

**CONVERGENCE OF INFORMATION TECHNOLOGY, OPERATIONS
FUNCTIONS AND PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

BY

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DECLARATION

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

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This research has been approved for examination with my approval as the University supervisor.

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DEDICATION

This research is dedicated to my parents Mr. and Mrs. Omido, Anita Ruth, Christabel Mayienga, and Berryl Abungu. You all went without a son, boyfriend and best friend and never complained when I was pursuing my degree.

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LIST OF ABBREVIATIONS AND ACRONYMS

IT	Information Technology
OM	Operations Management
ITAA	Information Technology Association of America
BDI	British Department of Industry
UNESCO	United Nations Educational and scientific organization
ERP	Enterprise Resource Planning
ATM	Automatic Teller Machine
PWC	PricewaterhouseCoopers
OT	Operations Technology
BSC	Balance Score Card
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Actions
PU	Perceived Usefulness
PEOU	Perceived Ease of Use
DOI	Diffusion of Innovations
TQM	Total Quality Management
JIT	Just in Time
TPM	Total Productive Maintenance

ABSTRACT

Organizations are made up of the different functions which contribute to the performance of the organization. Historically IT and Operations resided in different parts of the organization, though several organizations nowadays still practice that. IT and operations are converging and in some cases they are sitting at the same floor and blending their capabilities to enable productions of smarter products and services (Causey, Thielbar, and Bart 2012). The objective of the study was to determine the degree of convergence in Operation and Information Technology in commercial banks and to assess the impacts of IT and Operation convergence on performance of commercial banks in Kenya. The study adopted an exploratory research design. The study population consisted of 43 commercial banks in Kenya. Primary data was collected through the use of questionnaires and secondary data was collected from the financial statements of the commercial banks. The data was analyzed by use of descriptive statistics. The Regression analysis was used to assess the impacts of Information Technology and Operations convergence on performance of commercial banks. The study established there was a degree of convergence between Information Technology and Operations in the following areas starting with the highest to lowest; product upgrade, product management, real time implementation, product development, strategic planning, decision making, process development and budget making. The study also found commercial banks had heavily invested in Information Technology in the following areas from highest to lowest; customer requests, core banking systems, cash management and transfers, alternative channels, POS systems and loan processing. The study found out there was a small relationship between the convergence of Information Technology and Operations processes on organizational performance but no relationship at the management practices. The chi-square test indicated a moderate linear relationship between convergence of Information Technology and organizational performance. This implied that convergence of the two functions does not necessarily lead to banks making higher profits. There are many factors which contribute to the performance of commercial banks in Kenya. The study established that the commercial banks which had not converged the two functions but had converged the processes and the organizational structure. The banks which had been in existence for more than 10 years had the highest convergence score either at the processes or at the organizational structure. There were interesting results from the research where most banks merged the two functions at early age but after operating for five years they separated the two functions and after 10 years they converged again. The researcher can argue that the banks understood the importance of having Operations and Information Technology functions working together for effectiveness and efficiency and that's why they merged the two functions again after separating them

CHAPTER ONE: INTRODUCTION

1.1 Background

Organizations are made up of different functions which perform different activities. The functions include; operations, human resource, marketing, procurement, finance and Information Technology. These functions perform different tasks which lead to the organization achieving its overall goals."There was a day when oil and water didn't mix, lambs did not lie with lions, east and west did not converse and at utilities, those in operations didn't trek with those in Information Technology (IT) or vice versa" (Causey, Thielbar, and Bart 2012, p.24) .Those days are gone, Information Technology and operations are joining and in a few organizations they are situated on similar floor and mixing their capacities to empower creations of more brilliant products and services. Information Technology has been a current issue for the past few years. Almost every day newspapers cover news related to Information Technology. Information Technology has also been widely used in the academia, government and private bodies. Information Technology simplifies life and that's the reason why everybody or every institution wants to use it. Different institutions or different people use Information Technology differently.

The Information Technology department is involved in providing the infrastructure for automation, the governance for the use of the network and operating systems, and assistance in providing the operational units the functionality they need (Shaukat&Zafarullah, 2010). Information Technology (IT) is transforming into the most essential figure in the development of the banking industry. Information Technology Association of America (ITAA) defines IT as the study, design, development, implementation, support or management of computer-based information

systems, particularly software applications and computer hardware. On the other hand, British Department of Industry (BDI) defines IT as the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by micro-electronics based combination of computing and telecommunication (shadhanga, 2014).

Operations management has been in existence for so many decades though only of late most organizations have started putting emphases on the importance of Operations. Organizations found out for them to survive in the market, they have to offer products or services of high quality and produce products at a low cost and this is possible by having a good operation system in place. Chopra et al (2004) defines operations management as the design and management of transformation processes that create value for society. While Krajewskiet et al. (2007) and Chase et al. (2006) defined Operations Management (OM) as a function that enables the organization to achieve their goals through efficient acquisition and utilization of resources. Renner (2003) defines operations efficiency as the ability to work well and produce good results by using the available time and suppliers in the most effective way. Operation is the part of the business that gets the work done. The core objective of all organizations is to effectively and efficiently produce goods or services hence value creation. Operations department is responsible for coming up with the strategies to achieve the above objectives.

Organizations play an important role in our lives. Organizations contribute to our social, economic, and political environment. The growth of the organizations is measured through performance. Organizations performance is an important variable

as it indicates the growth of organizations. Organizations performance is about setting goals which are ambitious and achieving them. This research concentrated on the convergence of IT and operations management and the performance of organizations. A brief overview of the core concepts of the study are be discussed below.

1.1.1 Information Technology

Information Technology is a general term used to allude to the utilization of PCs or some other procedure that produces, control, store, convey, as well as disperse data. What's more it incorporates equipment, programming, databases, systems and other related segments which are utilized to manufacture data frameworks (Shaukat&Zafarullah, 2010). The commercial use of IT encompasses both computer technology and information communications technology. United Nations Educational and scientific organization (UNESCO) also defines IT as a scientific technology and engineering discipline and the management techniques used in information handling and processing their applications, computers and their interaction with men and machines and associated social, economic and cultural matters (shadhanga, 2014).

Bigelow (2015) asserts that IT can likewise allude to the design, strategies and controls administering the utilization and capacity of information. Rouse (2015) argues that the term Information Technology was invented by the Harvard Business Review, with the purpose of differentiating between purpose built machines which only performed specific tasks and general purpose computing machines which had the capability of performing different tasks.

The IT function ensures the organization objectives are aligned with the IT infrastructure. It also ensures the security of data, networks and systems are working well. The IT function is responsible for providing the organization with the required or up to date infrastructure and software. It is also responsible for the operating system, hardware and network management. In addition the IT function will ensure the accuracy and completeness of data stored in the master file. Laudon and Laudon (2012) assert that without IT an organization does not have the power to make decisions. It empowers an organization staffs to work without supervision. Rahim and Kurnia (2006) assert that IT creates a better relationship between the organization and the customers.

1.1.2 Operations Management

Operations management handles the way products or services are transformed into outputs (Waters, 2002). Harry and Schroeder (2000) define operations management as the transformation of how the firm conducts its daily operations. Slack et al, (2004) defines operations management as the decisions and actions which set the role, objectives and activities of the running of an organization. Operations management include: product and process design, supply network design, inventory planning and control, capacity planning and control, supply chain planning and control, enterprise resource planning (ERP), lean synchronization, project planning and control, quality management, layout, operations improvement, and risk management (Slack, Chambers, Johnston, 2010).

Waters (2002) states that from the traditional view an organization has three functions: marketing, operations and finance. Operations function deals with the

transformation of a product/service from the supplier until the product reaches the customer. The transformation process is categorized into three phases; inputs, transformation and outputs. The first one is the input which consist of the following; raw materials, labor, technology, machines and capital. The inputs are mixed and moved to the second phase which is the transformation of the raw materials into a product of service. The last phase is the output where we have either the product or service. The value of the product is increased during the transformation at every stage. Customers give feedback after using the product which sometimes alters the inputs. Russell (2007) asserts that in operations excellence is important irrespective of how superior the product is.

The performance of an organization will last as long as the organization can implement its operations strategy. Slack, Chambers and Johnston (2014) asserts that Operations strategy sets the role of operations. Operations strategy plays an important role in operations management; it specifies how resources will be used to support the organization strategy. It's the part that assists operations management to achieve competitive advantage. The competitive advantage includes; quality, cost, flexibility and timeliness/fast delivery of products. A successful organization produces flexible products, which are of high quality at a lower cost and delivered to the customer within the shortest time as possible.

1.1.3 Organization performance

Brealey et al (2009) defines organizational performance as the process of measuring the efficiency and effectiveness with which an organization uses its assets in order to earn revenue. The organizational performance of any particular organization has a

specified duration, most organizations use one year. Robbins (2000) asserts that the main measures of any performance of an organization are efficiency, timeliness, productivity, quality, and effectiveness. Chavan (2009) asserts that most organizations only focus on one measure of organizational performance and that is effectiveness. There are several financial and non-financial indicators for measuring the performance of an organization. The non-financial indicators include the Balance Scorecard while the financial indicators include Returns on Assets, profits, Earnings per share and Returns on Equity. The research focused on the earnings per share and profits which are a financial indicator to measure the profitability of an organizations performance.

1.1.5 Commercial banks in Kenya

A commercial bank is an institution that provides financial services including issuing money, lending money and processing transactions and credit card (campels et.al 1993). Commercial Banks are licensed and regulated by the Banking Act (cap 488, Laws of Kenya) and by the central bank of Kenya Act (cap 491, Laws of Kenya). They are the overwhelming players in the Kenyan Banking sector and nearer consideration are paid to them while directing off-site and on location observation to guarantee that they are in consistence with the laws and controls. (www.cbk.or.ke)

Right now, Kenya has 44 banks and 13 authorized microfinance banks; 31 banks are locally owned and 13 are foreign owned. The locally owned comprise of three banks with huge shareholding by the Government of Kenya and State Corporations, 27 business banks and one mortgage finance institution, Housing Finance. The commercial banks in Kenya play the following roles: They provide a safe place for

clients to keep their cash, they store the cash in vaults and make accessible to the clients whenever they need the cash. They facilitate the exchange of money from one account to another. They offer loaning administration. Banks offer foreign exchange services; they sell and buy foreign currencies to/from the customers. They help brokers managing global exchange. They offer financial advice to their customers. They additionally keep valuable items for customers, these valuable items include: title deeds, certificates, jewelry and even keys at a fee and in conclusion Banks goes about as trustees; they manage the properties of deceased on behalf of the family. This is to forestall wrangles which can lead to destroying the properties.

The Kenyan banks have not been left behind as far as innovations are concerned. The following innovations have been adopted in the banking industry. Internet banking has reduced paperwork. Mobile banking and Agency banking has enabled customers to transact from any location they are. ATM's and smart card applications have made life easier for the customer as they don't have to carry cash all through. Cheques have contributed 48% payments of non-cash payments. In 2005 the Central bank of Kenya introduced the use of Real Time Gross Settlements (RTGS) as a means of making payments.

1.2 Research Problem

The converging of IT and operations may bring a clear advantage to financial institutions including expense and hazards diminishments and improved performance and picks up in adaptability. This would enable banks to achieve efficiency and operate effectively. Lysons (2006) asserts that the aim of Operations efficiency is to maximize productivity. The converging of IT and operations infers that IT and

operations systems are orchestrated, regular administration and process models are introduced, security and information are overseen midway and assets re-gifted to comprehend and know the prerequisites of both orders. The purpose behind re-skilling the assets are on the grounds that a great number of people in IT don't know much about operations and the other way around.

Operations heavily rely on IT to be able to deliver efficiently and the best service to the bank customers (Rahim &Kurnia, 2006). It seems almost impossible for operations in the banking industries to function without IT (Laudon&Laudon, 2012). Commercial banks in Kenya have created and operated IT and Operations as two distinct departments, keeping up partitioned innovation, conventions, gauges, administration, models and hierarchical units; while most of them have computerized operations. Kenya has grown in terms on technology use compared to other African countries. This growth can be seen through many banks adopting financial technology (Fintech) solutions; Fintech provides financial institutions with cutting edge solutions and services. Mpesa has also contributed to the growth of IT in Kenya; Kenya was the first country in the world to introduce mobile money transfer. Today customers can withdraw or deposit to bank accounts through Mpesa. This rate of IT growth and innovations in Kenya motivated the researcher to study the banks in Kenya which have converged and those which have not converged.

A study carried out by PWC (2014) focused on the convergence of everything, which is also referred to as internet of things. The study found out the convergence will bring a lot of business opportunities and better consumer relationship but might have risks like hacking. Harp and Brown (2016) concentrated on IT/ Operations

Technology convergence but mostly focused on the energy, oil and gas industries. The paper found out the successful convergence of IT and OT promises significant results in many areas. They (Harp and Brown, 2016) indicate that organizations have a long way to successful convergence the two functions. Locally Guyo (2014) concludes that technology adoption had a positive influence on operations efficiency of banks. Oduor (2012) found out that management and the type of Information system used has an impact on operational performance.

The above studies contributed to the areas of operations and IT in Kenya. Whether IT and operations convergence may lead to performance of organization; this is subject to further interrogation in Kenya. This study attempted to fill this identified gap.

The study sought to answer the accompanying inquiry: what is the level of IT and operations convergence among commercial banks in Kenya? What is the effect of IT and operations convergence on the performance of commercial banks in Kenya?

1.3 Research Objectives

The study sought to achieve the following objectives:

- i. To determine the degree of convergence in Operations and Information Technology in commercial banks.
- ii. To assess the impact of IT and Operation convergence on performance of commercial banks in Kenya

1.4 Value of the Study

Findings from this research will benefit academicians by broadening their understanding of the importance of converging Information Technology and operations in commercial banks.

The findings may as well attract other researchers to study other organizations on the importance of merging the two departments. The available literature in this area is full of case studies from the west, which as pointed out by Aosa (1992), cannot be replicated without amendments for organizations operating in Africa. This study will also increase literature on IT and Operations merger in Kenya which may be used by all stake holders. The study will also be used as a reference point for material on the relationship between operational efficiency and adoption of technology by commercial banks. Other researchers in the same field will also have an easy time determining what have being done in the area so far to know which point of view they will base further studies on. The study will also propose areas for further study which will ease the earlier mentioned process.

The findings will benefit the financial institutions as it will give them insight on whether to converge the IT and operations departments or not and the benefits of each process. The study will benefit the management of commercial banks in Kenya by helping them understand the need for Information Technology and operations convergence. The study will also identify the challenges/problems commercial banks in Kenya might experience in the process of converging IT and operations

The policy makers might learn from my project and realize the importance of merging the two functions. They will come up with policies on how to successfully converge the two.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Information Technology function has become part of all organizations lives. Through IT work has been made easier and products/services cheaper. In developed countries IT is a necessity for organizations to survive. The developing countries have not been left behind as majorities are now appreciating IT in their day to day activities (Pritam 2002). IT has led to time saving, increased compliance, and reduced administrative cost, production of cheaper products, reduced competition and customers being served better. Lysons (2006) asserts that it's still difficult for some organizations to adopt IT due to the cost. Organizations that adopt IT aim at making their operations efficient and cost minimization. IT improves effectiveness and efficiency; in addition it also ensures products/services are produced of high quality.

The Operations function is the part of the organization that is concerned with planning, coordinating and controlling resources that the company needs to produce products or services (Barnes 2008). The success of any organization is determined by how well its operations are managed. Hill (2005) emphasizes that operation function is responsible for 70% of the activities and resources in an organization.

2.2 Theories of Operations and Technology innovation

The theories cited in this research forms the background of Information Technology and its impact on operations in organizations leading to performance. The researcher critiqued the theories below.

2.2.1 Transaction cost theory

Transaction cost theory was first studied in firms in 1937 by Ronald Coase. He did a research on “the Nature of the Firm” and advised economists “to bridge what appears to be a gap in economic theory between the assumption that resources are allocated by means of the price mechanism and the assumption that allocation is dependent on the entrepreneur-coordinator. We have to explain the basis on which, in practice, this choice between alternatives is affected.” (Coase 1937, p. 389). Coase believed firms existed because they reduced bargaining costs, they kept secrets on trades, they reduced information cost and cost of transactions. Coase theory on the nature of the firm failed for two decades. Williamson and Winter (1991) states that “one could say that Coase’s approach on the transaction costs did not face time as well as the theory on the whole” (p.8).

Many researchers have had contradicting views on the theory; today the same theory represents how efficiency is analyzed in organizations. This theory believes that any transaction that is done by a human being has a cost (Williamson 1979). The transaction theory talks about investment cost and operational costs. Aiston and Gillespie (1988) talked of the three stages in organizations where transaction cost is applied. The first stage is the pre-production; the second stage the production and lastly the post-production stage. Williamson (1991) asserts that uncertainty in the market and arrangements which are not acceptable will lead to an increase in transaction costs. Lack of proper systems in operations will lead to wastes. This waste is what is referred as the transaction cost which affects the efficiency of the operations channels.

2.2.2 System Theory

Capra (1997) asserts that systems theory is concerned with a holistic approach. It investigates the whole and not parts (Chockland, 1997; Weiberg, 2001; Jackson, 2003). Luhmann, (1997) argues that there's a relationship between different parts. These parts interaction is more important when there's a purpose to be shared (Golinelli, 2009). We cannot understand a phenomenon through categorizing it into parts; we need to look at it from the global perspective for us to fully understand the phenomenon (Von Bertalanffy, 1998). Von states that an entity has an open system, closed system and isolated system. The open system interacts with the external environment. The external environment exchanges people, information, matter and energy with the organization. The closed system there's only exchange of energy while the isolated system there's no exchange. Burns and Stalker (1961) applied systems theory in understanding the relationship that existed between an organization and its environment.

Beer (1972) gave a different argument on systems theory. He argued that in a changing environment an entity used for surviving purpose is referred to as a system. Katz and Kahn (1966) applied open system to organizations; they argued organizations are systems which are built up by energy from the environment. Kim et al (1990) linked Total Quality Management and systems thinking. They argued that the goals of organizations are achieved depending on the relationship that exists between different parts. The main focus of system theory is interactions. An element behavior is different when it interacts with one or several other elements. The ability of an organization to manage its functions and relationships; having a smooth flow of information, good communication channels and harmonizing its operations is

determined by a good system model. These separates firms which are competitive and performing well to non-competitive firms (Christopher, 2007).

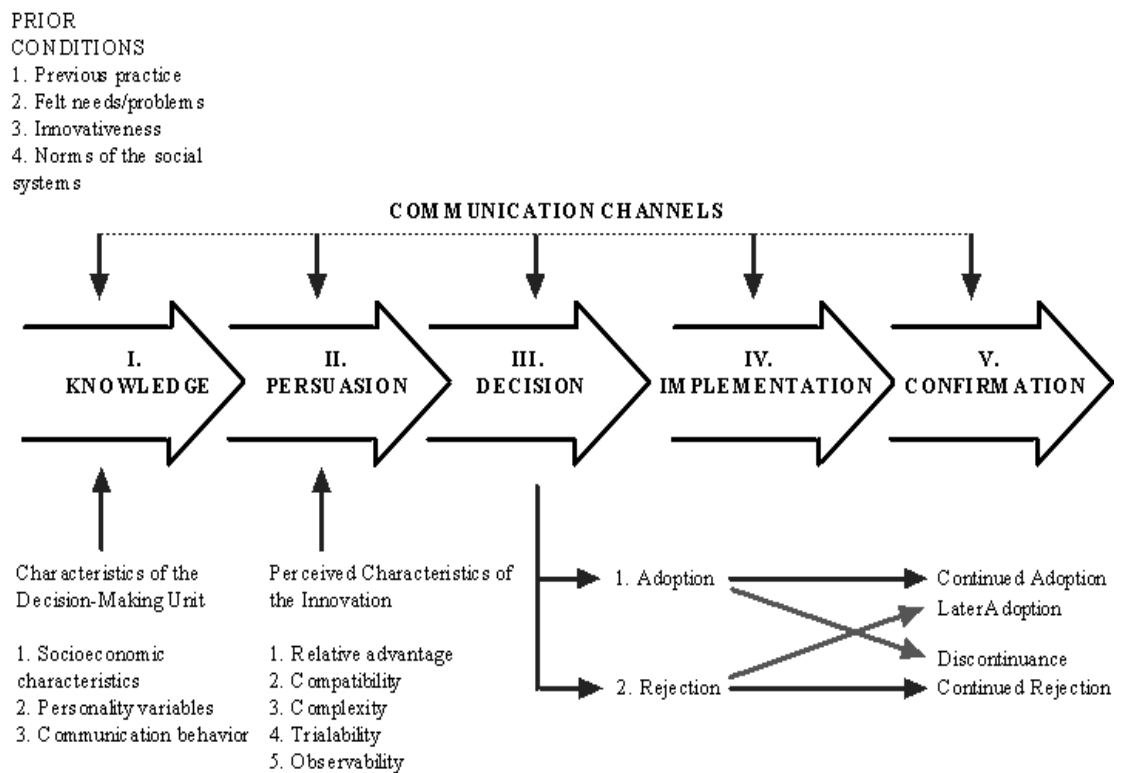
2.2.3 Diffusion of innovations (DOI)

This theory is about how innovations spread in an organization or a social system. It's concerned with the spread of new ideas. Rogers and Kincaid (1981) define diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. The theory believes different individuals have different degrees of accepting innovations. The theory states that there are five types of individuals when it comes to the adoption of technology: innovators, early adopters, early majority, late majority, laggards (Rogers 1995).

Rogers (1995) asserts that an innovation is determined by three categories of individual characteristics. The first category is the leader attitude towards the new idea. The second category is based on the organization structure: how complex the organization is, the size of the organization, weather the organization is centralized or decentralized and formation. The last category is the openness of the system.

Rogers (2003) defines the innovation decision process as “information seeking and information processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation” (p.172). The innovation decision process has five steps: knowledge, persuasion, decision, implementation and confirmation.

Figure 2.1: the innovation decision process



Source: diffusion of innovations fifth edition by Rogers (2003)

The theories apply to the study in the following ways. The Transaction Cost Theory talks about cost which an organization incurs in case of mismanagement of the organization resources. The theory focuses on efficiency in the operations function of an organization. The System Theory talks about relationship between different systems in an organization. The theory argues that the systems which are interrelated should work together. It state that an element performs better when it interacts with other elements. This brings out the relationship between Operations and IT functions. When the two are converged they might perform better than working separately. The Diffusion Theory is about how innovations spreading from the early adopters to the laggards. The convergence of IT and Operations is an innovation which has been

adopted by a few banks. The other banks might learn from the few which have converged and borrow the same idea.

2.3 Information Technology and Operation Functions convergence.

The use of IT has redefined the banking operations globally. Today the banks are offering sophisticated services to customers and at the same time coming up with other services which are IT dependent. Technology has come up with new ways of serving banking customer and new products such as ATMs and Internet Banking (Singh 2002). Banks all over the world try to find technological solutions so that they can serve their customers better. Today's business environment is dynamic. The customers know exactly what they want and how fast they should receive it.

The dynamism of the business environment and the customers being aware of what they expect to receive from the organization is solved by applying the principles of operations management. Operations management in any organization deals with the way services or products are transformed from inputs to outputs (Waters, 2002). All operations in all organizations irrespective of how well they are managed are still capable of improvement (Lassiter, 2007). To the customers operations is important because it leads to their satisfaction, while to the organization operations deals with cost reductions by eliminating errors and thus increase dependability. Operations management achieves all these with the use of Information Technology. Information is an important aspect of operations, without IT operations in organizations might be crippled.

IT contributes greatly to the success of any organization. Laudon & Laudon (2012) asserts that without IT an organization has been deprived the power to make

decisions. IT makes work easier for operations in that multitasking is made possible. Slack et al (2010) argues that technology empowers the staff to perform to their maximum. Having IT in the operations empowers the staff to work without supervision. Rahim &Kurnia (2006) asserts that IT creates a better relationship between the organization and the customers. Operations cannot function without IT, for an organization to achieve significant results operations and IT have to work hand in hand. A survey carried out by BMC software (2012) called the white paper indicates that convergence of IT and operations leads to better success in organizations. Bezzina and Terrab (2005) define convergence as ways in which an organization relates to the society and new ways of doing business. While Stobbe and Just (2006) defines convergence as a process of qualitative change between two or more existing segments.

2.4 Information Technology, Operations convergence and organization performance

An organization that adopts IT performs better in terms of their operations. Operational performance is measured by reduction in costs, new products, and level of quality in products/services. In developed countries IT is believed to have a positive impact on the performance of an organization. Drucker (1992), Lang (2002), Vasudevan (2003) supports the same view by arguing that IT is an important tool in developed countries because of the stiff competition. Bamidele (2006) argues that IT improves the performance of organizations. Sanusi (2003) asserts that in developing countries IT is a major determinant to the survival of organizations. Odedra and Kluzer (1998) assert that the developing countries are increasingly investing in IT by using their own funds or borrowing. Anandrajan et al (2002) argues that the funds

spent on IT by organizations annually exceed 1.5 trillion US dollars. Harris and Davision (1999) assert that the lending by World Bank on IT has increased over six times of the total lending by the bank.

The desire for organizations to perform better has prompted Substantial Interest in IT, this drawn the consideration of numerous specialists. Despite several researches having been carried out on IT and its effect on organizations performance; many researchers are still divided over the issue. Wilcock et al (1998) asserts that the effect of IT on performance is questionable. The productivity paradox –IT has no impact on productivity supported the scholars who argued that there's no relationship between IT and productivity (Turner, 1985, Loveman, 1988, 1994; Roach, 1988; Mitra&Cyaya, 1996; Strassman, 1997; Dasgupta&Sarkis(1999). Paul David (1990) argued that IT would not have a measurable impact on productivity until it reached a critical mass of diffusion and experience. A study done by Brnjolfsson and Loren Hitt (1993) and Frank Lichtenburg (1993) showed that there was a relationship between IT investment and the organizational levels of output. Kraemer and Dedrick (1994) did a research on the Asia- Pacific countries. The outcomes indicated proof of a critical relationship between the level of IT spending and the GDP growth. Dewan and Min (1997) did a research which showed IT investment generated excess returns than returns invested in other projects.

Operations performance contributes to the overall performance of the organization (Brah& Lim, 2006)). Information Technology enables the improvement of operations function and thus leading to the organizational performance. When operations integrate IT, it empowers the employees thus leading to better results. The operations

function is concerned with products/services that are suitable to the organization, to the customers and affordable (Robb and Arthanari, 2008). Operations function has various practices which aid in the general performance of the organization. Total quality management (TQM) is the first practice of OM. Hendricks and Singhai (1996) asserts that TQM is associated with the betterment performance of an organization.

Ross (1993) and Powell (1995) defines TQM as a management philosophy that integrates with a series of practices emphasizing continued improvement, meeting consumer expectations and needs, reducing re-work, long-term planning, redesigning processes, competitive benchmarking, teamwork, constant results measurement, and a close relationship with suppliers. Many researchers have studied TQM but none come up with a definition that was agreed upon by all the researchers (slack et al 2002). Kaynak (2003) did a research which identified different practices that different researchers associate with TQM. Irrespective of the different definitions of TQM Cho and Pucik (2005) studied TQM and organizations profitability. The research covered 488 firms in 10 different industries. The results showed a positive relationship between TQM and the profits that organizations make. Sila (2007) tested TQM practices on the performance of organizations. The outcomes showed there was a direct relationship between TQM and organizations performance.

Fulleton and MC Watters (2001) did a research on the practice of Just in Time (JIT) and argues that the impact of JIT is tangible to an organization which has a wide spread of culture. He concluded that JIT will work better in line with other operations practices. The same argument is supported by Flynn et al (1995) and Kiran et al (1995).JIT is producing products/services when the customer makes a request or needs the product/service. Claycomb et al (1999) study on 200 American firms found

JIT contributed to the efficiency of organizations. Matsui (2007) did a survey on 50 Japanese companies. The results showed a significant impact of JIT on organizations performance. MC Kone, Schroeder, Cua (2001) used Total productive maintenance (TPM) to test 117 production plants if there was any relationship between TPM and organization performance. The outcome showed there was a positive relationship. Prasanth, Poduvial, Pramod and Jagathy (2013) defines TPM as “maintenance program in which the field operators look after the routine maintenance and maintenance personnel develop modifications to improve reliability and availability of the equipment’s, maximize equipment efficiency and productivity of processes by eliminating losses and reducing costs thereby improving quality of the products and ensuring higher top and bottom lines for the organization” (p.29) Eli et al (2006) asserts that TPM has proved to be the tool that saves firms from collapsing.

2.5 Summary of Literature Review

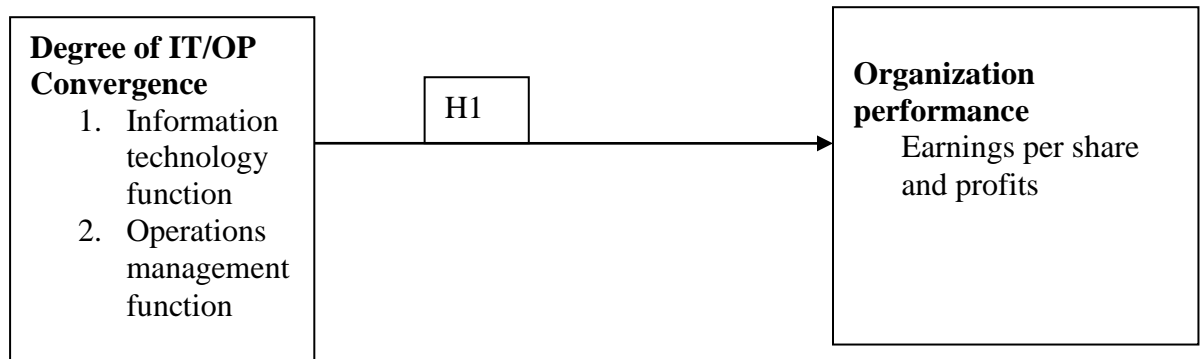
From the empirical studies, it can be conclude that operations and IT contributes to the performance of the organization. Empirical studies give much focus on: the impact of Information Technology on performance in organizations and the impact of operations on performance in organizations. The researcher did not come across any literature on the convergence of IT and operations functions on commercial banks. Additionally the research did not find any study done in Kenya on the convergence of IT and operation functions and its relation to the performance of commercial banks. This study intends to address this knowledge gap by studying the convergence of IT and operation functions and performance of commercial banks in Kenya.

2.6 Conceptual Framework

Figure 3.2 conceptual framework

Independent variables

Dependent variable



The link can be observed by testing the hypotheses below.

Ho: convergence of IT and Operation functions at the Management practices does not have a positive impact on organizational performance.

Ho: convergence of IT and Operation functions at the operations processes does not have a positive impact on organizational performance.

The conceptual framework explains the convergence of IT function and operations functions (independent variables) interact leading to performance of the organization (dependent variable).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

Research methodology portrays the procedures to be followed in conducting the study (Mugenda & Mugenda, 2003) and also, a systematic way of solving a research problem (Kothari, 2004). This methodology discussed the research design, population under study, sample design, data collection, data analysis and the way the data was processed.

3.2 Research Design

This study adopted an exploratory research design. The researcher sought to understand more about convergence of IT and Operations in commercial banks in Kenya. The researcher studied IT and Operations from a new angle which the results might be unexpected or startling. The research design assisted the researcher to identify if there was any relationship between IT/OT convergence and the performance of commercial banks.

3.3 Population and sampling

This study involved all the 43 commercial banks in Kenya, regulated by the central bank of Kenya. 31 banks are locally owned and 13 are foreign owned. The locally owned financial institutions comprised three banks with significant shareholding by the Government of Kenya and State Corporations, 27 commercial banks and one mortgage finance institution, Housing Finance. A census was carried out due to the small number of commercial banks in Kenya.

3.4 Data Collection

Data was collected using primary and secondary sources during the research. The primary data was collected through questionnaires; the secondary data was obtained from central bank of Kenya website. Data collected helped us to have a deeper understanding of the convergence of Information Technology and Operations functions and the performance of commercial banks in Kenya. The questionnaires were closed – ended and was self – administered. May (2004) suggested that questionnaires were an efficient data collection mechanism provided the research had a deeper understanding of what exactly they were required to do.

The researcher had two questionnaires. One was directed to the Operations Manager, the second questionnaire was directed to the IT manager. Questionnaires had two sections addressing issues related to the research objectives. Part I of the questionnaires aimed at providing general information, while parts II addressed issues concerning IT and operations convergences.

3.5 Data Analysis

Data analysis is the computation of certain measures and searching for patterns of relationships that exist among data groups (Manoj, 2006). Kothari (2006) adds that before data analysis, the data has to be processed in order to be put in a usable form. The questionnaires will be analyzed using Statistical Package for Social Sciences (SPSS). The first objective was analyzed using mean and standard deviation to evaluate the various characteristics of convergence. The second objective was analyzed using regression analysis; the output explained the relationship between the

independent and the dependent variables. The following regression model was used to examine the relationship.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

- Y = organization performance
- β_0 = constant
- $\beta_1 X_1$ = convergence score
- ε = Error term

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter covers the data analysis, findings, interpretation and presentation of results. The first objective of this study was to determine the degree of convergence in Operations and Information Technology in commercial banks. The second objective was to assess the impacts of IT and Operation convergence on performance of commercial banks in Kenya. Data was analyzed using the aid of SPSS analysis package. It was then presented by tables, pie charts and bar graphs and interpreted with frequencies and percentages. Likert-type findings were further processed to yield meaningful interpretation using mean and the standard deviation. The researcher targeted all the 43 commercial banks in Kenya. The questionnaires were personally administered. The following table shows response rate of the study.

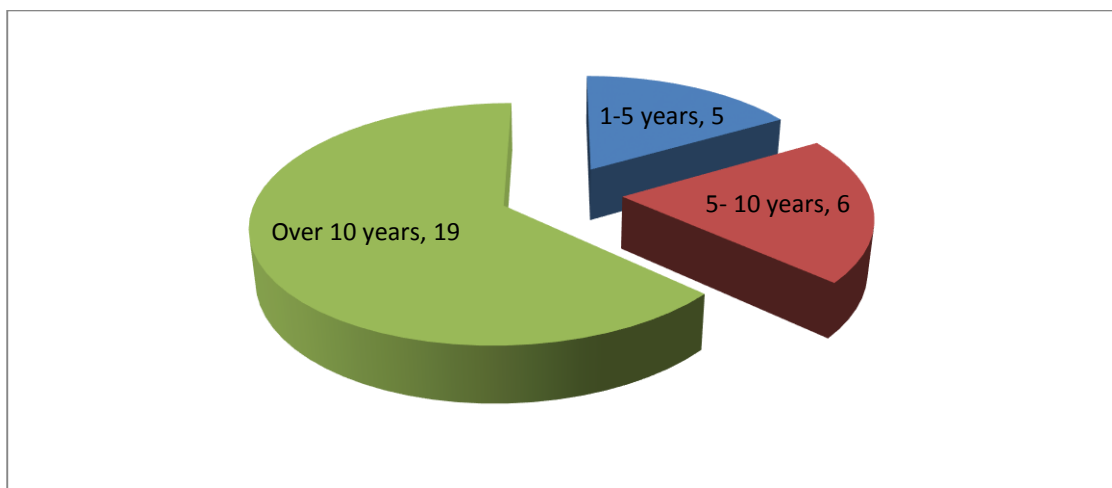
4.2 General Information

This section discussed the general information about the commercial banks in Kenya. A total of 43 questionnaires were issued out. The completed questionnaires were checked for completeness and consistency and out of the 43 questionnaires distributed, 30 were returned. The returned questionnaires' represented a response rate of 69.8% and this response rate was deemed to be adequate in the realization of the research objectives. Mugenda & Mugenda (2003) stated that a response rate of more than 50% is deemed to be adequate.

4.2.1 Number of years in existence

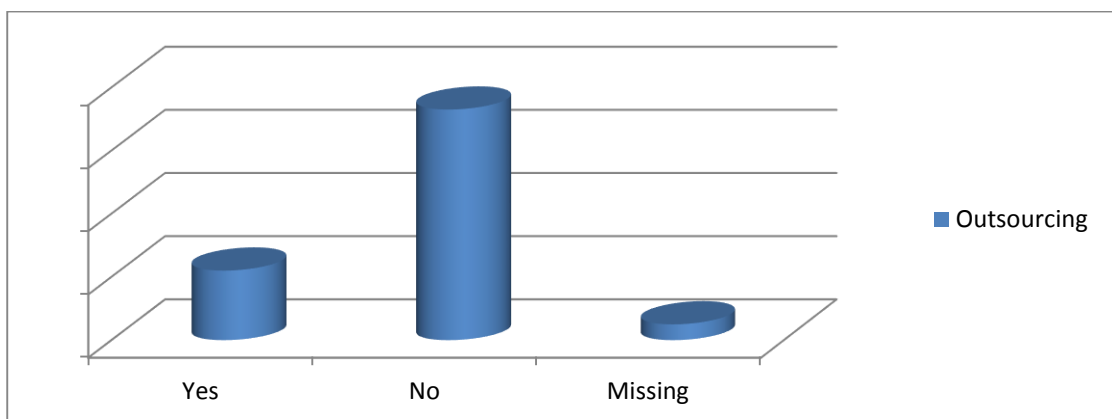
The findings showed that majority of the commercial banks had been in existence for over 10 years comprising 63.3 % of the respondents while 20% indicated their banks had been in operations between 5 to 10 years. This meant that over 83.3% of the commercial banks sampled had been in operations for more than 5 years and this implied that they had an experience on running operations and Information Technology departments with a view to improving their performance as an organization. Only 16.7% of commercial banks had indicated they had been in operations for less than 5 years.

Figure 4.1 Years in existence



4.2.2 Outsourcing and Information Technology

Figure 4.2 Outsourcing



The researcher sought to find out how many commercial banks had outsourced their Information Technology. The findings were that 22% of the respondent outsourced IT while the majority of the respondents 73% did not outsource IT and 5 % didn't answer the question. This meant that for the majority (73%) of the commercial banks their IT is was not outsourced. Lysons (2006) asserts that some organizations are not able to adopt IT due to the high cost. This implied that the commercial banks which are not able to adopt IT due to high cost will prefer outsourcing which is a cheaper means. The commercial banks which outsource IT are no able to converge IT and Operations processes because they rely on a third party entity to provide them with the technology. This will limit them from merging the two departments. They can only converge at the organization structure; where IT manager and Operations manager report to the same person. It can also be a risk for them because they will be giving too much control of their main processes to a third party.

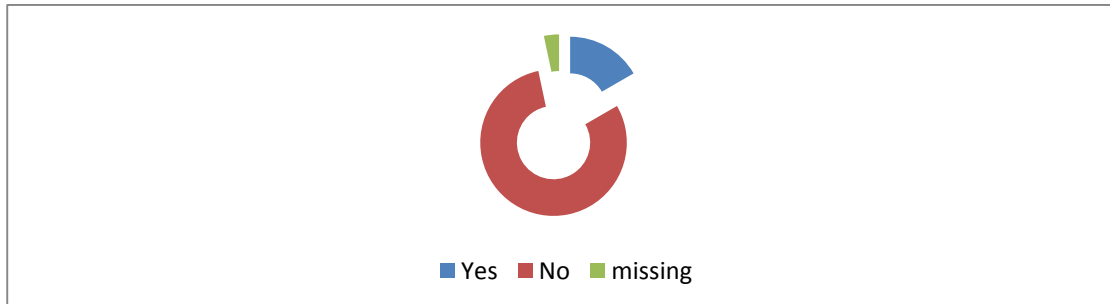
4.3 Objective findings

4.3.1 Degree of Convergence in Operations and Information Technology functions

In this section, the study aimed to find out how many commercial banks have merged the Information Technology and Operation functions. The figure below shows that majority of the respondents (80%) which comprised of 24 banks have not merged the two functions. The banks which indicated they had merged were 5 which comprised of 17% of the total respondents while 1 bank did not answer the question. This implied that 80% of the commercial banks IT and Operations are operated as separate functions. Most of the respondents argued that IT and Operations functions are supposed to be separate. One IT manager argued that there's a challenge in aligning

the two departments. He argued that most managers of IT and Operations don't understand what the other does.

Figure 4.3 Convergences between IT and Operations



4.3.2 IT and Operations functions location

This section aimed at finding out if the Information Technology and Operations function are located on the same floor but with separate departments. 63% of the respondents indicated Information Technology and Operations functions are not located on the same floor. 37% indicated IT and Operations are located on the same. Out of the 37% respondents who indicated IT and Operations are located on the same floor, 70% indicated the two functions are not located in the same department while 30% said they are located in the same department. This meant that more than 50% of the respondents IT and Operations functions are located at different departments within the organization but those which IT and Operations functions are located on the same floor more than 2/3 the two functions are on the same department. This implied that the convergence between IT and Operation function only existed to a very small extent. Most commercial banks have not merged the two functions. The results are illustrated in the table 4.1

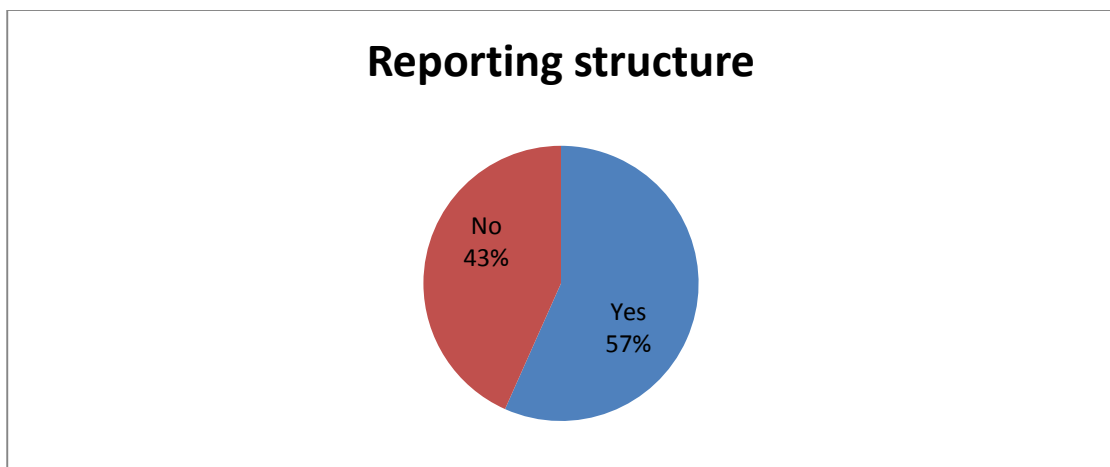
Table 4.1 IT and Operations Location

	Same floor	Not on same floor	Same department	Not on same department
Yes	37%		30%	
No		63%		70%

4.3.3 Reporting structure

This section of the questionnaire sought to establish from the respondents the reporting structure of IT and Operation managers. 57% of the respondents indicated Information Technology and Operation functions managers' report to the same person while 43% don't. This meant the IT and Operations functions managers from more than 50% of the commercial banks report to the same person. This implied that there was convergence at the organization structure where managers of the different functions reported to the same person. Commercial banks which had been in existence for many years had the highest convergence at the organizational structure. The results are illustrated in the figure 4.4 below

Figure 4.4 Reporting Structure



4.3.4 Information Technology and Operations Function

This section was based on several factors discussed below. Some of the questions were on a Likert scale. Respondents were asked to rate on a scale of 1 – 5. The scales where by a Very large extent represented 5, Large extent represented 4, Average extent represented 3, Small extent represented 2, and No Extent represented 1 (See Appendix 3). The section discussed: usage of Information Technology by operations function, the extent to which Information Technology and Operation function work together and Back office automation. The discussions are illustrated in the table 4.2 below.

Table 4.2 Information Technology and Operations Function

	Usage of IT by Operation function		Convergence of IT and Operations		Back office automation	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Small extent			1	3.3	1	3
Average	4	13.3	3	10	3	10
Large extent	2	6.6	7	23.3	8	27
Very large extent	24	80	19	63.3	18	60
Total	30	100	30	100	30	100

This section sought to find out the extent to which Information Technology is used by Operations function. The majority of the respondents (80%) indicated they used IT to

a very large extent while 6.6% of the respondents indicated they used IT to a large extent. The study found out only 13.3% of the respondents used IT on average. From the findings it can be concluded that commercial banks understood the importance of using IT to improve their performances and serve their customers better. The findings are consistent with Pritom (2002) argued that the developing countries had not been left behind in appreciating IT in their day to day activities. Laudon and Laudon (2012) supported the same argument by stating without IT an organization has been deprived the power to make decisions.

The researcher found out 63.3% of the respondents indicated Information Technology and Operation functions worked together to a very large extent while 23.3% indicated the two functions worked together to a larger extent. This implied that 86.6% of the commercial banks the two functions worked closely together. It can be concluded that commercial banks understood for them to come up with products or services which they can serve their customers better than the two functions had to work together. The researcher found out only 3.3% of the respondents indicated IT and Operations functions worked together to a small extent. The table above also showed the extent to which the back office is automated. The researcher also found out that 87% of the commercial banks their back office had been automated. All the successful organization the two functions which contribute by a very large extent to the success of an organization have to work together. This findings support the Systems theory that states any systems which are interrelated should work together. It states that an element performs better when it interacts with other elements. This clearly indicated when IT and Operation functions work together they might perform better than them working separately. This implied that 86.6% of the respondents IT and Operations

functions are converged to a high degree while 87% of the respondents the back office had been automated. This can be concluded that there's a high convergence rate between IT and Operation working together but the degree of convergence increases at the Back office.

4.3.5 The extent in which IT and Operations work together

Table 4.3IT and Operations working together

	N	Mean	Std. Deviation
Product upgrade	30	4.42	.743
Product management	29	4.28	.854
Real-time implementation	29	4.24	.885
Product development	30	4.18	.930
Strategic planning	30	4.12	.846
Decision making	30	4.00	.974
Process development	30	4.00	1.023
Budget making	28	3.73	1.00
Overall		4.12	0.91

The results in the table 4.3 above indicate product upgrade was leading with a mean of 4.42 in the areas in which IT and Operations worked together. The researcher found out Product management was ranked second position with a mean of 4.28 while real time implementation was position three with a score of 4.24. This meant that whenever the operation teams are upgrading or managing a product, and implementing of customer results at real time they have to consult with the IT function. However the surprising results were product development was ranked fourth position with a score of 4.18. This meant that the operations team involved IT at the

product development partially. Process development and budget making were ranked the lowest level with a score of 4.00 and 3.73. The overall mean was 4.12; this meant Product upgrade, product management, Real-time implementation, product development and strategic planning were above the score for the management practices areas. This can be concluded that the Management practices have converged to larger extent.

The results above support the transaction cost theory which argued that lack of proper systems in operations leads to wastes which is referred to as the transaction cost. For an organization to avoid the transaction cost the IT function has to work hand in hand with the Operations functions. Lessiter (2007) argued that with the use of IT no matter how well an organization operation is managed it can still be improved. The above results clearly showed products upgrade was leading in the degree of convergence between IT and Operations. The results above also supported a study carried out by Brnjolfusson, LorrenHitt (1993) and Frank Lichtenburg (1993) which showed there was a relationship between the use of IT and the organization levels of output. This implied that the respondents had a certain degree of convergence between IT and Operation as listed in the table above.

4.3.6 The extent in which the processes below are IT enabled

Table 4.4 Processes which are IT enabled

	N	Mean	Std. Deviation
Customer request	30	4.85	.840
Core banking systems	30	4.70	.647
Cash management and transfers	30	4.58	.720
Alternative channels	30	4.43	.767
POS systems	30	4.38	.769
Loan processing	29	4.33	.729
Overall		3.82	.745

The Table 4.4 above indicates Customers are an important asset to the commercial banks, without them the banks will run out business. The researcher found out that Customer request was leading on the areas which are IT enabled in different Commercial banks with a mean of 4.85. This meant the banks valued their relationship with their customers and thus giving their requests first priority. Core banking systems are systems that support the banks most common and critical transactions. The study found out that most commercial banks had core banking systems which were IT enabled, it was ranked the second highest with a mean of 4.70. This meant for a bank to successfully run its day to day operations they needed a core banking systems which was IT enabled. The commercial bands had to adopt alternative channels as means of survival. With the alternative channels they can serve their customers irrespective of where they are without necessarily having to go the bank. The study found out the alternative channels was ranked as the third highest services which are IT enabled with a score of 4.58. Loan processing was ranked as

the lowest service which was IT enabled with a score of 4.33. The overall mean was 3.82; all the Operations processes were above the overall mean which meant Operations heavily uses IT. The findings above are in line with the System theory which argued that the processes which are interrelated should work together. Rahim & Kurnia (2006) asserts that IT creates a better relationship between the organization and the customers. This could be the reason why customer requests is leading in the commercial banks as the area which is IT enabled. This implied the processes above had a certain degree of convergence between IT and Operations.

4.3.7 Level of automation

The study found out that 60% of the respondents their Operation function was partially automated, 35% their operations were fully automated while 5% their operations were done manually. This implied that majority of the commercial banks are still using paper work to a certain extent to run their operations. When a customer applies for a loan they will be asked to fill several forms, the loan officer will open a file in which the documents for the client will be kept. The same applied to when a customer is opening an account; they will fill account opening forms. The forms are always kept a secure location. The commercial banks are striving to achieve automation of their processes but at the moment there are processes which will be carried out manually. The results can be seen from the table 4.5 below

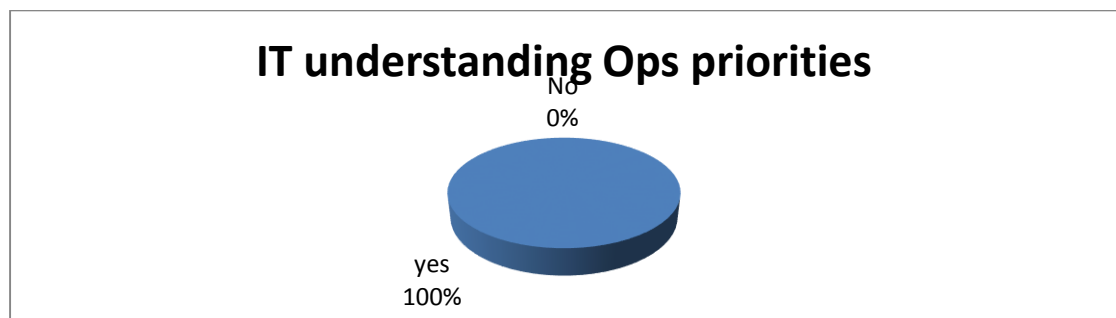
Table 4.5 Automation

	Frequency	Percent
Partially automated	18	60
Fully automated	21	35
Manual	1	5

4.3.8 IT understanding Operations Function

This section of the study sought to identify if IT understood the priorities of Operation function. Barnes (2008) asserts that the success of any organization is determined by how well its operations are managed. Hill (2015) supported the same argument by stating that operation function is responsible for 70% of the activities and resources in an organization. This is the reason why IT has to understand the priorities of an organization. This is clear on the figure 4.5 below which implied that all the respondents IT functions understood the priorities of Operations.

Figure 4.5 Operation priorities



4.3.9 Number of years and convergence

Table 4.6 Number of years and convergence

	Years & convergence		Years & Location		Years & reporting structure	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
1-5 years	20	80	20	80	0	100
5-10 years	8	92	17	83	17	83
Over 10 years	17	83	32	68	42	58

Table 4.6 above showed the relationship between the number of years the bank had been in existence versus merging of Information Technology and Operation functions.

Yes (%) represents banks which had been in existence for less than 5% years and had converged while No (%) is vice versa. The researcher found the banks which had existed for over 10 years had the highest level of convergence between IT and operation function. This could be as a result of experience and exposure over the years of operations. The second argument was the banks which had been in existence for many years had many branches and thus it was easier to manage the functions while merged. The banks which existed between 5 to 10 years had the lowest degree of convergence with 8% while those which had existed below 5 years had 20%. It can be concluded that the banks converge the two functions from an early stage but after being in the industry for 5 years and above they separate the functions. With time the commercial banks realized the two functions work better while converged and that's the reason after 10 years they converge them again.

This section aimed to identify if there was any relationship between the number of years the banks had been in existence versus the location of IT and Operations function. The study found that the banks which had been in existence for more than 10 years had the highest degree of convergence in terms of location with 32%. It can be concluded that reason for the convergence is due to the size of the banks. These banks had many branches and some had expanded to neighboring countries. It was easier for them to operate the two functions on the same floor. The banks which had existed between 5 to 10 years followed with 17% surprisingly the banks which had existed below 5 years had the second highest convergence in terms of location with 20%.

The researcher sought to find out if there was a relationship between the numbers of years a bank had existed versus the reporting structure. The researcher found out that the banks which had existed for over 10 years had the highest degree of convergence at the reporting structure with a 58%. It can be concluded due to the size of the banks which had been in existence for many years it was easier to manage the two functions if their heads reported to the same person. This will help in the two functions working together closely as the systems theory suggested that elements which are closely related should function together. The banks which had existed between 5 to 10 years were second position with 17% while those which existed below 5 years had no convergence at the reporting structure. It can be concluded that the banks which existed below 5 years were still small and that's the reason why they had not converged completely. The study found that the banks which were above 5 years but below 10 years had started converging at the reporting structure. This could be as a result of them starting to expand.

4.3.10 Ownership and Convergence of IT and Operations

Table 4.7 Ownership and convergence of IT and Operations

	Ownership and Convergence		Ownership and location		Ownership and reporting structure	
	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
Locally	21	79	41	59	18	82
Internationally	0	100	22	78	56	44
Both	0	100	80	20	0	100

The table above showed the ownership of banks versus convergence. Yes (%) represents the banks which had converged and are either owned locally, internationally or both while No (%) is vice versa. The study found out locally owned

banks were the only ones which had converged IT and Operations functions with 21% while internationally owned banks had not converged. This implied that the local banks were leading in terms of convergence of IT and Operations functions while the internationally owned had not converged any of the two functions. It can be concluded that the locally owned banks had been converged because their mother companies were in Kenya. The study also found out the banks which had both internationally and local ownership had the highest convergence at the location of IT and Operations of 80% followed by locally owned banks with 41%. The internationally owned only had the lowest convergence at the location with 22%. It can be concluded that the banks which were both internationally and locally owned had merged at the location because of the local ownership influence.

This section aimed to identify if there was any relationship between ownership of banks versus the reporting structure. The table 4.7 showed internationally owned banks were leading in the convergence at the reporting structure with 56% while the locally owned banks had the lowest with 18%. This implied that the international banks were leading in convergence at the reporting structure. More than 50% of the international banks the IT and Operations managers reported to the same person. This meant there was a degree of convergence in terms of organizational structure.

4.4 Impacts of IT and Operation convergence on performance of commercial banks in Kenya

4.4.1 Assessing the impacts of IT and Operation convergence on performance of commercial banks in Kenya

This section discussed the performance of banks between those which have merged Information Technology and Operations functions versus those which operate the two functions separately.

Table 4.8 IT and Operations versus performance

	Merged IT and Operations	Not merged IT and Operations	Marginal row total
Profit	40%	92%	132
Loss	60%	8%	68
Marginal column total	100	100	200

The table above showed 40% of banks which represented 2 banks which had merged IT and Operations made profit for the last three years. 60% of the banks which represents 3 banks had not merged IT and Operations made loss for the last three years. This implied that banks which had converged the IT and Operations functions didn't perform well as expected. This could be as a result of maybe other factors within the banks. The researcher referred to the convergence of the two functions as being one department. The productivity paradox – IT has not impact on productivity argues that it's not easy to link organizational performance and investment in IT. The paradox argues that organizations which have invested in IT are not guaranteed of excellence in performance. There are many factors which contribute to performance. A chi-square test of a two way table was done to test the relationship between the variables. The chi-square statistics was 60.24. The results were found to be significant

at $p < 0.05$. This implied that there was a relationship between convergence of IT and Operations function versus organization performance.

Table 4.9 Convergence at the Processes and Organization structure

	Merged IT and Operations	Not merged IT and Operations	Marginal row total
Processes	100%	80%	180
Organization Structure	100%	70%	170
Marginal column total	200	150	350

The study found out 92% of banks which represented 23 banks which had not merged IT and Operations made profit for the last three years while 8% made loss for the last three years. This banks had not merged the IT and Operations function but had merged the processes while some the IT and Operations managers reported to the same person. That's an indication of convergence at the organizational structure. This implied that there's a degree of convergence between the two functions either at the processes or at the organizational structure. The banks which had not merged the two functions but had merged at the processes or at the organizational structure received a significant return from having IT in the organization. These banks had merged more than 70% of the processes in the organization. The researcher concludes that IT plays a significant role in the organizational performance. Brnjolfsson and Loren Hitt (1993) and Frank Lichtenburg (1993) argued that there was a relationship between IT investment and the organizational levels of output. A research done by Kraemer and Dedrick (1994) on the Asia- Pacific countries showed evidence of a significant relationship between the level of IT spending and the GDP growth. Dewan and Min (1997) did a research which showed IT investment generated excess returns than

returns invested in other projects. A chi-square test of a two way table was done to test the relationship between the variables. The chi-square statistics was 0.3813. The results were found not significant at $p < 0.05$. This implied that there was no relationship between convergence at processes and organization structure versus organization performance.

4.5 Relationship between Degree of Convergence in Management practices and organizational performance

The relationship between convergence and organizational performance was tested using linear regression analysis. The table below presented the model summary, ANOVA and coefficients of regression.

Table 4.10 Regression model summary for management Practices

Model	R	R square	Adjusted R square	Std. Error of the estimate
1	.155	.024	-0.011	4.41050

R. squared is the coefficients of determination which tells us the variation in the dependent variable due to changes in the independent variable. Table 4.10 above showed the value of R squared was -0.011 R is the correlation coefficient which showed the relationship between the study variables, from the findings in table 4.10 above there was a low degree of correlation as shown by .155.

Table 4.11 ANOVA Results for management Practices

Model	Sum of squares	df	Mean square	F	Sig
Regression	13.440	1	13.440	0.691	.413 ^b
Residual	544.671	28	19.453		
Total	558.111	29			

The ANOVA results established the regression model had a significance level of 0.413 which is more than 5%. This was an indication that the regression model does not predict the dependent variables significantly well. This indicated the regression model did not predict the outcome variables. It was not a good fit for the data.

Table 4.12 Regression Coefficient for management Practices

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.188	4.783		1.712	.098
	Management	.121	.145	.155	.831	.413

From the data above the established regression equation was $Y = 8.188 + 0.121X$. The significance level is above 0.05 hence failed to reject null hypothesis. This meant that there was no convergence at the management practices versus the organization performance.

4.6 Relationship between Operations Convergence and organizational performance

Table 4.13 Regression Model Summary for Banks Operations

Model	R	R square	Adjusted R square	Std. Error of the estimate
1	.303	.092	.059	4.25483

R. squared is the coefficients of determination which tells us the variation in the dependent variable due to changes in the independent variable. Table 4.13 above showed the value of R squared was 0.092. This implied that there was a total of 9.2%

variation in the dependent variable (profit), which is large. R is the correlation coefficient which showed the relationship between the study variables, from the findings in table 4.13 above there was a low degree of correlation as shown by 0.303

Table 4.14 ANOVA Results for Banks Operations

Model	Sum of squares	df	Mean square	F	Sig
Regression	51.211	1	51.211	2.829	.104 ^b
Residual	506.900	28	18.104		
Total	558.111	29			

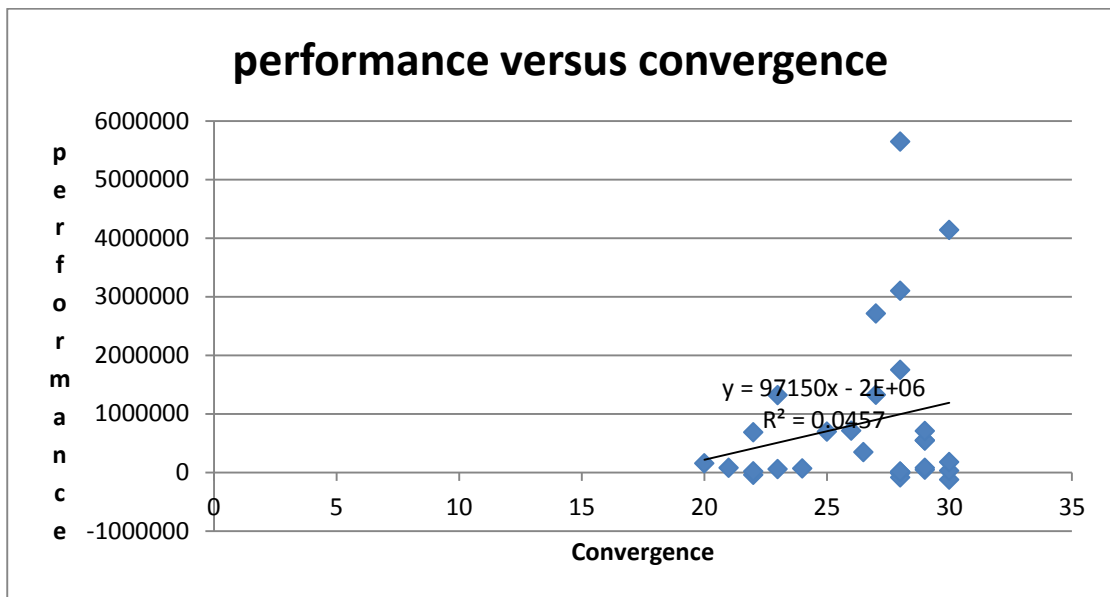
The ANOVA results established the regression model had a significance level of 0.104 which is more than 5%. This was an indication that the regression model does not predict the dependent variables significantly well. This indicated the regression model did not predict the outcome variables. It was not a good fit for the data.

Table 4.15 Regression Coefficient for Banks Operations

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	23.014	6.532		3.523	.001
processes	-.415	.247	-.303	-1.682	.104

From the data above the established regression equation was $Y=23 + -0.415X$. At a significance level of 10% the null hypothesis was rejected. There was a small relationship between the convergences of banks processes versus the performance.

Figure 4.6: Scatter plot



The scatter plot showed there was a moderate positive linear correlation between convergence and performance. This meant that there was a moderate connection between convergence of Information Technology and Operations versus the performance of the commercial banks.

4.7 Hypothesis testing

The P-value is more than 0.05 for the management Practices and hence it can be concluded there was no significant relationship between convergences of Management practices versus performance. At 10% significance the null hypothesis was rejected. Hence the Operations processes convergence at 10% significance indicated a weak relationship between Information Technology, Operations processes convergence and organizational performance.

4.8 Discussion of Findings

Convergence in organizations is divided into three sections; one is convergence at the functions. This is where the IT and Operations functions are merged together. The

second convergences at the processes, this is where the Operations involves IT functions when they are designing or improving their products. Here the IT and Operations would work hand in hand at this convergence. The third convergence process is at the organizational structure. This is where the IT and operations manager report to the same person.

4.8.1 Degree of Convergence in Operations and Information Technology functions

Objective one of the study was to determine the degree of convergence in operations and Information Technology functions. The study found out only 17% of the commercial banks had merged the two functions while the rest operated them separately. The study also found out that 37% of the banks had the IT and Operations functions located on the same floor while 30% of the 37% said the functions were located in one department. The researcher found out there was also a high degree of convergence at the reporting structure where 57% of the banks indicated IT and Operations managers reported to the same person. The study found 80% of the commercial banks used IT to a very large extent while 13.3% which was the lowest used IT to average. This was supported by Pritom (2002) who argues that the developing countries had not been left behind on appreciating IT in their day to day activities. Laudon and Laudon (2012) supported the same argument by stating that without IT organizations cannot achieve excellence. This is clearly seen from the study where 80% of the commercial banks have invested in IT for better performance.

The study sought to determine which processes in operations had the highest degree of convergence. The study found out product upgrade had the highest score of 4.42 followed by Real time implementation and product development with scores of 4.24,

4.18 and 4.12. Budget making had been ranked the lowest area in which IT and Operations functions worked together. Lessiter (2007) argued that with the use of IT no matter how well an organization operation is managed it can still be improved. The above table clearly showed products upgrade was leading in the degree of convergence between IT and Operations. Budget had the lowest degree of convergence between the two departments. The results above supported a study carried out by Brnjolfusson, Lorren Hitt (1993) and Frank Lichtenburg (1993) which showed there was a relationship between the use of IT and the organization levels of output. This meant the commercial banks had converged the processes above on different degrees depending on which they felt was of more importance than the others.

The study found out several areas were leading in IT enabled for commercial banks. The areas had the highest investment of IT by the commercial banks. Customer request was leading on the areas which were IT enabled in different Commercial banks with a score of 4.85. Customers are the most valuable and most import assets for commercial banks. Rahim & Kurnia (2006) asserts that IT creates a better relationship between the organization and the customers. This could be the reason why customer requests is leading in the commercial banks as the area which is IT enabled. Core banking systems followed with a score 4.70. Alternative channels, POS systems and loan processing ranked 3rd, 4th, 5thand 6th with scores of 4.58, 4.43, 4.38 and 4.33.This was a clearly indication that the commercial banks have converged to different degrees on the areas above. More than 95% of the commercial banks had automated their operations. This indicated that the operations of the commercial banks

heavily depend on IT for them to serve the customers at a fast speed and efficient way.

The researcher found out that 100% of the commercial banks understand the needs and priorities of the Operations. This argument is supported by Barnes (2008) who asserts that the success of any organization is determined by how well its operations are managed. Hill (2015) supported the same argument by stating that operation function is responsible for 70% of the activities and resources in an organization.

Banks which had been in existence for more than 10 years had the highest level of convergence while those which had been in existence for less than 5 years having the lowest degree of convergence. There was a relationship between the numbers of years the banks had been in existence versus convergence. The same banks which had been in existence for more than 10 years had the highest degree of convergence when it came to location of IT and Operations functions. The study found out that the banks which had been in existence for more than 10 years the IT and Operations managers reported to the same person. This implied that the banks which have existed for more than 10 years had the highest degree of convergence. The local banks had the highest convergence while the international banks in Kenya had not merged the two functions. The researcher found out the international banks was leading in convergence of the reporting structure. More than 50% of the international banks the IT and Operations managers reported to the same person. This implied that the banks both international and local had converged in different areas. The research indicated that there is degree of convergence of the processes in operations and Information Technology.

It can be concluded that the study objectives of determining the degree of convergence between Information Technology and Operations was met. The study found out that the commercial banks all used the IT to high levels. This implied that for an organization to survive they don't have a choice but to invest in Information Technology.

4.8.1 Impact of IT and Operation on performance of Commercial banks

The second objective was to test whether the convergence of IT and Operation functions had an influence on the performance of commercial banks in Kenya. The chi-square testing indicated there was an association between IT and Ops functions convergence versus performance. This implied that to a small extent organizational performance depended on convergence of IT and Operations. At 10% significance the Hypothesis testing indicated that there was a relationship between the convergences of Operations processes versus the organizational performance. The hypothesis indicated that there was no relationship between convergence of IT and Operations and performance. This contradicts the results of the chi-square which indicated there was an association. This difference could be due to the small sample size of banks which had converged the IT and Operations functions. The scatter plot indicated a moderate positive liner correlation between Convergence of IT and Operations on performance. This meant that the convergence of IT and Operations plays a role in the way the commercial banks performance. There was a moderate connection between IT and Operations with the small sample size of banks which had converged IT and Operations. This meant if the sample size was large the connation would have been strongly positive.

It can be concluded that the study objectives of assessing the Impacts of Information Technology, Operation functions and organizational performance was met to a small extent. The study found out that there was an association between IT and Operations convergence and performance. The sample size of banks which had converged was very small and this could be the reason why the objective was met to a small extent.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section talks about the discoveries accumulated from the investigation of data also the conclusions reached. Findings have been summarized alongside the objectives of the study.

5.2 Summary of the findings

The purpose of conducting this study was to determine the degree of convergence in Operations and Information Technology in commercial banks and to assess the impacts of IT, Operation convergence on performance of commercial banks in Kenya. The target population included all the 43 commercial banks in Kenya. Primary data was collected by use of a closed-ended questionnaire while the secondary data was collected from the website of the commercial banks. Descriptive statistics such as frequency distributions, percentages, variations and measures of central tendency were used to summarize basic features of the data in the study.

This study found out 80% of the commercial banks in Kenya had not merged IT and Operations functions. The findings also showed there was a convergence at the reporting structure of more than 50% of the commercial banks where the IT and Operations managers reported to the same person. The results also showed high IT usage by the commercial banks, the IT and Operations functions worked together to a high extent and most of the banks back office had been automated. The most popular areas where IT and Operations functions worked together was product upgrade followed by product management, real time implementation, product development

and strategic planning. These results were supported a research carried out by Brnjolfusson, Lorren Hitt (1993) and Frank Lichtenberg (1993) which showed there was a relationship between the use of IT and the organizational levels of output.

The study found out the following four processes had the highest level of IT investment by the commercial banks in Kenya. The first process was customer requests followed by core banking systems, cash management and transfers and lastly alternative channels. The banks which had existed for over 10 years had the highest level of convergence while the banks which had existed between 5 to 10 years had the lowest level of convergence at the reporting structure, location and in general. Furthermore the study identified locally owned banks had converged more than the internationally owned banks in general but convergence at the reporting structure the internationally owned banks were leading. The banks which were both locally and internationally owned led at location convergence where the IT and Operations functions were located on the same floor.

The study found there was no relationship between convergence of Information Technology and Operations and organizational performance.

5.3 Conclusion

The study examined the degree of convergence in Operations and Information Technology in commercial banks in Kenya. The study found out that there was a degree of convergence between Operations and Information Technology in the following areas starting with the highest to the lowest; product upgrade, product management, real time implementation, product development, strategic planning,

decision making, process development and lastly budget making. The study also found the following areas in commercial banks had the largest investment in Information Technology from the highest to the lowest; Customer request, Core banking systems, cash management and transfers, alternative channels, POS systems and lastly loan processing. The researcher can conclude that the commercial banks had merged to a certain degree at the processes and the organizational structure. Operations cannot function without Information Technology; this can be seen from the results where all the commercial banks used IT on different extent depending on their size and finances.

The study also examined the impacts of IT, Operation convergence on performance of commercial banks in Kenya. The study found out that there was no relationship between Information Technology, Operations convergence and the performance of commercial banks in Kenya. Thus the study concludes that convergence of Operations and Information Technology functions has no relationship with the performance of commercial banks. When commercial banks convergence IT and Operations functions is not with the main idea of making more profits but with the aim of improving the operations of the organization.

5.4 Recommendations

This study recommends that information and adequate education to be carried out between the Information Technology and Operations employees to understand the importance of each function and how they can work together to achieve greater benefits. One of the IT managers indicated the employees from the two functions don't know what happens in the other function.

The study found out there was a relationship between convergence of Operations processes and organizational performance while at the management practices there was no relationship with performance. The study recommends management to increase the use of IT; this could result to better performance. It is evident from the Operations convergence that IT plays a significant role in the performance of organizations.

The study found out the banks which have been in existence for more than 10 years had the highest degree of convergence. These banks have had a lot of exposure and experience over the years and that was the reason for them having the highest degree of convergence. The study recommends the other banks to increase their degree of convergence between IT and Operations as it's evident for organizations to perform better their Operations should be heavily dependent on IT.

The study found there was an association between convergence of IT and Operation functions and organizational performance. The chi-square indicated that organization performance was associated with convergence of IT and Operations convergence. The study recommends the banks which had converged to a small extent to increase their convergence rate between IT and Operations.

The study found out process development was the second last areas which IT and Operations worked together. Process development is a critical area in an organization. Organizations which have efficient and effective processes the Operations consult the IT function more on the systems and software which should be used to make a error process. The study recommends the IT and Operations functions to improve on the

working relationship between the two functions. The study also found out the loan processing was the area which had the least IT investment by the commercial banks. This meant loan processing involves a lot of paper works and physical storage of the clients details in a file. Banks make the largest portion of their profits from the interest rates the customers pay form taking loans. This section of the bank plays a huge role in the performance of the banks. The study recommends the banks to invest more in IT systems for the loan processing so as to reduce the paper work and store safely the client's information.

5.5 Limitation of the study

The researcher used questionnaires as the instrument to collect data, there may be a problem of social desirability. Some respondents may have the tendency to exaggerate or provide responses deemed to be desirable by others, instead of giving honest responses.

The researcher had a challenge of getting previous studies in this area. It's a new area of study and thus not many people have done researchers in the area. This made it almost impossible for the researcher to compare his findings and the findings of other people from other countries.

The study focused on the hard concepts of convergence between IT and Operations. There are several aspects of convergence which are soft from the human being perspective. The study did not look at the soft aspect of convergence.

The study had only five commercial banks which had converged IT and Operation function. The sample size was a limitation to the researcher. The researcher might not have achieved the expected results because of the small sample size.

5.6 Suggestions for further research

This study sought to asses' impacts of Information Technology in commercial banks and determines the degree of convergence in Operations and Information Technology in commercial banks. This study recommends another study to be carried in other sectors as the researcher only focused on the commercial banks.

The researcher also recommends a study to be carried on customer perspective on the use of IT to improve the products or services they get from the commercial banks. The researcher focused on the Convergence of IT, Operations functions and the organizational performance, the researcher recommends a study to be carried on the Convergence of IT, Operations and the Operational benefits.

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Appendix I: List of Licensed commercial Banks in Kenya

1. AfricanBankingCorporationLimited
2. Bankof AfricaKenyaLimited
3. Bankof Baroda(K)Limited
4. Bankof India
5. BarclaysBankof KenyaLimited
6. Brighton Kalekye Bank
7. CfCStanbicBankLimited
8. CharterhouseBankLimited
9. ChaseBank(K)Limited
10. CitibankN.AKenya
11. CommercialBankof AfricaLimited
12. ConsolidatedBank of KenyaLimited
13. Co-operativeBankof KenyaLimited
14. CreditBankLimited
15. DevelopmentBank of Kenya Limited
16. Diamond TrustBankKenya Limited
17. EcobankKenyaLimited
18. EquatorialCommercialBankLimited
19. EquityBankKenyaLimited
20. FamilyBankLimited
21. FidelityCommercialBankLimited
22. FirstCommunityBankLimited
23. GuarantyTrustBank(K)Ltd
24. GiroCommercialBankLimited

25. GuardianBankLimited
26. GulfAfricanBankLimited
27. HabibBankA.GZurich
28. HabibBankLimited
29. ImperialBankLimited
30. I&MBankLimited
31. JamiiBoraBankLimited
32. KCB BankKenyaLimited
33. Middle EastBank(K)Limited
34. NationalBankofKenyaLimited
35. NICBankLimited
36. OrientalCommercialBankLimited
37. ParamountBankLimited
38. PrimeBankLimited
39. SidianBankLimited
40. StandardCharteredBankKenyaLimited
41. Trans-National BankLimited
42. UBAKenyaBankLimited
43. VictoriaCommercialBankLimited

Source: Central Bank of Kenya (2016)

Appendix II: Introductory letter

Researcher: Nicholas Omido

Researcher Supervisor: Dr. MurangaNjihia

Researcher Moderator: Dr. X.N Iraki

University: University of Nairobi

RE: RESEARCH DATA COLECTION

I'm Nicholas Omido, a university student from the University of Nairobi. I am doing a research about the convergence of Information Technology function and Operations Management function and performance of commercial banks in Kenya. I am working under the supervision of my supervisor Dr. Muranga Njihia. The goal of my study is to determine (1) the degree of convergence of operations and Information Technology in commercial banks. (2)To assess the impacts of IT and operations convergence on performance of commercial banks in Kenya.

Once this project is complete, all the information I collect, might be used by other researchers on the same topic In future. If you want to know what I find out in my study, please let me know. I will provide you with an electronic copy of the main findings or the finished project. The findings of this project will benefit the commercial banks as it will give them insight on whether to converge the IT and operations departments or not and the benefits of each process.

Kindly read the instructions and respond to the questions provided for you. You may provide any documentation on the same at your discretion. Your positive response

will help achieve the objectives of the study. The information provided will be treated with strict confidentiality for the purpose whatsoever. Your response and cooperation will be highly appreciated

Thank you in advance,

Yours Faithfully,

Nicholas Omido

D61/75824/2014

Appendix III: Questionnaire

Data obtained from this research is only for the achievement of the study objectives. Therefore, your cooperation in answering the questions will be highly appreciated.

PART I: GENERAL INFORMATION

1. Name of company (optional).....
2. What's your position in the company.....
3. How long (years) has your company been in business in Kenya?
1-5 Years_____ 5-10 Years_____ Over 10 Years_____
4. Is your company locally owned or internationally owned?
_____yes _____No
5. Does your company have operations department? _____yes _____No
6. Does your company have Information Technology department?___Yes___No
7. Is the Information Technology function outsourced? ___Yes___No
8. How many branches does your organization have in Kenya_____
9. Does your company have branches in other countries except Kenya?
Yes_____ No_____
a) If yes, how many countries?
10. Whodo IT manager report to.....
11. Who do Operations manager report to.....
12. Who does the person IT manager or Operations manager report to report.....
13. **PART II: Degree of Convergence in Operations and Information Technology**
14. Is your Information Technology function and operation function merged into one? Yes_____ No_____

15. Is your Operations and Information Technology functions located on the same floor? Yes _____ No _____

16. Is your Operations and Information Technology functions located in the same department? Yes _____ No _____

17. Do the IT manager and operations manager report to one person?
Yes _____ No _____

18. To what extent do operations use IT in your organization?

1=No extent, 2=Small extent, 3=Average, 4=Large extent, 5=Very large extent

1 2 3 4 5

19. To what extent does IT and operations work together?

1=No extent, 2=Small extent, 3=Average, 4=Large extent, 5=Very large extent

1 2 3 4 5

20. To what extent has the back office been automated?

1=No extent, 2=Small extent, 3=Average, 4=Large extent, 5=Very large extent

1 2 3 4 5

21. To what extent does IT and Operations work together in the following areas

1=No extent, 2=Small extent, 3=Average, 4=Large extent, 5=Very large extent

	1	2	3	4	5
Decision making related to products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
strategic planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
product development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
process development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
real time implementation of feedback	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
product upgrade	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
product management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Budget making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. To what extent are the following processes IT enabled?

1=No extent, 2=Small extent, 3=Average, 4=Large extent, 5=Very large extent

	1	2	3	4	5
cash management and transfers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
core banking systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
alternative channels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POS systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loan processing					<input type="checkbox"/>
Customer requests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

23. Is the operation function fully automated _____, partially automated _____ or manual _____

24. Does the IT function understand the priorities in operations?

Yes _____ No _____

Appendix IV: secondary data sheet

Years	2015		2014		2013	
Name of Commercial Banks	Profits 000	Earnings per share	profits	Earnings per share	profits	Earnings per share
African Banking Corporation Limited	289,919	2.66	269,347	2.52	442,163	4.14
Bank of Africa Kenya Limited	(1,023,361)		144,111		755,685	
Bank of Baroda(K) Limited	2,026,117	40.94	2,216,911	44.80	2,039,696	41.22
Bank of India	1,107,937		1,021,293		1,009,458	
Barclays Bank of Kenya Limited	8,400,582	1.55	8,387,346	1.54	7,622,642	1.40
Brighton Kalekye Bank						
CfCStanbic bank Limited	4,905,734	14.41	5,686,661	14.38	5,127,156	12.97
Charterhouse Bank Limited						
Chase Bank (K) Limited	2,297,449		2,316,601	0.25	1,569,905	0.22
Citibank N.A Kenya	3,400,960		2,44,063		2,998,585	

Commercial Bank of Africa Limited	4,615,261	17.38	3,774,585	15.16	3,476,822	14.15
Consolidated Bank of Kenya Limited	44,422	0.87	(281,632)	(14.14)	(109,108)	(5.48)
Co-operative Bank of Kenya Limited	10,471,591	4.28	8,351,326	1.69	9,108,000	2.2
Credit Bank Limited	(59,745)		(91,715)		52,796	
Development Bank of Kenya Limited	121,620	2.33	220,592	12.69	190,620	9.56
Diamond Trust Bank of Kenya Limited	5,912,082	5.0	5,083,519	4.80	4,756,635	4.0
Ecobank Kenya Limited	90,373		(320,212)		(881,892)	
Spire Bank	(486,382)	(0.69)	(326,431)	(0.69)	55,650	
Equity Bank Kenya Limited	7,761,000	2.09	16,835,990	4.55	12,641,836	3.41
Family Bank Limited	1,936,658	1.55	1,780,602	1.58	1,226,403	1.09
Fidelity Commercial Bank Limited	(85,671)	(0.50)	221,655	1.99	211,914	2.40

First Community Bank Limited	(12,114)		50,437		132,202	
Guaranty Trust Bank (K) Ltd	470,210		533,648		331,286	
Giro Commercial Bank Limited	452,439		3,95,589	9.30	378,048	9.52
Guardian Bank Limited	2,29,329	10.50	261,251	11.60	275,335	12.23
Gulf African Bank Limited	730,703		402,196		285,477	
Habib Bank A.G Zurich						
Habib Bank Limited	294,584		318,526			
Imperial Bank Limited	999,645		2,064,491	1,654	1,853,994	1,485
I&M Bank Limited	6,032,643		5,234,548		4,981,361	
Jamii Bora Bank Limited	17,737		19,686		93,887	
KCB Bank Kenya Limited	14,341,382	4.82	16,848,862	5.63	19,623,071	6.49
Middle East Bank (K) Limited	34,835	1.37	68,627	2.71		
National Bank of Kenya Limited	(1,183,294)	(3.96)	800,968	2.86	1,089,896	

NIC Bank Limited	4,477,355	7.00	4,120,855	7.07	3,323,381	6.71
Oriental Commercial Bank Limited	42,902	0.51	71,947	0.87	139,970	1.70
Paramount Bank Limited	158,025	158.03	147,846	147.85	94,658	94.66
Prime Bank Limited	2,139,000	2.08	2,393,000	2.52	1,829,000	1.96
Sidian Bank Limited	372,320		514,043		359,917	
Standard Chartered Bank Kenya Limited	6,342,427	19.97	10,436,180	33.21	9,262,921	29.42
Trans-National Bank Limited	251,622	0.84	190,816	0.63	255,212	0.79
UBA Bank Kenya Limited	47,642		40,083		46,483	
Victoria Bank Kenya Limited	713,800	23.87	464,345	15.86	431,903	14.82