INFLUENCE OF INFORMATION COMMUNICATION TECHNOLOGY INNOVATIONS ON PERFORMANCE OF KENYA COMMERCIAL BANK LTD.

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Influence Of Information Communication Technology Innovations On Performance Of Kenya Commercial Bank Ltd.

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DECLARATION

This thesis is my original work and has not been presented for a degree at any other university.

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DEDICATION

This study is dedicated to my family, Dorothy and Faith for their support and encouragement.

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ABBREVIATIONS AND ACRONYMS

ATMs   Automated Teller Machines

DOI   Diffusion of Innovation

GCI   Global Competitive Index

GCR   Global Competitive Report

GoK   Government of Kenya

ICT   Information and Communication Technology

IS   Information System

IT   Information Technology

KCB   Kenya Commercial Bank

PEOU   Perceived Ease of Use

R&E   Research & Development

PU   Perceived Usefulness

RoK   Republic of Kenya

SPSS   Statistical Package for Social Sciences

TAM   Technology Acceptance Model

TRA   Theory of Reasoned Action

UTAUT   Unified Theory of Acceptance and Use of Technology

WEF   World Economic Forum

ABSTRACT

The Financial services sector in Kenya has undergone transformation in the past years with several innovation driven improvements. Commercial banks in Kenya and the rest of the world have continued to use huge investments in ICT based innovations and training of manpower to handle the new technologies. The relationship between the growing investments in ICT based bank innovations and the banks performance in Kenya needs to be studied and establish whether ICT innovations strategies have contributed to the performance of commercial banks in Kenya. The main objective of the present study was to find out the influence of Information Communication Technology Innovations on financial performance of Kenya Commercial Bank Ltd. The specific objectives being; To find out how technology innovations, product innovations, market innovation and process innovation influence performance of Kenya Commercial Bank Ltd. It attempts to draw on theoretical literature and empirical studies on innovation management and technological capabilities in an effort to explore the role of ICT innovations on performance of Kenya Commercial Bank Ltd. The development was intended to inform further research and enable organizations to develop pathways for ICT Induced innovations. The study employed descriptive research design and inferential statistics. The target population of this study was the management staff working at Kenya Commercial Bank Ltd. Primary data was collected using a questionnaire while secondary data was obtained from annual reports of the Kenya Commercial Bank Ltd. The data was then coded to enable the responses to be grouped into various categories. The results of the study established that technology innovations, process innovations and market innovations had a positive and significant effect on performance of Kenya Commercial Bank Ltd with t-values of 2.302, 2.065 and 2.175 respectively at significance levels of less than 0.05 while product innovations had a positive influence on performance of Kenya commercial Bank Ltd with the t-value of 0.195 but its influence was not statistically significant since the p-value was 0.846 which is greater than 0.05.

CHAPTER ONE

INTRODUCTION

This chapter covers the background information of the study, the statement of the problem, general and specific objectives of the study and the corresponding research questions. The Chapter also provides the importance and scope of the study as well as operational definition of technical terms used in the study.

1.1 Background information

Information and Communications Technology (ICT) is defined as any technology that facilitates communication and assists in capturing, processing and transmitting information electronically (Stiglitz, 2003). ICTs are a valuable source of business innovation because they provide substantial efficiency gains. As Koellinger (2005) puts it "ICT makes it possible to reduce transaction costs, improve business processes, facilitate coordination with suppliers, fragment processes along the value chain (both horizontally and vertically) and across different geographical locations, and increase diversification."

Each of these efficiency gains provides an opportunity for innovation. For example, IT automated system links lead to more streamlined businesses processes and allow staff to be more responsive to emerging customer needs. Similarly, technologies which allow staff to effectively communicate and collaborate across wider geographic areas will encourage strategies for less centralized management, and more flexible external relations, all of which involve different types of innovative activity.

Gretton, Gali and Parham et al. (2004) suggested two reasons why business use of ICT encourages innovative activity. Firstly, ICT is a 'general purpose technology' which provides an 'indispensable platform' upon which further productivity-enhancing changes, such as product and process innovations, can be based. For example, a business which establishes a web presence sets the groundwork from which process innovations, such as electronic ordering and delivery, can be easily developed. ICT-based methods for design, test and simulation enable greater precision and reduce costs (Sudarsan, Steven and Ram., 2005). In this way, adopting general purpose ICT makes it relatively easier and cheaper for businesses to develop innovations.

Secondly, the spillover effects from ICT usage, such as network economies, can be sources of productivity gains. For example, staff in businesses which have adopted broadband Internet are able to collaborate with wider networks of academics and international researchers more closely on the development of innovations and keep abreast of current consumer trends. These are spillover benefits because the R&D efforts of other researchers in the collaborative group can be appropriated by all.

Econometric analysis confirms that ICTs play an important role in enabling business innovation. Gago and Rubalcaba (2007) find that businesses which invest in ICT, particularly those which regard their investment as very important, or strategically important, are significantly more likely to engage in services innovation.

Just the fact of having a broadband connection seems to enable the innovative activity of firms. According to Grimes , Ren and Stevens (2011) broadband-enabled firms are more likely to have a webpage than firms without this type of connection, which in turn provides a simple platform to introduce innovations related to the use of the Internet for

commercial transactions. In this sense, the results of Bertschek ,Cerquera and Klein (2011) confirm that high-speed Internet connections have a significant and positive effect on a firm's probability to introduce new products or processes.

1.1.1 Global Perspective

Abello and Prichard (2008) link the Innovation Survey and the Business Use of Information Technology Survey in Australia and find that different ICT technologies are associated to different types of innovations. For example, connection to the Internet via cable modem is significantly associated with innovation in products, while wireless connection is more significant for organisational/managerial operations.

The Eurostat ICT impacts project (Eurostat, 2008) shows that, on average, ICT usage is positively related to firm performance. The strength of these results varies over countries, however, and it also appears that the benefits of different types of ICT usage are industry specific. By linking Eurostat firm-level data on ICT use with firm-level estimates of ICT investment, Van Leeuwen (2008) shows that e-sales and broadband use affect productivity through their effect on innovation output. Broadband use, however, only has a direct effect on productivity if R&D is not considered as an input to innovation.

The findings by Spiezia (2011) support the hypothesis that ICTs act as an enabler of innovation, in particular for product and marketing innovation. Unlike the findings by other studies, these effects appear large both in manufacturing and services. No evidence is found, however, that ICT use increases the capability of a firm to cooperate with other firms/institutions, to develop innovation in-house or to introduce more "innovative" (new-to-the-market) products. These results suggest that ICTs enable firms to adopt

innovations developed elsewhere but they do not increase their "inventive" capabilities, i.e. the capability to develop new products and processes.

The available econometric evidence at firm level shows that a combination of investment in ICTs and changes in organisational and working practices contributes to firm productivity growth. Crespi, Criscuolo and Haskel (2007) use CIS data for the UK and find a positive effect on firm performance of the interaction between ICT and organisational innovation.

1.1.2 Financial performance

There are various measures of organizational performance. However the most used is profitability. Profitability measures the extent to which a business generates a profit from the factors of production: labor, management and capital. Profitability analysis focuses on the relationship between revenues and expenses and on the level of profits relative to the size of investment in the business (Gilbert & Wheelock, 2007).

Four useful measures of firm profitability are the rate of return on firm assets (ROA), the rate of return on firm equity (ROE), operating profit margin and net firm income. The ROA measures the return to all firm assets and is often used as an overall index of profitability, and the higher the value, the more profitable the firm business. The ROE measures the rate of return on the owner's equity employed in the firm business. It is useful to consider the ROE in relation to ROA to determine if the firm is making a profitable return on their borrowed money. The operating profit margin measures the returns to capital per dollar of gross firm revenue. Recall, the two ways a firm has of increasing profits is by increasing the profit per unit produced or by increasing the volume of production while maintaining the per unit profit. The operating profit margin

focuses on the per unit produced component of earning profit and the asset turnover ratio (discussed below) focuses on the volume of production component of earning a profit (Crane, 2011).

Net firm income comes directly off of the income statement and is calculated by matching firm revenues with the expenses incurred to create those revenues, plus the gain or loss on the sale of firm capital assets. Net firm income represents the return to the owner for unpaid operator and family labor, management and owner's equity. Like working capital, net firm income is an absolute dollar amount and not a ratio, thus comparisons to other firms is difficult because of firm size differences (Gilbert & Wheelock, 2007).

1.1.3 Effect of Technology innovation on financial performance of commercial banks.

It is widely recognized that innovation is key to the economic performance of firms. Innovative firms grow faster in terms of employment and profitability. An innovation is an idea, practice, or object that is perceived to be new by a person or adopting entity. The innovation is not seen as something periodical that happened by accident nor something that results from the action of an individual agent. Innovation is seen as the result of an interactive and non linear process between the firm and the environment. When an innovation emerges, diffusion unfolds which entails communicating or spreading of the news of the innovation to the group for which it is intended (Okunoye & Frolick, 2007). Adoption however is the commitment to and continued use of the innovation. The diffusion of innovations theory provide explanations for when and how a new idea, practice or newly introduced information and communication medium is adopted or rejected over time in a given society (Okunoye & Frolick, 2007).

According to Agboola (2006), the application of information and communication technology concepts, techniques, policies and implementation strategies to banking services has become a subject of fundamental importance and concerns to all banks and indeed a prerequisite for local and global competitiveness. ICT directly affects how managers decide, how they plan and what products and services are offered in the banking industry. It has continued to change the way banks and their corporate relationships are organized worldwide and the variety of innovative devices available to enhance the speed and quality of service delivery (Agboola, 2006).

The internet offers a potential competitive advantage for banks and this advantage lies in the areas of cost reduction and more satisfaction of customer needs (Bradley & Stewart, 2003 and Jaruwachirathanakul & Fink, 2005). Encouraging customers to use the Internet for banking transactions can result in considerable operating costs savings (Sathye, 1999). The internet is the cheapest distribution channel for standardized bank operations, such as account management and funds transfer (Polasik and Wisniewski, 2009). Customer dissatisfaction with branch banking because of long queuing and poor customer service is an important reason for the rapid movement to electronic delivery (Karjaluoto, Mattila & Pento, 2002). The commitment of senior management is a driving force in the adoption and exploitation of technology (Shiels, McIvor & O'Reilly, 2003).

According to Porteus (2006), Mobile banking is emerging as a key electronic channel for the global banking and financial services industry. The ubiquitous nature of mobile devices and services, and the ability of mobile banking services to reduce overall operational costs, streamline operations, and expand customer base are expected to boost prospects in the industry. Increasing adoption of mobile phones among general

consumers, particularly among the younger generation (in the 18-34 years age group), and rapid rise in demand for mobile payments are expected fuel demand for mobile banking services. The industry is also expected to benefit from favourable government and regulatory specifications, which are aimed at providing banking services to unbanked customers to promote economic development.

Bank for International Settlement (BIS) in their study recognized that safe and efficient retail payment systems enhance the effectiveness of the financial system, boost consumer confidence and facilitate the functioning of commerce. Conceptionally, payment systems are coined as being two-sided markets (Rochet & Tirole, 2006). Virtually every economic transaction involves the use of a payment instrument, such as cheques, electronic funds transfers, and so on (Berger, 2003). Hasan, Schmiedel and Song (2009) in their study to provide a combined and integrated view of the importance and significance of retail payments for bank performance using country level retail payment service data across 27 EU markets found out that countries with more developed retail payment services, banks perform better, in terms of both their accounting ratios and their profit and cost efficiency. They further found that the relationship is stronger in countries with higher levels of retail payment transaction equipment, like ATMs and POS terminals.

1.1.4 Banking Sector in Kenya

In Kenya, studies by Bikker and Bos, (2006) concluded that innovation in Kenyan banking industry were driven by technological advances, changing customer needs and intensified competition. The changing business environment can be explained by a number of factors; - First, customer productivity and profitability in the retail segment has gradually collapsed in many markets in Africa and around the world. Secondly, the

self-aware attitude of the new customer towards the bank has led to a shift of power in the customer bank relation. Thirdly, tighter regulation demanded by government and institutions led to increasing costs for compliance. This power shift have dictated changes in the way customers and bankers conduct their business, making service innovation essential to achieve competitive advantage .

Over the last few years, Kenyan banks have been pre-occupied with innovations in the services they offer and how they offer them. Such service innovations have become the value proposition for particular banks. For instance , Equity bank (2013) identify itself with money transfer services, mobile banking, ATM services, card services, equity cash back, FAQS, Visa personal payments, online banking and agent banking. Consolidated Bank (2013) identify with banking product which are classified into personal banking products and business banking products. This is characterized by services product innovations: internet banking, mobile banking, agent banking, Forex rates, ATM locations, Branches and debit cards. Chase bank embraces the following services: bank teller, electronic banking, money transfer, safe deposit lockers, and night safe and executive management offices. Barclays bank(2013) is currently focusing on investing in technology and system capabilities so as to offer more affordable and convenient products such as the internet banking, smart phone and tablet banking services to enhance service delivery to all customers wherever they are.

1.1.5 Kenya Commercial Bank Limited.

Kenya Commercial Bank (KCB) is a financial services provider headquartered in Nairobi Kenya. As of December 2010, it was among the three largest commercial banks in Kenya

with assets of more than US$2.65 billion (KES: 223 billion), and shareholders capital valued at US$486 million (KES: 40.9 billion). The other two large Kenyan commercial banks are Barclays Bank Kenya and Standard Chartered Bank Kenya. As of December 2010, KCB Group, the parent company of KCB Kenya, had the largest branch network in Kenya (168 branches) of all 44 licensed commercial banks in the country. Shares of the stock of Kenya Commercial Bank Group (KCB Group), the parent company of Kenya Commercial Bank, are listed on the Nairobi Stock Exchange (NSE), under the symbol (KCB). The Group's stock is also cross listed on the Uganda Securities Exchange (USE), the Rwanda Stock Exchange (RSE) and the Dar-es-Salaam Stock Exchange (DSE) (KCB, 2012).

The history of Kenya Commercial Bank (KCB) dates back to 1896 when its predecessor, the National Bank of India opened an outlet in Mombasa. Eight years later in 1904, the bank extended its operations to Nairobi, which had become the headquarters of the expanding railway line to Uganda. The next major change in the bank's history came in 1958. Grindlays Bank merged with the National Bank of India to form the National and Grindlays Bank. Upon Kenya's independence in 1963, the Government of Kenya acquired 60% shareholding in National & Grindlays Bank in an effort to bring banking closer to the majority of Kenyans. In 1970, the Government of Kenya acquired 100% ownership of the bank's shares to take full control of the largest commercial bank in Kenya. National and Grindlays Bank was renamed Kenya Commercial Bank. The Government has over the years reduced its shareholding in KCB to 23%, as of December 2008.

In 1972, Savings & Loan (Kenya) Limited was acquired to specialize in mortgage finance. In 1997, another subsidiary, Kenya Commercial Bank (Tanzania) Limited was incorporated in Dar es Salaam, Tanzania, to provide banking services and promote cross-border trading. In May 2006 KCB extended its operations to South Sudan following licensing by the Bank of South Sudan. In November, 2007, the first branch of KCB Uganda Limited opened in Kampala, Uganda following licensing by the Bank of Uganda. In 2008, KCB expanded to Rwanda, where the first branch opened in Kigali in December 2008.

As of August 2010, the Government of Kenya owns 17.74% of Kenya Commercial Bank. The remaining 82.26% is owned by institutional and private investors. KCB has more than 150 branches throughout Kenya, making it the largest banking network in the region. It has the largest number of own-branded ATMs in Kenya. Since 2004 all of the branches in Kenya have been re-branded as part of a wider corporate branding exercise. KCB has partnered with Pesa Point to increase the number of ATM points where customers can access their funds (KCB, 2012).

1.2 Statement of the problem

Kenya Commercial Bank limited has adopted innovations in various ways which include T24 Core banking system, Internet banking, KCB M-Benki, Card technology as well as partnerships with several organizations. During the period of innovation they have experienced performance in aspects of market share and profitability. There are concerns that these ICT led innovations might add value to the organization performance as the bank reported a profit before tax of Ksh. 20.1bn for the year to 31st December, 2013. This reflects a 17% increase from Kshs 17.2bn to Kshs 20.1bn (KCB Report, 2014).

Previous studies regarding performance effect of technology-led innovation to bank performance have provided inconsistent results. Batiz-Lazo and Woldesenbet (2006) and Mwania & Muganda (2011); in their study concluded that financial innovations had significant contribution to banks performance, While Pooja and Sing (2009) and Franscesa and Claeys (2010) concluded that financial innovation had least impact on bank performance. It is at the center of such mixed conclusions that creates and necessitates the need to carry out the study from a Kenyan context to establish the effect of ICT led innovations on performance of Kenya Commercial Bank Ltd.

Despite the importance of technological innovations in explaining banking performance, the effects of technological innovation on performance, is still misunderstood for two main reasons; first, there is a lack of understanding about the drivers of innovation and secondly innovation's effects on bank's performance remains untested (Mabrouk & Mamoghli, 2010). There is a knowledge gap on a combined effect of information communication technology innovations on financial performance of Kenya Commercial Bank. Most of the studies considered the effect of a single technological innovation on financial performance and effect of composite of ICT innovations has not been tested in Kenya. This study therefore aimed to answer the following research question: Does information communication technology innovation have effects on the financial performance of Kenya Commercial Bank?

1.3 Objective of the Study

1.3.1 General Objective

The general objective of the study was to establish the influence of Information Communication Technology innovations on performance of Kenya Commercial Bank Ltd.

1.3.2 Specific Objectives

Specifically, the study sought to:

i. To establish how Technology Innovations influences performance of Kenya Commercial Bank Ltd.

ii. To find out how Product Innovations influences performance of Kenya Commercial Bank Ltd.

iii. To explore how Market Innovations influences performance of Kenya Commercial Bank Ltd.

iv. To assess how Process Innovations influences performance of Kenya Commercial Bank Ltd.

1.4 Research Questions

i. How do Technology Innovations influence performance of Kenya Commercial Bank Ltd?

ii. How do Product Innovations influence performance of Kenya Commercial Bank Ltd.?

iii. How do Market Innovations influence performance of Kenya Commercial Bank Ltd.?

iv. How do Process innovations influence performance of Kenya Commercial Bank Ltd.?

1.5 Importance of the Study

The research has covered critically the various ICT induced innovations strategies that have been adopted by the Kenya Commercial Bank and how each of the strategies influences the performance of the bank. The study has provided theoretically and empirically backed evidence on ICT led innovations. Understanding on how the various ICT induced innovations influences performance of the bank is important in directing policy and proper allocation of limited resources. The study bridged the gap by establishing the association that exists between ICT led innovations and performance of Kenya Commercial Bank Ltd.

1.6 Scope of the Study

The study focused more on the effects of information communication technology innovations on performance of Kenya Commercial Bank Limited. The ICT led innovations used in the study are, Technology innovations, product innovations, market innovations and process innovations. The financial performance measures used are, commission fee based income, interest based income, customer acquisition and retention and income generating potential of the bank. The study utilized both primary and secondary data.

1.7 Limitation of the Study

Due to time and resource constraints the study only reviewed information communication technology innovations in Kenya Commercial Bank Ltd and did not include other commercial banks in Kenya. However this provides an opportunity for further research.

The study experienced an initial slow response from the respondents who complained about the length of the questionnaire. This was mitigated by having constant follow up on phone and physical visits to the respondents' offices by using research assistants. The study had cost implications which were not readily avail to acquire the requisite resources.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviewed studies that have been done in the area of Information Communication Technology Innovations. The specific areas covered were theoretical orientation, conceptual framework, the empirical review of past studies, critique of the existing literature and research gap.

2.2 Theoretical Review

Theories are formulated to explain, predict, and understand phenomena and, in many cases to challenge and extend existing knowledge, within the limits of the critical bounding assumptions. The theoretical framework is the structure that can hold or support a theory of a research study. The theoretical framework introduces and describes the theory which explains why the research problem under study exists. A theoretical framework consists of concepts, together with their definitions, and existing theory/theories that are used for the particular study (Torraco, 2004).

2.2.1 Diffusion of Innovation (DOI) Theory

Rogers' (1995) Diffusion of Innovation (DOI) theory is a popular model used in information systems research to explain user adoption of new technologies. Rogers defines diffusion as 'the process by which an innovation is communicated through certain channels over time among the members of a social society' (Rogers, 1995). An innovation is an idea or object that is perceived to be new (Rogers, 1995).

According to DOI, the rate of diffusion is affected by an innovation's relative advantage, complexity, compatibility, trialability and observability. Rogers (1995) defines relative advantage as 'the degree to which an innovation is seen as being superior to its predecessor'. Complexity, which is comparable to TAM's perceived ease of use construct, is 'the degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand'. Compatibility refers to 'the degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters'. Trialability is the 'degree to which an idea can be experimented with on a limited basis'. Finally, observability is the 'degree to which the results of an innovation are visible' (Rogers, 1995).

The diffusion theory is relevant because it explains the reason why banks adopt technical innovations. One of the reasons why banks adopt technical innovations is relative advantage. This means that banks that adopt technical innovations have relatively better financial advantage than those who do not.

2.2.2 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a theoretical model that explains how users come to accept/adopt and use a technology. Original TAM was proposed by Davis in 1989. The model suggests that when a user is presented with a new technology, a number of factors influence their decision regarding how and when they will use it. This includes its perceived usefulness (PU) and its perceived ease of use (PEOU). However, the TAM does not account for the influence and personal control factors on behavior. Other factors such as economic factors, outside influences from suppliers, customers and competitors are also not considered by the TAM (van Akkeren & Harker, 2003).

This model adopts well established causal chain of "beliefs, attitude, intention, actual behavior", which was developed from the theory of reasoned action by social psychologists. In Davis's study, two important constructs are identified; perceived usefulness and perceived ease of use (Davis, Foxall & Pallister, 2002). These perceptions predict attitudes toward the system adoption. Then the attitude develops the intentions to use and the intentions cause actual system usage. In many recent studies regarding technology, TAM is adopted extensively. TAM was adopted and showed that it contributes to the prediction of individual usage of technology, (Fishbein & Ajzen, 2010). TAM assumes that perceived usefulness (the degree to which a person believes that using a particular system would enhance his or her performance) and perceived ease of use (the degree to which a person believes that using a particular system would be free of effort) with the influence of pre-existing external variables being the primary determinants for adoption of a new technology.

Perceived ease of use has a direct effect on perceived usefulness and both determine an individual's attitude toward use, which leads to behavioral intention to use a system and actual use of the system (Davis, Foxall & Pallister, 2002). TAM is tailored to IS contexts, and was designed to predict information technology acceptance and usage on the job. TAM theory is relevant in that it explains the type of technology banks adopt. The bank will adopt a technology with perceived ease of use as it does away with traditional banking. This theory instigates the second research question: How do product innovations influence performance of Kenya Commercial Bank Ltd.

2.2.3 Schumpeterian Theory of Creative Destruction.

Schumpeter (1928, 1939) who saw innovations as perpetual gales of creative destruction that were essential forces driving growth rates in a capitalist system. Schumpeter's thinking evolved over his lifetime to the extent that some scholars have differentiated his early thinking where innovation was largely dependent on exceptional individuals willing to take on exceptional hazards as "an act of will", i.e., entrepreneurs, from his later thinking that recognized the role of large corporations in organizing and supporting innovation. This resulted in his emphasis on the role of oligopolies in innovation and which later was falsely viewed as the main contribution of his work. (Freeman, 1994).

Schumpeter (1928) pointed to the discontinuous and disruptive nature of technological change in capitalism that brings the inseparable combination of short-term instability and long-term growth. He was not a technological determinist but recognized the social and organization forces that played key roles in his cyclical process of industrial change. Schumpeter argued that entrepreneurs, who could be independent inventors or R&D engineers in large corporations, created the opportunity for new profits with their innovations. In turn, groups of imitators attracted by super-profits would start a wave of investment that would erode the profit margin for the innovation. However, before the economy could equilibrate a new innovation or set of innovations, conceptualized by Schumpeter as Kondratiev cycles, would emerge to begin the business cycle over again.

For all his insight on the role of innovation, Schumpeter still did not really explain the source of innovation. He was able to point to its importance and its role in timing economic cycles but did not address its source. This rather interestingly allowed Keynesian economics to argue that levels of investment were the cause of innovation. It

was not until the 1960s that economists would begin again to search for the source of innovation. The importance of innovation was highlighted by researchers like Abramovitz (1956) and Solow (1957) who were able to demonstrate how little neoclassical economics was able to explain. Based on data on the United States economy from 1909-49, Solow showed that only 12.5 percent of the increase of per capita output could be traced to increased use of capital. This left a surprisingly large 87.5 percent residual that Solow attributed to technical change.

Romer (1986, 1994) echoes Solow's observation and continued the call for innovation theorists to internalize the process of innovation within their models. To this end, the work on innovation that emerged from the base set by Schumpeter has been concentrated on the creation of innovation and its subsequent diffusion between firms, industries, and regions.The Schumpeterian Theory is relevant because new technology replaces old technology which is better because new technology is better and adds value to the adopter.

2.3 Conceptual Framework

A conceptual framework is a research tool intended to assist a researcher to develop awareness and understanding of the situation under scrutiny and to communicate it. When clearly articulated, a conceptual framework has potential usefulness as a tool to assist a researcher to make meaning of subsequent findings. It forms part of the agenda for negotiation to be scrutinized, tested, reviewed and reformed as a result of investigation and it explains the possible connections between the variables (Smyth, 2004).

A conceptual framework for the present study shows the influence of Information Communication Technology innovations on performance of Kenya Commercial Bank Ltd and this is depicted in figure 2.1.

Technology Innovations
- ❖ Channel expansions.
- ❖ Wide range of banking transactions
- ❖ Facilitates process & product innovations
- ❖ Benefits of scale effect.
- ❖ Per-transaction basis advantage.

Product Innovations
- ❖ Provision of unique/superior value.
- ❖ Safeguarding & improving quality
- ❖ Long term business growth
- ❖ Knowledge generation & introduction of new products.

Market Innovations.
- ❖ Improves the mix of target markets.
- ❖ Skillful Market segmentation.
- ❖ Better ways to serve target markets.
- ❖ Identification of better(new) potential markets.

Process Innovations.
- ❖ Time utilization.
- ❖ Business process efficiency.
- ❖ Customer satisfaction and retention.
- ❖ Value addition.

Financial Performance

Independent Variables

Dependent Variable

Figure 2. 1: Conceptual framework

2.4 Empirical Review

This section provides a review of studies which have been done in the past regarding the factors influencing adoption and use of ICT. The empirical review identifies the studies, authors, areas of investigation and the findings reported.

2.4.1 Technological Innovations

Yasuharu (2003) argued that implementation of information technology and communication networking has brought revolution in the functioning of the banks and the financial institutions. It is argued that dramatic structural changes are in store for financial services industry as a result of the Internet revolution; others see a continuation of trends already under way. DeYoung, Lang, and Nolle (2007) reported that Internet adoption improved U.S. community bank profitability – primarily through deposit-related charges. In a related study, Hernando and Nieto(2007) find that, over time, online banking was associated with lower costs and higher profitability for a sample of Spanish banks.

Technological innovation such as the use of computer automation and electronic banking influences speed of bank services delivery, enhanced management decision making and saving time (Alu, 2002). Information and Communication Technology has provided self-service facilities (automated customer service machines) from where prospective bank customers can complete their account opening documents direct online. It assists customers to validate their account numbers and receive instruction on when and how to receive their cheque books, credit and debit cards (Agboola, 2001).

Laudon (2010) argues that Technological Innovation deals with the Physical devices and software that link various computer hardware components and transfer data from one physical location to another. ICT products in use in the banking industry include Automated Teller Machine, Smart Cards, Telephone Banking, MICR, Electronic Funds Transfer, Electronic Data Interchange, Electronic Home and Office Banking. Electronic Banking has tremendously improved the services of banks to their customers (Agboola, 2001).

Kariuki (2005) argues that there exist positive impacts of e-banking on the turnover and profitability and to a lesser extent on employment, most notably when e-commerce is part of larger business strategies of bank. Further, Kariuki (2005) provides evidence that the use of e-banking can contribute to improved bank performance, in terms of increased market share, expanded product range, customized products and better response to client demand.

2.4.2 Product Innovation

Mabrouk and Mamoghli (2010), in their study on Dynamics of Financial Innovation and Performance of Banking Firms: Context of an Emerging Banking Industry, analyzed the effect of the adoption of two types of financial innovations namely; product innovation (telephone banking and SMS banking and so on) and process innovation (Magnetic strip card (debit, ATM and credit card), Automatic cash dispenser; (Automatic teller machine; Electronic payment terminal and so on) on the performance of banks. Their analysis included two adoption behaviours, first mover in adoption of the financial innovation and imitator of the first movers. They found out that first mover initiative in product innovation improves profitability while process initiative has a positive effect on

profitability and efficiency. Banks that imitate are less profitable and less efficient than first mover.

Different terminologies have been used to categorize and describe product development. Cooper, Scott and Kleinschmidt (2002) for example, embraces two distinct activities: old product development, which involves updating and improving existing products, and new product development, which involves a greater degree of innovational challenge. They similarly categorized product development into primary and secondary innovations. Primary innovations were broadly concerned with the development of new markets and relate to instances where there is a high degree of technical originality and a commensurate change in consumer behavior. Secondary innovations, on the other hand, are basically business or company focused and typically involve improvements to an existing market. Product portfolio decisions are the manifestation of a firm's innovation and marketing strategies.

The common approach to managing new product development is to develop and manage a portfolio of specific projects (Wheelwright & Clark 1992). Practically speaking, choosing the product portfolio determines the firm's strategy for the medium term future and is senior management responsibility (Storey and Easingwood, 1998; Cooper, Scott and Kleinschmidt, 2002). Operationally, portfolio decisions involve two strategic components: a development strategy regarding the number and rate of new product introductions (introduction intensity), and a market entry strategy regarding the relative speed to market (pioneering intensity). Past research suggest that better-managed firms structure their portfolios by striking a balance in the product innovation portfolio across these strategic components. However, past research has not systematically decomposed

the components of portfolio strategy to examine how the components work together in relation to financial performance.

2.4.3 Market Innovations

Market orientation as a business culture leads to business performance improvement, as proved by numerous studies (Slater & Narver, 1995). It is precisely product innovation that is considered as a moderator of the link between market orientation and successful business operation (Slater & Narver, 1995). Innovations have a positive impact on business performance by leading to a market share increase and/or cost reduction and, in turn, a profit rise. Market oriented enterprises deliver superior quality products to their customers while complying with ecological, health and safety standards as well as with legal norms.

Agboola (2006), in his study on Information and Communication Technology (ICT) in Banking operations in Nigeria using the nature and degree of adoption of innovative technologies; degree of utilization of the identified technologies; and the impact of the adoption of ICT devices on banks, found out that technology was the main driving force of competition in the banking industry. During his study he witnessed increase in the adoption of ATMs, EFT, smart cards, electronic home and office banking and telephone banking. He indicates that adoption of ICT improves the banks' image and leads to a wider, faster and more efficient market. He asserts that it is imperative for bank management to intensify investment in ICT products to facilitate speed, convenience, and accurate services, or otherwise lose out to their competitors.

Hernando and Nieto (2006), studied whether internet delivery channels change bank's performance, they found out that adoption of internet as a delivery channel involved gradual reduction in overhead expenses (particularly, staff, marketing and IT) which translates to an improvement in banks´ profitability. The study also indicates that internet is used as a complement to, rather than a substitute for, physical branches. The profitability gains associated with the adoption of a transactional web site are mainly explained by a significant reduction in overhead expenses. This effect is gradual, becoming significant eighteen months after adoption and reaching a maximum generally two and a half years after adoption. Their study showed that multichannel banks present statistically significant evidence of efficiency gains that is reduction in general expenses per unit of output. Banks would further profit from cost reductions to the extent that the Internet delivery channel functions as a substitute for traditional distribution channels. Their analysis shows that this effect varies over time and explains, in terms of cost and income structure, the main drivers of better performance.

2.4.4 Process Innovations

In the banking sector, Robinson, Sayer and Palliser (2007) observed that the most visible process innovations in recent years have been those exploiting internet technologies to allow for rapid increase in online banking transactions. Also, other process innovations have been observed: the development of a new, automated, integrated back-office system has allowed banks to outsource and offshore routine administration and customer service functions. At the same time centralization of transactions processing and of such core operations as credit risks assessment and sanctioning has reduced the role of local branch and led to a raft of branch closures. Payment methods have been migrated from checks to

credit cards, debit cards, chip and pin and now contactless payment systems, how consumers transact business is now being revolutionized.

According to Riddle (2008) service delivery process innovation involves changes to the service delivery process or how the service is being provided with significant changes in the role of staff, strategic partners, and/ or customers, the most typical form of innovation including increased accessibility and changes in the degree of self service. Bernard, Lima and Souza(2007) found that automating back office processes such as account opening or closing, processing checks, mortgage and loan personal approvals, etc. has helped banks reduce cycle times, reduced high level staffing, improved visibility into the status of requests for front office and customers, standardization of processes and improved quality of services to customers.

Banerjee (2009) found that most recent innovations in the banking sector focused on delivery of products or services, management of customer interactions and administration of back office functions. Process innovations such as: internet related has improved online banking; Automated and integrated back office systems have enabled banks to outsource or offshore routine administration and customer service functions. Centralized transaction process in core operations such as credit risk assessment and loan approval has reduced the role of the local branch. Payment processes have been revolutionized by the introduction of chip-and-pin and contactless payment systems such as smart cards. Robinson, Sayer and Palliser (2007) suggest that process innovations have been very important in transforming back office functions, streamlining customer interactions and in facilitating outsourcing, off-shoring and similar cost management strategies.

2.5. Research Gap

Batiz-Lazo and Woldesenbet (2006) and Mwania and Muganda (2011); in their study concluded that financial innovations had significant contribution to banks performance. Pooja and Sing (2009) and Franscesa and Claeys (2010) concluded that financial innovation had least impact on bank performance. It is at the center of such mixed conclusions that creates and necessitates the need to carry out the study from a Kenyan context to establish the effect of ICT led innovations on performance of Kenya Commercial Bank Ltd.

Despite the importance of technological innovations in explaining banking performance, the effects of technological innovation on performance, is still misunderstood for two main reasons; first, there is a lack of understanding about the drivers of innovation and secondly innovation's effects on bank's performance remains untested (Mabrouk & Mamoghli, 2010). There is a knowledge gap on a combined effect of information communication technology innovations on financial performance of Kenya Commercial Bank. Most of the studies considered the effect of a single technological innovation on financial performance and effect of composite of ICT innovations has not been tested in Kenya. This study therefore aimed to answer the following research question: Does information communication technology innovation have effects on the financial performance of Kenya Commercial Bank?

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This study sought to analyse the effect of ICT innovations on performance of Kenya Commercial Bank. This chapter sets out various stages and phases that were followed in completing the study. The chapter comprises the following sub-topics; research design, data collection procedures, sampling techniques and data analysis procedures.

3.2 Research Design

This study used descriptive survey research design. Orodho (2003) and Kothari (2004) describe a descriptive survey design as a design that seeks to portray accurately the characteristics of a particular individual, situation or a group. According to Polit and Beck (2003), in a descriptive study, researchers observe, count, delineate, and classify. They further describe descriptive research studies as studies that have, as their main objective, the accurate portrayal of the characteristics of persons, situations, or groups, and/or the frequency with which certain phenomena occur. Lavrakas (2008) describes a descriptive survey research design as a systematic research method for collecting data from a representative sample of individuals using instruments composed of closed-ended and/or open-ended questions, observations, and interviews. It is one of the most widely used non-experimental research designs across disciplines to collect large amounts of survey data from a representative sample of individuals sampled from the targeted population.

3.3 Target Population

Target population in statistics is the specific population about which information is desired. According to Ngechu (2004), a population is a well-defined or set of people, services, elements, events, group of things or households that are being investigated. The target population of this study was the 608 staff working at Kenya Commercial Bank Limited Headquarter in Nairobi. The study focused more on the section and particularly on the top, middle and lower level management staff who are directly dealing with the day to day management of Kenya Commercial Bank Limited since they were the ones conversant with the effects of innovation strategies on performance of Kenya Commercial Bank Limited. The population characteristic was a summarized in table 3.1

Table 3.1: Target Population

Staff level	Population	Percentage
Top Management	70	11.5%
Middle level	158	26%
Low Level	380	62.5%
Total	**608**	**100%**

Source: Source: KCB Ltd, 2013

3.4 Sample and Sampling Technique.

Stratified random sampling technique was used in this study to select a sample size. For the purpose of the study the sample frame was stratified into various groups. The structure in KCB has put staff in three categories Directors and executives, middle level management comprises functional heads while low level management operational staff and assistants. The sample frame was stratified through top management level, middle level management and low level management. According to Ngechu (2004), the technique produces estimates of overall population parameters with greater precision and ensures a more representative sample is derived from a relatively heterogeneous population to make each stratum homogenous.

According to Cooper and Schindler (2003), random sampling frequently minimizes the sampling error in the population. Moreover, larger samples minimize errors. For the purpose of sample size, Kotler et al (2001) argues that if well chosen, samples of about 10% of the population often give a good reliability, thus for this research, a sample of 61 respondents will give good reliability as shown in Table 3.2 .

Table 3. 2: Sampling Size

Level	Population	Sample ratio	Sample size
Top level management	70	0.1	7
Middle level management	158	0.1	16
Low level management	380	0.1	38
Total	**608**	**0.1**	**61**

3.5 Data Collection

3.5.1 Type and Sources of Data

The study collected both primary and secondary data for the purpose of analyzing the effects of Information Communication Technology Innovations on performance of Kenya Commercial Bank Limited. Primary data was collected using a questionnaire while secondary data was obtained from annual reports of the company.

3.5.2. Data Collection Instrument

With respect to effects of ICT innovations on performance, this study utilized a questionnaire used in various previous research projects (Lumpkin & Dess, 2001). The questionnaire designed in this study comprised of two sections. The first part was designed to determine fundamental issues including the demographic characteristics of the respondent, while the second part consists of questions where the four variables were focused. The questionnaire was designed in line with the objectives of the study.

To enhance quality of data to be obtained, Likert type questions are included whereby respondents indicated the extent to which the variables are practiced on a five point Likerts scale. The structured questions were used in an effort to conserve time and money as well as to facilitate in easier analysis as they were in immediate usable form; while the unstructured questions were used so as to encourage the respondent to give an in depth and felt response without feeling held back in revealing of any information.

3.5.3   Data Collection Procedure

Data collection involved a self-administered questionnaire. The researcher dropped the questionnaires physically at the respondents' place of work. The researcher left the

questionnaires with the respondents and picked them up later. Each questionnaire was coded and only the researcher knew which person responded. The coding technique was only used for the purpose of matching returned, completed questionnaires with those delivered to the respondents.

3.6 Pilot Study

The aim of the pilot study was to test the reliability of the questionnaires. According to Kothari (2000), a pilot test was necessary for testing the reliability of data collection instruments. Cooper and Schindler (2003) explain reliability of research as determining whether the research will truly measure that which it was intended to measure or how truthful the research results will be. Pilot study will thus be conducted to detect weakness in design and instrumentation and to provide proxy data for selection of a sample (Mugenda & Mugenda, 1999).

The pilot data was not included in the actual study. The pilot study allowed for pre-testing of the research instrument. The clarity of the research instruments to the respondents was established so as to enhance the instrument's validity and reliability. The pilot study facilitated familiarity with research and its administration procedure as well as identifying items that required modification. The result helped to correct inconsistencies that arose from the instruments, to ensure it measured what was intended.

3.6.1 Validity

Validity is the degree by which the sample of test items represents the content the test is designed to measure (Cooper & Schindler, 2003). Content validity which is employed by this study is a measure of the degree to which data collected using the questionnaire

represents a specific domain or content of a particular concept. Mugenda and Mugenda (1999) contend that the usual procedure in assessing the content validity of a measure is to use a professional or expert in a particular field. To establish the validity of the research instrument, the opinions of experts in the field of study especially ICT innovations will be obtained to facilitate the necessary improvement in the questionnaire to enhance validity.

3.6.2 Reliability

The study selected a pilot group of 5 individuals representing 1% of the target population to test the reliability of the research instrument. The rule of thumb suggests that 5% to 10% of the target sample should constitute the pilot test (Cooper & Schilder, 2011). Consideration of the levels and background such as expertise and experience was taken into account. The clarity of the questionnaire to the respondents was established so as to enhance the instrument's reliability.

3.7 Data Analysis

Before processing the responses, the completed interview guide was edited for completeness and consistency. The content analysis was used to analyze the respondents' views about the influence of Information Communication Technology innovations on performance of KCB. The advantage of using content analysis is that it enables grouping of the collected data into various groups for easier analysis which is presented in continuous prose. Descriptive statistics tool SPSS helped in describing the data and determining the extent used. Frequencies, percentages, means, correlations, multiple regression model and F-test have been used to analyse data.

CHAPTER FOUR

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

4.1 Introduction

This chapter presents the data analysis, interpretation and discussion of the research findings. The analysis aimed at simplification, organization, summarization, description and interpretation of the data in order to communicate the results in a meaningful manner. The responses were qualitatively and quantitatively analyzed by use of statistical tools like bar charts, tables, percentages, and pie charts for comparisons.

4.2 Response Rate

Sixty one (61) questionnaires were issued to the management staff at KCB head office units for which sixty (60) questionnaires were dully completed. This represents a response rate of 98 % which is sufficient to give the findings and the recommendations adequate credence and reliability. The response rate is considered adequate given the recommendations by Sekaran (2003) who suggests 30% response while Mugenda and Mugenda (2003) advise on response rates exceeding 50%. Based on these assertions, this implies that the response rate for this study was adequate.

4.3 Characteristics of Respondents

Figure 4.1 shows the response on statements regarding the gender of each respondent. The figure shows that 60% of the respondents were male while 40% of the respondents were female. This implies that it was not bias in terms of gender.
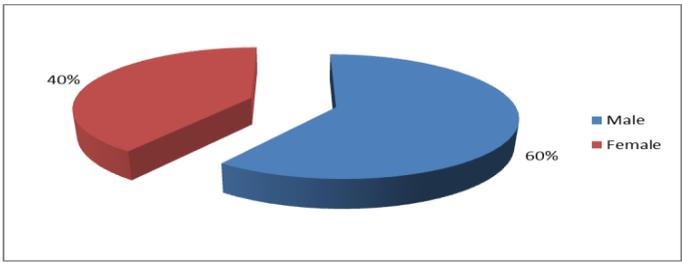
Figure 4. 1: Gender
4.3.1 Age Bracket
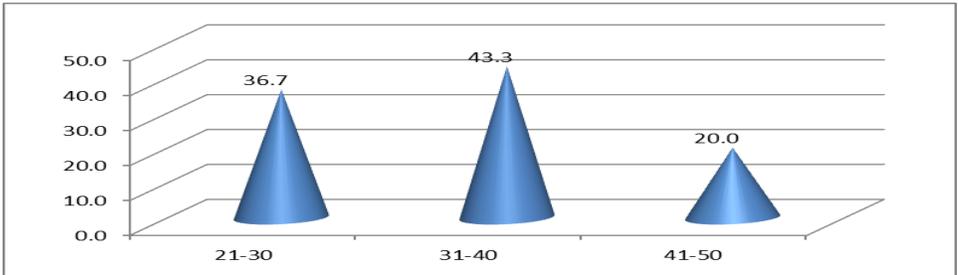
Figure 4. 2; Age Bracket.
Figure 4.2 shows the responses on statements regarding the age of the respondents. The

figure shows that 43.3% of the respondents were aged between 31-40 years, 36.7% were

aged between 21-30 years while 20% of the respondents were aged between 41-50 years.

4.3.2 Department
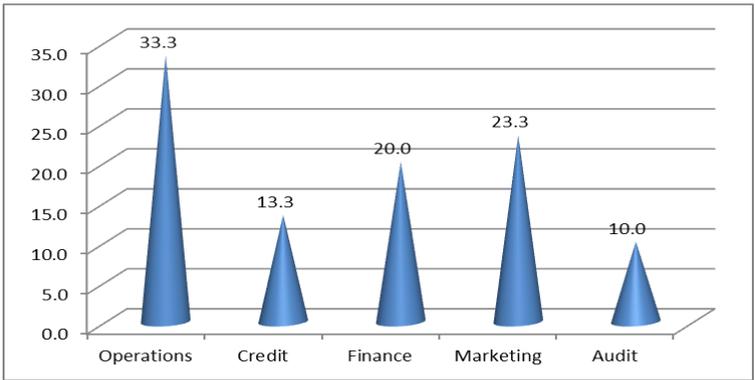
Figure 4. 3: Department
Figure 4.3 shows the responses on statements regarding the departments where the

respondents worked. The figure shows that 33.3% of the respondents were from

operations department, 23.3% were from marketing department, 20% were from finance, 13.3% from credit and 10% from audit department. This implies that the respondents were spread across all the departments at the head office and this eliminated any chance of exclusion.

4.3.3 Duration of existence in the Banking Sector
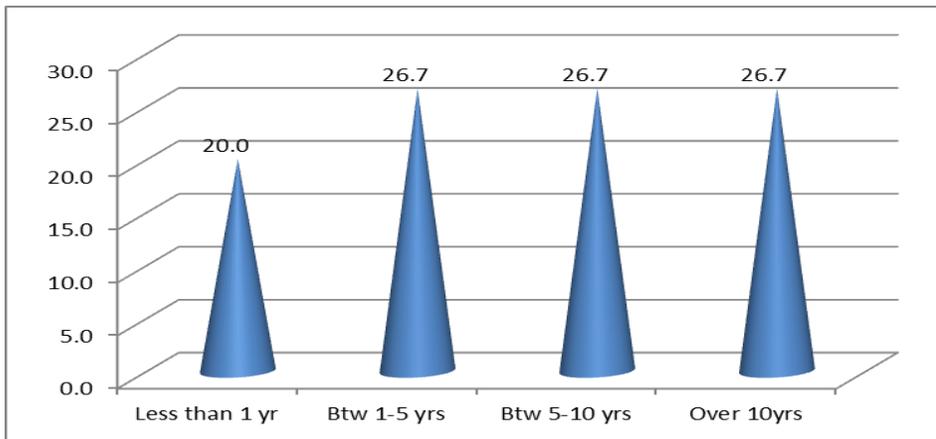
Figure 4. 4: Duration of existence in the Banking Sector

Figure 4.4 shows the responses on statements regarding the duration of service to the bank. The figure shows that 26.7% of the respondents have been in the bank between 1-5 years, between 5-10 years and over 10 year respectively. 20% of the respondents have been in the bank for less than one year. This implies that most of the respondents had worked in the banking sector long enough to provide information in relation to the topic of study, that is, to establish the influence of information communication technology innovations on performance of Kenya Commercial Bank Ltd.

4.4 Information communication technology innovations.

Results in Table 4.1 shows the responses on statements regarding the various forms of ICT innovations that Kenya Commercial Bank Ltd uses. The table shows that the bank uses T24 (Temenos Technology); internet banking; mobile banking; the bank embraces product improvement and introduction of new products, the bank explores new markets through technology advancement and implements new clearing process (Cheque truncation Process). This implies that Kenya Commercial bank Ltd embraces ICT induced innovations in the course of doing business so as to improve their performance.

The findings reinforced the study by Yildirim and Philippatos (2007) who did a study on the banking sectors of 11 Latin American countries. They stipulated that rivalry between banks pushes the banks to engage in a differentiation processes of the products they supply, and can stimulate financial innovation. Yildrim and Philippatos (2007) find that a high degree of foreign investment in banks' capital is associated with a high level of competitiveness. This improves the quality and differentiation of their products and stimulates financial innovation by introducing more modern skills, management techniques and technologies. This improves the quality and differentiation of their products and stimulates financial innovation by introducing more modern skills, management techniques and technologies. Corrocher (2006) asserts that size also makes it easier to diversify business risk by starting up a variety of innovative projects.

Table 4. 1: Information communication technology innovations used.

Statement	Yes	No
The bank uses T24(Temenos Technology)	100	0
The bank uses internet banking	100	0
The bank uses mobile banking	100	0
The bank embraces product improvement and introduction of new products.	100	0
The bank explores new markets through technology advancement.	100	0
The bank implements new clearing process (Cheque truncation Process)	96.7	3.3

4.4.1 Extent to which technology innovations affects performance of KCB.

Results in table 4.2 shows responses on statements regarding the effects of technology innovations on commission fee based income. Fifty percent of the respondents agreed that technology innovations affected the bank positively, 23.3% strongly agreed, 20% disagreed while 6.7% strongly disagreed. Asked whether TI influenced interest based income positively, 53.3% agreed, 26.7% strongly agreed, 10% disagreed while 10% strongly disagreed. On whether TI in general improved income generating potential of the bank, 50% strongly agreed while 50% strongly disagreed. Asked whether TI have enabled the bank to reduce risks and frauds, 50% agreed, 30% strongly agreed, 13.3% disagreed while 6.7 strongly disagreed. Finally on whether TI has a positive influence on customer acquisition and retention, 46.7% strongly agreed, 43.3% agreed while 10% strongly disagreed.

The findings agree with those in a study conducted by, DeYoung, Lang, and Nolle(2007) who reported that Internet adoption improved U.S. community bank profitability–primarily through deposit-related charges. In a related study, Hernando and Nieto(2007) find that, over time, online banking was associated with lower costs and higher profitability for a sample of Spanish banks. Yasuharu (2003) also asserts that implementation of information technology and communication networking has brought revolution in the functioning of the banks and the financial institutions. He goes ahead and argues that dramatic structural changes are in store for financial services industry as a result of the Internet revolution; others see a continuation of trends already under way. Hendrickson and Nicholas (2011) concluded that banks perform better when they adopt innovations across their several branches. These sentiments are shared by Rafael and Francisco (2007) in their study on the impact of various regional banking sector developments and innovations during 1986-2001 in Spain. Iftekhar, Schmiedel and Song (2009) also assert that if a bank joins in an ATM network, it can generate income from other banks' customers that use its ATM machines (technology innovation) or from third parties that cooperate with it.

Table 4.2: Extent to which technology innovations affects performance of KCB.

Statement	% Strongly Disagree	%	%	%	% Strongly

	Disagree	Neutral	Agree	Agree
Technological innovations have had a positive effect of increasing commission fee based income.	6.7	20	50	23.3
Technological innovations have influenced positively the increase of interest based income	10	10	53.3	26.7
Technological innovations have expanded the income generating potential of the bank.	50			50
Technological innovations have enabled the bank to reduce risk and frauds	6.7	13.3	50	30
Technological innovations have had a positive effect on customer acquisition and retention.	10		43.3	46.7

4.4.2 Contribution of Product Innovations to Performance of KCB.

Results in table 4.3 shows responses on statements regarding the effects of product innovations on commission fee based income. 36.7 percent of the respondents agreed that product innovations affected the bank positively, 40% strongly agreed while 23.3% strongly disagreed. Asked whether PI influenced interest based income positively, 53.3% agreed, 40% strongly agreed while 6.7% disagreed. On whether PI in general improved income generating potential of the bank, 50% strongly agreed while 50% strongly agreed. Asked whether PI have enabled the bank to reduce risks and frauds, 40% agreed, 26.7% strongly agreed, 23.3% disagreed while 10 strongly disagreed. Finally on whether PI has a positive influence on customer acquisition and retention, 40% strongly agreed, 46.7% disagreed while 13.3% strongly disagreed.

The findings regarding product innovation are similar to those found in Kenya by Misati, Njoroge, Kamau and Ouma (2010) whose study revealed that mobile banking as a product had expanded the range of services that a bank could offer and hence expanded incomes for banks. Similar findings were shown in a study in Uganda by Porteus (2006) and another one in Tunisia by Mabrouk and Mamogholi (2010) who concluded that mobile banking (product innovation) helped to increase bank incomes and profitability.

Table 4. 3: Extent to which Product innovations influences performance of KCB

Statement	% Strongly Disagree	% Disagree	% Neutral	% Agree	% Strongly Agree
Product innovations have had a positive effect of increasing commission fee based income.	23.3			36.7	40
Product innovations have influenced positively the increase of interest based income		6.7		53.3	40
Product innovations have expanded the income generating potential of the bank.				50	50
Product innovations have enabled the bank to reduce risk and frauds	10	23.3		40	26.7
Product innovations have had a positive effect on customer acquisition and retention.	13.3	46.7			40

4.4.3 Market innovations and Bank Performance

Results in table 4.4 shows responses on statements regarding the effects of market innovations on commission fee based income, 40 percent of the respondents agreed that

market innovations affected the bank positively, 33.3% strongly agreed, 23.3% disagreed while 3.3% strongly disagreed. Asked whether MI influenced interest based income positively, 36.7% agreed, 46.7% strongly agreed, 13.3% disagreed while 3.3% strongly disagreed. On whether MI in general improved income generating potential of the bank, 56.7% strongly agreed, 26.7 agreed while 16.7% strongly disagreed. Asked whether MI have enabled the bank to reduce risks and frauds, 50% agreed, 33.3% strongly agreed, 13.3% disagreed while 3.3 strongly disagreed. Finally on whether MI has a positive influence on customer acquisition and retention, 43.3% agreed, 46.7% strongly agreed, while 10% strongly disagreed.

Table 4.4: Extent to which market innovations affects performance of KCB.

Statement	% Strongly Disagree	% Disagree	% Neutral	% Agree	% Strongly Agree
Market innovations have had a positive effect of increasing commission fee based income.	3.3	23.3		40	33.3
Market innovations have influenced positively the increase of interest based income	3.3	13.3		36.7	46.7
Market innovations have expanded the income generating potential of the bank.	16.7			26.7	56.7
Market innovations have enabled the bank to reduce risk and frauds?	3.3	13.3		50	33.3
Market innovations have had a positive effect on customer acquisition and retention.	10			43.3	46.7

4.4.4 Process innovations and bank Performance.

Results in table 4.5 shows responses on statements regarding the effects of process innovations on commission fee based income, 46.7 percent of the respondents agreed that market innovations affected the bank positively, 36.7% strongly agreed while 16.7%

strongly disagreed. Asked whether PI influenced interest based income positively, 50% agreed, 40% strongly agreed while 10% strongly disagreed. On whether PI in general improved income generating potential of the bank, 53.3% agreed, 40% strongly agreed while 6.7% strongly disagreed. Asked whether PI have enabled the bank to reduce risks and frauds, 46.7% agreed, 43.3% strongly agreed while 10% strongly disagreed. Finally on whether PI has a positive influence on customer acquisition and retention, 50% agreed, 43.3% strongly agreed, 3.3% disagreed and 3.3% strongly disagreed.

The findings reinforced the study by Mabrouk and Mamoghli (2010) who did a study on Dynamics of Financial Innovation and Performance of Banking Firms: Contexts of an Emerging Banking Industry, analyzed the effect of the adoption of two types of financial innovations namely; product innovation (telephone banking and SMS banking etc.) and process innovation (Magnetic strip card (debit, ATM and credit card), Automatic cash dispenser; (Automatic teller machine; Electronic payment terminal etc.) on the performance of the banks. Their analysis included two adoption behaviours, first movers in adoption of the financial innovation and the imitator of the first movers. They found out that first mover initiative in product innovation improves profitability while process initiative has a positive effect on profitability and efficiency.

Table 4.5: Extent to which of process innovation affects performance of KCB.

Statement	% Strongly Disagree	% Disagree	% Neutral	% Agree	% Strongly Agree
Process innovations have had a positive effect of increasing commission fee based	16.7			46.7	36.7

income.			
Process innovations have influenced positively the increase of interest based income	10		50	40
Process innovations have expanded the income generating potential of the bank.	6.7		53.3	40
Process innovations have enabled the bank to reduce risk and frauds?	10		46.7	43.3
Process innovations have had a positive effect on customer acquisition and retention.	3.3	3.3	50	43.3

4.4.5 Overall performance

Describing the performance of bank in the last three years

Figure 4.5 shows the responses on statements regarding the respondents' opinion on how the bank has performed in the last three years. The figure shows that 63.3% of the respondents described the performance of bank in the last three years as good, 23.3% described as very good, 6.7% described as very bad while 3.3% of the respondents described the performance of bank in the last three years as bad and average respectively. The banks performance has therefore been for the last three years has therefore been good.

These findings are supported by Hasan, Schimiedel and Song (2010), Hernado and Nieto (2006) and DeYoung (2005) in studies done in Italy, Spain and USA respectively. These studies concluded that investment in electronic technology seemed to influence positively the performance of banks as measured by return on assets and return on equity. The conclusions also suggested that electronic technology like the internet and EFT were used

more as a complement than as a substitute for physical branches, suggesting the dominance of a multi-channel banking model.
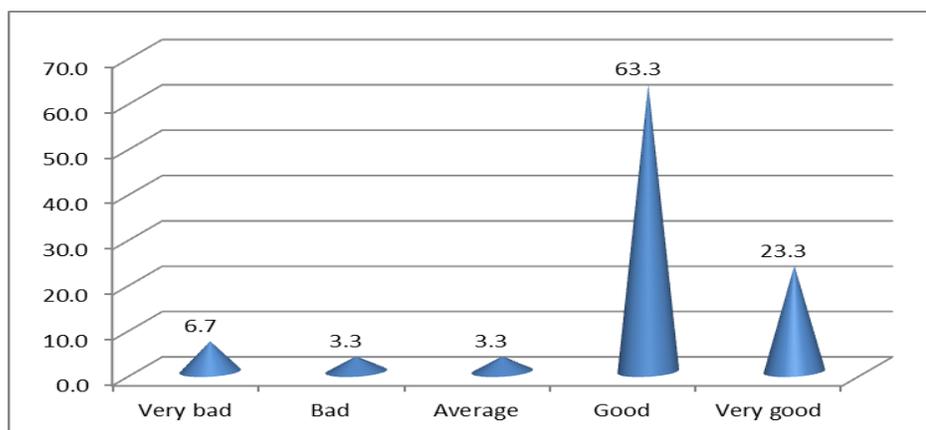
Figure 4. 5: Describing the performance of the bank in the last three years

4.4.6 Extent of agreement or disagreement that the performance is influenced by, management practices

Figure 4.6 shows the responses on statements regarding the respondents' opinion on whether they agreed or disagreed that bank performance is influenced by management practices. The figure shows that 36.7% of the respondents strongly agreed that performance is influenced by management practices, 23.3% somewhat disagreed, 16.7% somewhat agreed, 13.3% strongly disagreed while 10.0% of the respondents neither agreed or disagreed that performance is influenced by, management practices.

Agboola (2006) conducted a study on the application of information and communication technology concepts, techniques, policies and implementation strategies to banking services. The study concluded that ICT directly affects how managers decide, how they plan and what products and services are offered in the banking industry. It has continued to change the way banks and their corporate relationships are organized worldwide and

the variety of innovative devices available to enhance the speed and quality of service delivery (Agboola, 2006).
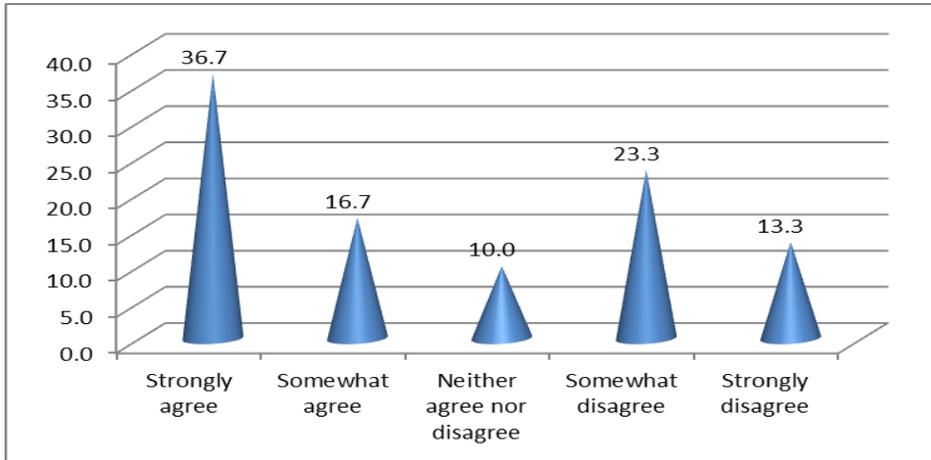
Figure 4.6: Extent of agreement or disagreement that the performance is influenced by, management practices.

4.4.7 Extent of agreement that ICT innovation influences performance of KCB

Results in table 4.6 shows responses on statements regarding the effects of ICT innovations on performance of KCB, 26.7 percent of the respondents strongly agreed that technological innovations influence performance of KCB, 6.7% agreed ,3.3% disagreed, 3.3% strongly disagreed while 60% had a neutral stand. Asked whether product innovations influenced performance of the bank, 56.7% agreed, 26.7 strongly agreed, 13.3% disagreed and 3.3% strongly disagreed. Asked whether market innovations affected performance of the bank, 50% agreed, 40% strongly agreed, 6.7% disagreed and 3.3% strongly disagreed. Finally on whether process innovations influence performance of the bank, 50% agreed, 30% strongly agreed, 15% disagreed, 4% strongly disagreed while 1% had a neutral opinion.

Table 4.6: Extent of agreement that ICT innovation influences performance of KCB

Statement	% Strongly Disagree	% Disagree	% Neutral	% Agree	% Strongly Agree
Technological innovation	3.3	3.3	60	6.7	26.7
Product innovation	3.3	13.3		56.7	26.7
Market innovation	3.3	6.7		50	40
Process innovation	4	15	1	50	30

4.5 Regression Analysis

Regression analysis was used to model, examine, and explore the relationships between Performance of KCB Limited against the four Independent variables used for the study, this was important in measuring the extent to which changes in one or more variables jointly affected changes in another variable. Regression analysis was used to generate an equation applied to the independent variables in order to best predict the dependent variable in the model. Each independent variable is associated with a regression coefficient describing the strength and the sign of that variable's relationship to the dependent variable. Analysis was done using SPSS version 11.5 to generate the model summary, Analysis of variance (ANOVA) and coefficients of regression.

4.5.1 Model Summary

A model summary was generated using SPSS version 16 to calculate R, R Squared, Adjusted R Square and Standard error of the estimates for dependent and independent variables. The results are shown in Table 4.7

Table 4. 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.508(a)	.258	.204	.89757

The statistics contained in the table explain how much of the variation in the value of KCB performance was explained by the regression model. The value of R in the model was 0.508 showing a moderate correlation between independent variables and dependent variable (performance). The study further showed, R-square (0.258) which measured the proportion of the variation in the performance of KCB that was explained by variations in the independent variables, meaning 25.8% of the variation was explained by the regression model.

The Adjusted R-square (0.204) measured the proportion of the variance in the performance of KCB that was explained by variations in the technological innovations, product innovations, market innovations and process innovations. In this case the Adjusted R-Square shows that 20.4% of the variance was explained. The unexplained variation of the dependent variable is absorbed by the error term.

4.5.2 Analysis of Variance for the Independent variables on Performance.

Analysis of Variance (ANOVA) was used to determine the linear relationship among the variables under investigation. Using this method, the sum of squares, degrees of freedom (df), mean square, value of F (calculated) and its significance level was obtained. The results are shown in Table 4.8

Table 4. 8: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	15.423	4	3.856	4.786	.002[b]
Residual	44.310	55	.806		
Total	59.733	59			

From Table 4.8, the value of F (calculated) was found to be 4.786. This was above the F (critical) value of 2.92 which meant the model used in the study was statistically significant. The relationship was significant ($p < 0.05$) showing a linear relationship among the variables under the study meaning there was 95% chance that the relationship among the variables was not due to chance.

4.5.3 Multiple Regression Analysis

The study applied a regression model using SPSS version 16 to assess the extent of influence of the independent variables on the dependent variable. The regression model was as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \text{ (significant level 0.05)}$$

Where:

Y = Performance of KCB.

β_0 = Constant (coefficient of intercept) β_1 = Beta coefficients

X_1 = technology innovations X_2 = product innovations

X$_3$= process innovation   X$_4$= market innovation

$\beta_1 ... \beta_4$ = regression coefficient of four variables

The overall coefficient estimates for the independent variables on performance of KCB is shown in Table 4.9

Table 4. 9: Overall coefficient estimates for the variables

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	7.978	.984		8.110	.000
Information communication technology innovations	.270	.117	.272	2.302	.025
product innovations	.032	.165	.025	.195	.846
process innovation	.305	.148	.256	2.065	.044
market innovation	.391	.180	.275	2.175	.034

As shown on Table 4.9, technology innovations, product innovations and market innovations had a positive and significant effect on the performance of Kenya Commercial Bank as indicated by beta values. The relationships ($p<0.05$) are all significant with technology innovations (t=2.302, $p<0.05$), product innovations (t=2.065, $p<0.05$) and market innovations (t=2.175,$p<0.05$). On the other hand the t and p value for product innovation were (t=0.195, $p>0.05$), this relationship is statistically not significant

hence the effect of product innovation was found to have no significance in the performance of Kenya Commercial Bank.

From the findings there was a significant positive relationship between technology innovations, product innovations and market innovation and banks performance. The findings imply that there is interrelationship in the various technological innovations in the banking industry such a change in one technology affect the other. This is consistent with studies by Kariuki (2005) who showed the positive impacts of ICT on their banking performance using bank turnover and profits as measure of performance. He established that banks those with high profit growth are more likely to be using greater numbers of advanced ICTs. He concluded that e-banking leads to higher profits though in long-term but not in short-term due to high ICT investment cost. All this studies used profit and turnover as measures of bank performance.

Table 4.9 further shows the constant in this model is represented by a value of 7.978, which is the expected value of KCB Performance when the values of the independent variables are equal to zero. Based on the analysis, the regression equation for the independent variable on the dependent variable resulted to the following;

$$Y = 7.978 + 0.270X_1 + 0.032X_2 + 0.305X_3 + 0.391X_4$$

Where:

Y = Performance of KCB

X_1 = technology innovations

X_2 = product innovations

X_3 = process innovation

X_4 = market innovation

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of findings, answers to research questions and conclusions drawn from the data analysis performed in chapter four with subsequent recommendations in relation to the influence of ICT innovations on performance Kenya Commercial Bank.

5.2 Summary of Findings

The four independent variables investigated in the study were found to explain 25.8% of all the factors that influence performance of KCB hence 74.2 % of factors outside the study and the error term cannot be explained on how they influence the dependent variable.

5.2.1 Technology innovations

From the study investigating the influence of technological innovation on performance of Kenya Commercial Bank Ltd, the study found out that respondents strongly agreed that technological innovations have expanded the income generating potential of the bank, it has had a positive effect on customer acquisition and retention.; technological innovations have influenced positively the increase of interest based income ; technological innovations have enabled the bank to reduce risk and frauds and that technological innovations have had a positive effect of increasing commission fee based

income. Technological innovation influenced performance of KCB with a t-value of 2.302 and 0.025 significance level, making the variable significant.

5.2.2 Product innovations.

From the study to investigate the influence of product innovations on performance of Kenya Commercial Bank Ltd, the study found out that respondents strongly agreed that Product innovations have expanded the income generating potential of the bank. Respondents agreed that Product innovations have influenced positively the increase of interest based income; Product innovations have had a positive effect on customer acquisition and retention; Product innovations have had a positive effect of increasing commission fee based income and that Product innovations have enabled the bank to reduce risk and frauds. Product innovations influenced performance of KCB with t value 0.195 and 0.846 significant level, making the variable not to be statistically significant.

5.2.3 Market innovations

Additionally the study found out that respondents agreed that market innovations have expanded the income generating potential of the bank; market innovations has had a positive effect on customer acquisition and retention.; market innovations have influenced positively the increase of interest based income; market innovations have enabled the bank to reduce risk and frauds and that market innovations have enabled the bank to reduce risk and frauds. Market innovations influenced performance of KCB with t value 2.175 and 0.034 significant level, making the variable significant.

5.2.4 Process innovations

The study also found out that respondents agreed that process innovations have developed a positive effect on customer acquisition and retention; process innovations have enabled the bank to reduce risk and frauds; process innovations have expanded the income generating potential of the bank; Process innovations have influenced positively the increase of interest based income and that process innovations have had a positive effect of increasing commission fee based income. Process innovations influenced performance of KCB with t value 2.065 and 0.044 significant level, making the variable significant.

5.3 Conclusion

Based on the objectives and the findings of the study the below conclusions can be made: Technology innovations were found to be having a positive and significant influence to banks performance. ATMs, credit cards and online banking are therefore important despite it being an expensive investment. Technology innovations is therefore influential in driving the numbers for the bank since most of the respondents agreed that it influence banks performance positively.

Product innovations also has a positive influence to bank performance, respondents overwhelmingly agreed with its positive effect on increasing interest based income and on customer acquisition and retention. It can therefore be concluded that customers are always happy with the banks products.

Process innovations influences performance of the bank positively, the respondents overwhelmingly agree with it positive effect on increasing commission fee based income and interest based income. It can therefore be concluded that KCB customers are always happy with the banks process improvements.

Market innovations also had a positive and significant effect on KCB performance. Majority of the respondents strongly agreed that it has positively influence customer acquisition and retention. It can therefore be concluded that most of the KCB customers are stuck with the bank because they serve a wider market.

5.4 Recommendations

Kenya Commercial Bank should continue investing in ICT induced innovations more so in delivery channels like ATMs, Mobile banking and internet banking since this will enable them control their costs more efficiently and much better than having many physical branches. The volumes of transactions that can be processed on channels like the internet and mobile are high as compared to delivering such transactions using manual processes. This helps to minimize the cost per unit of service and hence better returns to the bank. Kenya Commercial Bank should explore more and better ways of maximizing their utilization and returns from card payment systems, ATMs, mobile banking and internet banking.

Since information communication technology innovations are aggressively and continuously adopted in Kenya, Kenya Commercial Bank should allocate more resources towards research and development to researchers who would continue to invest their time and skills in discovering more ICT induced innovations. It is recommended that Kenya

Commercial Bank also pursue a strategy to provide incentives for technology transfer from more developed economies in order to promote adoption of more superb top class ICT innovations. Better performance for Kenya Commercial Bank due to ICT innovations translates to an improved profit before tax. A further study can therefore be conducted to investigate the effect of ICT innovations on all commercial banks in Kenya.

5.5 Area of Further Research

The study investigated the influence of ICT innovations on performance of Kenya Commercial Bank Ltd. The study covered four (4) main variables namely: technology innovations, product innovations, market innovations and process innovations. From the findings obtained the independent variables investigated only explained 25.8% of ICT innovations influenced performance of KCB leaving 74.2% to other factors and error term unexplained. Further studies are highly recommended to investigate the other factors that could affect performance of the bank which were not cover in the study.

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APPENDIX I: RESEARCH QUESTIONNAIRE.

This questionnaire is meant to collect data regarding the *influence of information communication technology innovations on performance of Kenya Commercial Bank Ltd.*

SECTION A: GENERAL INFORMATION

1: RESPONDENT PARTICULARS

Gender: Male [ ] Female [ ]

Age Bracket (tick as appropriate)

i	10-20	
ii	21-30	
iii	31-40	
iv	41-50	
v	Over 50	

Department (tick as appropriate)

i	Operations	
ii	Credit	
iii	Finance	
iv	Marketing	
v	Audit	

How long have you worked in the Banking Sector (tick as appropriate)

i	Less than 1 yr	
ii	Btw 1-5 yrs	
iii	Btw 5-10 yrs	
iv	Over 10yrs	

SECTION B: INFORMATION COMMUNICATION TECHNOLOGY INNOVATIONS.

No	Statement	Yes	No
1.	The bank uses T24(Temenos Technology)		
2	The bank uses internet banking		
3	The bank uses mobile banking		
4	The bank embrases product improvent and introduction of new products.		
5	The banks explores new markets through technology advancement.		
6	The bank implements new clearing process (Cheque truncation Process)		

SECTION C: INVESIGATE THE INFLUENCE OF TECHNOLOGICAL INNOVATION ON PERFORMANCE OF KENYA COMMERCIAL BANK LTD.

This section has statements regarding the influence Technological Innovation on performance of KCB Ltd. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes using a tick (√) or cross mark (x)

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	Technological innovations have had a positive effect of increasing commission fee based income.					
2	Technological innovations have influenced positively the increase of interest based income					
3	Technological innovations have expanded the income generating potential of the bank.					
4	Technological innovations have enabled the bank to reduce risk and frauds?					
5	Technological innovations has had a positive effect on customer acquisition and retention.					

SECTION D: INVESTIGATING INFLUENCE OF PRODUCT INNOVATIONS ON PERFORMANCE OF KCB LTD.

This section has statements regarding the effect of product innovations on performance of KCB Ltd. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes using a tick (√) or cross mark (x).

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	Product innovations have had a positive effect of increasing commission fee based income.					
2	Product innovations have influenced positively the increase of interest based income					
3	Product innovations have expanded the income generating potential of the bank.					
4	Product innovations have enabled the bank to reduce risk and frauds?					
5	Product innovations have had a positive effect on customer acquisition and retention.					

SECTION E: INVESTIGATING INFLUENCE OF MARKET INNOVATION ON PERFORMANCE OF KCB LTD.

This section has statements regarding the effect of market innovations on performance of KCB Ltd. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes using a tick (√) or cross mark (x).

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	Market innovations have had a positive effect of increasing commission fee based income.					
2	Market innovations have influenced positively the increase of interest based income					
3	Market innovations have expanded the income generating potential of the bank.					
4	Market innovations have enabled the bank to reduce risk and frauds?					
5	Market innovations has had a positive effect on customer acquisition and retention.					

SECTION F: INVESTIGATING INFLUENCE OF PROCESS INNOVATION ON PERFORMANCE OF KCB LTD

This section has statements regarding the effect of process innovations on performance of KCB Ltd. Kindly respond with the response that matches your opinion. Please tick as appropriate in the boxes using a tick (√) or cross mark (x).

No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
1	Process innovations have had a positive effect of increasing commission fee based income.					
2	Process innovations have influenced positively the increase of interest based income					
3	Process innovations have expanded the income generating potential of the bank.					
4	Process innovations have enabled the bank to reduce risk and frauds?					
5	Process innovations has had a positive effect on customer acquisition and retention.					

SECTION G: OVERALL PERFORMANCE

1. How would you describe the performance of your bank in the last three years?

    Very bad   [ ]

    Bad   [ ]

    Average   [ ]

    Good   [ ]

    Very good   [ ]

2. To what extent do you agree or disagree that the performance is influenced by, management practices?

Strongly agree   [ ]

Somewhat agree   [ ]

Neither agree nor disagree   [ ]

Somewhat disagree   [ ]

Strongly disagree   [ ]

3. To what extent do you think the following ICT innovation influences performance of Kenya Commercial Bank Ltd?

TPMP	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Technological innovation	□1	□2	□3	□4	□5
Product innovation	□1	□2	□3	□4	□5
Market innovation	□1	□2	□3	□4	□5
Process innovation	□1	□2	□3	□4	□5

Thank you for your cooperation

APPENDIX II: INTRODUCTION LETTER

CHURCHIL ODHIAMBO AHOYA

P.O.BOX 1987 – 00400 KISUMU

Email: cahoya22@gmail.com

Date…………………………………..

To…………………………………….

……………………………………….

……………………………………….

Dear Sir/Madam,

RE:COLLECTION OF RESEARCH DATA

My names are Churchil Odhiambo Ahoya and a MSc student in ICT Policy and Regulation. Currently, I am carrying out a research on the ''*Influence of Information Communication Technology on Performance of Kenya Commercial Bank Ltd*''. I am in the process of gathering relevant data for this study. You have been identified as one of the collaborators and respondent in this study and kindly request for your assistance towards making this study a success.

I therefore kindly request you to take some time to respond to the attached questionnaire. I wish to assure you that your response will be treated with confidentiality and will be used solely for the purpose of this study.

I thank you in advance for your time and responses. It will be appreciated if you can fill the questionnaire within the next 5 days to enable early finalization of the study.

Yours Sincerely,

Churchil O. Ahoya

Student Reg No. HD314-C004-0947/2011

APPENDIX III: OPERATIONALISATION OF VARIABLES

Variable	Type of variables	Indicators	Measurement	Measurement scale	Data analysis Method.
Performance	Dependent	➤ Total income. ➤ Profitability. ➤ Return on Assets. ➤ Customer deposits.	➤ Influence of Information Technology Innovations on performance as shown by records and responses.	Ordinal	➤ Descriptive statics. ➤ Central tendency ➤ Frequency distribution
Technology innovations	Independent	➤ T24(Temenos technology) ➤ Mobi(Mobile banking) ➤ Internet Banking ➤ Card technology	➤ Technology innovations as shown by bank records and responses	Ordinal	➤ Descriptive statics. ➤ Central tendency ➤ Frequency distribution
Product innovations	Independent	➤ Product improvement. ➤ Product range extension. ➤ Product costs revision. ➤ Product replacement. ➤ New product introductions ➤ Product repositioning.	➤ Product innovations as shown by bank records and responses.	Ordinal	➤ Descriptive statics. ➤ Central tendency ➤ Frequency distribution
Market innovations	Independent	➤ Creating value through pricing ➤ Resource availability. ➤ Customer satisfaction and capabilities. ➤ Entry into new markets. ➤ Environmental analysis and response to change.	➤ Market innovations as shown by bank records and responses.	Ordinal	➤ Descriptive statics. ➤ Central tendency ➤ Frequency distribution
Process innovations	Independent	➤ Cost reduction ➤ Process improvement ➤ Conformance to regulation	➤ Process innovations as shown by banks record and responses	Ordinal	➤ Descriptive statics. ➤ Central tendency ➤ Frequency distribution