THE RELATIONSHIP BETWEEN THE LEVEL OF TECHNOLOGICAL INNOVATION AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA.

BY

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D61/72681/2009

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER IN BUSINESS ADMINISTRATION OF THE UNIVERSITY OF NAIROBI.

NOVEMBER, 2011

DECLARATION

This research proposal is my original work and has not been presented for the degree in any other university.

Sign.........JNK................... Date .....7/,1/ 2011.............................

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DEDICATION

This research project is dedicated to my dear parents Mr and Mrs Kariuki. My Brothers and Sisters who always had faith in me. Thanks for your prayers and unwavering support.

ACKNOWLEDGEMENT

ABSTRACT

Commercial banks in Kenya are at crossroads. The new electronic age has transformed the delivery of banking services. Customers nowadays demand new and differentiated financial products and services. In essence banks must search for new strategies of delivering their products and services. With pressure from dynamic and advancement of technological innovation, different electronic distribution channels have been adopted to meet the demands of customers.

The main objective of this research is to determine the relationship between the level of technological innovation and financial performance of the commercial banks in Kenya. This study used a descriptive survey owing to the small number of commercial banks in Kenya. The data for this study was obtained from primary source with the use of well structured and pre-tested questionnaires which were distributed among management team of Kenyan banks. The study concluded that commercial banks have continuously employed various technological innovations which include ATM services, Electronic money transfers, mobile banking, internet banking services and online account opening. The study concludes that technological innovations have lead to increased financial performance of commercial banks in Kenya through increased bank sales, return on equity and profits increment. The study recommends that for banks to meet their customers needs and remain competitive then they need to employ modern technological innovations such as internet based banking and online account opening at a great extent.

TABLE OF CONTENTS

LIST OF TABLES

ABBREVIATIONS

ATM- Automated Teller Machine

CBK- Central Bank of Kenya

IT- Information Technology

R&D- Research and Development

RTGS- Real time gross settlement

SIN- Systems Integration and Networking

CHAPTER ONE

INTRODUCTION

1.1   Background of the Study

The banking sector in Kenya has registered a significant growth in terms of size, products and profitability level. As at December 2010 there were 43 licensed commercial banks and 1 mortgage finance company. Out of the 44 institutions, 31 are locally owned and 13 are foreign owned. The locally owned financial institutions comprise 3 banks with significant shareholding by the Government and State corporations, 27 commercial banks and 1 mortgage finance institution. Commercial banks have enhanced technological innovations that would help them cut costs and enable customer's access services from the comfort of their homes. Most of the Kenyan banks have in the past two years introduced electronic banking products that have increased the efficiency of transactions. They have also revamped the core banking systems spending between Kenya shilling 600 and 750 million   in what has reduced the need for paperwork and backroom offices due to automation of branches, which has rendered a number of workers redundant (CBKwebsite,2010).

Banking institutions must play a catalytic function to develop technological innovation driven economy. The experience of developed countries has evidently demonstrated that a shift of government industrial policy making towards a technological innovation driven economic strategy is absolutely critical. Allegedly successful industrial policy performs an important function in fostering firms to inculcate a culture based spirit of innovation and addresses firms concerns in the realm of innovation pursuits (Goh, 2002).

Technological innovation is used to refer to the process through which technological advances are produced (Goh, 2002).The innovation process includes a set of activities that contribute to increase in capacity to produce new goods and services (product innovations) or to implement new forms of production (process innovations). The concept of learning and knowledge creation

are often used to describe the innovation process; companies innovate through a constant learning process through which they generate new technological knowledge. (Goh.2003). The innovation process has been associated with the creation of core competencies.

Technological innovations have recultivated researcher interest towards the field of consumer adoption. Robertson (1971) classifies innovations based on their impact on behavior and social structure. Technological innovations are most likely to fall into the discontinuous innovations category (Moore, 1999) and can thus be regarded as knowledge intensive innovations. The knowledge needed for technological innovation comprehension is likely to be contingent upon the aspects of technology. According to Rogers (1995), technology consists both of a software and a hardware aspect embodies the technology as a material or physical object (computers have hardware such as semiconductors and electric cables) and software is the information base used (e.g. coded commands and instructions and other information aspects).

Technological change has been described by technology push (Schumpeter, 1939) and demand pull or their interaction as triggers of innovation. More recently (1990s), the theoretical analysis has moved towards the theory of technological innovation as an interaction within a network of companies identified in the systems integration and networking (SIN) model (Rothwell, 1992). Rothwell, (1992) argue that technology push is not enough because it can be constrained by the power of technological change in shaping the competitive dynamics of an industry. Technology push is not stable because rapid technological changes create many alternatives from which firms choose their technology strategy.

One important driver of organizational learning is experience with process technology. Organizational learning might be said to occur as an organization and its members build a knowledge base of action- outcome relationships relevant to its tasks and technologies(Argote, 1999) These knowledge bases have been called technological knowledge(Bohn, 1994).As technological knowledge bases become more complete through learning, knowledge is said to be mature(Bohn, 1994). In developing his model of knowledge maturity (Bohn focuses on what he calls technological Knowledge.

The financial performance of commercial banks and other financial institutions is usually measured using a combination of financial ratios analysis, benchmarking, measuring performance against budget or a mix of these methodologies (Barley, 2000). The common assumption, which underpins much of the financial performance research and discussion, is that increasing financial performance will lead to improved functions and activities of the organizations. The subject of financial performance and research into its measurement is well advanced within finance and management fields. It can be argued that there are three principal factors to improve financial performance for financial institutions; the institution size, its asset management, and the operational efficiency (Bijker, 2007).

Chien Ho, and Song Zhu (2004) showed in their study that most previous studies concerning company performance evaluation focus merely on operational efficiency and operational effectiveness which might directly influence the survival of a company. By using an innovative two - stage data envelopment analysis model in their study, the empirical result of this study is that a company with better efficiency does not always mean that it has better effectiveness. A paper in the title of efficiency, customer service and financing performance among Australian financial institutions showed that all financial performance measures as interest margin, return on assets, and capital adequacy are positively correlated with customer service quality.

The key issues affecting the banking industry in Kenya include; changes in the regulatory framework, where liberalization exists but the market still continues to be restrictive, declining interest margins due to customer pressure leading to mergers and reorganizations, increased demand for non-traditional services including the automation of a large number of services and a move towards emphasis on the customer rather than the product and introduction of non-traditional players, who now offer financial services products.(The Kenyan Banking Sector Report, 2007).

Among the key trends is what appears to be strong emergence of technology driven banking services in Kenya. Banking is edging away from over reliance on traditional banking halls to other platforms supported by technology and in particular telecommunications. This is emerging as threat to the banks because it has enabled non bank competitors like safaricom short circuit

banks by offering cheap money transfer (The Kenyan Banking Sector Report, 2007).Among the key trends is what appears to be the strong emergence of technology driven banking services in Kenya. Banking is edging away from over reliance on traditional banking halls to other platforms supported by technology and in particular telecommunications. This is emerging as a threat to the banks because it has enabled non bank competitors like safaricom short circuit banks by offering cheap money transfer (The Kenyan banking sector Report.2007).

Hill and Utterback (2009) identified technological innovation as a major agent of development and change in societies which has been linked to rising productivity, employment growth and a strong position in export markets, trade and improved quality of life. However, the inherent complexity of the process of technological innovation and its involvement in interaction with different environments as well as industry specific factors, made studies of the characteristics of technological innovation seem difficult to carry out.

Innovation has been identified as an important factor in firm survival (Utter back, 1996). Companies in high technology industries, such as Sony, are often discussed as examples of firms that depend critically on the continued succession of new product innovations for survival (Roberts, 1999).This continuous innovation is difficult to achieve; to survive, the firm must meet customer demands for rapid incremental improvement.

Waves of technological change happen in all industries. Technology goes through periods of incremental change followed by radical technological breakthroughs, and thus the innovation response must vary to suit the environment(Tushman,1986).The new economy has created an environment whereby incremental innovation may lead to corporate failure, and that companies should make non linear innovations to survive (Hamel, 1998).

Longitudinal research has shown how changes in the technological environment often change the market leader as firms reposition themselves. (Tushman and Anderson, 1986).Incremental innovation is known to reinforce the dominance of established firms, yet radical innovation destroys the usefulness of the established firms capabilities (Henderson and Clark, 1990).This is

often referred to as the competency trap, whereby existing companies do not adapt to external conditions.

Hammer (1990) stresses that organizations should "obliterate rather than automate" believing that technology are often introduced for technology sake without contributing to the overall effectiveness of the operation. However, banks traditional lack of resources usually result in a compromise situation (Vossen, 1999).

Kimingi (2010) did a study on the effects of technological innovations and financial performance of banks and depicted that organizational structure, technological infrastructure and technical feedback with other organizations affect the adoption of technological innovations. The study also depicted that technological innovations affect financial performance through increased sales and competitive positioning.

A study on the relationship between information technology conceptualization and bank performance depicted that Implementation of IT make organizations to save great resources and reduces costs of operations, reduce cost per transaction in organization operations and enable firms to satisfy their customer's needs. Implementing in IT makes the firms become more flexible in it operations as it leads to acquisition of qualified personnel in the firm, production of quality products and expand its market shares. (Muasya and Nixon 2009).

1.2   Statement of the Problem

A fundamental assumption of much recent research in operations improvement and operations learning has been that technological innovation has a direct bearing on performance improvements (Upton and Kim, 1999). Strategic management in the banking sector demand that banks should have effective systems in place to counter unpredictable events that can sustain their operations and minimize the risks involved through technological innovations. Only those organizations that are able to adapt to their changing environment and adopt new ideas and ways of doing business that can be guaranteed hope of survival. Some of the forces of change that have greatly influenced the performance of commercial banks include mainly technological advancement.

According to Goh, (2002) there are numerous barriers to innovation in developing nations. The developing countries with low literacy rates and weak higher educational systems often face great difficulties assimilating new technologies for innovation development as they lack the essential human capital to leverage on technological developments, scientific knowledge and technical skills.

Kihumba (2008), conducted a study on the determinants of financial innovation and its effects on banks performance in Kenya. The study focused on financial innovations as a strategy and thus did not cover the relationship between technological innovations and financial performance of commercial banks in Kenya. This study will answer the following question: "To what extent does the level of technological innovation in commercial banks related to financial performance?"

1.3   Objectives of the Study

i.   To establish the level of innovations adopted by the commercial banks in Kenya.
ii.   To determine the relationship between the level of technological innovation and financial performance of commercial banks in Kenya

1.4   Significance of the Study

This study is expected to benefit the management of commercial banks in their quest to come up with new technological innovations that will help them to cut costs and maximize on profitability.

The Central Bank of Kenya will find the results of this study very important as it continues to effectively play its regulatory role of safeguarding the safety and soundness of the industry through ensuring that the innovations that the banks come up will lead the growth of the market.

Investors will be in a position to evaluate what products, processes and institutions innovations to embrace.

Finally, the findings of this study will help other researchers and academicians in their quest to understand and manage the changes that the banking sector is undergoing through product, process and institutional technological innovation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter entails variety of concepts, theoretical framework, empirical evidence and conclusion in regard to the relationship between technological innovation and financial performance of commercial banks in Kenya.

2.2 Theoretical Review

The theoretical framework will be based on various theories and literature capturing technological innovations.

2.2.1 Technology Push Theory or Engineering Theory of Innovation

Technology push or engineering theory depicts that innovation opportunities to improve the products or the manufacturing processes, are found in the uptake of research results. According to this theory, basic research and industrial R&D are the sources of new or improved products and processes. The production and uptake of research follows a linear sequence from the research to the definition of a product and specifications of production, and the application of technology to make a product that conforms to the specifications defined by research that has also produced patents and scientific publications(Schumpeter,1939).

2.2.2 Complexity Theory

Complexity theory has become influential in recent models in social science. In the context of innovations and new technologies, most applications have focused on technology adoption and technology diffusion, whereas the topic of the innovation process has received less attention. There are three families of complexity models of technological innovation: fitness landscape models, network models and percolation models. The models are capable of analyzing complex

interaction structures (between components of technologies, between agents engaged in collective invention) while avoiding 'over-parameterization' (Rothwell,1992b).

2.2.3 Diffusion of Innovation Theory

Diffusion of innovation theory seeks to explain how, why, and at what rate new ideas and technology spread through cultures. Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. The origins of the diffusion of innovations theory are varied and span across multiple disciplines (Rogers,1962)

2.3 Technological Innovation

Innovation is derived from the Latin word novus, meaning new. It is defined by the dictionary as "introduction of something new" or a new idea, method or device (Tornatzky and Fleischer, 1990).In this study, the word innovation refers to technological as opposed to any other form of innovation. Among the variety of definition, technological innovation is considered as a process which is science, technology and system based. This process includes several factors affecting and affected by the firms internal capabilities, its networking and its technological learning ability and influenced by its environmental factors. It would mobilize all existing potential resources to augment the firm's innovation capacities, ending with the introduction of a new or better product or production process.

Technological innovation and the appropriate implementation of new technologies are a fundamental part of development process of all nations. The literature evidence reveals that successful technologies in each nation are those which are rooted in their own indigenization efforts. Indigenous technological innovation can originate just as much from a re-invention of historical techniques or an adaptation of local technology as from advanced industrialized countries.

2.3.1 Models of Technological Innovation

The early innovation models were the linear models of innovation. These simplistic models were replaced by the interactive model of technology push and market pull and later, by the value build up model Jolly (1997). The models of innovation can be classified using, iteration in and adoption of the innovation, as the classifying variable. Iterative models look at the interactions of the people involved in the innovation process whereas adoptive models examine the feedback after the innovation has been adopted. Two kinds of adaptive models are discussed in literature: static and dynamic models, based on feedback after the innovation diffusion. In static models there is no feedback after the user has adopted the innovation, which is not the case with dynamic models of innovation.

The interest in the technological innovation process still continues in response to capitalize the tremendous opportunities offered by new technologies. It is now also well acknowledged that the process of technological innovation is a complex process and many actors hold a role in it (Afuah, 1998). The presence of the various actors and champions is a necessary condition for innovative output but not sufficient enough.

2.3.2 Approaches to Technological Innovation

The economics of technological innovation approach studies the role of technological change in economic growth and efficiency (Rosenberg, 1994). This literature is interested in challenging and expanding economic theory to include a better account of the technological change process.

The technology and business strategy approach focuses on how technological change influences the structure of industries, and the success of businesses (Utterback, 1994).In this literature, technological changes cycles between periods of radical and routine innovation, as companies struggle to position themselves relative to the dominant technological designs that emerge through a complex interaction of strategic intent, technological advance. and regulation.

2.4   Factors affecting Adoption of Technological Innovation

The process of technological innovation at the firm level depends upon a number of inter-related factors which range across all sections of a firm and is strongly influenced by the interplay of many components in the firms external environment. In this respect, the major focus of this study was to analyze the influence of various factors on cultivating technological innovative activities within the manufacturing firms. Boland, (2007) model shows how technological innovation behavior is influenced by three elements: the firm- specific characteristics, its external technology- based relationships and its environment including the impact of national and international factors.

2.4.1   Firm-Specific Characteristics

This refers to the most important determinants that explicitly influence the firm's technological innovation behavior. There are a combination of factors including firm's contextual variables, managerial and employment structure, organization structure, technological infrastructure and staff skill development. The firm's contextual variables refer to its ownership structure, size, production, location, age, experience and its industrial sector (Mansfield, 2001; Andriessen 2001).

2.4.2 Firms External Potential Sourcing

This consists of firm's technological relationships including technological collaborations, technology transfer relationships and technical feedback, with other firms (Kelley and Brooks, 2008; Mansfield, 2001).

2.4.3   Firms Environmental Condition

Firm's environmental condition points to the factors, which indirectly influence technological innovation process of the industrial sector. In this research, the effects of government policies and the role of financial systems as initiatives for cultivating innovative activities are explored (Adam and Farber, 2000).

11

Innovation has been identified as an important factor in firm survival (Utter back, 1996). Companies in high technology industries, such as Sony, are often discussed as examples of firms that depend critically on the continued succession of new product innovations for survival (Roberts, 1999).This continuous innovation is difficult to achieve; to survive, the firm must meet customer demands for rapid incremental improvement.

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Longitudinal research has shown how changes in the technological environment often change the market leader as firms reposition themselves. (Tushman and Anderson, 1986).Incremental innovation is known to reinforce the dominance of established firms, yet radical innovation destroys the usefulness of the established firms capabilities (Henderson and Clark, 1990).This is often referred to as the competency trap, whereby existing companies do not adapt to external conditions.

2.7   Empirical Review

Empirical evidences and results from studies show similar trends on the positive impact of technological innovation and bank performance. Several studies have been carried out in regards to technological innovations in the banking sector.

Hammer (1990) stresses that organizations should "obliterate rather than automate" believing that technology are often introduced for technology sake without contributing to the overall effectiveness of the operation. However, banks traditional lacks of resources usually result in a compromise situation (Vossen. 1999). It is important to link technology to innovation in sustaining competitiveness. Organizations that can combine customer value innovation (Kim and

Mauborgne, 1999) with technology innovation have an increased chance of enjoying sustainable growth and profit.

Han, (2001) indicates that some innovations are built on existing products, services, or procedures, and are incremental in nature. Others involve greater degrees of difference and are more radical than incremental. Some innovators aim to be first, others aim for second place. He adds that a different dimension of innovations is the degree to which they imitate something already familiar.

The adoption and diffusion approach to technological innovation has many features for IS research. Adoption is conceived as a social change process, in which an innovation is communicated over time among members of a social system (Rogers, 1995). While accounting for the nature of social systems and social relationships, this theory focuses on perceived attributes of a technology, such as relative advantage, compatibility and complexity (Moore and Benbasat, 1992). This approach has created a cumulative research tradition that allows us to place IS research in the context of other technology- based social changes.

A study on innovation processes and the perceived role of the CEO in the banking industry depicted that banks should focus on norms that support creativity and implementation in order to build an innovative process. (Gitonga, 2003).

A study on the determinants of financial innovation and its effects on banks performance concluded that technological innovations influence the structural aspects of banks in Kenya particularly on financial innovation as a strategy. Use of various aspects of technological innovations is thus expected to have great effects of financial performance of an organization. (Kihumba, 2008).

A study on the effects of technological innovations on the financial performance of commercial banks in Kenya depicts that most Kenyans trust the use of the ATM as compared to other technological innovations. It also depicts that online account opening has not been widely used in Kenya. (Kimingi,2010).

A study on the challenges in the implementation of mobile banking information systems in commercial banks in Kenya depicted that if ICT systems are not properly implemented it can lead to huge losses for the organization (Otieno. 2008).

A study on the relationship between information technology (IT) conceptualization and Bank performance depicted that organizations conceptualize IT as a means to create impact on its performance. Organizations make decisions to adopt IT due to industrial Pressure. It concludes that firms invest in IT depending on its financial capabilities as well as its technical features. Organizational culture or value also influences firms decision making on IT investment (Muasya and Nixon 2009).

2.8. Conclusion

Over the last three decades the role of banking in the process of financial intermediation has been undergoing a profound transformation, owing to changes in the global financial system. It is now clear that a thriving and vibrant banking system requires a well developed financial structure with multiple intermediaries operating in markets with different risk profiles. Taking the banking industry to the heights of international excellence will require a combination of new technologies, better processes of credit and risk appraisal, treasury management, product diversification, internal control and external regulations and not the least, human resources.

The available literature shows that there exist a strong relationship between technological innovations and financial performance of the banking industry. As noted by Ayres (2008) technology affects the wealth of companies. There is, however, need to investigate the relationship between technological innovations and financial performance of commercial banks in Kenya. The available literature provided insights on how different technological innovations are adopted in different contexts

CHAPTER THREE

RESEARCH METHODOLOGY

3.1   Introduction

This chapter provides a discussion of the research methodology that was used in this study. It discusses the research design especially with respect to the choice of the design. It also discusses the population of the study, sample and sampling techniques, data collection methods as well as data analysis and data presentation methods employed in the study.

3.2   Research Design

The research design employed in this study was descriptive in nature. Descriptive studies describe characteristic associated with the subject population .Saunders et al (2003) assert that a descriptive research portrays an accurate profile of persons, events or situations. Kimani (2006) notes that a descriptive research collects data from members of a population and helps the researcher get the descriptive existing phenomena by asking individuals about their perceptions, attitudes, behavior or values. Moreover, it explores the existing status of two or more variables at a given position in time and whether a relationship exists between them; hence most suitable in establishing the relationship between the level of technological innovation and financial performance of commercial banks in Kenya. Both qualitative and quantitative data was collected using both close and open ended questionnaires. The study used a census survey owing to the small number of commercial banks in Kenya.

3.3   Population and Sample

According to Cooper, D.R and Schindler, (2003), a target population is one the researcher wants to generalize the result of the study. Therefore the research will comprise of all the

16

commercial banks in Kenya as at 31stDecember 2010, licensed and registered under the banking act. According to the Centra Bank of Kenya, there were 44 licensed banks as at 31st December 2010.The study conducted a census survey owing to the small number of commercial banks in Kenya the yearsof review is from 2001-2010. The sample that was used in this study is 100 percent of the population which gives a sample of 44. The sample is considered adequate based on Saunders et al (2003) view that, a sample should be at a minimum: consist of 30 elements for statistical analysis.

3.4   Data Collection

Primary data was collected using questionnaires with close ended and open ended questions that were administered to various banks officials. The questionnaires were dropped to the various banks and picked later.

Secondary data was collected from secondary source. High reliance was placed on the annual reports and financial statements andaccounts. These were obtained from NSE library and the respective banks company secretary.

3.5   Data Analysis

Data that was collected from he questionnaires was edited for completeness and consistency. The data for this study hall be quantitative and qualitative hence both descriptive and content analysis techniqes will be employed. Content analysis was used to analyze the qualitative data while descriptive methods was used to analyze quantitative data.

The analysis of quantitative data was carried out using SPSS version 17.The findings were presented using tables. The likert cale was used to analyze the mean score and standard deviation, which helped in determining the relationship between the level of technological innovation and financial performanc of commercial banks in Kenya. To quantify the strength of

the relationship between the variables, the researcher used Karl Pearson's coefficient of correlation. This will be used to measure the relationship between the level of technological innovation and financial performance of commercial in banks in Kenya.

3.6 Data Validity and Reliability

The researcher carried out a pilot study to pretest the validity and reliability of data collected using the questionnaire. According to Berg and Gall (1989) validity is the
degree by which the sample of test items represents the content the test is designed to measure. Content validity was employed as a measure to which data collected using a particular instrument represents a specific domain or content of a particular concept.

According to Shanghverzy (2003) reliability refers to the consistency of measurement and is frequently assessed using the test-retest reliability method. Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals and by using uniform testing procedures.

The researcher selected a pilot group of 4 individuals from the target population of the staff working in commercial banks in Nairobi to test the reliability of the research instrument. The pilot data is included in the actual study. The pilot study allowed for the pre-testing of the research instrument. The clarity of the instrument to the respondents is necessary to enhance the instrument validity and reliability. The aim is to correct inconsistencies arising from the instruments.

CHAPTER FOUR

DATA ANALYSIS FINDINGS AND DISCUSSION

4.1   Introduction

This chapter covers data analysis, discussion and findings of the research. The aim is to analyze data from the respondents. The results are presented in figures and tables. Out of the 44 respondents that the researcher aimed to achieve, 36 were able to correctly fill and return the questionnaires, hence achieving 81 percent. This is considered reasonable to form basis of the conclusions of the study.

4.1.1   Technological Innovation s and Financial Performance

In this section the researcher aimed at identifying the level at which the bank uses various technological innovations in its operations. A Likert scale of 1 to 5 where 1 is to a very great extent , 2 is to great extent, 3 is to moderate extent, 4 is to a low extent and 5is to no extent was used.

Table 4.1 The Level of Technological Innovations usage by Commercial Banks.

Technological innovation	Mean	Standard deviation
Electronic money transfer	1.556	0.504
Internet Banking Transactions	1.77	0.797
Mobile banking technologies	2.22	0.796
ATM deposits and withdrawals	1	0
Online Account opening	4	0.9562

Source: Research data 2011

From the figure above it shows that commercial banks in Kenya use technological innovations in their operations. The respondents cited that ATM deposits and withdrawals is used to a very great extent. This is depicted by a mean of 1, hence all respondents rated Atm deposits and withdrawals at 1.Electronic money transfer, internet banking and mobile banking are used at a

19

great extent. Online account opening was used at a low extent this is depicted by a mean of 4 and a standard deviation of 0.9562. This was so because banks are required to conduct due diligence on their customers which can only be achieved through face to face interaction with the customers. Other technological innovations included account queries through various banks contact centers, Real time gross settlement (RTGS) where transactions are processed on real time basis without batching transactions together, cheque truncation where cheques images are scanned to the clearing house, hence clearing cheques faster.

Technological innovation is considered as a process, which is science, technology and system based. The study inquired the level of agreement on how the various factor of technological innovations form the banks technological system. A Likert scale of 1 to 5 where 1 is to a very great extent, 2 is to a great extent, 3 is to a moderate extent, 4 is to a low extent and 5 is to no extent was used. Data was presented using mean and standard deviation

Table 4.2 Level of Agreement of various statements about Technological Innovations and the process of its implementation in the Bank

Technological innovations and the process of implementation	Mean	Standard Deviation
Different social groups are inevitably involved in technological innovation	2.111	0.575
Networks of interest groups must be attracted into new technological system	1.333	0.478
Technological innovations compete for scarce resources	1.556	0.969
The rapidity of technological innovation puts organizations under severe pressure to innovate effectively	1.333	0.478

Source: Research data, 2011

The results data depicted in the table 4.2 above shows that networks of interest groups must be attracted into new technological system and the rapidity of technological innovations puts organizations under severe pressure to innovate effectively are at a great extent this is depicted by a mean of 1.333 and standard deviation of 0.478 for both factors.

Technological innovations compete for scarce resources also influenced the process of implementation of technological innovations this is depicted by a mean of 1.556 and standard deviation of 0.969.

Table 4.3 The extent to which various factors affected financial performance of the bank.

Factor	Mean	Standard deviation
Competitive environment	1.111	0.319
Uncertain environment	1.667	0.828
Service quality improvement	1.111	0.319

Source: Research data 2011

Competitive environment and service quality improvement affected the level of financial performance more; this is depicted by a mean of 1.111 and a standard deviation of 0.319. Uncertain environment also affected the level of financial performance though it was rated lower than the other two factors at a mean of 1.667 and a standard deviation of 0.828

Table 4.4 Level of agreement on how various factors of technological innovations form the banks technological system

Extent	Mean	Standard deviation
Internal capabilities	1.444	0.504
Networking	1.556	0.504
Technological learning ability	1.667	0.676
Environmental factors	2.222	0.637

Source: Research data, 2011

The data in table 4.4 above depicted that internal capabilities, networking, technological learning ability and environmental factors form the banks technological system this is depicted by the means of 1.444, 1.556, 1.667, 2.222 and standard deviations of 0.504, 0.504, 0.676, 0.637 respectively.

21

Table 4.5 The level at which various factors affect adoption of various technological innovations in the bank

Factor	Mean	Standard Deviation
Firms specific characteristics such as organizational structure, technological infrastructure	1.556	0.695
Firms external potential sourcing and networking such as technology transfer relationships and technical feedback with other organizations, customer and agents	1.444	0.504
Firms environmental condition for instance effects of government policies and role of financial systems as initiatives for cultivating innovative activities	2.222	1.045

Source: Research data, 2011

The table 4.5 above shows that firms external potential sourcing and networking such as technology transfer relationships and technical feedback with other organizations, customer and agents and firms specific characteristics such as organizational structure, technological infrastructure affected the level at which various factors affect adoption of various technological innovations in the bank to a very great extent with means of 1.444, 1.556, and standard deviations of 0.504, 0.695 respectively. Firms environmental condition for instance effects of government policies and role of financial systems as initiatives for cultivating innovative activities affected the level at which various factors affect adoption of various technological innovations in the bank to a great extent this is depicted by a mean of 2.222 and standard deviation of 1.045.

Table 4.6 The extent do the various aspects of technological innovations influence financial performance of the bank

Financial performance measurement	Mean	Standard Deviation
Simple learning by doing	1.889	0.575
Advances in the designing	1.778	0.929
Constructing and managing complex and advanced industrial processes	2.0	0.676
Manifestation of the ability to innovate technologies	2.333	0.956

Source: Research data 2011

Simple learning by doing and advances in the designing technological factors influenced financial performance of the bank to a very great extent this is depicted by means of 1.889,1.778andstandard deviations of 0.575,0.929 respectively. Constructing and managing complex and advanced industrial processes and manifestation of the ability to innovate technologies influenced financial performance to a great extent this is depicted by means of 2.0,2.333 and standard deviation of 0.676, 0.956 respectively.

Table 4.7 The extent to which technological innovation influence various factors in the bank

Factor	Mean	Standard deviation
Increases sales	1.111	0.318
Profits increment	1.667	0.956
Return on Equity	1.556	0.504

Source: Research data 2011

The table 4.7 shows that increases in sales, profits increment and return on equity factors are influenced by technological innovations to a very great extent this is depicted by means of 1.111, 1.667, 1.556 and standard deviation of 0.318.0.956, 0.504 respectively. These results depicted that the level of technological innovations influences financial performance of the bank

2.5   Financial Performance

Performance is the outcome of all the organization operations and strategies (Wheelen and Huger, 2002). Measuring financial performance accurately is critical for accounting purposes and remains a central concern for most organizations. Performance measurement systems provide the foundation to develop strategic plans, assess an organization completion of objectives, and remunerate managers (Ittner and Larcker, 1998).

Financial performance is essential to the survival of firms in the competitive and uncertain environment. Management is eager to learn how the effort of service quality improvement is related to an organization performance (Sousa and Voss, 2002). Financial performance ultimately reflects whether or not service quality is realized in a firm. Financial performance is conceptualized as the extent to which a firm increases sales, profits, and return on equity. These are indicators of financial performance and manifest the well being of a firm collectively.

2.6   Relationship between Technological Innovation and Financial Performance

Technology is one of the key elements that define a society or civilization. The critical role of technological innovation in the development of a company and its contribution on the economic growth of firms has been widely documented. (Ayres, (2008) identified technology as the wealth of companies. According to Abernathy and Utterback, (2005) the primary role of technological innovation is to assure the survival of the entity, as well as the business ecosystem. which in turn is based on achieving sustainable financial performance.

Hill and Utterback (2009) identified technological innovation as a major agent of development and change in societies which has been linked to rising productivity, employment growth and a strong position in export markets, trade and improved quality of life. However, the inherent complexity of the process of technological innovation and its involvement in interaction with different environments as well as industry specific factors, made studies of the characteristics of technological innovation seem difficult to carry out.

Table 4.8 The extent to which Technological Innovations affect the Financial Performance on the various aspects

Technological innovation and Financial performance	Mean	Standard deviation
Contributes on the economic growth of banks	1.444	0.504
Competitive positioning	1.111	0.319
Assures the survival of the bank	2.111	1.115
Efficiency	1.222	0.637
Higher profitability	1.889	1.008
Achievement of sustainable financial performance	1.556	0.695
Service quality	1.222	0.422

Source: Research data, 2011

It is evident from table 4.8 above that technological innovations affect the financial performance of the bank. This is so because economic growth of banks, competitive positioning, efficiency, higher profitability, sustainable financial performance and service quality are factors that are affected by the level of technological innovations to a very great extent as depicted by the means and standard deviations. Survival of the bank factor is affected by the level of technological innovations to a great extent this is depicted by a mean of 2.111 and a standard deviation of 1.115.

Table 4.9 Correlations

Inferential statistics namely Pearson's product moment correlation analysis was employed for the study variables. Pearson's product moment correlations were chosen in order to assess whether there is a relationship between the study variables.

Correlations

		Return on Equity	Electronic money transfer	Internet banking transactions	Mobile Banking Technologies	ATM deposits and withdrawals	Online Account opening
Return on Equity	Pearson Correlation	1	-.062	-.104	.043	.103	-.041
	Sig. (2-tailed)		.720	.546	.802	.549	.814
	N	36	36	36	36	36	36
Electronic Money Transfer	Pearson Correlation	-.062	1	.594(**)	.299	.200	.191
	Sig. (2-tailed)	.720		.000	.077	.242	.265
	N	36	36	36	36	36	36
Internet Banking Transactions	Pearson Correlation	-.104	.594(**)	1	.536(**)	-.031	.646(**)
	Sig. (2-tailed)	.546	.000		.001	.856	.000
	N	36	36	36	36	36	36
Mobile Banking Technologies	Pearson Correlation	.043	.299	.536(**)	1	.060	.751(**)
	Sig. (2-tailed)	.802	.077	.001		.729	.000
	N	36	36	36	36	36	36
ATM deposits and Withdrawals	Pearson Correlation	.103	.200	-.031	.060	1	-.056
	Sig. (2-tailed)	.549	.242	.856	.729		.745
	N	36	36	36	36	36	36
Online Account Opening	Pearson Correlation	-.041	.191	.646(**)	.751(**)	-.056	1
	Sig. (2-tailed)	.814	.265	.000	.000	.745	
	N	36	36	36	36	36	36

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

The correlation coefficient ranges from -1 < 0< 1 and the more the value tends to 1 the greater the relationship is significant. The Karl Pearson coefficient of correlation shows the relationship between the variables in the data. From the output above, at alpha level =0.01 with 2 tailed test, ATM deposits and withdrawals has a significant correlation with return on equity at 0.103 than the other variables.

4.2   Summary of Findings and Interpretation

The researcher found out that commercial banks in Kenya use various technological innovations in their operations which include electronic money transfer, internet banking transactions, mobile banking technologies, ATM deposits and withdrawals. The respondents cited that ATM deposits and withdrawals is used to a very great extent. This is depicted by a mean of 1, hence all respondents rated ATM deposits and withdrawals at 1.Electronic money transfer, internet banking and mobile banking are used at a great extent.

The firms external potential sourcing and networking such as technology transfer relationships and technical feedback with other organizations, customer and agents and firms specific characteristics such as organizational structure, technological infrastructure affected the level at which various factors affect adoption of various technological innovations in the bank to a very great extent with means of 1.444, 1.556, and standard deviations of 0.504, 0.695 respectively. Firms environmental condition for instance effects of government policies and role of financial systems as initiatives for cultivating innovative activities affected the level at which various factors affect adoption of various technological innovations in the bank to a great extent this is depicted by a mean of 2.222 and standard deviation of 1.045.

The researcher found that increases in sales, profits increment and return on equity factors are influenced by technological innovations to a very great extent this is depicted by means of 1.111, 1.667, 1.556 and standard deviation of 0.318.0.956, 0.504 respectively. These results depicted that the level of technological innovations influences financial performance of the bank.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATION

5.1   Introduction

This chapter presents the conclusions of the data   findings on the relationship between the level of technological innovation and financial performance of commercial banks in Kenya. The conclusions are   structured based on the specific objectives of the study. From the analysis and data collected, the following discussions, conclusions and recommendations were made. The recommendations were based on the objectives of the study.

5.2 Conclusions and Recommendation

The study concludes that commercial banks employs various technological innovations, which include ATM services, electronic money transfers, mobile phone transactions , internet banking and online account opening. It revealed that ATM technology is the most available technology in User's banks whereas online account opening is rarely used. This shows that still Kenyan banks are at initial stages of adopting technological innovations. . Mobile banking transactions is geared to be used at a greater extent in   the future. This is due to the recent technological innovations adopted in the telecommunications industry. This will caps the menace of shortage of financial intermediaries in rural areas.

The study further concludes that technological innovations have lead to improved financial performance of commercial banks in Kenya. This was through increased bank sales, profits increments and return on equity. The study recommends that for banks to be highly competitive, they need to employ modern technological innovations such as internet based banking services and online account opening. The study recommends that for banks to meet their customers needs and remain competitive then they need to employ modern technological innovations such as internet based banking and online account opening at a great extent.

5.3 Limitations of the Study

The study used primary data from questionnaires hence this was subject to the respondents feelings, emotions, attitudes and perceptions. The researcher hence encouraged the respondents to participate without holding back any information.

There was limited time to carry out the study hence the researcher did follow up on the respondents so that they can complete the questionnaires on time. There was lack of sufficient funds that would enable the researcher to access all financial institutions hence the researcher restricted herself to commercial banks.

Respondents were reluctant in giving information due to the fear that the information can be used to publish negative messages on the bank. The researcher dealt with this by use of an introduction letter from the University, and also by insisting that data collected will be used only for academic purposes

5.4 Suggestions of Further Studies

The researcher suggests that a similar study should be done on the relationship between the level of technological innovations and financial performance on all financial institutions. This is because the banking industry is comprised of various other financial institutions which differ in their way of management and have different settings all together.

Another Study can be on the use of technology in credit scoring in financial institutions and finally a study on how cheque truncation will lead to   efficiency of customers' transactions and its impact on financial performance of commercial banks in Kenya.

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APPENDIX I

INTRODUCTION LETTER TO THE RESPONDENTS

August 2011

THE HUMAN RESOURCE MANAGER,

---LTD.

P.O. BOX

NAIROBI.

Dear Sir,

RE: REQUEST TO COLLECT DATA FOR MBA RESEARCH PROJECT

I am a student pursuing Master in Business Administration at the University of Nairobi. Pursuant to the prerequisite course work, I would like to conduct a research project on the relationship between the level of technological innovation and financial performance of commercial bank in Kenya. The research will involve use of questionnaires administered to members of the management team.

I kindly seek your authority to conduct the research in this bank through questionnaires and use of relevant documents. I have enclosed an introductory letter from the University. Your assistance is highly valued.

Thank you in advance

Yours Faithfully

APPENDIX II

QUESTIONNAIRE

Kindly answer the following questions by filling the spaces provided
THE RELATIONSHIP BETWEEN TECHNOLOGICAL INNOVATION AND FINANCIAL PERFORMANCE

1. To what extent does this bank make use of the following technological innovations in its operations? Use a scale of 1 to 5 where 1 is to very great extent and 5 is to no extent

Technological innovation	1	2	3	4	5
Electronic money transfer					
Internet Banking Transactions					
Mobile Banking technologies					
ATM deposits and Withdrawals					
Online Account opening					
Others (Others.....................................)					

2. To what extent do you agree with the following statements about technological innovations and the process of its implementation in the bank? Use a scale of 1 to 5 where 1 is strongly agree and 5 is strongly disagree

Technological innovations and the process of implementation	1	2	3	4	5
Different social groups are inevitably involved in technological innovation					
Networks of interest groups must be attracted into new technological system					
Technological innovations compete for scarce resources					
The rapidity of technological innovation puts organizations under severe pressure to innovate effectively.					
Others (Others.....................................)					

35

3. To what extent do the following factors affect financial performance of this bank? Use a scale of 1 to 5 where 1 is to a very great extent and 5 is to no extent

factor	1	2	3	4	5
Competitive environment					
Uncertain environment					
Service quality improvement					
Others (Others.............................)					

4. Technological innovation is considered as a process, which is science, technology and system based. In light of this statement. rate the extent to which the following factors of technological innovations form the banks technological system. Use a scale of 1 to 5 where 1 is to a very great extent and 5 is to no extent.

Extent	1	2	3	4	5
Internal capabilities					
Networking					
Technological learning ability					
Environmental factors					
Others (Others.......................................)					

5. To what extent do the following factors affect adoption of various technological innovations in this bank? Use a scale of 1 to 5 where 1 is to very great extent and 5 is to no extent.

Factor	1	2	3	4	5
Firms specific characteristics such as organizational structure, technological infrastructure					
Firms external potential sourcing and networking such as technology transfer relationships and technical feedback with other organizations, customer and agents.					
Firm's environmental condition for instance effects of government policies and role of financial systems as initiatives for cultivating innovative activities.					
Others (Others.......................................)					

6. To what extent do the following aspects of technological innovations influence financial performance of this bank?

Financial performance measurement	1	2	3	4	5
Simple learning by doing					
Advances in the designing					
Constructing and managing complex and advanced industrial processes					
Manifestation of the ability to innovate technologies					
Others (Others.......................................)					

7. To what extent does technological innovation of this bank influence the following factors? Use a scale of 1 to 5 where 1 is to a very great extent and 5 is to no extent

Factor	1	2	3	4	5
Increases sales					
Profits increment					
Return on Equity					
Others (Others.....................................)					

8. To what extent do technological innovations affect the performance of the bank in the following aspects? Use a scale of 1 to 5 where 1 is to a very great extent and 5 is to no extent

Technological innovation and financial performance	1	2	3	4	5
Contributes on the economic growth of banks					
Competitive positioning					
Assures the survival of the bank					
Efficiency					
Higher profitability					
Achievement of sustainable financial performance					
Service quality					
Others (Others.....................................)					

9. What are the hindrances to technological innovations that influence financial performance in this bank?

....

....

10. What are the possible solutions to the challenges hindering technological innovations in this bank?

....

....

THANK YOU!!

APPENDIX III

LIST OF COMMERCIAL BANKS IN KENYA

1	AFRICAN BANKING CORPORATION
2	BANK OF AFRICA
3	BANK OF BARODA
4	BANK OF INDIA
5	BARCLAYS BANK OF KENYA
6	CFC STANBIC BANK
7	CHARTERHOUSE BANK(UNDER STATUTORY MANAGEMENT)
8	CHASE BANK
9	CITIBANK N.A KENYA
10	COMMERCIAL BANK OF KENYA
11	CONSOLIDATED BANK OF KENYA
12	CO-OPERATIVE BANK OF KENYA
13	CREDIT BANK
14	DEVELOPMENT BANK
15	DIAMOND TRUST BANK
16	DUBAI BANK OF KENYA
17	ECOBANK KENYA

18	EQUATORIA COMMERCIAL BANK
19	EQUITY BANK
20	FAMILY BANK
21	FIDELITY COMMERCIAL BANK LTD
22	FINA BANK
23	FIRST COMMUNITY BANK LTD
24	GIRO COMMERCIAL BANK
25	GUARDIAN BANK LTD
26	GULF AFRICAN BANK
27	HABIB BANK A.G.ZURICH
28	HABIB BANK LTD
29	IMPERIAL BANK LTD
30	I&M BANK
31	JAMII BORA BANK LTD
32	KENYA COMMERCIAL BANK
33	K-REP BANK
34	MIDDLE EAST BANK
35	NATIONAL BANK OF KENYA
36	NIC BANK
37	ORIENTAL COMMERCIAL BANK
38	PARAMOUNT UNIVERSAL BANK
39	PRIME BANK

40	STANDARD CHARTERED BANK
41	TRANS-NATIONAL BANK
42	VICTORIA COMMERCIAL BANK
43	UBA KENYA
44	HOUSING FINANCE(MORTGAGE FINANCE INSTITUTIONS)