customers' credit status [ ]
d. Customers access their accounts with any branch [ ]
e. Undertake posting of the books of account [ ]
f. Generate management reports [ ]
h. Check the performance of the various products of the bank [ ]
i. Undertake audit of various accounts [ ]
h. Provide uniform records on customers [ ]
k. Any other (please specify) .....
.....
.....

2. Judging from the roles play by ICT in your banking operations, will say that technology can be a tool for competitive advantage?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

3. Based on your experiences with the use of ICT tools that NRB has in place how will assess the performance of these technologies in terms of meeting the goals of the bank?

a. Excellent [ ]
b. Good [ ]
c. Satisfactory [ ]
d. Fair [ ]
e. Poor [ ]

ICT AS A COMPETITIVE TOOL
Please react as appropriate to the following questions/statements

4. ICT provides banks with means to attract and maintain customers
   a. Strongly agree [ ]
   b. Slightly agree [ ]
   c. Slightly disagree [ ]
   d. Strongly disagree [ ]
5. The use of ICT enables the bank to render timely services to its customers.
   a. Strongly agree [ ]
   b. Slightly agree [ ]
   c. Slightly disagree [ ]
   d. Strongly disagree [ ]

6. The deployment of ICT tools by NRB ensures reliable customer service delivery by the bank.
   a. Strongly agree [ ]
   b. Slightly agree [ ]
   c. Slightly disagree [ ]
   d. Strongly disagree [ ]
7. The operations of NRB have seen much improvement since the bank has deployed tools such as computers, networks etc in the system.
   a. Strongly agree [ ]
   b. Slightly agree [ ]
   c. Slightly disagree [ ]
   d. Strongly disagree [ ]
8. The deployment of ICT technologies by NRB has brought about good internal control system to the bank
   a. Strongly agree [ ]
   b. Slightly agree [ ]
   c. Slightly disagree [ ]
   d. Strongly disagree [ ]

9. To what extent are these variables important in promoting the competitive position of your bank?

Please tick (√)where applicable	Not at all important	Some what important	Very important
ICT help reduce human error			
ICT helps to easily manage the various loan portfolio of the bank			
IT tools use by the bank help generate various reports to support management decision-making process			
The use of ICT help cut down labour cost			
The bank has shorten the average customers' waiting time through ICT tools deployed by the bank			
The deployment of ICT by the bank has increased the productivity of the bank			
The deployment of ICT provides an enhance data security to the bank			
ICT deployment enable banks to introduce more products innovations by the bank			
The use of ICT tools has cut down on operation costs of the bank			
ICT has brought about quality service by the bank to its customers			
ICT facilitate speedy transaction between the bank and its customers			
Training of end users on the use of the technology ensure higher performance & increase the sales of the bank			

Any other advantage that ICT provide the bank (Please state)

.....

10. Which of the following advantages will you say the deployment of ICT tools by your bank has over sister banks that do not have these technologies?

a. Large customer base (enhanced market share) [ ]
b. Lower operating cost [ ]
c. Loyal clients [ ]
d. Ability to manage more products efficiently [ ]
e. Easy access by customers to their accounts [ ]
f. Shorter waiting time by customers for service delivery [ ]
g. Quality management decisions [ ]
h. Improved revenue/profitability [ ]
I. Higher sales volume in terms of loans given out to customers [ ]
k. Improved savings mobilization [ ]

l. Improved loan repayment rate due to ability to track loan performance [ ]

Any other (please state) .....

.....

11. Lack of innovative technologies by the bank negatively affects the operations of the bank

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

12. Do you agree that ICT tools deployed by NRB are meeting customer service satisfactions using the following variables?

Please mark tick (√)where applicable	YES	NO
Easy access by customers to their accounts		
Quick service delivery to customers		
Customers can access their account with any branch of the bank		
The facility takes care of customers' special needs e.g. Literates as well as illiterates can use the technologies		
Reliable service to customers		
Ability to deliver the desired service that customers required		
Safety to customers accounts		
Assurance that customers account status remains accurate (less risky)		
The technologies are always functional to provide customers needs		

Any other (Please state)

.....

.....

.....

Economic gains from ICT investment

13. The benefit derived from ICT tools deployed by the bank far exceeded the cost incurred in deploying such technologies.

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

14. To what extent will you agree that gains made from investing into ICT can fully be made after end users become fully used to the facility?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]

d. Strongly disagree [ ]

15. What is your opinion on the view that much gains cannot be made from IT in the first year of deploying it into the system .

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

Please assign reason for your position .....
.....
.....

16. In profit terms how do you view the performance of your bank/branch since your operations were computerised?

a. Strongly increasing [ ]
b. Some what increasing [ ]
c. Some what not increasing [ ]
d. Strongly not increasing [ ]

17. To make much gains from IT investment the technology must be aligned to the business tasks, structure of the organization, and the acceptability by users of the technology?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

Please comments.....
.....
.....

Factors affecting technological diffusion in rural banks in Ghana

18. To what extent would you agree that the rural banks in Ghana have as many innovative technologies as the Commercial and others banks in the country?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

19. What in your opinion might account for the slow rate of technological diffusion in the rural banking sector?

a. Lack of funds [ ]
b. Lack of skilled IT personnel [ ]
c. Lack of interest from the rural banks [ ]
d. Lack of management support [ ]
e. Lack of appropriate policies by supervisory authorities (e.g. Bank of Ghana, Apex Bank) [ ]

20. Will you say that if adequate IT training is given top management and staff of rural banks, the Sector will experience a faster rate of technological diffusion?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

21. To what extent will you agree that a bank which has high level IT professionals has a relative advantage over others which do not have such skilled personnel?

a. Strongly agree [ ]
b. Slightly agree [ ]
c. Slightly disagree [ ]
d. Strongly disagree [ ]

22. To what extent do you think the following variables will contribute to the success of technological diffusion in your bank?

Please tick (√)where applicable	Not at all important	Some what important	Very important
Training support			
Top management support			
Clear understanding of the functionality of the technology			
End users involvement in technology diffusion			
Motivated staff (in terms of staff interest in the technology)			
Reduced level of resistance to the technology by end users			
Skilled human resource base			
Good returns on investment made on such technologies			

Any other (Please state)

.....

.....

.....

Thank you for your support

APPENDIX FOUR

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BUSINESS

INTERVIEW QUESTIONNAIRE FOR CUSTOMERS

A study is being conducted into the strategic use of IT as a competitive tool in the rural banking sector in Ghana. Your participation and views are highly solicited to help accomplish this study. This is primarily an academic exercise and views presented will be treated as confidential

Instruction(s)

Please read through the questions below and endeavour to answer all questions as best as you can. Tick [√] where appropriate and supply any other needed information where necessary.

Background Characteristics
Please tick [√] or comment where applicable

I. What is your gender?
- a. Male [ ]
- b. Female [ ]

II. Age
- a. 20 – 24 [ ]
- b. 25 – 29 [ ]
- c. 30 – 34 [ ]
- d. 35 – 39 [ ]
- e. 40 – 44 [ ]
- f. 45 – 49 [ ]
- g. 51+ [ ]

III. Sector of Business operation
- a. Formal sector (salaried worker) [ ]
- b. Informal sector (trader/craftsman) [ ]

1. How long have you been a customer of Nwabiabya Rural Bank (NRB)?

- a. 1998 - 1999 [ ]
- b. 2000 [ ]
- c. 2001 – 2004 [ ]
- d. 2005 – 2008 [ ]

2. How will you assess the services rendered to you by NRB since you join the bank

- a. Fully satisfied [ ]
- b. Slightly satisfied [ ]
- c. Slightly dissatisfied [ ]
- d. Fully dissatisfied [ ]

3. If you were a customer of this bank since 1997 to date, will you say that you were more satisfied with service quality provided to you by the bank after 2000 to date than before 2000?

a. Ye [ ]
b. Njo [ ]

4. If your answer to question 3 above is yes, in what accounts for your satisfaction?

a. Shorter time spent in the banking hall [ ]
b. Accurate statement on accounts [ ]
c. Transactions with the bank are generally fast [ ]
d. Customers always have reliable services [ ]
e. There is care for those who cannot even read or write to easily access required services [ ]
f. The staff of the bank are always able to use their systems to efficiently deliver services to customers [ ]

ICT AS A COMPETITIVE TOOL

Please react as appropriate to the following questions/statements

5. Given that a new bank such as Barclays or Standard Chartered Bank opens a branch in your area today, will you still like to Patronise the services of NRB?

a. Yes [ ]
b. No [ ]

6. Please give reason for your position on Q6 above

a.....
b.....
c.....
d.....
e.....

7. Do you patronise the services of any other bank apart from NRB?

a. Yes [ ]
b. No [ ]

8. If your answer to Q8 is yes, which of the following technologies has that bank?

a. ATM [ ]
b. Networked [ ]
c. Telephone Banking [ ]
d. E-Switch [ ]

9. How will you assess the services of that bank as against that of NRB?

a. Far more efficient than that of NRB [ ]
b. Slightly more efficient than that of NRB [ ]

d. Far poorer than that of NRB [ ]

10. In your opinion to what extent do the following accounts for differences in the service delivery by banking institution?

Please tick (√)where applicable	Strongly agree	Agree	Disagree
New technologies to support service delivery			
Automated its services			
The attitude of bank staff towards customers			
Quick service delivery			
Reliable service delivery			
Error free services			
Less waiting time in transacting business with that bank			

Any other (Please state).....

11. In your opinion which of the following innovative technologies makes banks more attractive to you?
    a. Automated Teller Machine (ATM) [ ]
    b. Telephone Banking (TB) [ ]
    c. Branch Network (BN) [ ]
    d. Personal Computer Banking (PCB) [ ]
    e. Internet Banking (IB) [ ]
    f. Electronic Fund Transfer at Point of Sale (EFToS) [ ]
    g. Telephone [ ]
    h. Computers [ ]
    i. E. switch [ ]
    k. Any other (please specify).....
    .....
    .....

12. To what extent will you agree that the deployment of these technologies make services provided by bank more efficient than services rendered to you by banks which do not have them?
    a. Strongly agree [ ]
    b. Slightly agree [ ]
    c. Slightly disagree [ ]
    d. Strongly disagree [ ]

13. What measures will advise NRB puts in place to make its services more appealing to you and other customers?
    a.....
    b.....
    c.....
    d.....

Thank you for your supports