

ABSTRACT

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 services that is compatible with the demands of the electronic marketplace (Balachandher et al, 2001). In Ghana however, banking institutions have been subjected to much criticism for not providing their customers with innovative and convenient banking services, with the results that some customers especially businesswomen, find it more convenient keeping their savings at home than in the banks (Safo and Andoh, 1990).

One of the areas of ICT that is of great concern to academics and professionals is the issue of how it has impacted on banking activities. Although there are many previous empirical studies about impact of ICT on large companies, the scientific community has only started to pay attention to similar institutions especially in developing economies. This study examined the impact of ICT on banking activities in Ghana. The issue is of critical significance given the important role ICT play in the banking industry. The study made use of both primary and secondary data sources. Interviews and questionnaires were used to collect primary data from the field. The secondary data included annual reports of banks, journals and articles on ICT, technical papers and library work including the internet. Empirical studies of work done by some other people were also used. Analysis of the study was based on qualitative and quantitative measures. The results of the study suggest that ICT has played an effective and significant role in the banking industry in Ghana. It was observed that though ICT has had a positive impact in the banking industry, there is still more room for improvement.

The findings revealed that there is the urgent need to further strengthen the use of ICT. The bankers should also educate their customers to make use of their ICT services available.

In conclusion, there should be further training for the entire staff of the institutions on new developments in the use ICT in the banking industry. This will let them be abreast with latest technologies available in the ICT Industry. Also a mini ICT center may be set up either within the banking hall or outside where customers will be able to access some of their ICT services, provided the necessary procedures are adhered to. This will reduce the queues in the banking halls. Customers can check their accounts and do other businesses without joining the queue.



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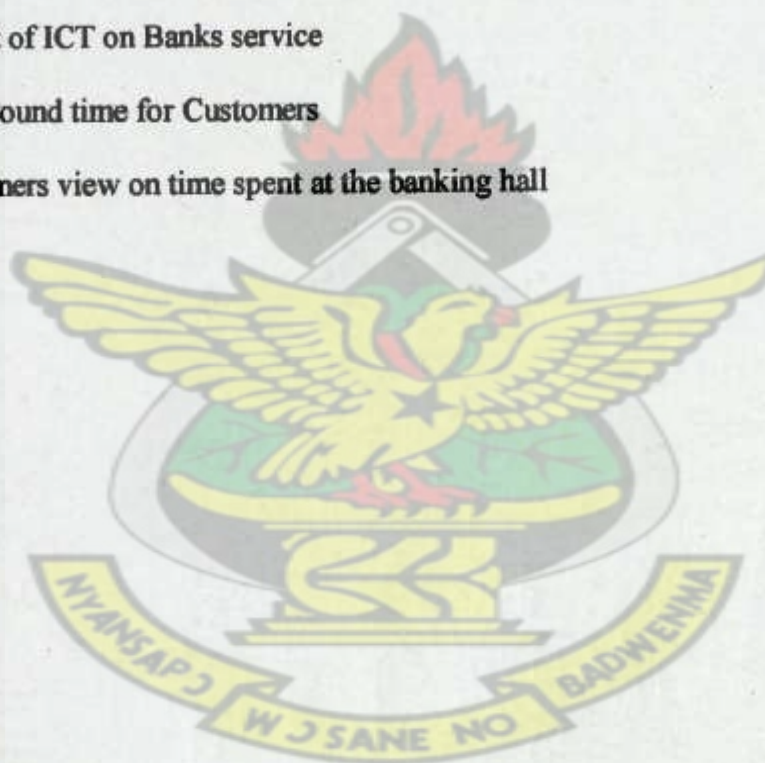
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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
ATM	- AUTOMATED TELLER MACHINE
B2B	- BUSINESS TO BUSINESS
B2C	- BUSINESS TO CUSTOMERS
B2G	- BUSINESS TO GOVERNMENT
ECOBANK	- ECOBANK GHANA LIMITED
ERP	- ENTERPRISE RESOURCE PLANNING
ESSB	- ELECTRONIC BUSINESS BANKING SYSTEM
HDD	- HARD DISK DRIVE
ICT	- INFORMATION AND COMMUNICATION TECHNOLOGY
IT	- INFORMATION TECHNOLOGY
LAN	- WIRELESS LOCAL AREA NETWORK
MICR	- MAGNETIC INK CHARACTER RECOGNITION
PACIFIC	- PACIFIC SAVINGS AND LOANS LIMITED
PC	- PERSONAL COMPUTER
SME	- SMALL AND MEDIUM SCALE ENTERPRISES
SMS	- SHORT MESSAGE SENDING
STANCHART	- STANDARD CHARTERED BANK LIMITED
VSAT	- VERY SMALL APERTURE TERMINAL SATELLITE
WAN	- WIDE AREA NETWORK
W-LAN	- WIRELESS LOCAL AREA NETWORK

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CHAPTER ONE

1.0 Introduction

The introduction of ICT in the banking industry has had a significant impact on banks operating with physical branches. Especially the internet has made it possible for banks to cut cost by offering online banking at a lower cost. The banking industry is heavy user of ICT. Activities of the banking industry include book keeping, keeping records of customers, retrieval of customer information, and payment of salaries. The rest are deposit and withdrawal, cheque processing, customer account updating and loan processing which are constantly needed in the banking industry (Marilyn, 1986). Others include trade finance, treasury operations, investment, risk analysis, letter of credit, etc.

The introduction of ICT has changed the processes and activities of the banking industry. Before the advent of ICT processing of cheques were done manually. However, with adoption of the Magnetic-Ink character Recognition (MICR) by the American bankers Association in 1956, cheque processing has been automated. The ability to use computers creatively to collect, organize, control and distribute money is now the determining factor of banking success or failure. ICT has also made it possible for banking customers to have twenty four (24) hours access to their money. Automated Teller Machines (ATM) have almost taken the place of cashiers. To withdraw money, one needs to insert a card with a unique code and answer some few questions. Before the advent of computers all banking operations such as, processing of data and deposits, balancing of accounts, withdrawals of deposits, recording invoices were all done manually. This adversely affected the operations of the players in the banking industry.

An important indicator of the general uptake of ICT in the banking industry relates to the use and availability of Internet. Internet access is a precondition for e-banking. A high availability of internet among customers can be an important facilitator to inducing improved usage of online banking.

The application of networks (WAN, LAN, Extranet, Intranet) is a vital part of an effective ICT-enabled system, which is especially true in the case of banks with a branch network. Networks are among other things used by banks to facilitate collaboration across functions, or to advance productivity and efficiency by supporting business operations and decisions across the inter-networked enterprise.

In Ghana, the Central Bank took bold initiatives to integrate ICT into its Payment Systems Development Strategy. This strategy constitutes the National Electronic Payments System (NEPS) and is aimed at providing a framework for electronic delivery of financial services to every segment of the economy on a common platform. The main objective of this project is to deepen financial intermediation by deploying electronic payment products that will meet the needs of the "banked", "un-banked" and "under-banked". The principal components of NEPS are the National Switch and Smartcard Payments System (The Switch), the Cheque Codeline Clearing (CCC) System and the Automated Clearing House (ACH). One of the main aims of the strategy is to improve interoperability of ATMs owned by different banks, Electronic Funds Transfer at Point of

Sale (EFTPOS) systems, e-money, internet, SMS and telephone banking, among others (Bank of Ghana, 2006).

However, in the presence of all these benefits presented by ICT to the banking industry, disturbingly customers have to join long queues in banks before being served. Also available literature has been showing an increasing interest toward the influence of information and communication technologies (ICT) on business performance. Although this theme has been widely investigated, very different results have been achieved up to now: some researchers assert a positive impact of ICT use on business performance (Barua, 1995; Stratopoulos, 2000), others consider it insignificant (Strassmann, 1990; Yosri, 1992) or even assume a negative impact (Brynjolfsson, 1995; Holland, 1997; Setzekorn, 1998). In any case, it is still not clear which factors influence or determine this contribution (Weill, 1992; Mukhopadhyay, 1995; Broadbent, 1996). Thus, it is crucial to discover the impact of ICT on banking activities and to improve the business performance through the ICT leverage in Ghana with special emphasis on the three commercial banks in order to make ICT "a good servant rather than a bad master" (Revell, 1997).

1.1 Statement of the Problem

The banking activities prior to the advent of ICT, coupled with increase in demand of their services brought about some problems, which needed to be rectified. Some of the challenges include long hours of waiting by customers before being attended to, inaccurate financial statements and inaccurate records keeping of customers. In view of this, the introduction of ICT into the business processes was to help eliminate or reduce the incidence of such problems. The most significant of the ICT renaissance is the automation of most of the banking processes.

Although banking is among the most ICT-intensive industries in Ghana and among those that started earlier to rely massively on computers for their operations, the large bulk of applied literature on bank technology includes very few studies on this topic, mainly because of the paucity of appropriate quantitative and qualitative information. The study will overcome this hurdle by using the three commercial banks (Ecobank, StanChart and Pacific), which have a large customer base and information on all banking activities that are supported by ICT, as well as a wide range of products.

The renaissance has been in existence for over a decade and there is the need to find out the impact of ICT on the activities of banking institutions in Ghana and make recommendations or amendment where feasible. Moreover many people find it very difficult to identify the contribution of ICT to an organization especially in our part of the world. There is therefore an urgent need to assess the impact of ICT on banking activities

address such wrong perceptions and improve upon the quality of existing ICT infrastructure and encourage its use in other industries.

1.2 Objectives of the Study

The main objective of the study is to assess the impact of ICT on banking activities in Ghana. Accordingly the following broad objectives would be discussed

- a) To assess how ICT have been able to improve the performance of banks.
- b) To find out customers' reaction towards the introduction of ICT in banking operations.
- c) To collate views, offer suggestions and make recommendations where necessary, on the use of ICT in financial service provision.

1.3 Significance of the Study

The banking industry is very important to national development and as such must be governed by very practical and pragmatic policies. Such policies must seek to create more value for customers and shareholders.

Banking industry possesses key characteristics (fragile, intangibility, heterogeneity, inseparability, variability, nature of promotional tools employed, etc) distinguishing them from the manufacturing industry. These characteristics make their management a bit more difficult and challenging for their managers than their manufacturing counterparts in delivering quality service to their valued customers.

To effectively address these challenges and competitively position banking organizations in the increasing competitive business climate in Ghana, management and leaders need to lay appropriate foundation to provide conditions for proper design, structure and setting based on ICT to deliver quality service to their valued and increasing sophisticated customers in accordance with their needs and preferences as well as meet international best practice standards.

Financial services contribute significantly to the (account for between 5 and 10 per cent) GDP of most developing countries. Banks contribute to a large proportion of finance-related output and play an important role in the key activities for the functioning of the economy, such as the allocation of capital and the provision of liquidity, payment and safekeeping services. Efficiency improvements in the production and delivery of these services can bring widespread welfare effects.

Again the acquisition and the treatment of information is a central activity in banking and the impact of innovations in ICT is likely to be larger than in other industries and the stability of the banking system is a primary policy objective. Innovations affecting production costs and profit opportunities can have major consequences for the industry structure altering banks' incentives to take risks and need to be monitored by regulators.

Finally, the study will help policy implementers to address the shortfalls in the structure and processes of aligning ICT with the general business goals. It will also help to create awareness about the importance of ICT as a tool for organizational development and

competitive advantage so as to maximize profit as well as shareholder value and also help to raise the productivity level of the country through efficient banking services.

1.4 Scope of the Study

All banking institutions cannot be covered by the researcher due to time constraints on the part of the researcher. The three (Stanchart, Ecobank, and Pacific) Commercial Banks will serve as the study area due to the following reasons.

They were selected for this case study on the basis that they have branches in almost all the regions in Ghana and most of their processes have been aligned with ICT. The situation is such that in spite of the stiff competition existing in the financial industry, the banks have experienced significant increases in their customer base and profits as well. This has led the banks, except Stanchart, to open or in the process of opening new branches to help meet the increasing needs of their diverse customers. The banks have also acquired permanent land of its own on which some of their present offices are located in the country.

There has been expansion in the operational activities of Ecobank. Thus aside the normal banking operations (such as savings, fixed deposit, current account, lending & borrowing, forex), a stockbrokerage section/department and payment point for utility bills has been established to make the premises of these banks one stop financial market all through the extensive use of ICT. Most people contend that the rapid development of these banks is

due to availability of resources and that it is a privately owned company of which profits accrued is quickly ploughed back.

The institutions are also located almost at the center of the country. This makes the institution easily reached or accessible to all people in and around the country. People from all parts of the country are able to do business with the banks. This strengthens the fact that customers of the banks need not carry money on them anywhere. All over the country they have access to their money just at the click of a button. The study will give a good assessment of all the various tribes and the perception about products and services provided by the banks after the integration of ICT into their activities. This shows that the three commercial banks will be a good representative of all banking institutions in the country.

1.5 Research Question and Unit of Analysis

The study is intended to verify the truth or otherwise in the following statement: "ICT has impacted positively on banking activities in Ghana". Due to the research question, the customers and workers of the banks will be used as the unit of analysis.

1.6 Methodology

1.6.1 Research design

The design to be used for the study will be a descriptive cross sectional survey. This method seeks to gather information so that a description of what is going on can be made.

It may be designed to discover whether there is any relationship between two variables that is ICT and performance (Agyedu et al, 1999).

1.6.2 Data Collection

The sample of the study is the Management, Staff and customers of Ecobank Ghana Limited (Ecobank), Standard Chartered Bank (Stanchart) and Pacific Savings and loans Limited (Pacific). The study relied on both secondary and primary sources of data.

a) Secondary Data

Secondary data would be obtained from journals, magazines, newspapers, the annual management reports of the banks, and various studies made available through library work.

b) Primary Data

The primary data is to be collected from interviews and use of questionnaire. The researcher would visit the offices of the banks to collect information through personal interviews with management, staff and customers as well as the completion of questionnaires submitted to them.

1.6.3 Data Analysis

The collected data would be tabulated, analyzed and interpreted with the help of graphs.

1.7 Limitations of the Study

Although every effort will be made to ensure the credibility of the results, it will still be faced with some problems. The problems envisaged have been listed below.

First time, material and financial constraints of the researcher narrowed the scope of the study to the three commercial banks in Kumasi. Other banking institutions were not covered. All generalization was based on these institutions. Thus lack of in depth study of the problem may faintly discolour the outcome of the study but effort will be made to render the study as representative of the whole as possible. Also non-cooperation of the institutional workers due to time constraints and restrictions will also create problems. Certain information is considered confidential and secret so on the part of these workers they will be reluctant to give out such information. Again the workers will found it difficult to take time off their busy schedule to answer the questionnaire.

1.8 Organization of the study

The study was divided into four main chapters. The first chapter covers the introduction, statement of the problem, the objectives of the study, hypothesis of the study, the significance of the study, the scope of the study, the methodology used in the study, the limitations and the organization of the study. Review of various literature associated with the study appears under chapter two. Chapter three covers the collection of data on the topic from the management staff, employees and customers of Ecobank Ghana Limited and analysis of the findings. Chapter four which is the final chapter looks at the

summary, conclusions as well as suggestions and recommendations based on the findings of the study.

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CHAPTER TWO

REVIEW OF LITERATURE

2.0 INTRODUCTION

The role of ICT in the banking industry has received attention since the 18th century (Smith (1776), Bagehot (1873) and Schumpeter (1912, 1934)). More recent works include Rousseau and Wachtel (1998), Beck et.al. (2000) and Levine (2003) among others. To this end, a review of the literature beginning with the concept of banking was undertaken.

2.1 Concept of ICT and banking

We are always collecting data, consciously and sometimes subconsciously. The names, number of customers, money, and other financial transactions of people in a group; the speed of a vehicle; marks scored in assignments; the number of students in the university; the number and classification of books in the library: this data is consciously collected.

This poses several challenges: storage; access; analysis; presentation. Analysis is critical in that it reduces data to information, based on which decisions can be taken. A collection of one hundred sets of marks is just data. If this is analysed to get averages and other statistics, information about performance is obtained. Poor performance leads to a management decision: investigate, establish the cause of poor performance; and take corrective action.

The computer as a very efficient abacus, albeit billions of times faster, and using binary instead of decimal arithmetic: A computer, by its very name, was originally just an arithmetic device. The modern computer has, in addition to its arithmetic function, storage (permanent

memory, for example the hard disk drive), memory where data can reside temporarily (random access memory, or RAM), a keyboard for convenience of data entry and control, and a display for feedback and presentation to the user. The use of systems based on binary digital arithmetic for data acquisition, storage, and analysis has added advantages: storage space is reduced; and data acquisitions as well as analysis are much cheaper and faster. Currently, the word digital, with all its connotations of trendy; speed; accuracy, is almost invariably used to mean binary digital. The hardware, the software, the methods, and the know-how required or used in acquiring, storing, processing, and displaying data and information is collectively known as Information and Communication Technology, ICT.

Banks basically, are financial institutions set up to provide consumers with savings services, money transmission services and credit services (Sinkey, 1990). In other words, a bank is a business which provides financial services for profit. They are involved in safekeeping transaction and portfolio management functions for the purpose of making profits and providing best services to their customers. Customers are key to a bank's activities because they are the most important source of a bank's deposit mobilization and revenue generation in the form of credit lending. These customers may either be individual or institution. Traditional banking services include receiving deposits of money, lending money and processing transactions. Some banks (called Banks of issue) issue banknotes as legal tender. Many banks offer ancillary financial services to make additional profit; for example: selling insurance products, investment products or stock broking. Currently in most jurisdictions the business of banking is regulated and banks require permission to trade. Authorization to trade is granted by bank regulatory authorities and provide rights to conduct the most fundamental banking services such as

accepting deposits and making loans. There are also financial institutions that provide banking services without meeting the legal definition of a bank (see banking institutions).

Banks have a long history, and have influenced economies and politics for centuries.

Traditionally, a bank generates profits from transaction fees on financial services and from the interest it charges for lending. In recent history, with historically low interest rates limiting banks' ability to earn money by lending deposited funds, much of a bank's income is provided by overdraft fees and riskier investments. The name *bank* derives from the Italian word *banco*, *desk*, used during the Renaissance by Florentines bankers, who used to make their transactions above a desk covered by a green table cloth.

2.2 Services offered

The improvement in information and communication technology (ICT) has enhanced the creation of new business models and has revolutionized the distribution channels of financial systems resulting in not only a reduction in the transaction costs but also has improved the convenience and accessibility for the customers (Devlin, 1995). According to Norton (1992) and Mishkin and Strahan (1999) this is a key factor that is transforming the financial system. On the same note, improvement in information technology also makes it easier for investors to monitor corporations, thus reducing asymmetric information (Mishkin and Strahan, 1999). As such, banks which have not invested significant amounts in technology have consequently faced an erosion of their market shares to other non-banking institutions. Technological advances facilitate the rapid transmission of digitized information within and across borders, which is becoming

increasingly important for successful banking transaction as financial services are largely informational in nature (Bradley and Steward, 2002). In another recent study, Berger (2003) identified the changes in the use of selected banking technologies, indicating a significant growth in the use of new IT and financial technologies. To this extent the impact of new technology on the financial sector need to be addressed (Suoranta and Mattila, 2003), as ICT is radically changing the financial sector landscape.

Although the type of services offered by a bank depends upon the type of bank and the country, services provided usually include:

- Taking deposits from their customers and issuing checking and savings accounts to individuals and businesses
- Extending loans to individuals and businesses
- Cashing cheques
- Facilitating money transactions such as wire transfers and cashiers checks
- Issuing credit cards and debit cards
- Storing valuables, particularly in a safe deposit box
- Cashing and distributing bank rolls

Financial transactions can be performed through many different channels:

- Branch
- ATM
- Mail
- Telephone banking
- Online banking

In Ghana, commercial banks such as Ghana Commercial Bank, Standard Chartered Bank, Ecobank Ghana, Zenith Bank, UBA Bank, etc. are all using the above mentioned channels in their service delivery to customers. Examples of the software being used include FLEXCUBE - Ecobank Ghana, Electronic Business Banking System - Standard Chartered Bank. According to the ARB Apex Bank report (2007), the bank has purchased eMerge (a software) for 123 rural banks in Ghana. This is to ensure uniformity in functionality and facilitate exchange of information between the banks.

2.3 COMMERCIAL BANKING

By the early 1900s New York was beginning to emerge as a world financial centre. Companies and individuals acquired large investments in (other) companies in the US and Europe, resulting in the first true market integration. This comparatively high level of market integration proved especially beneficial when World War I came—both sides in the conflict sought funds from the United States, by issuing new securities and selling existing holdings, though the Allied Powers raised by far the larger amounts. Being a lender to the world resulted in the largest growth of a financial economy to that point. The stock market crash in 1929 was a global event—markets crashed everywhere, all at the same time, and the volume of foreign selling orders was high. The Great Depression followed, and the banks were blamed for it, although the evidence has never been strong to connect the speculative activities of the banks during the 1920s with either the crash or the subsequent depression of the 1930s. Nonetheless, there were three prominent results from these events that had great effect on American banking. The first was the passage of

the Banking Act of 1933 that provided for the Federal Deposit Insurance system and the Glass-Steagall provisions that completely separated commercial banking and securities activities. Second was the depression itself, which led in the end to World War II and a 30-year period in which banking was confined to basic, slow-growing deposit taking and loan making within a limited local market only. And third was the rising importance of the government in deciding financial matters, especially during the post-war recovery period. As a consequence, there was comparatively little for banks or securities firms to do from the early 1930s until the early 1960s. All this while ICT was not so evident in the processes and activities of commercial banks. ICT integration was much felt during the second half of the last century.

2.4 GLOBAL BANKING

Deregulation and privatization of government-owned enterprises in the 1980s indicated that governments of industrial countries around the world preferred private sector solutions to problems of economic growth and development to state operated and semi-socialist programs. This spurred a trend that was already prevalent in the business sector, large companies becoming global and dealing with customers, suppliers, manufacturing, and information centres all over the world.

Global banking and capital market services proliferated during the 1980s and 1990s as a result of a great increase in demand from companies, governments, and financial institutions, but also because financial market conditions were buoyant and, on the whole, bullish. Interest rates in the United States declined from about 15% for two-year U.S.

Treasury notes to about 5% during the 20-year period, and financial assets grew then at a rate approximately twice the rate of the world economy. Such growth rate would have been lower, in the last twenty years, were it not for the profound effects of the internationalization of financial markets especially U.S. Foreign investments, particularly from Japan, who not only provided the funds to corporations in the U.S., but also helped finance the federal government; thus, transforming the U.S. stock market by far into the largest in the world.

Nevertheless, in recent years, the dominance of U.S. financial markets has been disappearing and there has been an increasing interest in foreign stocks. The extraordinary growth of foreign financial markets results from both large increases in the pool of savings in foreign countries, such as Japan, and, especially, the deregulation of foreign financial markets, which has enabled them to expand their activities. Thus, American corporations and banks have started seeking investment opportunities abroad, prompting the development in the U.S. of mutual funds specializing in trading in foreign stock markets.

Such growing internationalisation and opportunity in financial services has entirely changed the competitive landscape, as now many banks have demonstrated a preference for the "universal banking" model so prevalent in Europe. Universal banks are free to engage in all forms of financial services, make investments in client companies, and function as much as possible as a "one-stop" supplier of both retail and wholesale financial services. Many such possible alignments could be accomplished only by large

acquisitions, and there were many of them. By the end of 2000, a year in which a record level of financial services transactions with a market value of \$10.5 trillion occurred, the top ten banks commanded a market share of more than 80% and the top five, 55%. Of the top ten banks ranked by market share, seven were large universal-type banks (three American and four European), and the remaining three were large U.S. investment banks who between them accounted for a 33% market share.

This growth and opportunity also led to an unexpected outcome: entrance into the market of other financial intermediaries: nonbanks. Large corporate players, were beginning to find their way into the financial service community, offering competition to established banks. The main services offered included insurances, pension, mutual, money market and hedge funds, loans, credits and securities. Indeed, by the end of 2001 the market capitalisation of the world's 15 largest financial services providers included four nonbanks.

In recent years, the process of financial innovation has advanced enormously increasing the importance and profitability of nonbank finance. Such profitability priorly restricted to the nonbanking industry, has prompted the Office of the Controller of the Currency (OCC) to encourage banks to explore other financial instruments, diversifying banks' business as well as improving banking economic health. Hence, as the distinct financial instruments are being explored and adopted by both the banking and nonbanking industries, the distinction between different financial institutions is gradually vanishing.

A recent innovation in 2005 was the creation of prosper.com, a financial institution based on the idea of a person-to-person (P2P) system. Prosper.com allows individuals and groups to bid on interest rates for loans as either borrowers or lenders, effectively making each individual person a banking institution. The system is protected by credit ratings and identity verification. Again the use of ICT was not evident as compared to the second half of the last century. However, technological issues have affected the banking business; the rise of telephone banking and the impressive diffusion of the Web-based banking. These innovations make branch networks less important and national boundaries irrelevant. Computer banking, either through the Internet or proprietary networks, is gaining a growing and growing importance (Global Banking Industry, http://media.wiley.com/product_data/excerpt/34/04713931/0471393134.pdf, accessed May 1, 2009).

2.5 ICT in SubSaharan Africa

The use of ICT services in Sub-Saharan Africa has grown rapidly over the last ten years. This growth has been overwhelmingly in the mobile phone segment of the sector and has been driven by high levels of investment and competition among operators in the newly liberalized markets. A total of \$23 billion was invested in the ICT sector in Sub-Saharan Africa between 1996 and 2006, predominantly by the private-sector.² More than half of the population of Sub-Saharan Africa now lives within range of the mobile networks and, by the end of 2007, there were approximately 180 million mobile subscribers in the region (equivalent to 23% of the population) (ITU 2008). This growth in availability of basic voice services is likely to continue. Network coverage continues to expand and the

average revenue per user generated by networks in the region remains three times higher than in countries such as Bangladesh, India, and Pakistan. The price of telecommunications services in Sub-Saharan Africa may therefore still have some way to fall and, as it does, the use of mobile communications is likely to increase. Recent research indicates that, if effective competition among network operators is established, over 90% of the population of Sub-Saharan Africa will be living within reach of the networks (World Bank 2008).

The usage of the internet in Africa is growing rapidly and the ICT industry has responded by increasing the capacity of international internet connectivity in the region. Between 2004 and 2007, the international internet bandwidth connected to Sub-Saharan Africa (excluding South Africa) grew at 96% per year, compared with a global average annual growth rate of 51% per year (Telegeography 2008). The fact that internet usage is growing, despite the constraints imposed by high prices, poor quality and limited availability is an indication of the potential demand and usage of ICT. The ICT industry is responding to this demand by investing in international infrastructure such as submarine fiber-optic cable projects which are currently underway on both the East and West coasts of the continent.

2.6 Success and adoption of ICT

Lucas (2005, p. 5) mentions that the key to success with technology is not the technology per se but the ability to manage it well. The same is the view of Caruso (2003), with emphasis on the implementation of security policy to safeguard IT infrastructure. Concerning the management of ICT infrastructure, many tools have been developed including the use of different best practices presented in frameworks such as Information Technology Infrastructure Library (ITIL), Control Objectives for Information and Related Technology (COBIT), Capability Maturity Model (CMM), and International Organization for Standardization (ISO) 17799. These four frameworks are some of the different frameworks that incorporate useful best practices used in managing ICT infrastructures in different businesses sectors including the banking sector, which is the focus of this article.

According to Araya et al (2007) and Cordis (2007), the integrative view on ICT infrastructure refers to the inclusion of elements that directly deal with ICT and organization such as direct ICT human resources, ICT technological infrastructure, ICT proprietary resources (protected patent, and copyright), and ICT budget. Indirect resources include personnel outside ICT department as management, culture of the organization and its structure, relationship with business partners, and budget outside the ICT department that provides training for employees in general. All these resources combined not only direct resources but also other resources, sustain the success of ICT with the organization and contribute to the competitive advantage of the organization.

Toussea-Oulai and Ura and Mwesige argue that poor basic infrastructures is a barrier to ICT adoption in developing nations. To properly adopt and use ICT, the basic infrastructural requirements include electricity and educated workers. Also, commitment from the government and other policy makers should be put in place. It has been observed that many African countries have a long way to go before securing a steady supply of electricity. ICT adoption can only remain a dream to such a nation.

2.7 Value Chain of the Banking Industry

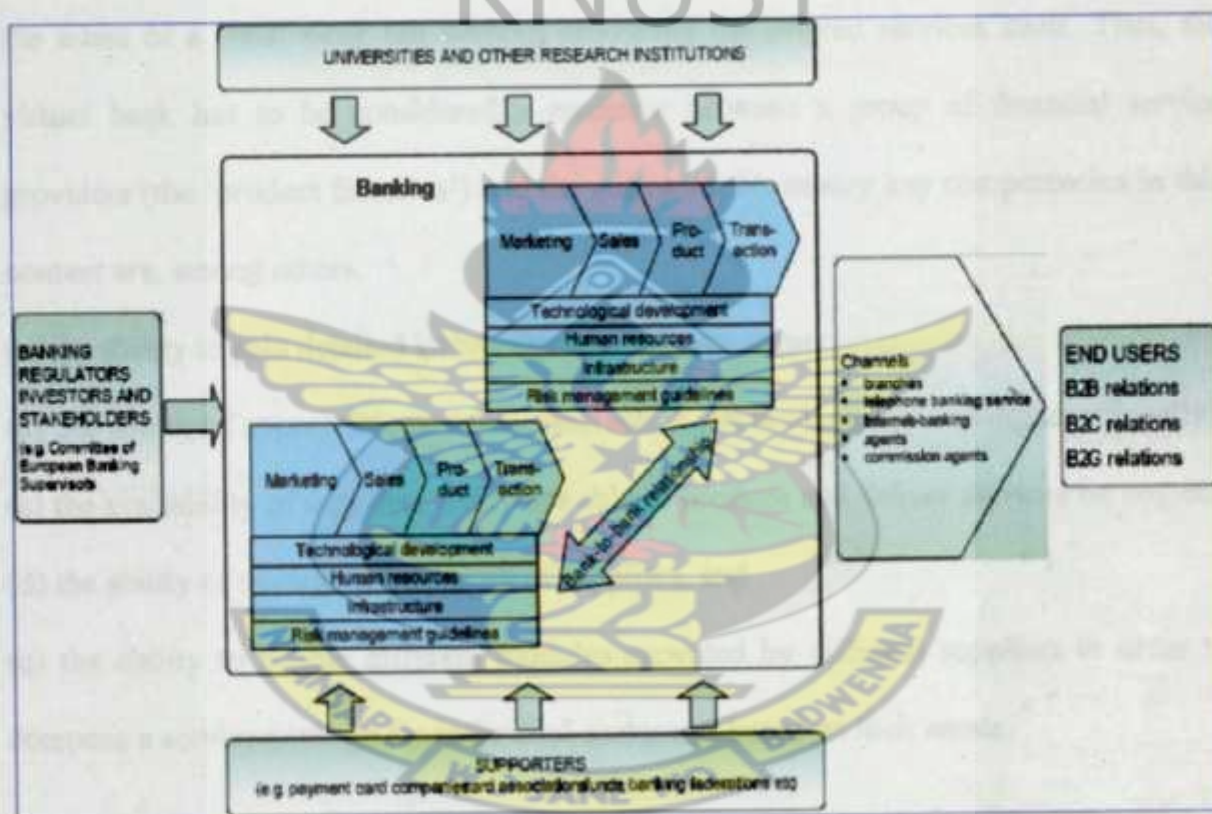
The Banking Industry's value system consists of several main players, where the central role is occupied by the banks themselves, offering their services to customers – these being businesses (B2B) - Businesses buying from and selling to each other over the Internet, individual consumers (B2C) - Businesses that sell their products or services to consumers over the Internet, avoiding any intermediaries, and public authorities (B2G) - Businesses buying from and selling to the government over the Internet. Many stakeholders in the BI exert influence over banks. Banking regulators, investors and other stakeholders have an impact on the banking value chain. Universities and other research institutions are, due to their academic work, relevant for the development in the BI. Payment Card associations, funds and banking federations are included in the “supporters” category even though they may also act as banks, banking regulators and/or investors. The services offering of a bank can be divided into:

a) Products

(accounts, mortgages, deposits, investment and pension funds, credit, loans, mortgages, guarantees).

- b) **Services**
(credit cards, cheques, promissory notes, receipts, transfers)
- c) **Channels** - means through which banks reach their clients
(branches, telephone banking service, Internet/e-banking, agents, commission agents)

Based on these definitions of bank offerings and relevant stakeholders, the Banking Industry value system is illustrated below



Source: Rambøll Management 2007

2.8 Virtual Banks as New Financial Intermediaries

The concept of a virtual bank is one whose development is very evident in the US and in Europe. The term virtual bank in this context is related to virtual organizations as a structure to generate economic values. While the traditional financial industry is

characterized by structures of huge, but often inflexible and multi-national companies, the new intermediaries are rather lean and flexible organizations. They are mostly based on virtual structures and thus are able to respond to market developments and customers demands much more quickly. According to Sakar et al (1995), virtual banks are to be considered typical intermediaries.

The virtual bank in this context constitutes a financial intermediary within an electronic environment like, e.g., an Electronic Market. It offers financial services to customers in the sense of a 'real' bank but without producing the offered services itself. Thus, the virtual bank has to be considered a mediator between a group of financial service providers (the 'product factories') and the customer. Necessary key competencies in this context are, among others,

- (a) the ability to gain detailed knowledge about the customer,
- (b) the ability of appropriate customer interaction (technologically and organizationally),
- (c) the availability of suppliers which are able to produce and deliver services on request,
- (d) the ability of managing a network of suppliers, and
- (e) the ability to bundle different modules provided by different suppliers in order to compose a service package for individual customers based on their needs.

Table 1: Examples of new financial intermediaries

Company (URL)	Remarks
Quicken.com (www.quicken.com)	Portal site for financial services
Advance Bank (www.advancebank.de)	Virtual bank in Germany founded in 1996; offers all typical bank services only via the Net ; services are produced through a group of partners
MLP Bank (www.mlp.de)	Virtual bank in Germany founded 1997; offers all typical bank services through a network of existing branches and consultants of the mother company; services are produced through a group of partners
GetSmart (www.getsmart.com)	GetSmart mediates financial services (from credit cards to mortgages) from different suppliers
InsWeb (www.insweb.com)	InsWeb mediates insurance services from different suppliers
Ecobank (www.ecobank.com)	Official website of the bank from where e-banking is offered
Ghana Commercial Bank (www.gcb.com.gh)	Official website of the bank from where e-banking is offered
Standard Chartered Bank (www.standardchartered.com/gh)	Official website of the bank from where e-banking is offered
Barclays Bank (www.barclays.com/africa/ghana)	Official website of the bank from where e-banking is offered

2.9 ICT and banking

ICT may be defined as the modern handling of information by electronic means, which involves its access, storage, processing, transportation or transfer and delivery (Ige, 1995). Alu (2002) observed that ICT affects financial institutions by easing enquiry, saving time, and improving service delivery. Some available telecommunications and information technologies which are presently being used in the banking industry in Nigeria are telephone, facsimile, wireless radiophone, very small aperture terminal satellite (VSAT), telegraphy, and computer systems (Ugwu, 1999). In Ghana, the situation is not different from what is being described above. In fact this indifference has

enabled Nigerian banks in Ghana to easily link up easily with their branches in Nigeria and other African countries.

2.10 New Trends

When it comes to the renewal of ATMs, there are several technologies in the pipeline that have not yet reached worldwide acceptance, but are expected to influence the development of ATMs in the near future. Examples include biometrics, where authorisation of transactions is based on the scanning of a customer's fingerprint, iris or face; Cheque/Cash Acceptance, where the ATM accepts and recognise cheques and/or currency without using envelopes; Bar code scanning; On-demand printing of "items of value" (such as movie tickets, Travellers Cheques); Dispensing additional media (such as phone cards); Co-ordination of ATMs with mobile phones; Customer-specific advertising; and Integration with non-banking equipment. These upcoming technologies will force the banks to invest in renewal of the ATMs to align with customer expectations and to decrease the reliance of customers on bank branches for standard banking interactions such as account balancing and cash withdrawal/payment.

CHAPTER THREE

METHODOLOGY AND BRIEF PROFILE OF SELECTED BANKS

3.0 Introduction

This section of the write-up deals with the analysis of the research methods and justification for the choice used for this research. It includes research design, population and sampling, instruments used for data collection and analysis) and profile of the three commercial banks.

3.1 Methodology

Churchill (1995) states that research methodology is a way to systematically solve a research problem. There are basically, two conventional approaches to conduct research. These are:

- i) Qualitative – based on qualitative phenomenon. Hutton (1990)
- ii) Quantitative – based on quantitative phenomenon. Churchill (1995)

Creswell (2002) suggests that combining qualitative and quantitative approaches within the same piece of research enables the researcher to provide richer detailed analysis. Linking qualitative and quantitative data ensures the overall effectiveness of the research process as one can enhance the findings of the other, notes Beloucif (2003). In this study qualitative and quantitative method was used.

3.2 Research Strategy

Research Strategy is defined as a general plan of how the researcher will go about answering the research question(s) posed (Mark Saunders, Philip Lewis and Adrian

Thornhill, 1997). It is concerned with the overall approach to be used in conducting the research. Robson (1993) lists the three traditional research strategies as:

- * Experiment
- * Survey
- * Case Study

For the purpose of this study Case Study strategy was used. Yin (2004) defines the case study as an empirical inquiry that investigates a contemporary phenomenon within its real-life context when the boundaries between the phenomenon and context are not clearly evident and multiple sources of evidence are used. Case studies help in exploring characteristics such as change and other dynamic processes. Creswell (2002) describes a case study as an exploration of a “bounded system” or a case or multiple cases over time through detailed, in-depth data collection involving multiple sources of information rich in context.

The case study method (e.g., Shavelson and Townes, 2002, pp. 99-106), is pertinent when your research addresses either a descriptive question (what happened?) or an explanatory question (how or why did something happen?); in contrast, a well-designed experiment is needed to begin inferring causal relationships (e.g., whether a new education program had improved student performance), and a survey may be better at telling you how often something has happened. The case study approach is also relevant where one wants to illuminate a particular situation, to get a close (i.e., in-depth and first-hand) understanding of it. This method helped the researcher to make direct observations and collected data in natural settings, compared to relying on “derived” data (Bromley, 1986, p. 23) e.g.,

responses to questionnaires. The case study method is best applied when research addresses descriptive or explanatory questions and aims to produce a first-hand understanding of people and events.

3.3 Research design

The study adopted an integrative approach, which combined the relevant elements of case study, descriptive, qualitative and quantitative research techniques. To achieve the set objectives of the study, a sample of the management, staff and customers of three commercial banks were selected on the basis of which generalization application to the population from which the sample was derived were arrived at. The data for the study were then analyzed using descriptive techniques like charts, graphs and tables. The unit of analysis was the speed and processes in the organization. The study mainly collected and analyzed qualitative and quantitative data on the impact of ICT on banking activities from respondents using the cross-sectional method of data collection (data was collected only once over a period of one week).

The study adopted the descriptive research approach. This approach was used because it involves describing, recording, analyzing and interpreting conditions that exist. This study was therefore conducted to identify the impact of ICT on banking activities with special reference to the three commercial banks. The unit of analysis was the speed and processes with which services are provided in the organizations. The study mainly collected and analyzed qualitative and quantitative data from respondents using the cross-

sectional method of data collection (data will be collected only once over a period of one week).

The study relied on both secondary and primary sources of data. The secondary sources of data were obtained from journals, magazines, newspapers and other published work on ICT and Banking Institutions.

3.3.1 Population and Sampling

The population for the study was made up of Management, staff and customers of Ecobank Ghana Limited, Standard Chartered Bank, and Pacific Savings and Loans Limited.

A sample size of one hundred and twenty (120) including management, staff and customers of Ecobank Ghana Limited, Standard Chartered Bank, and Pacific Savings and Loans Limited was chosen for the study. A total of twenty (20) staff (including management, heads of department and other staff members) was selected from banks for the study. For the customers, all banks were selected from which sixty (60) customers were sampled through random sampling technique. Purposive sampling was used to limit the population to only Management, Staff and customers of the three commercial banks. This technique, which is not perfectly representative, was typically more representative than other type of techniques. The technique also permitted the estimation of the representativeness of the sample statistics to the population parameters. Also the time frame within which the researcher was expected to complete the research called for the

use of such a technique. Stratified random sampling technique was used to group the workers into levels (staff and management) and the random sampling technique was used to select members to be interviewed. In stratified sampling, the population is divided into groups called strata. A sample is then drawn from within these strata (Agyedu et al, 1999).

Random sampling is a method by which every member of the population has an equal chance of being selected. The members of each group would be randomly selected to make up for the population to be used for the research. With this method, the individual members of a finite population are numbered serially. Then a decision is taken about the sample size and how to select the sample. The sample members were chosen by selecting at some uniform interval as the ' N^{th} ' interval (e.g. taking every fifth or sixth member).

3.3.2 Instrument used

Primary sources of data were obtained from interviews (through questionnaire method) with the staff, management and customers of the organization. The questionnaire method gave the respondents the opportunity to answer the questions without influence or whatsoever from the researcher. It is also a very good method for collecting statistically quantifiable information. The interview method was a useful tool where language became a barrier between the researcher and the respondents. It contained both closed and open-ended questions. The items on the questionnaire had options from which respondents selected options that best suited the extent to which they agree with the statements (e.g 1 = Poor, 2 = Fair, 3 = Average, 4 = Good, 5 = Very Good). The

questionnaires were distributed at the premises of Ecobank Ghana Limited, Standard Chartered Bank, and Pacific Savings and Loans Limited.

3.3.3 Data Collection

The sample of the study is the Management, Staff and customers of Ecobank Ghana Limited. The study relied on both secondary and primary sources of data.

a) Secondary Data

Secondary data was obtained from journals, magazines, newspapers, the annual management reports of the banks, and various studies made available through library work.

b) Primary Data

The primary data was collected from interviews and use of questionnaire. The researcher visited the offices of the banks to collect information through personal interviews with management, staff and customers as well as the completion of questionnaires submitted to them.

3.3.4 Data Collection Procedure

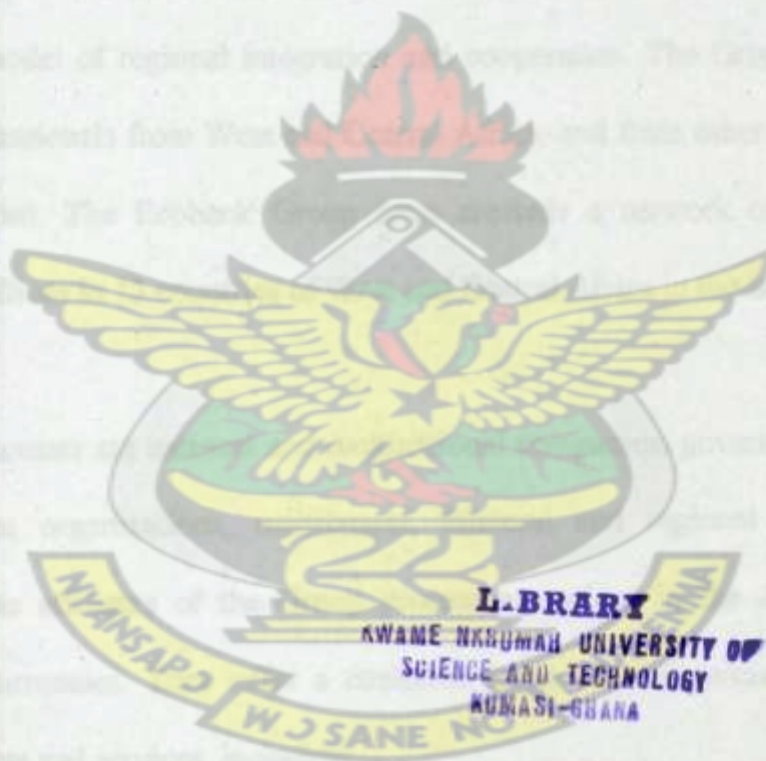
The questionnaires were personally administered by the researcher at the workplace of the respondents. A period of seven (7) days was given to them to answer the items.

The secondary sources of data was collected from news papers, publications, journals, various research work done in the area of ICT and Banking, magazines, internet, etc

3.3.5 Data Analysis

The results were organized using tables and percentages. The technique applied in analyzing the data was for easy understanding. This facilitated the easy interpretation and analyses of the data.

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3.4 BRIEF PROFILE OF SELECTED BANKS

ECOBANK TRANSNATIONAL INCORPORATED

ECOBANK is a private sector banking group based in 13 countries of West and Central Africa, namely: Benin, Burkina Faso, Cameroon, Cape Verde, Côte d'Ivoire, Ghana, Guinea, Liberia, Mali, Niger, Nigeria, Senegal and Togo. Ecobank Transnational Incorporated (ETI) plays a central role in the definition and implementation of common policies and standards on the basis of a "one bank" concept across the group's network.

The Ecobank Group has become an established regional banking institution. It is considered a model of regional integration and cooperation. The Group employs more than 2000 professionals from West and Central Africa, and from other African and non-African countries. The Ecobank Group have created a network of more than 109 branches and offices in 13 countries of West and Central Africa in the last fifteen years.

Ecobank's customers are national and multinational companies, government institutions, non-government organizations, multilateral, bilateral and regional institutions, and individuals. The affiliates of the Group process operations in the African and other international currencies. They offer a complete range of commercial and investment banking products and services, including:

- Current accounts,
- Savings accounts,
- Deposit accounts,
- Foreign exchange,

- Cash management,
- International trade,
- Fund management,
- Loans and overdrafts

Specialized units provide financial services in investment banking, asset management and insurance. Using a common technology platform, the Ecobank affiliates carry out highly automated and standardized operations to maintain a consistent quality of their products and services. In each location, our bilingual teams (English and French) are trained to handle transactions of domestic, regional and international nature.

Moreover, Ecobank enforces management standards and policies in the areas of ethics, anti-money laundering, conflict of interest and corporate governance. These policies and standards are periodically reviewed to reflect local requirements and international practices.

Unique Model

Created by Africans of various nationalities, managed by professionals of diverse experiences, the Ecobank Group is a unique model of regional integration and cooperation. Its expansion will continue to draw on the values that have made it successful:

- A one bank vision transcending existing barriers
- Consideration for people
- Appropriate technology

- o Standardization
- o Quality of service
- o Good corporate governance.

Ecobank is planning to develop the potential offered by the Internet as an efficient distribution and communications channel that will be integrated into the services provided by our network of branches and offices.

STANDARD CHARTERED BANK, GHANA LIMITED

Standard Chartered Bank Ghana Limited has been in operation since 1896, when it was known as the Bank of British West Africa. The Bank is 80% owned by Standard Chartered PLC, and the remainder of the stock is owned locally and traded on the Ghana Stock Exchange. It is the oldest bank in Ghana, and ranked consistently amongst the top three banks, locally. It provides a wide range of services in the consumer and corporate and institutional banking sectors, including comprehensive trade finance, cash management services and foreign exchange products through our treasury operations. They have 19 branches and two agencies located in the main regions of the country. These are fully computerized and networked with automated teller machines which are located at most branches. Corporate and institutional banking services are provided in three main locations in Accra (covering Tema) Kumasi and Takoradi.

Consumer Banking

Standard Chartered Bank Ghana offers a wide range of personal banking products and services nationwide through a network of 19 branches, 6 excel centres, 1 agency on the

Kwame Nkrumah University of Science And Technology Campus and alternate channels such as ATMs, call centres, transactional banking, debit cards, personal loans, and short message sending (SMS) banking. Standard Chartered Bank is the only bank which has 2 Small and Medium Scale Enterprise (SME) centres in the country. Customers enjoy the privilege of a banking partner that is flexible and tailors solutions to take care of their specific banking needs. Standard Chartered services are backed by a strong commitment to providing its customers with effective and reliable banking services and out serving their expectations

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Wholesale Banking

Standard Chartered Bank offers its corporate and institutional clients comprehensive banking solutions with particular emphasis on relationship banking.

Corporate clients benefit from a full range of flexible financial propositions that address individual needs. Clients can access traditional as well as structured products in the areas of lending, trade finance, cash management and treasury. Customers also have access to cross-border payments, treasury services, transaction banking and custodial services - all supported by electronic funds transfer and cash management systems.

Wholesale Banking provides innovative solutions to address the needs of valued customers. An extensive knowledge of international markets combined with a deep local insight puts the Bank in a unique position to provide quality advice and information on currencies, interest rates and risk management. The Bank has always been at the forefront

of creative product offerings. Products offered include foreign exchange forwards and spots, high-yield deposits and foreign currency options. The Bank is an authorized Foreign Exchange Dealer of the Central Bank

PACIFIC SAVINGS AND LOANS LIMITED

Pacific Savings and Loans Company Limited (PSL) was registered in direct response to an identified opportunity in the financial services environment in the country. By its activities, it aims to help boost the economy by mobilizing savings and providing credit to the majority of Ghanaian individuals and small business institutions that have hitherto lacked access to credit. The company has its registered office at House No 25A, Ridge Residential Area, Kumasi.

PRODUCTS AND SERVICES

The company has developed the under listed products and services for its valued customers.

- ***Pacific Saver Account:*** Pacific Saver Account has been created for small and medium entrepreneurs both registered and unregistered who have a high “cash transaction” disposition. Customers operating this account can make payments and withdrawals at zero cost and also earn an attractive rate of interest.
- ***Pacific Business (Developer) Account:*** Pacific Business Developer facilitates a prudent business account for mainly importers of merchandise and their attendant retailers. This account comes with a guaranteed daily doorstep banking service to aid in deposits and withdrawals.

- **Current Account:** Current Account facilitates the customer to carry out his day to day financial transactions at a comparatively lower cost than the company's competitors whilst having the ability to pay third parties with a cheque instrument. It is most suitable for retailers, wholesalers, importers/ distributors of merchandise and their attendant retailers/exporters and manufacturers.
- **Pacific Daily Saver:** Pacific Daily Saver Account has been created for small entrepreneurs such as traders, artisans and stall owners in pedestrian zones, who have a lot of 'cash transactions' predispositions and do not have the time to come to a branch on a daily basis to make deposits.
- **Pacific Time Deposit Accounts:** These accounts are opened for business entities, individuals, clubs, societies, churches, groups etc. Interest rate is paid at maturity with a fair policy for premature termination. The interest rates offered on the time deposit accounts is one of the best rates on the market and tracks the Government treasury rate at a few percentage points below.
- **Pacific Services:** Cheque clearing, special clearing of cheques, cheque book ordering, standing order, bankers draft, salary transfer, account statement, counter cheque, balance enquiry, business advisory etc.

CREDIT PRODUCTS

To meet the credit facility demands of the company's customers who are patronizing above products, the company deemed it fit to design the under listed credit products to enable the customers have access to credit depending on their need and the product they are supporting by their deposits.

- a. Pacific Saver (Individual) Loan Account.
- b. Pacific Developer Loan Account
- c. Pacific Group Saver Loan Account
- d. Pacific Micro (Individual) Loan Account
- e. Pacific Group Micro Loan Account
- f. Pacific Time Deposit Loan Account
- g. Overdraft Account/Short Term Facility
- h. Emergency Loans: Funerals, Church, Clearing



CHAPTER FOUR

Results and Analysis

4.0 Introduction

This section of the case study presents analysis of interviews and questionnaires answered by the Management, Staff and Customers of Ecobank Ghana Limited (Ecobank), Standard Chartered Bank Ghana Limited (Stanchart), and Pacific Savings and Loans Limited (Pacific) in addressing the research question and the objectives. A total of 120 questionnaires (for all the banks) were distributed in this way. 108 questionnaires were returned to the researcher, indicating 90% response rate which comprises 59 by the bankers and 49 by customers. The instrument used in the survey can be found in the Appendix. The researcher also conducted personal interviews with bank managers and IT staff from each bank in order to gain appreciation of what type of IT systems and electronic application services were available in the banks.

4.1 ICT devices being used

An analysis of the types of ICT devices being used by banks is presented in Table 2. The focus of the analysis is on the six main devices identified in literature namely ATMs, intranet, extranet, facsimile, Telephone Banking, PC, Internet, LAN and WAN. The information was basically from personal interviews with Bank managers and IT staff in the respective banks. As shown in Table 2, it was found that computers, telephone, electronic mail, ATMs and Networks (LAN, WAN) are the most popular electronic ICT devices being used by the banks.

Table 2: ICT devices being used

Types of IT System	Ecobank	Stanchart	Pacific
Telephone	X	X	X
Facsimile	X	X	X
Computer	X	X	X
Electronic Mail	X	X	X
LAN	X	X	X
WAN	X	X	
EFT	X	X	X
MICR	X	X	X
ATM	X	X	

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4.2 Analysis of response by Bankers

4.2.1 Performance

The research showed that the advent of ICT has impacted positively on the activities of the banking institutions. Most of the problems they were facing as an institution have been eliminated by the use of ICT.

(a) Processing of Loans

According to the staff interviewed, loan processing time has been reduced by at least 70% after ICT. For instance at Pacific loan processing takes a maximum of three (3) working days whereas it used to be 10 – 15 working days before ICT. From table 3 below, 100% of the respondents (management and staff of the banks) testified that the introduction of the ICT has impacted positively on processing of loans by eighty (80%) percent (good). According to the staff because they have a digital database of all the customers who have taken loan from them, their debt and the time allocated for each to make up all payments, it is easier to evaluate whether the prospective borrower or customer qualifies for the facility as per the bank's criteria. Every payment made goes into the database automatically. This facility which according to the bankers did not exist before the introduction of ICT into banking processes.

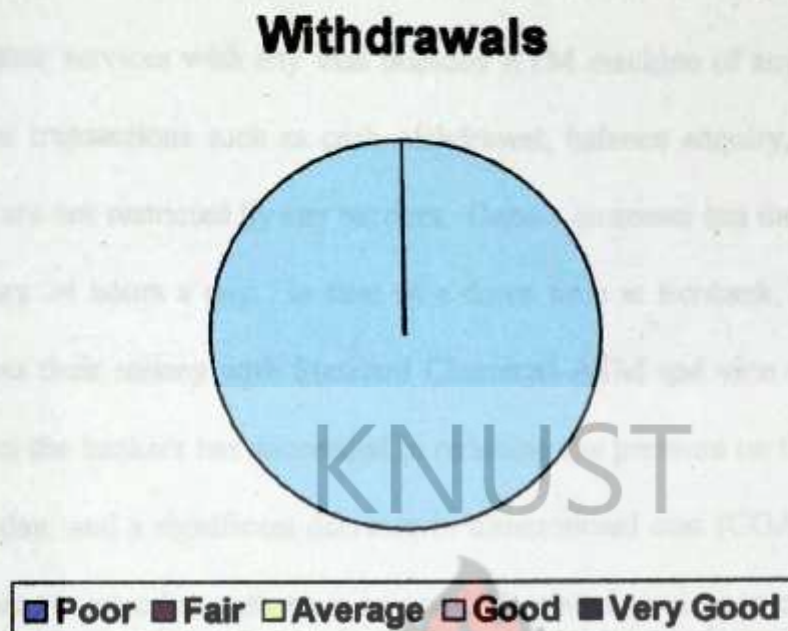
Table 3: Bank Performance

Item	Poor (1)	Fair (2)	Average (3)	Good (4)	Very Good (5)
Processing of Loans				100%	
Opening of New Accounts					100%
Deposits				100%	
Withdrawals				100%	
Customer Requests				6.5	93.5
Process Time				2.8%	97.2%
Error Rate			8.3%	91.7%	
Financial Analysis					100%
Decision Making					100%
Flow of Information					100%
Storage of Information				100%	
Impact of ICT on bank Services				20%	80%
Service provision by the bank					100%

(b) Withdrawals

The bankers accepted that before the advent of ICT withdrawals by customers was taking much longer time and it was almost impossible to withdraw from a different branch of the same bank either within the same region or elsewhere. They were not having instant access to customer's information to enable the smooth completion of the transaction. Where they were even aware of the account number, it was difficult verifying the signature and the true physical identity of the customer at a different branch. Typical of those times, bankers had to such through heap of files to find the file of the customer for surety purposes.

Figure 1



However, with ICT as a business enabler the situation has improved significantly by over 100% as shown in Figure 1 above. According to the respondents (bankers), customers are now able to access their money at all bank branches nationwide either through face-to-face with the teller or ATM. Hirschland (2003) supports the fact that ATMs provide 24-hour access to speedy transactions. ATMs with the support of smart cards provide flexible payment options and more convenient access to client accounts. Customers don't need to carry huge sums of money traveling within or outside the country. This is supported by Essinger (1999), international ATM sharing has given customers the opportunity to travel to any part of the world and withdraw funds in dozens of countries in one visit. It does away with all the problems of travellers cheques and the risk of carrying huge sums of money when traveling.

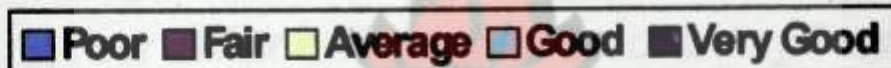
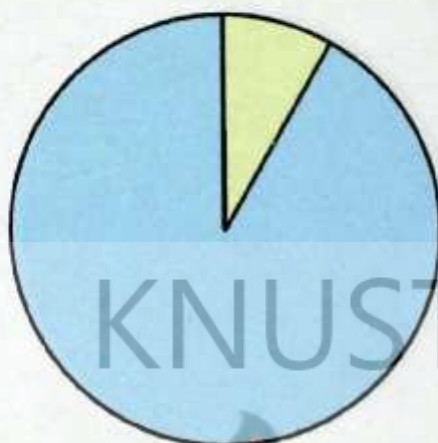
In an interview with the staff of Ecobank Ghana Limited and Standard Chartered Bank Limited, it was confirmed that customers with the visa branded ATM cards can access cash and other services with any visa branded ATM machine of any bank. The ATMs are used for transactions such as cash withdrawal, balance enquiry, and bill payments. Customers are not restricted by any barriers. Once a customer has the card, he has access to his money 24 hours a day. In case of a down time at Ecobank, their customers can easily access their money with Standard Chartered ATM and vice versa. This process according to the bankers has succeeded in reducing the pressure on the tellers, especially during the day, and a significant decrease in transactional cost (CGAP, 2006). The staff has more time to attend to customers on non-ICT related services to customers.

(c) Error rate

Figure II (below) indicate that 91.7% of the respondents agreed that ICT has reduced the error rate by 80% (good) and 8.3% also agreed that it has reduced by 60% (average). The respondents stated that though in the past they were doing everything possible to avoid certain errors, there were always some errors in their work. This according to them, sometimes demanded long hours of search and re-calculation to correct the errors. But ICT has really changed most of these hustles they use to go through. In case of an error the system is able to alert you earlier before the situation gets to the worse. They said that the system has built in data validation checks that ensure that the right data is entered. For instance you can do a 'reversal of a transaction'. With this tool a teller can easily reverse a transaction that has a mistake or was wrongfully entered.

Figure II

Error Rate



(d) Financial analysis

All the respondents (Figure III below) accepted that the advent of ICT has improved financial analysis by the banks by 100% (very good). According to the respondents the software being used by the banks is able to update the account position of customer at anytime. It also manages withdrawals and deposits instantly. They said it has made periodic generation of customer statements much easier. Loans are also well managed with the help of embedded rules in the software (EBBS, Flexcube) that checks the status of customers before granting the loan or otherwise.

Figure III

Financial Analysis



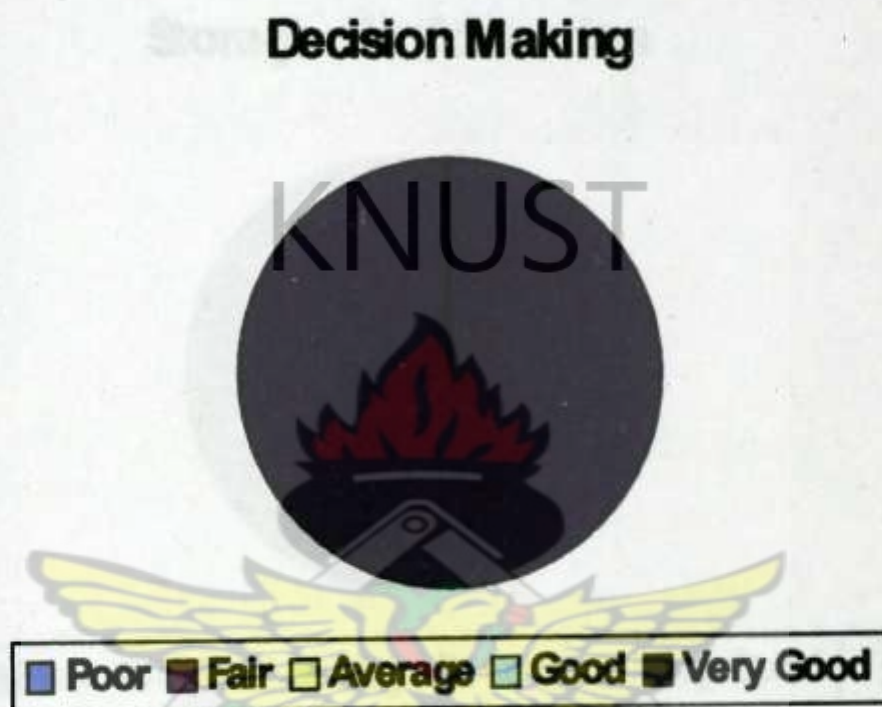
■ Poor ■ Fair ■ Average ■ Good ■ Very Good

(e) Decision Making

As shown in Figure IV the respondents agreed that ICT has improved decision making in the banks by 100% (very good). The bankers affirmed that decision making of their institutions has really improved. With the introduction of ICT common integrated software has been installed for use by all staff of the bank. Ecobank Ghana Limited uses FLEXICUBE, Standard Chartered Bank Ghana Limited uses Electronic Business Banking System (EBBS) and Pacific Savings and Loans Limited uses . With the help of the decision support system, reliable and accurate report is generated for management activities and other banking activities are now prompt and reliable as well. This according to the respondents facilitates processing of information and availability as well. Top managers don't need to descend down to tellers before they can have access to information. They only need to log on to the banks ERP system and every information is

available, reliable and its integrity is as well assured. Thus strategic managers of the banks are able to make quick and reliable strategic decisions for the growth of the institution and the value of the organization as well.

Figure IV



(f) Storage

One of the many areas currently being renewed in the banks is the replacement paper-based processes with digital process. Electronic mail is increasingly being applied for especially non-legal correspondence like account statements, marketing and sales. Customers have to fill a form to receive their statements through the electronic mail. This was particularly evident at Standard Chartered Bank Ghana Limited. Again large amounts of information are stored digitally with the help of real time processes. In an interview with banks IT staff, they confirmed that now a chunk of their information is

stored digitally on HDD and also on a removable drive for recovery purposes. As shown in Figure V all the respondents testified that with the introduction of ICT the storage of information has improved by 100% (very good).

Figure V

Storage of Information



(g) Flow of Information

Figure V indicate that all the respondents believe that flow of information has improved by 100% (very good) and this is due to the presence of networks like LAN, W-LAN etc. Networks application is a vital part of an efficient and effective ICT-enabled system, which is especially true in the case of banks with multiple branches to be linked.

Figure VI

Flow of information



Local Area Network (LAN) may also be seen as a basic indicator of the minimum infrastructure required to enable banks to send and receive information as well as conduct e-banking at a substantial level (e-Business Watch, Sector Study on the Financial Industry, 2002/2003). With the help of the LAN and the specialized software, the banks report generation for the management activities and other banking activities are now prompt and reliable. Wire-based LAN is currently the dominating technology in all the banks. This is due to the fact that it is a relatively low-tech and easily manageable ICT solution.

The banks also use an intranet among other things to facilitate collaboration across functions, sending and receiving information and to advance productivity and efficiency

by supporting business operations and decisions across the inter-networked enterprise. The respondents testified that the intranet has brought about effective, fast and reliable communication flow as well reliable and faster communication. Extranets on the other hand are not as commonly used as Intranets. An Extranet is a system by which banks can provide access into their system (network) to customers and suppliers. The Extranet is considered as a safer way of conducting e-banking services compared to communicating over the Internet, as it is a closed data network between a bank and its customers. The rather low uptake might be explained by the fact that an Extranet is often customised to individual customers, as it has to correspond with the customers' own ICT systems.

Table 4: Turnaround time for Customers to access their account

0 – 10 minutes	100%
11 – 20 minutes	
21 – 30 minutes	
31 – 45 minutes	

As shown in table 4 above, all the respondents testified that customers who visit the banking hall to access their account spend a maximum of ten (10) minutes. The use of ICT has largely facilitated the arrival and departure of customers/clients to the bank. This is due to the use of ATM's hooked to the visa platform allowing customers a worldwide payment solution and access to money at ATM's with the visa logo globally.

(i) Benefits and Disadvantages of ICT

The benefits mentioned by the respondents (management, staff and IT) are as follows;

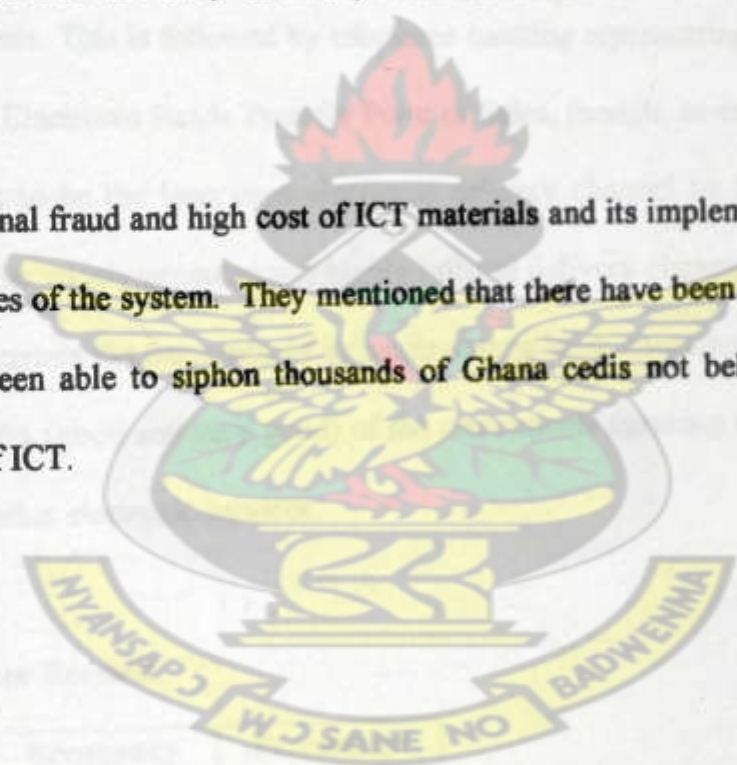
It has improved the database management of the banks. According to the bankers, now managers need not keep several heaps of files containing salient information about customers which are relevant to the organization. ICT has come to create a digital version of data keeping making it more user-friendly and convenient. The data stored on the HDD is well protected. Also the security of the information stored is assured as unauthorized persons are denied access to the information through the use of security mechanisms such as biometric, password, etc. Again credit officers have been saved the hustle of calculating all transactions made before a statement could be prepared for customers. Upon request customers will have access to their statement within two days.

The networked system has also increased the rate of transactions and as a result the turn around time of customers has reduced significantly to a maximum of ten (10) minutes. This networking through internet, intranet and extranet, within and with all the branches nationwide sending and receiving of information is real time. This transaction medium also lowers their overhead cost. ICT – based transactions needs less time than pure cash based transactions because it can be completed electronically. A survey by CGAP revealed that, low-cost “direct banking” technology channels, such as internet Banking and ATMs, process transactions at only one-fifth ($\frac{1}{5}$) the cost of a branch teller (CGAP, 2006).

The advent of ICT has also eliminated signatory problems. Signatures of customers are now digitized. The signature on any issued cheque is verified with the digitized version to ensure authenticity. This reduced fraud associated with signatories.

Customers have been granted a high degree of satisfaction because of ease of banking. The networked system enables customers to transact business more efficiently and independently as they have access to their money at any branch and any time. Thus, giving much flexibility to the customer. They can check their balance, credit, or even make payments on-line and carry out many routine transactions without going into a branch.

However, occasional fraud and high cost of ICT materials and its implementation are the main disadvantages of the system. They mentioned that there have been instances where personnel have been able to siphon thousands of Ghana cedis not belonging to them through the use of ICT.



4.3 Analysis of response by customers

Table 5: Use of ATM by customers

Response	Frequency	Percentage
Poor		
Fair		
Average	1	2.0
Good	3	14.3
Very Good	45	83.7
Total	49	100

With respect to the type of IT innovations used by customers (Table 5), ATMs appear to be the most widely accepted and highly used electronic delivery tool indicating 56.7% of the total respondents. This is followed by telephone banking representing 20.8% and PC banking (15.2%). Electronic Funds Transfer Point of Sales, though, an earlier form of IT innovation, seems to be the least used electronic delivery channel by bank customers. Since ATMs are the widely accepted and highly utilized delivery channel, it is important at this point to ascertain the frequency of its usage among bank customers. This is shown in table 5 with 98% (good and very good) of the respondents agreeing that they use the ATM more than other electronic services.

Table 6: Customer Request

Response	Frequency	Percentage
Poor		
Fair		
Average	1	2.0
Good	8	14.3
Very Good	40	83.7
Total	49	100

From table 6 above, out of a total of 49 respondents, 98% (good and very good) agreed that ICT provides adequate responses to their request of products/services information, as against 2% who wasn't sure. This reflects that, ICT Innovation provides adequate responses to customer's request.

Table 7: Service Delivery

Response	Frequency	Percentage
Poor		
Fair		
Average		
Good	9	18.4
Very Good	40	81.6
Total	49	100

The response of customers as shown in table 7 above gives the responses of customers about the impact of ICT on service delivery. All 49 representing 100% (good and very good) of the customers who responded agreed that ICT has brought efficiency in the service delivery of the banks.

Table 8: Impact of ICT on Banks service

Response	Frequency	Percentage
Poor		
Fair	5	10.2
Average	3	6.1
Good	9	18.4
Very Good	32	65.3
Total	49	100

Table 8, shows the responses of customers with respect to the impact of ICT on bank services. A total of 41 respondents representing 83.7% (good and very good) agreed that

ICT has improved the banks' services 10.2% respondents however did not agree that ICT has improved the banks' services.

Table 9: Turnaround time for Customers to access their account

Response	Frequency	Percentage
Poor		
Fair	2	4.1
Average	1	2.0
Good	2	4.1
Very Good	44	89.8
Total	49	100

The responses of customers as shown in Table 9 confirm that ICT has reduced the turn around time of customers. Out of 49 respondents, 44 representing 89.8% (good and very good) agreed that the time involved in transacting business with their banks has been reduced significantly with ICT. A total of 2 respondents representing 4.1% however disagreed with this view.

Table 10: Customers view on time spent at the banking hall

	Frequency	Percentage
0 – 10 minutes	10	20.4
11 – 20 minutes	18	36.7
21 – 30 minutes	12	24.5
31 – 45 minutes	6	12.3
1 hour or more	3	6.1

The results, as indicated in table 10 show that, 36.7% representing 18 out of a total of 49 respondents spend between 11 and 20 minutes in the banking hall. This indicates that bank customers to a large extent spend much time in the banking hall for their transactions in Ghana.

Are computers helping the bank to deliver good service?

The general response was positive. All the customers agreed that the computers have impacted positively on the banks to provision of fast, efficient and reliable service. They sited situations as efficient network service that allows one to know his balance and withdraw money with ease through the ATM. Others also believe that it gives easy accessibility to their accounts through the internet. Also the risk of losing data has been drastically minimized.

However, they expressed some misgivings about the service delivery of the banks. They mention that some times one has to join long queues and waste a lot of time before you are served. The only explanation given by the banks is either the link is down or is slow. Sometimes too the ATM's may breakdown during the weekends and that means one will have to wait till Monday before having access to the money.

They also complained about discrepancies in their statements sometimes. For instance the stated balance may differ with the actual balance known to the customer. This problem according to the respondents is very much palpable with the ATM's.

Recommendations by Customers

They advised that the bank should educate customers to patronize branches nearer to their communities to minimize the pressure and long waiting hours at the banking hall. Such education must emphasize that all transactions can be done at all the branches because of the networking and that there is no need travelling to a particular branch for some special

needs. They stated further that the banks should also come out with more electronic products and services to reduce the turnaround time of customers. They believe that such products will give them the opportunity to sit at the comfort of their homes and transact business with the bank. They emphasized that with such products and services a single click of a button will do a lot of work. Hence reduce the number of customers who visit the bank daily and the consequent queue at the bank.

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5.1 Recommendations

From the findings of the study, I believe that the following recommendations will help banks and their customers to realize the full benefits of ICT.

CHAPTER FIVE

Summary, Recommendations and Conclusion

5.0 Summary

ICT have played a major role in enhancing performance and efficiency in the banking sector. The author using the three commercial banks (Ecobank, Stanchart and Pacific) for the study set out to find the impact of ICT on banking activities in Ghana. The study was organized into two parts. The first part which dealt with the background information on the study was collected from secondary sources while their effect on the activities was from a survey. A sample size of one hundred and twenty (120) respondents was selected using purposive and simple random sampling technique. Analysis of the data collected reveal that ICT has impacted positively on banking activities in Ghana and majority of the customers claim it has really facilitated their transactions with the banks. It was realized that the financial service providers are linked nationally and globally through ICT, in particular the Internet. However, much of the digitization of the banking sector in Ghana is at an infant stage. Further, due to low ICT adoption rate among the general population in Ghana's economy, financial institutions are unable to realize higher return on investment on their infrastructure.

5.1 Recommendations

From the findings of the study I believe that the following recommendations will help banks and their customers to realize the full benefit of ICT;

- The banks may help or provide their customers with a PC and free access to the Internet if the customers are willing to use the e-banking services for a stipulated time period in the banking hall.
- Financial institutions (banks) should also develop new user friendly systems and applications for the general population.
- Government and banks should play a key role in enhancing not only the infrastructure, but also put in place various incentives at the national level to encourage people to use this medium (ICT) of financial transaction. This may include a national law protecting the use of information and also making PC available and affordable as possible for every Ghanaian.
- It is also recommended that further studies may be conducted to include ICT security.

5.2 Conclusion

Technological developments particularly in the area of Telecommunications and Information Technology are revolutionizing the way business is done in Ghana. ICT 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 insurgency in the financial industry has activated a new wave of change in the banking sector for the provision of service/products that is compatible with the

demands of ICT. Certainly, the advances in ICT have introduced new delivery channels in the Ghanaian banking sector. This paper sought to find out the impact of ICT on banking activities and performance in Ghana with special emphasis on selected commercial banks in Kumasi. The study focused on changes in performance of the banks with regards to services/products.

The data for the study was mainly obtained from the field survey through questionnaire administration and interviews. Out of an initial sample of 120, 108 questionnaires were received representing a response rate of 90%. Bank management, staff and IT personnel in the respective banks were also interviewed to ascertain the type of ICT equipments in use by the respective banks in Ghana. The devices include telephone, computers, internet, ATM's, fax machines.

With respect to the impact of ICT on banking activities, it was found that most bank workers and Ghanaian banking customers support the assertion that ICT has impacted positively on banking activities in Ghana. The results of the study generally indicate that, ICT have contributed positively to the provision of banking services and the growth of the Ghanaian banking industry. However, internet banking is not yet developed in Ghana.

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APENDIX I

QUESTIONNAIRE FOR BANKERS TO SOLICIT VIEWS ON THE TOPIC; IMPACT OF ICT ON BANKING ACTIVITIES IN KUMASI

This questionnaire is designed to gather information on the above stated topic for project work in partial fulfillment of the requirement for the award of an MSc ICT Degree in the Osei Tutu II Institute for Advance ICT Studies, Kumasi.

1. Sex: Male () Female ()
2. Educational Background
Basic school ()
Secondary ()
Tertiary ()
None of the above ()
Other (please specify)
3. Department
4. How many years have you worked with the bank?
Less than a year () One year ()
Two years () Three years or more ()
5. What are your current Responsibilities?
.....
.....
6. Do you think your duties require/demand the use of Computers?
Yes () No ()
Please explain your answer
.....
.....
7. Is the bank using computers in all her departments?
Yes () No ()
8. Is your bank using any specialized computer program?
Yes () No ()

If yes what is the name?

.....

9. How do you rate your bank's system performance with regards to the following,

Item	Poor (1)	Fair (2)	Average (3)	Good (4)	Very Good (5)
Processing of Loans					
Opening of New Accounts					
Deposits					
Withdrawals					
Customer Requests					
Process Time					
Error Rate					
Financial Analysis					
Decision Making					
Flow of Information between and within the bank					
Storage of Information					
Impact of ICT on bank Services					
Service provision by the bank					

10. Explain how the system impact on decision making of the bank?

.....

11. How long does it take for a customer to be served by your bank?

0 – 10 minutes	
11 – 20 minutes	
21 – 30 minutes	
31 – 45 minutes	
1 hour or more	

12. On the average, how often does your system goes down?

(Not often) (Daily) (1 or 2 times a week) (Several times a week) (Quite frequent)

13. Please mention the benefits the introduction of ICT have brought to you outfit .

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14. Mention the disadvantages that have resulted after the introduction of ICT into the banks activities.

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15. In your view what has been the impact of ICT on the banks activities.

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16. Do you have any recommendations?

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APENDIX II

QUESTIONNAIRE FOR CUSTOMERS TO SOLICIT VIEWS ON THE TOPIC; IMPACT OF ICT ON BANKING ACTIVITIES IN KUMASI

This questionnaire is designed to gather information on the above stated topic for project work in partial fulfillment of the requirement for the award of an MSc ICT Degree in the Osei Tutu II Institute for Advance ICT Studies, Kumasi.

1. Sex: Male () Female ()
2. Educational Background
 - Basic school ()
 - Secondary ()
 - Tertiary ()
 - None of the above ()
3. How long have you being saving (banking) with the bank?
 - Less than a year () One year ()
 - Two years () Three years or more ()
4. What type of account do you operate with the bank?
 - Current Account () Savings Account ()
 - Fixed Deposit () Others ()
5. Are you aware that the bank has automated its processes?
 - Yes () No ()
6. How do you rate the bank's system performance with regards to the following.

Item	Poor (1)	Fair (2)	Average (3)	Good (4)	Very Good (5)
Online Banking					
ATM					
Response to your request					
Processing of Loans					
Opening of New Accounts					
Deposits					
Withdrawals					
Customer Requests					
Turnaround time					
Error Rate					
Financial Analysis					
Decision Making					
Flow of Information between and within the bank					
Storage of Information					

Impact of ICT on Bank Service					
Service provision by the bank					

7. Please select the time you spend in the bank by ticking the appropriate box.

0 – 10 minutes	
11 – 20 minutes	
21 – 30 minutes	
31 – 45 minutes	
1 hour or more	

7. How do you receive your statement of accounts?

Through Post ()

Internet ()

Other (please specify)

8. Do you sometimes see mistakes in your account statement?

Yes ()

No ()

If yes please explain with example

.....

9. Do you think the computers are helping the bank to deliver good services to you?

Yes ()

No ()

Please explain

.....

10. Please give recommendations that you think can help the bank provide efficient service to its customers.

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