

**THE INFLUENCE OF INFORMATION TECHNOLOGY
INNOVATION ON THE OPERATIONAL PERFORMANCE OF
COMMERCIAL BANKS IN KENYA**

BY

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UNITED STATES INTERNATIONAL UNIVERSITY- AFRICA

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**INFLUENCE OF INFORMATION TECHNOLOGY INNOVATION ON THE
OPERATIONS PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

BY

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**A Research Project Submitted to Chandaria School of Business in Partial Fulfilment
of the Requirement for the Degree of Master of Business Administration (MBA)**

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STUDENT DECLARATION

I the undersigned, declare that this research project is my original work and has not been presented to any other institution of higher learning for academic credit other than United States International University.

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Eunice Mbogo (647904)

This research project has been submitted for examination by my approval as the appointed supervisor

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Dean, Chandaria School of Business

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ABSTRACT

The purpose of this study was to establish whether ICT-based innovations influence operations performance of commercial banks in Kenya. The study was guided by the following research questions: How does ICT-based product innovations influence operations performance? How does ICT-based process innovation influence operations performance? How does ICT-based market innovations influence operations performance?

A descriptive survey research design was adopted for this study. The study had a population of 43 commercial banks operating in Kenya, out of which, all were sampled for the study. Purposive sampling was used to identify operations managers who took part in the study. Data was collected using closed-ended structured questionnaire. Data was analyzed for descriptive statistics (frequencies and percentages) and inferential statistics (correlations and regressions) using Statistical Package for Social Sciences (SPSS) version 22

The findings on research question one revealed the existence of a statistically significant relationship between ICT-based product innovations and operations management. All components under product innovation, including tangible and intangible products, management support contributed to the significant relationship

The second research question revealed that there exists a statistically significant relationship between ICT-based process innovations and operations performance. All components examined under ICT-based process innovation including process re-engineering, process management support, and customer service contributed to the significance of the relationship

The third research question revealed existence of a statistically significant relationship between ICT-based market innovations and operations performance. ICT-based market innovation examined included use of Facebook platforms, Twitter, LinkedIn, and YouTube platforms, which, all contributed to the significance of the relationship

This study concludes that all components examined in this study including tangible products, intangible products and management support, were all essential in determining operations performance at commercial banks. The study also concludes that management

support, process re-engineering, and customer service delivery all contribute to enhancing operational performance of commercial banks. Finally, this study concludes that Facebook, Twitter, LinkedIn and YouTube social media platforms significantly contribute to commercial banks operational performance by advancing banks performance agenda, strategic operational objectives, and acquisition of new clients.

This study recommends that management in commercial banks should develop ICT incubation centers within the banks that have the mandate to develop product innovations. This will not only enhance the banks competitive advantage, but also operational performance. This study also recommends that management in commercial banks should explore mechanisms for enhancing the use of process re-engineering particularly to old processes and products. This can only be enhanced by use of ICT-based processes within organizations. Finally, this study recommends that commercial banks should invest more resources in developing robust content for engaging social media platforms such as Facebook, Twitter, YouTube and LinkedIn. Facebook has millions of users daily; thus, enhancing use of Facebook means that more potential clients could be reached with the banks advertising and other relevant information necessary for operations performance.

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I would like to acknowledge Dr. Jeremiah Koshal for guiding me in the entire process of writing this research project

DEDICATION

I would like to dedicate this research project to my family and friends for their special support and encouragement. Thank You.

CHAPTER ONE

1.0 INTRODUCTION

1.0 Background of the Study

The advent of Information Communication Technology (ICT) has revolutionized how business is done around the world (Gera and Gu, 2010). The discovery and evolution of ICT has enabled business to gain access to information and channel the information in a manner that enhances competitive advantage and market performance. Information Communication and Technology is defined as computer based software programmes, hardware's, and interconnection to the internet with intent of enhancing information processing and communication (Statistics Canada, 2012). ICT is also defined as the combination of communication related technologies through computer based programmes (UNESCO, 2002); and the integration of computer based communication platforms and channels through internet networks and connectivity as a way of enhancing operational performance and efficiency (Enas and Mutaz, 2012).

Operational efficiency is an essential component of organizational performance. According to Abdolvand, Albadvi and Ferdowsi (2012) operation performance is defined as the organizational accomplishment of outcomes based on expected outcomes. Outcomes are usually based on quality of services and products, speed of product and service delivery, flexibility, and dependability. In the banking sector, operations performance involves progress towards enhancing number of customers, market share, and expected returns shareholder returns (Lal and Saluja, 2012).

The study by Raymond and Bergeron (2011) is among the earliest to examine the efficiency of commercial banks by using frontier efficiency methods. They discovered that the majority of commercial banking system has exhibited 37 per cent allocative efficiency (AE) and 60 per cent technical efficiency (TE), suggesting that the overall cost inefficiency is mainly due to technical (managerially related) rather than allocative (regulatory). Thus, by using the data envelopment analysis (DEA) method to analyse the revenue, cost and profit efficiencies, (Gera and Gu, 2010) examines the performance of commercial banks over the period of 1997-2000, where the banks suffered slight inefficiencies during the global crisis of 1998-1999. The source of inefficiency of commercial banks, in general, has been scale, suggesting that the banks have been

operating at the wrong scale of operations. Therefore, Chu and Lim (2012) have discovered that the different levels between cost and profit efficiency are caused by the inefficiency from the revenue side. Revenue can be defined as how effectively a bank sells its outputs (Bergers and Mester, 2013). Maximum revenue is obtained as a result of producing the output bundle efficiently (Rogers, 2015). In fact, revenue efficiency is decomposed into technical and AE which are related to managerial factors and is regularly associated with regulatory factors (Isik and Hassan, 2012). Davenport (2013) also noted that to ascertain revenue efficiency, banks should focus on both TE (managerial operating on the production possibilities) and AE (bank producing the revenue maximizing mix of outputs based on certain regulations) through ICT innovation. Hence given the rapid development of the commercial banking sector, it is reasonable to expect that the performance of commercial banks has become the centre of attention among bank managers, stakeholders, policymakers and regulators. Berger and Humphery (2011) point out that studies focusing on the efficiency of financial institutions have become an important part of financial innovation.

The use of ICT has become paramount in enhancing operations performance (Kroeker, 2010; Yonck, 2010). As a result, organizations are forced to develop ICT strategies that enable the organization to leverage on internal competencies and networks to enhance operational performance. This is more evident in the banking sector where communication is extremely essential in promoting and advancing banks products and services (Zheng, Yang, and Mclean, 2010).

Innovation is defined as the introduction of a new way of doing things; a new idea, a new concept, a new method or device that introduces operational efficiency, effectiveness, or performance or a given service or product (Kroeker, 2010). Innovation was first derived from the word *novus*, a Latin word which means something new (Yonc, 2010). In the banking sector, innovation can be viewed from different perspectives. First and foremost, the technological know-how manifested in individuals working for the bank in a tacit or implicit form. This know-how is usually manifested in banking process improvement of operations, processes and development of new products and services. The second kind of innovation is instigated through dynamic processes of continuous change to meet new challenges. As these challenges arise, banks and employees develop mechanisms and new

ways of dealing with the challenges, and in the process, gain knowledge and experience that lead to innovation (Turban and Aronson, 2003).

Due to heightened competition for market performance and profitability in the banking sector, banks are turning to ICT innovations as a way of remaining competitive and sustainable (Gera and Gu, 2010). Additionally, ICT innovation is becoming more and more relevant due to three major trends in the business world: increasingly fragmented and demanding markets, intense international competitions, and diverse and rapidly changing technologies (Ajmal, Helo, and Keka, 2010).

The ultimate goal of ICT innovations in banks is to create competitive advantage in products and services provided by the banks. From operational perspective, ICT innovations do enhance efficiency and effectiveness in coordination, planning, and execution of organizational resources to production of competitive products and services. This in turn, attracts customers, enabling the bank to reach a wider market (Zheng, Yang, and Mclean, 2010). In the banking sector, innovation is achieved if a bank manages to deliver strategic operational and market advantages with minimal investment. Thus, one of the ways to effectively measure ICT innovations in the banking sector is to evaluate how the innovations have transformed operations performance. (Gera and Gu, 2010). Some of ICT technological innovations adopted by banks include introduction of Automated Teller Machines (ATM); Mobile Banking; Electronic Banking; and E-Communications. (Abdolvand, Albadvi, and Ferdowsi, 2012).

Developed countries have had use of banking technologies for more than five decades (Yonc, 2010). For instance, countries like USA, United Kingdom, Germany and other organization for economic cooperation on development (OECD) countries have relied on ICT banking platforms like mobile banking, online transfers and transaction, electronic transfers (EFTs) and Real Time Gross Settlement (RTGS) to enhance customer experience, and also to induce efficiency into banking institutions.

According to Davenport (2013), Bank of America was among the first to develop and use ATMs in 1957, with other banks following suit shortly. Currently, Bank of America has more than 16, 000 ATMs, while America banking sector has more than 400, 000 ATMs (Bank of America, 2016). On the other hand, developing countries like India started utilizing ICT innovation in the banking sector in the 1990s. Equally, Lal and Saluja

(2012) note that the adoption and use of ICT platforms like ATMs, e-banking services, and mobile banking enhanced competitive advantage for banks in developing countries by the early early 1980's compared to developing countries which were late to adopt this technologies.

In developing countries, for instance, in Africa, adoption of ICT innovation in the banking sector took place decades after developed countries adopted the same. Zheng et al., (2010) argues that late adoption of ICT innovation in the banking sector in Africa was due to high costs associated with ICT innovations, and limited technological know-how in utilizing ICT innovations in the banking sector. South Africa was the first country in Africa to embrace ICT innovations in the banking sector by adopting ATMs in 1981 by Standard Chartered Bank (Ajmal, Helo and Keka, 2010)

In Kenya, ICT innovation in the banking sector started in 1989 by the introduction on the Money Link ATM services by Standard Chartered Bank (Gera and Gu, 2010). This was followed by Baclays bank and other commercial banks. Over the years, ICT innovation in Kenyan banks has grown from ATMs to mobile banking, e-banking, e-communications, e-payments and transfers, and e-loans among other technological innovations (Enas and Mutaz, 2012). According to Ngugi, Pelowski and Ogembo (2010), Kenya banking sector has 42 commercial banks out of which two are under statutory receivership (Chase Bank and Imperial Bank). Out of the 42 banks, 3 are publicly owned banks, 25 are locally owned banks, while 14 are foreign owned banks. Commercial banks in Kenya are ranked in three categories: Tier 1, Tier 2 and Tier 3 banks based on their capitalization and market share index (CBK, 2016; Abishua, 2010). The banking sector in Kenya is governed by the Banking Act of 2015 Cap 488; The Central bank Act of 2015; The Microfinance Act of 2015; The National Payment System Act of 2011, and Kenya Deposit Insurance Act of 2012 (Giorgis, Tarus and Cheruiyot 2015).

The introduction of ICT innovation in Kenyan banking sector has seen a drastic jump in use of ATMs from 4.9 million in 2009, to 13.9 million in 2014. As such, bank deposit accounts grew from 2.4 million in 2005 to 28.4 million. The number of mobile money subscribers grew from 1.3 million to 25.6 million in 2015 (Gubbins, 2015). Mobile money agents grew from 1, 582 in 2007 to 123, 703 in 2014. The number of ATMs grew from 617 in 2006 to 2, 613 in 2014. In 2009, the amendment in the banking Act allowed commercial banks to have banking agents and as a result, banking agents grew from

8,809 to 35, 789 agents in 2014 representing 16 commercial banks (CBK, 2016; Gubbins, 2015). According to Ngugi *et al.*, (2010), Kenya commercial banks overall balance sheet grew by 21.4% from Kshs. 3 trillion in June 2015 to Kshs. 3.6 trillion in February 2016. Equally, commercial banks deposits grew by 20% from Kshs. 2.1 trillion in June 2015 to 2.6 trillion in February 2016, while pre-tax profits grew by 8% from Kshs. 71 billion in June 2014 to Kshs. 76.9 billion in June 2015. The CBK (2011) financial stability report attributes the positive performance of commercial banking sector in Kenya to ICT innovation particularly introduction of innovative financial products and services, mobile banking services, e-banking and other innovative use of ICT in delivering services to customers.

1.2 Statement of the Problem

Globally, the use of information technology to enhance operational performance has brought about dynamic benefits and challenges (Byrd and Davidson, 2003). On one hand, banks want to embrace the use of technology to enhance operational efficiency, but on the other hand, they are inhibited by the cost of technology, and the ever-changing nature of technology. Technology that might be viable for operation now, can easily go obsolete within one year (Lal and Saluja, 2012). Therefore, players in the global financial and banking sector, have to continuously reinvent with the changing technology and customer needs to remain efficient and profitable in operations. This challenge is not only limited to global or regional banks, but to Kenyan commercial banks as well. According to Ngugi *et al.*, (2010) Kenya commercial banks have invested heavily in ICT innovations such as ATMs, Mobile money technological platforms and e-banking transaction platforms. In as much as the benefits of using ICT in the banking sector are tangible, the capital outlay can be very costly to the local banks.

Several scholars have conducted studies in this area. For example, Jerop and Juma (2014) conducted a study on impact of ICT on financial performance of commercial banks. The study found the existence of a relationship between ICT and financial performance. However, the study did not examine how ICT innovations influence operations performance. A study by Enas and Mutaz, (2012) similarly focused on impact of ICT on banks performance, with a bias on e-banking, e-communications, e-payments, and e-loan systems. The study findings revealed that banks that had invested in e-platforms had significant reduction in cost, while enhanced profitability. A study by Sharma and Singh

(2011) also focused on impact of ICT on commercial banks financial performance in India, revealed that use of mobile banking significantly enhanced commercial banks financial position compared to traditional methods of banking. All these findings established the existence of a positive relationship between technology innovations and financial performance, however, these studies did not examine the impact of influence of ICT within banking internal operations. These studies recommended a need to conduct further studies on role of ICT for internal banks operation. Therefore, this study sought to fill the existing knowledge gap in literature on the influence of ICT on commercial banks operations performance, focusing on ICT based product innovation, process innovation, and marketing innovation.

1.3 Purpose of the Study

The purpose of this study was to determine the influence of ICT innovations on operational performance of commercial banks of Kenya.

1.4 Research Questions

This study was guided by the following research questions:

- 1.4.1 How does ICT -based product/service innovation influence the operational performance of commercial banks in Kenya?
- 1.4.2 How does ICT-based process innovation influence the operational performance of commercial banks in Kenya
- 1.4.3 How does ICT-based marketing innovation influence the operational performance of commercial banks?

1.5 Significance of the study

This study is significant to commercial banks, CBK, researchers and academicians.

1.5.1 Commercial Banks

The findings of this study could be used by commercial banks particularly integrating recommendation on how ICT innovations could enhance product and service efficiency, process efficiency and market performance. Furthermore, commercial banks could adopt the findings of this study to inform policy on the use of ICT in the banking sector.

1.5.2 Central Bank of Kenya

The Central bank of Kenya is the main regulator of commercial banks in Kenya. The findings of this study can be adopted to influence or inform policy on how to regulate or liberalize ICT in the banking sector in Kenya.

1.5.3 Researchers and Academicians

The findings of this study were significance to researchers and academicians in terms of testing hypothesis to confirm or compare the findings of this study with other studies. Similarly, this study can be used to enhance the body of empirical literature on the role of ICT innovation in enhancing operational performance of commercial banks.

1.6 Scope of the Study

The population of the study was 43 commercial banks in Kenya. The study was conducted in 3 months' time that is between January and April, 2017. The geographical scope of the study was Nairobi since all head offices for the Kenya commercial are in Nairobi.

1.7 Definition of Terms

1.7.1 Operational Performance

Operational performance is defined as the organizational accomplishment of specific outputs based on expected outcomes. Outcomes are based on quality of service and products, speed of product delivery, flexibility, and dependability (Abdolvand, Albadvi, and Ferdowsi, 2012).

1.7.2 ICT-based Innovation

ICT-based innovation is defined as the introduction of new ways of doing things, new ideas, new concept, new methods using information communication technology platforms as a way of enhancing efficiency and effectiveness in service or product performance (Kroeker, 2010).

1.7.3 Product Innovation

Product innovation is the progressing systematic or radical improvement to the function or use of a given product (Yonc, 2010)

1.7.4 Process Innovation

Process innovation is implementation of a new or significantly improved production or delivery method, including significant changes in techniques, equipment and, or software (Gera and Gu, 2010).

1.7.5 Marketing Innovation

Marketing innovation is defined as the incorporation of the advances in marketing science, technology, or engineering so as to increase the effectiveness and efficiency of marketing a product or service, and gain competitive advantage (Al Mashari and Zairi, 2011)

1.8 Chapter Summary

This chapter has presented the background information on the role of ICT innovations on operation performance in commercial banks. The problem statement is also presented followed by the purpose of the study, research questions, significance of the study and definition of terms. Chapter two discusses literature based on study research questions while chapter three present the study methodology; chapter four presents result and findings; while chapter five presents study discussion, conclusion, and recommendations,

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter reviews and presents the literature on factors that influence ICT innovation on operational performance of commercial banks. The study is based on the three research questions: how does the product/service efficiency factors, process efficiency factors, and market performance factors influence operational performance of commercial banks?

2.2 Influence of ICT-based Product/Service Innovation on Operational Performance

Product/service innovation is defined as the utilization of technology to introduce systematic or radical improvements in the way products/services are designed, conceptualised, function or how they are eventually used (Yonc, 2010). It has been widely recognized that information and communication technologies (ICT) have a great potential not only to improve the efficiency of the established business processes of firms, through which their usual products and services are produced, but also to facilitate and drive innovations both in their processes, and in the products and services. This can be highly beneficial, as innovation has become a critical element of modern economy, which is highly important for the prosperity of commercial banks, industries and nations (Organization for Economic Co-operation and Development, 2012). Products/services innovations can enable commercial banks to achieve differentiation over competitors, or even create new markets in which it has a dominant position, as well as provide an avenue for expansion into other industries, resulting finally in higher levels of profits. Product innovations create new methods of performing firm activities, which have lower costs and higher efficiency or generate new revenue, having also a positive impact on profitability. Especially in highly dynamic sectors, the capability of commercial bank to “renew” itself is critical for its survival (Tidd and Hull, 2015).

2.2.1 Tangible and Intangible Products

All commercial banks supply some type of service internally and externally. However, not all commercial banks include service products in their portfolios. According to

Schmenner (2011), much of the confusion related to service innovation may be traced to failing to distinguish between service products and service delivery. Lovelock and Yip (2014) have based this distinction on, between the processes used to create a service, and Schmenner (2011), who focuses on service in the context of how organizations relate to customers and stakeholders. In most cases, banks do focus on the traditional way of product innovation (Gallouj, 2014). This means that most banks do normally focus on traditional tangible products that customers can see, or their staff can be able to see and utilize. However, ICT-based product innovations should not be limited to tangible aspects like ATMs, ATM Cards, and physical money transfers, but rather, to intangible aspects of product/service innovation (Tidd and Hull, 2015).

Tushman and O'Reilly (2013) say that intangible service is about the system of attitudes, communication and experiences which is provided. In other words, intangible service innovations relate to new attitudes, ways of communicating and experiences. Thus, "attitude" mean what people say and do (Baker, 2015). In the context of commercial banks, this affects how customers experience service delivery. Hence, relationships reinforce the communication which affects attitudes in one direction or another. Therefore, according Gallouj (2014), intangible service may be developed along three axes. The first axis shows attitudes; the second axis relates to communication, and the third axis is the experience that is anchored in the actual service delivery. In other words, in the meeting with customers and others, it is possible to change the service delivery on the spot, by changing one's own responses to the behavior of others. This also change the experience for the customers, suppliers, and other stakeholders.

Some researchers, including Fitzsimmons and Fitzsimmons (2012), argue that knowledge from innovation research, especially product innovations, is transferable to service innovations. Gallouj (2014), amongst others, argues that this is not possible, because the service industry is qualitatively different from the manufacturing industry. Both are right, but on different terms, because they do not adequately distinguish between tangible and intangible service dimensions, where one may also affect the other. The development of tangible service products may be understood in the same way as the development of product innovations (Tushman and O'Reilly, 2013). Intangible service delivery is something found in all commercial banks, both with regard to internal customers and external stakeholders, such as suppliers, government authorities, etc. Although service is

consumed when it is produced, the customer's experience does not take place in a vacuum. It is the service delivery and what the customer experiences that constitute value for the customer. Service delivery and customer experience can be cultivated and improved. Customer experience may, for example, to some extent be steered by the expectation mechanism; an effective feedback system can be used to store and recreate expectations, so the experience is replicated for all the customers (Zeithaml, Parasuraman, and Berry, 2015).

Thus, the emergence and growing penetration of ICT innovation lead to the gradual realization of its great potential not only to improve the efficiency of established business processes of commercial banks, through which their usual tangible and intangible products and services are produced, but also to facilitate and drive important innovations in their processes, and also in their products and services (Kleis, Chwelos, Ramirez, and Cockburn, 2012). Also, ICT innovation can help to increase the productivity of these tangible and intangible service products through commercial banks' research and development (R&D) and innovation creation processes resulting in higher innovation performance (Thomke, 2015). Furthermore, ICT allow a better communication and exchange of knowledge among firm's employees from different functions and disciplines, and this facilitates the combination of scientific and operational knowledge from different domains, which according to Rogers (2013) is of critical importance for innovation.

2.2.2 Managing Product Innovation

In the resource based view (RBV), a resource is defined as an asset or input to production (tangible or intangible) that a commercial bank owns, controls, or has access to on a semi-permanent basis (Helfat and Peteraf, 2013). Essentially, the RBV conceptualizes firms as "bundles of resources" that are heterogeneously distributed across firms and assumes that these "resource differences persist over time. The bases for competitive advantage are essentially resources that meet the valuable, rare, inimitable and non- substitutable (VRIN) criterion and give rise to fresh value creating strategies that cannot be easily duplicated by competing firms" (Eisenhardt and Martin, 2013). Teece, Pisano and Shuen (1997) in a similar vein indicated that competitive advantage lies 'upstream' of product markets and rests on the firm's idiosyncratic and difficult-to-imitate resource. So, simplified, the sheer possession of these rare and hard to imitate resource and leveraging those drives value creating through development of competitive advantage (Flynn, 2015).

Over the years and responding to some criticism of the approach (Priem and Butler, 2011), the RBV was developed and enriched. It started to deal more explicitly with how a firm's external environment is influencing the process of managing resources and how a firm's resources are transformed into value. Sirmon and Ireland., (2011), for example recently proposed a dynamic resource management model of value creation. Bingham and Eisenhardt (2011) contributed to the RBV by arguing that operational performance stems from both the characteristics of individual resources, as well as the linkages among the resources. Then they apply the VRIN criteria basically to the combinations of resources and especially see inimitability as the key criterion for gaining competitive advantage.

The dynamic capabilities view (DCV) as compared to the initial, basic version of the RBV, offers the more dynamic version of the RBV by emphasizing that possessing a set of resources with VRIN characteristics is not enough to manage competitiveness in a changing business context. Instead, dynamic capabilities or the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments (Flynn, 2015) are seen as key and perceived as the cornerstone of competitive advantage. Dynamic capabilities are based upon highly firm- specific managerial and organizational processes (or routines) and are shaped to a considerable degree by its specific asset position (current specific endowments of technology, intellectual property, complementary assets, customer base and its external relations with suppliers and complementors) and paths dependencies (Kim and Kleiner, 2013). So, it is not merely the unique set of resources with VRIN characteristics at a certain point in time that matter (as is the case with the basic version of the RBV), but essentially a firm's ability to constantly adapt, reconfigure and innovate that is key (Hammer and Champy, 2013).

Helfat and Peteraf (2014) have defined an (organizational) product innovation capability as the ability of an organization to perform a coordinated set of tasks utilizing organizational resources, for the purpose of achieving a particular end result. Attaran (2014) on the other hand, have posited that dynamic capabilities for product innovation do not directly affect output for the firm in which they reside, but indirectly contribute to the output of the firm through an impact on operational capabilities, and functional capabilities. Winter (2012) has formulated the basic difference between zero level product innovation and higher order product innovation capabilities. He argues that high order

product innovation capabilities would change the product, the production process, the scale, or the customers (markets) served.

Bruni and Veron (2013) argue that innovation of products in commercial banks can draw on versatile technological resources and capabilities to build a potent product that can not only enhance competitive advantage, but operational performance. To this end, product innovation capabilities, as a higher order of capabilities are means that impacts upon operational capabilities, i.e. the regular way in which resources are transformed into innovative services (Nah, Tan and Teh, 2013). On the other hand, Tushman and O'Reilly (2013) also define product innovation capabilities as those hard to transfer and imitate innovation which organizations possess to develop, reshape, disintegrate and reconfigure existing and new resources and operational capabilities. These are needed to successfully offer clients a new product experience or new service solution and market these successfully in a sustainable fashion and hence swiftly adapt to a firm's changing environment. These service innovation capabilities are aligned with firm strategy, market dynamics and firm history and operational performance (Lovelock and Yip, 2014).

Eisenhardt (2013) argues that dynamic product innovation capabilities are built into organizational competencies, routines and processes organizations already have or newly developed to manage the process of product innovation. In practice, this means combining existing and creating new resources and operational capabilities in order to realize (temporary) competitive advantage and an up to date product offer. Hard to transfer and imitate means that these specific capabilities are partly idiosyncratic to the commercial banks, the service value system or the specific market in which the bank operates (Bingham, 2011). However, these capabilities contain some generic elements that can be used in other settings as well and most likely will need some customization. This implies that some best practices can be identified and that there is scope for learning. Thus, these capabilities are therefore not completely inimitable and not completely transferable either. If they were, it would be almost pointless to invest in dynamic service innovation capabilities. In that case, these capabilities would be free floating, would not result in (temporary) competitive advantage, and could be used immediately in different contexts (Fitzsimmons and Fitzsimmons, 2012).

Thus, commercial banks strategy, market dynamics and firm history will influence the particular subset of dynamic capabilities used for managing product innovation and the

pace at which certain dynamic capabilities become obsolete. In order to innovate effectively, new service experiences, new service concepts and/or new ways of delivering must be aligned with commercial banks operations. Therefore, process efficiency and market performance dynamics or turbulence will affect the rate at which firms need to adapt their capabilities (AlMashari and Zairi, 2011).

2.3 Influence of ICT-based Process Innovation on Performance of Commercial Banks

In the globalized business environment, commercial banks are experiencing consistent competition to move away from traditional aspects of delivering bank services, or organizing internal business operations to enhance performance (Nah et al., 2013). Traditional banks processes include having customers come into the bank halls and queue for services like banking, transfers, and even loan applications. According to Bingham (2013), banks that do not innovate and move rapidly from traditional way of offering bank services will find their operational performance unsustainable, with potential probability eroding banks competitive advantage compared to banks that use ICT-based process innovation (Kang *et al.*, 2011; Dess and Robinson, 2014; Bardhan, Krishnan and Lin, 2013)

Advanced information and communications technology (ICT) changes the ways in which production, coordination activities, and data processing are carried out (Uhlenbruck *et al.*, 2013). ICT also reshapes business practices in ways of gathering and analyzing information, developing strategic visions, finding the best approach for process redesign, and allowing collaborative teamwork (Attaran, 2014). Thus, improving the quality of service is one of the factors in commercial banks' survival but cost and speed of service are also vital. Hence, a powerful way of overall improvement is business process reengineering (BPR), defined by Hammer and Champy (2013) as the fundamental rethinking and radical redesign of processes to achieve dramatic improvements in critical contemporary measures of performance such as cost, quality, service and speed.

Therefore, in order to ensure successful BPR, it must be implemented appropriately. Without proper implementation, commercial banks may find difficulties in reaping the benefits of BPR. The mixture of results makes the issue of BPR implementation very important (Al Mashari and Zairi, 2011). It is expected that the greater the degree of

success in BPR implementation, the greater the results or outcomes in top management competence, re-engineering service quality and customer service management (Bingham, 2011).

2.3.1 Top Management Commitment

Nah et al. (2013) find the elements of top management support, project champions, enterprise resource planning (ERP) teamwork and composition, project management, change management programs, and culture are critical to the success of process efficiency in commercial banks. This is a significant move from the traditional banking where decisions are made in bank headquarters and passed down the chain without considerations on how local units need to innovate to serve their market. According to Kang *et al.*, (2011), standardization and centralization based integration, characterized by clarity of objectives, coordination and control of activities of different business units, is critical for successful implementation of process efficiency. However, Hammer and Champy (2013) argues that standardization and centralization cannot work in the era of ICT since it invalidates the ability for local bank units to localize their processes to their local niche markets. Business process re-engineering is important, and therefore, banks should embrace it particularly in ICT process based innovation (Dawe, 2015).

Business performance is an important construct in determining commercial banks success in implementing BPR. BPR improves commercial banks performance in terms of cost, quality, customer service, speed, process efficiency, effectiveness and productivity. Many researchers often use objective measures such as turnover and profit as a form of measuring enterprise business performance. However, according to Dess and Robinson (2014), perceived measures can replace objective measures of business performance. The feasibility of the perceived measures is further reinforced by Bontis, Chua and Richardson (2013). Furthermore, objective measures and perceived measures have strong reliabilities and correlation with one another (Lyles and Salk, 1996; Hansen and Wernerfelt, 1989; Bart, Bontis and Taggar., 2011). In this research, the perceived measures of business performance of the commercial banks involve benchmarking of the enterprise within the industry, the department and individuals. According to research from Bontis *et al.* (2015), employees' sentiments (satisfaction, motivation and commitment to the enterprise) have positive impacts on business performance and they are important indicators of business performance.

A change in the management system and culture can provide a favorable environment for radical changes as a result of BPR. Through human involvement, people in the enterprise actively involved in the redesigning and implementing the process are more prepared for the changes (Dawe, 2015). Thus, a strong and effective culture can be created. This culture is essential in accommodating the hardships of BPR implementations so that the commercial banks become more receptive to radical changes. Change of management system and culture complement reciprocally the effectiveness of management of risk, BPR project management and IT infrastructure because they are highly correlated (Lyles and Salk, 2013).

Top management, BPR champions and teams constantly assess the risks of BPR implementations to ensure that problems associated with radical changes are sufficiently dealt with (Hammer and Champy, 2013). These risks involve the efficiency, productivity, customer satisfaction, sales, profitability, employee turnover and absenteeism, quality awareness, employee morale and teamwork, organizational structure and culture, improved communication, processes, information technology (Wilkinson, McCabe, and Knights 2015). In addition, aligned BPR strategy with the corporate strategy of the enterprise, as a result of BPR project management, creates guidelines for achieving successful BPR and corporate objectives simultaneously. The incorporation of proper planning, design, execution and project management techniques also contribute to successful BPR implementation (Hammer and Champy, 2013).

When the old technologies are reengineered, there is likelihood of introducing advanced technologies such online and mobile technologies which bring radical changes of BPR initiatives (Kang *et al.*, 2012). The reengineered old technologies can make the commercial banks more receptive and prepared to anticipate the adversities associated with BPR. When reengineering the old technology systems, new software packages are introduced to ensure the efficient insertion of new processes. Nevertheless, software packages must be user friendly (Attaran, 2014). However, adequate measurement of IT infrastructure effectiveness must be present to ensure the infrastructure does not complicate the redesigned processes. Therefore, constant alignment of IT infrastructure with BPR initiatives is important. Hence careful execution of IT infrastructure can positively affect customer service management. Therefore, with proper utilization of IT

infrastructure, which may be highly advanced and sophisticated, positive effects in commercial banks performance may be achieved (Fitzsimmons and Fitzsimmons, 2012).

2.3.2 Re-engineering Process Quality

There is a rich body of literature indicating the concept of process when analysing the transparency and efficiency of an operational process (Levitt, 2012). The banking process of reengineering service quality performance may be defined as a series of steps/stages which converts inputs into an identifiable output intended for internal and external customers. To this end, it could be argued that a business process operates in a way analogous to a system which comprises a series of continuous actions or operations performed at different stages. Shostack (2014) argue that business process re-engineering exists as framework for increasing commercial banks performance, presented under the umbrella of blueprints of process analysis, process control, process improvement, process redesign.

A combination of people and technology do form important aspects of process innovations for organizations. Human capital, utilizing appropriate technology do form a blueprint that can be viewed as a process innovation of service delivery which is related to financial product development in the context of financial product augmentation, repositioning and cost reduction (Johne and Storey, 2011). Financial product development has often been the result of a process innovation. Innovation in the product domain includes changes in the features of the product itself (de Jong and Vermeulen, 2013). One example of process innovation is connected with changes in delivery method, which leads to reengineering of the operational process (i.e. product development). This type of product development is referred to as “reengineering efforts” which improve the performance including speed of delivery, customer time reduction, responsiveness to customer, convenience and introduce new working practices (Johne and Storey, 2011, Pg. 18).

Hammer and Champy (2013), say the results of BPR are radical improvements in critical contemporary measures of performance such as cost, quality, service and speed. Sidorova, and Isik (2010) posit that BPR can gain drastic improvements in critical contemporary measures of performance, inspired from a new mission, such as cost, process efficiency, effectiveness, productivity and quality. Thus, BPR can render

commercial banks more flexible and responsive to customers, efficient and cost effective. McAdam (2012), on the other hand notes that BPR can achieve process improvement, waste reduction and improved customer service that leads to customer satisfaction. Jarrar and Aspinwall (2013) and Al Mashari and Zairi (2011) equally concur BPR transforms the commercial banks to be more customer centric, process efficient, and productive.

2.3.3 Customer Service Management

Customers are the driving force of BPR (Hammer and Champy, 2013; Hammer and Stanton, 2015). The survival of an enterprise depends on its customers (Lewis, 2011). As commercial banks' customers become increasingly knowledgeable in the mechanics of financial products and services, they are more selective in their options (Chua, 2012). If they are dissatisfied with their current banker's products or services, they can easily switch to other bankers. In short, satisfying wants and desires are essential. Therefore, customer service management is an important endogenous construct in determining commercial banks success in BPR.

According to Lewis (2011), customer service is all the activities involved in making it easy for customers to reach the right parties within the company and receive quick and satisfactory service, answers and resolutions of problems. In a survey conducted on 100 professionals from *Fortune* 500 companies, "customer service" was ranked the third highest benefit of BPR at 40 percent (Flynn, 2015). It was similar to "increased profitability" that attained 42 percent. Banks and financial services firms in the USA also reported that reengineering has led to improvement in customer service (Wood, 2014). Many other researchers indicate improved customer service as a result of BPR initiatives (Ryan, 2015; Hoffman, 2013; Gianni and Grupe, 2011; Gritzuk, 2013; Verespej, 2015).

Kim and Kleiner (2012) say that achieving customer service excellence in the banking industry is essential in improving customer satisfaction. In good customer service management, it is imperative that there is market research into consumer behavior and expectations, customer databases and records, complaint and suggestion systems, management of service quality to meet customer expectations, product or service improvements, efficient customer handling, and lost customer analysis (Lewis, 2011; Cateora and Graham, 2015). Customer service management provides the basis for customer retention by matching or exceeding customer expectations through good

customer service management as already described above. When customer expectations are met or exceeded, customers will be delighted and satisfied. Therefore, customer retention indicates customer satisfaction (Lewis, 2011) in the commercial banking industry. Hence, effective customer service management has a positive effect on customer satisfaction (Lee, 2014)

Customer satisfaction is a person's feelings of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectations (Lewis, 2011). Research conducted in Malaysian banking industries suggests that customer satisfaction has a positive impact on commercial banks performance (Agus, Kumar, Latifah and Kadir, 2013). Although intangible, customer satisfaction is an intellectual economic asset to the commercial banks (Bontis *et al.*, 2015). The higher the customer satisfaction, the more it becomes part of the performance equation and predictor of business results (McColl-Kennedy and Schneider, 2000). Therefore, customer satisfaction has a positive impact on commercial banks performance. Since customer service management, as a construct, provides the basis for customer retention and customer retention indicates customer satisfaction, this construct will positively affect commercial banks performance. Similar studies by Bontis *et al.*, (2015) revealed that understanding of customers' wants in products and services similar to customer service management, has a positive association with commercial banks performance.

2.4 Influence of ICT-based Marketing Innovation on Operational Performance of Commercial Banks

Several studies have focused on marketing performance suggesting that firm ICT innovation is a determinant of commercial banks performance (Hammer and Champy, 2013; Chua, 2011). These studies depart significantly from the traditional way in which banks have marketed their products and services over the years. Lewis (2011) notes that traditional ways of marketing within banks included hiring marketing agents who would frequent public areas like malls, shopping centers, and other markets seeking to convince and enrol new clients to the banks services. However, new array of ICT based marketing innovations are changing how marketing is done in the globalized competitive environment (Chua, 2011).

The first wave of marketing innovation came with Bain (2013), who introduced the concept of structure conduct performance (SCP) to move away from traditional paradigms. The SCP involved examining the industry structure, number of competitors, heterogeneity of products and cost associated with differentiating one's products and services. As such, conduct in this regards refers to the banks adoption and implementation of product and service differentiation as a way of enhancing performance (Levitt, 2012). The second wave of research stems from the strategic management theory and shows that management behavior is an important factor in the relationship between marketing management and bank performance (Berger and Mester, 2013). The third wave comes from ICT marketing that shows that innovation plays a bigger role on bank performance (Chua, 2011). This study focuses on ICT-based marketing innovation through social media which has taken prominence in our society today.

In the 21st Century, social media has gained popularity as a major medium of transmitting information and even creating marketing innovation. According to Mothe (2012), social media is the computer based social networks that allow the sharing and dissemination of information over different online computer based social platforms. These platforms enable members of a given group to easily access and share information with one another in a faster, quicker and efficient manner. Palmer and Lewis (2009) argue that there exists a relationship between use of social media platforms and creation of marketing innovation. In a study, they conducted in the United Kingdom over use of social media, the relationship was strong and positive, $r(0.621); \leq 0.01$

Further, Palmer and Lewis (2009) posit that the growth in social media outlets mean that the traditional channels of marketing such as the TV, radio and print media have suffered a significant blow. According to Patterson (2007), most companies do have a social medial page through which they disseminate information and brand awareness campaigns. As such, most companies are gradually shifting their advertising and marketing channels to align with the changing trends in the global business environment.

Social media network are applications that allow users to build personal web sites accessible to other users for exchange of personal content and communication (Palmer and Lewis 2009). Social media according to Palmer and Lewis can be characterized as: online applications, platforms and media which aim to facilitate interactions, collaborations and the sharing of content. Fauser, Wiedenhofer, and Lorenz (2011) argue

that though communication is the core dimension of social media networks, not all platform categories are equally suitable for all marketing objectives because most of the platforms are not equally well suited for information, collaboration, and even for cultivating relationships. The purpose of social networks is primarily for communication and exchange of ideas of interest among peer groups or communities.

Terpstra, Kuijlen and Sijtsma (2014) argue that frequent communication initiated by an organization on the interactive social networks can lead to a long-term relationship that can benefit the organization should the relationship blossom into a constant consistent client. Keyton (2011), on the other hand, argues that organizations are the ones responsible for creating their own communities with their social network constructs. As such, organizations have a wider platform to establish credibility that attracts followers. In this way, collaboration between the organization and the social media user is developed and natured. This means that without information flow within the communities and the brand which in this case is the business, there would be no serious engagement amongst the online communities.

A unique role of social media is that enabling customers to talk to one another is, in a sense, an extension of traditional word of mouth communication (Mothe, 2012). Managers are faced with the question of how this power can be harnessed to benefit the organization. Although companies cannot directly control what consumers are saying, they do have the ability to influence the conversations consumers are having (Palmer and Lewis, 2009). The social media platforms reviewed under this study include Facebook, LinkedIn, Twitter, and You Tube

2.4.1 Facebook

Facebook is a social media interactive platform that was launched in 2004, and by end of 2015, Facebook had over 1.13 billion users (KPMG, 2015). Equally, the number of Facebook users on mobile devices has grown to more than 450 million users daily. According to Ingram, Raymond, LaForge, Ramon, Schwepker, and William (2011), Facebook operates an online platform for marketing innovation for services. This portal grants marketer the opportunity to design, create, and disseminate information concerning their products and services. Over the last ten years, Facebook has grown allowing users to share information, videos, links, images, that enable companies to profile these users for brand awareness campaigns (KPMG, 2013).

Ingram *et al.*, (2011) posit that the current trends in information technology means that organizations have to continuously reinvent themselves to fit within the trends that can enhance their chances of creating brand awareness. A study conducted by De Young (2010) in the USA revealed the existence of a relationship between Facebook advertising and brand awareness. Forty-two companies were surveyed for this study; all indicated that they have enhanced their brand awareness through Facebook advertising. Furthermore, 76% of the firms surveyed indicated that they had increased their sales as a result of brand awareness created on Facebook. To this, a study by KPMG (2015) on global market trends recommends that organizations that want to create a lasting impact on brand awareness, should pay a closer attention to social media platforms such as Facebook due to their ability to create referrals faster and in real time.

2.4.2 Twitter

Twitter is another social media platform that encourages users to create and share information in a faster manner. Information on twitter is usually shared in real time as it happens (Dutta, 2010). As such businesses that want to create brand awareness do utilize twitter as the platform to inform followers on new products, changes to existing products, product promotions, and even advertising. According to De Young (2010), businesses have the opportunity to disseminate and share information or news in a faster manner to a larger global audience at a cheaper cost compared to the previous traditional means of marketing.

Companies can also gather market data through comments provided on Twitter feeds and use this information to create market intelligence information that is essential for marketing for commercial banks and business growth (Tang, Zhulei, Smith and Montgomery, 2012). To a large extent, marketing information collected on Twitter can also form part of new product renovation and reengineering, enhancing the chances of an organization to compete favourably on the market. By the end of 2014, Twitter has more than 400 million active daily users (Dutta, 2010). If a company can manage to create a sizeable number of Twitter followers, then it will easily and quickly create brand awareness for its products (De Young, 2010).

2.4.3 LinkedIn

LinkedIn is an ICT-based marketing innovation platform that allows users to create their professional and business profiles that can be accessed by companies seeking a given set of skills, qualifications, and competencies (Travis, 2012). In LinkedIn, most companies have access to a wealth of user information provided when a user is creating their profile. Information provided by the user is usually accessed by companies seeking to target specific profile of users who they believe have the right set of traits as their potential client. This kind of targeting is important in that it helps organizations eliminate users who currently might not be of value to them (De Young, 2010). In most cases, companies pay fees to LinkedIn to be able to advertise their products and services to affiliated groups or particular LinkedIn members.

According to Travis (2012), one of the companies that have done good brand awareness through LinkedIn is Cathay Pacific Airway. Through LinkedIn followers, Cathay sends messages to users who are following their company on LinkedIn profile, by asking them to recommend the company to their friends and users. In 2012, 23% of Cathays clients were generated as a result of marketing innovation through LinkedIn platform (Fauser, Wiedenhofer, and Lorenz, 2011). It is therefore important that commercial banks that are seeking to use social media platforms do consider utilizing the LinkedIn user profiles as a channel for brand awareness creating, and also a channel of enhancing client base that can champion the positive image of the organizations products (Ingram *et al.*, 2011).

2.4.4 YouTube

YouTube is another ICT-based marketing innovation that utilizes social media channel that allows users to view videos and create profiled channels, or follow specific companies, or individuals who post specific information to which they are interested (Weber, 2014). According to Fauser *et al.*, (2011), YouTube was created in 2005 as a video sharing site, where users could upload videos, view other videos uploaded by other users, share informative or inspiring videos to users across the globe. As such, YouTube acts as a platform where content creators and advertisers create awareness of given products and services. According to Statista (2012), YouTube has over 3 billion videos, and more than 400 million views per day either on mobile devices or on their computers.

As such, YouTube is a platform that can enhance brand awareness if marketers and organizations pay closer attention to trends of YouTube users, profile them and use target marketing as a way of creating marketing innovation (Fauser *et al.*, 2011). Equally, organizations can create their own YouTube channels and have users follow the organizations postings, and by extension, create marketing innovation among products and services commercial banks' want to introduce to the market, or want to create awareness about (Ingram *et al.*, 2011).

2.5 Chapter Summary

This chapter has presented literature review based on the study research questions. First, review of the influence of ICT-based product innovation on operational performance of commercial banks; followed by influence of ICT-based process innovation on operational performance of commercial banks; and finally influence of ICT-based marketing innovation on operational performance of commercial banks. Chapter three presents the methodology adopted for the study.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

The research design for this study is discussed in this chapter. In identifying the influence of ICT innovations on operational performance of commercial banks of Kenya, the study has identified the population and the sampling design to come up with a representative sample. This involves identifying a sampling frame from which the sample is to be drawn. The chapter also states the sampling technique and the sample size. Finally, this chapter presents research procedures, data collection methods, and data analysis methods that have been adopted for the study.

3.2 Research Design

Cooper and Schindler (2014) define research design as the blue print for the research process. It shows exactly how a study is conducted; elaborates how the researcher conducts sample selection, the data collection instruments that will be used and research procedures among other specific tasks. Cox and Hassard (2010) on the other hand defines research design as clearly defined structures within which a research study is implemented.

This study adopted a descriptive research design, which involves direct exploration, analysis and description of particular phenomena as free as possible from unexplained presumptions, aiming at maximum intuitive presentations (Cooper and Schindler 2014). According to Saunders, Lewis and Thornhill (2009), descriptive design is used to document a study phenomenon in its real situation, without the interference of the researcher. This design enables the researcher to identify and describe characteristics of the study population, and their relationships. Therefore, the adoption of descriptive survey design enabled the researcher to collect descriptive data without influencing or interfering with the study environment. The study independent variables are ICT-bases product innovation, ICT-based process innovation, and ICT-based market innovation, while the dependent variable id commercial banks performance

3.3 Population and Sampling Design

This section discusses the population to be covered in the study, the sampling design, the sampling frame, sampling technique and the sample size.

3.3.1 Population

Cooper and Schindler (2014) define population as the total collection of elements about which the researcher wishes to make inferences. This study is interested in making inferences to 43 commercial banks in Kenya. The target population for the study was 43 operations managers from the commercial banks.

3.3.2 Sampling Design

Mugenda and Mugenda (2012) define a sampling design as the framework of guide that helps determine how study sample will be determined from a study population. On the other hand, Saunders *et al.*, (2009), define sampling design as the procedure or process or technique that is used by a researcher to pick a sub group from a population to participate in the study. The subgroup is carefully selected so as to be representative of the whole population with the relevant characteristics. Each member or case is referred to as a subject or element.

3.3.2.1 Sampling Frame

According to Creswell (2009), a sampling frame is a list of all elements from which the sample will be drawn. The sampling frame was obtained from the Central Bank of Kenya.

3.3.2.2 Sampling Technique

The sampling technique is the specific process by which the entities of the sample are selected (OECD, 2012). This study adopted a census sampling technique to ensure that all banks take place in the study. Operations managers who oversee operational performance of commercial banks were targeted for each bank. Mugenda and Mugenda (2012), note that a census is adequate in cases where the subject of study has a population less than 100

3.3.2.3 Sample Size

A sample size comprises a group of respondents, consisting of part of the target population carefully selected to represent that population (Cooper and Schindler, 2014). Since this study was a census of all the commercial banks, all the 43 operations managers were sampled. Since the study focused on operational performance, operations managers were better suited to respond to the questionnaire. Other departmental managers were not sampled since they are not in charge of banks day to day operations, and are not in charge of banks operational performance targets. Therefore, sampling operations managers only was conducive, and provided accurate respondents who provided accurate position of their bank on the influence of innovative technologies on operation performance. According to Saunders *et al.*, (2009) a sample size above 40 is scientific and can be used as a representative sample to a population of a similar scope

3.4 Data Collection Methods

The study utilized only primary data collected from the field. Copper and Schindler (2014) defines primary data as original search where data being collected is designed specifically to answer the research questions. The researcher used structured closed ended questionnaires to collect primary data. The questionnaire was divided into three sections. Section I of the questionnaire capture respondents' demographics; Section II captured data on ICT-based product/service innovation; section III captured data on ICT-based process innovation; section IV captured data on ICT-based market innovations. The attached questionnaire has the Likert scale questions. To collect data, the researcher emailed questionnaires to all the 43 bank operations managers, who were given a week to fill the questionnaire and email it back to the researcher.

3.5 Research Procedures

Research procedures are rules and guideline that a researcher adopts to carry out a study. This includes how to collect data, how to seek ethical permissions, how to ensure correct respondents are sampled among others (Creswell, 2009). This study begun by seeking approval from HR managers from commercial banks to conduct the study. The questionnaire was then piloted by using human resource managers from five of the commercial banks selected randomly. To conduct an effective pilot, Saunders *et al.*, (2009) argue that 10% of respondents' sample size have to be used. In this case, 10% of

the study sample size was 4.3, which was rounded up to 5 pilot respondents. The piloting of the questionnaire was essential in helping the researcher test the validity of the study tool, and the kind of findings it would return. Piloting also helped to test whether questions are clear, concise, and understandable. The findings of the pilot were used to adjust the questionnaire accordingly. After piloting, the adjusted questionnaire was emailed to the 43 operations managers for the commercial banks. The managers were given 7 days (one week) to fill the questionnaire. A follow up call was given to the manager every two days to ensure the questionnaire was attended to by the managers. The researcher reviewed all the questionnaires to ensure there was no missing data, or errors. The questionnaires were then coded and entered into the statistical program for social sciences (SPSS) for analysis.

3.6 Data Analysis Methods

Data analysis is the process of bringing order, structure and meaning to the mass of information collected in a research (Cox and Hassard, 2010). The quantitative data were analyzed using descriptive and inferential statistics provided by the statistical program for social sciences (SPSS) to generate the required frequencies and percentages interpreted to answer the research questions. Inferential analysis included correlations and regressions. Correlation was used to determine whether there exists any relationship between the variables, while regression analysis was used to test the level of significance for the relationship. The findings of the study were presented using tables and figures.

3.7 Chapter Summary

This chapter has presented the study methodology that was adopted for the study. The descriptive research has been adopted as the study research design. The population of the study presented in this chapter is 43 commercial banks in Kenya. The study was a census; therefore, all commercial banks were sampled. Data collection was conducted using a closed ended structured questionnaire. The research procedures adopted for the study have also been presented in addition to data collection, analysis, and presentation methods adopted by this study. Chapter four presents the results and finding of the study.

CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1 Introduction

Results and findings on influence of information technology innovations on operational performance of commercial banks in Kenya. The findings on ICT based product/ services innovations is presented first, followed by ICT based process innovation, and finally ICT based marketing innovations.

The study had a response rate of 93%. Out of the 43 banks, 40 managers gave their responses, 3 did not. A reliability analysis conducted on the questionnaire revealed a Cronbach Alpha value of about 0.7 as summarized in table 4.1. Saunders et al (2012) note that for a study to be reliable, the questionnaire tool should have an Alpha value above 0.7

Table 4.1: Reliability Analysis

Variables	No. of Items	Alpha Value
ICT Based Product Innovation	9	0.732
ICT Based Process Innovation	10	0.786
ICT Based Market Innovation	10	0.742

4.2 Demographic Information

The demographic information sought from respondents included gender of respondents, age of respondents, marital status, level of education, and number of years' respondents had spent at their organization.

4.2.1 Respondents Gender

Respondents of the study were asked to indicate their gender; the findings show that 37% of the respondents were male while 63% were female as indicated in figure 4.1

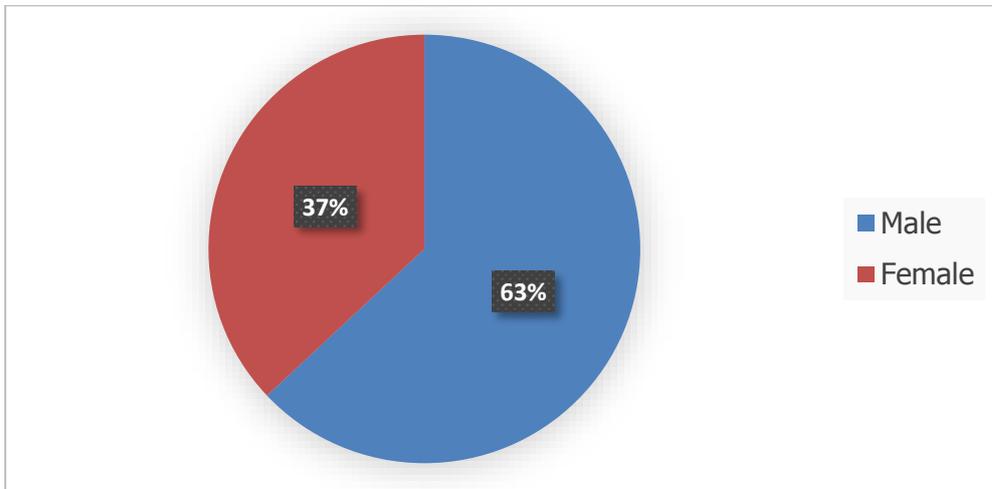


Figure 4.1: Respondents Gender

4.2.2 Respondents Age

On the issue of respondent's age, (47%) indicated they were aged between 35-54 years; (30%) were aged 26-34 years; while the remaining (23%) were aged 55-64 years as indicated in figure 4.2

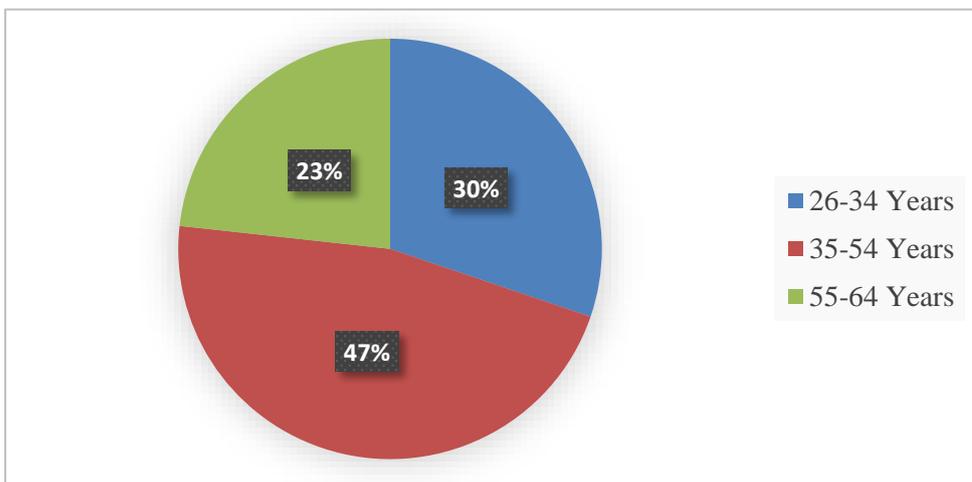


Figure 2: Respondents Age

4.2.3 Marital Status

When asked to indicate their marital status, (49%) indicated they were married, (23%) were separated, (21%) were single, while (7%) were widowed as summarized in figure 4.3

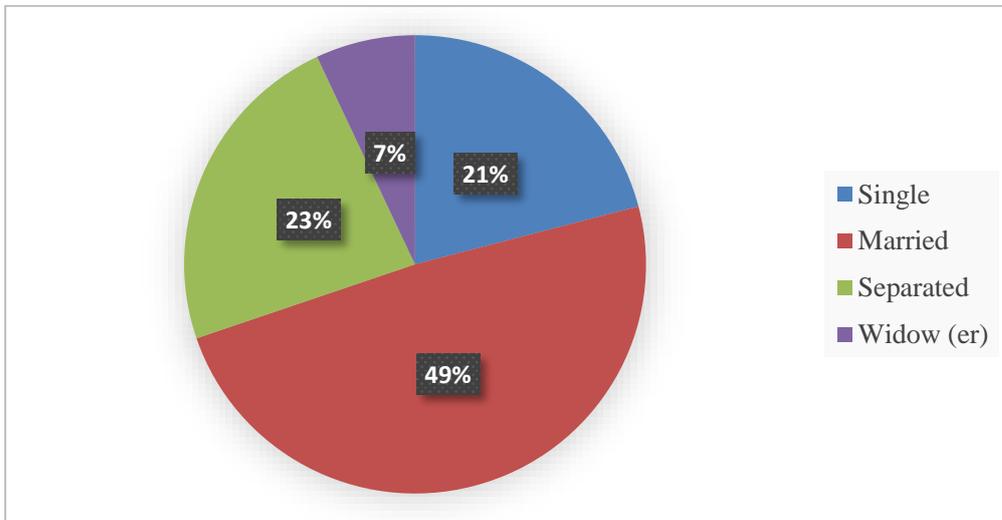


Figure 4.3: Respondents Marital Status

4.2.4 Level of Education

When asked about their level of education, (60%) of respondents had a bachelor's degree, while the remaining (40%) a master's degree as highlighted in figure 4.4

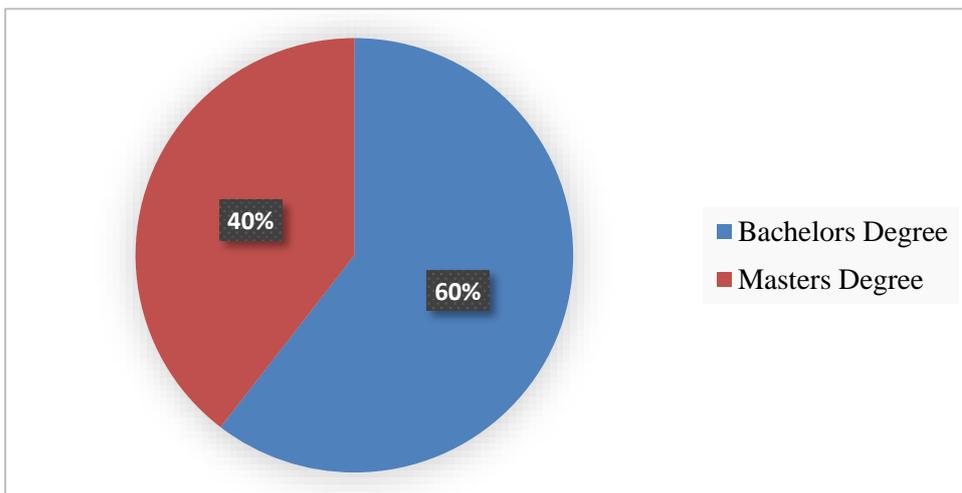


Figure 4.4: Respondents Level of Education

4.2.5 Number of Years at the Organization

When respondents were asked to indicate the number of years they had spent at the organization, (40%) said they had spent above 10 years; (37%) had 2-3 years; while the remaining (23%) had spent 4-10 years at their organization as highlighted in figure 4.5

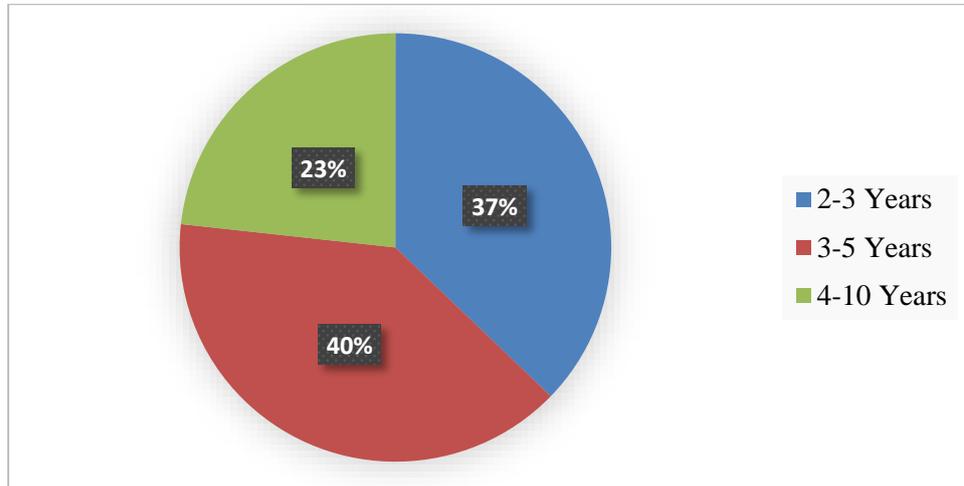


Figure 4.5: Number of Years at the Organization

4.3 Influence of ICT-based Product Innovation on Operational Performance

This study sought to determine whether ICT-based product/services innovation had influence on operational performance. The findings are summarized in the following sections:

4.3.1 Tangible ICT-based Product Innovation

When respondents were asked whether their organization had tangible ICT-Based product innovation, (35%) strongly agreed, 35% agreed, (12%) disagreed, (9%) strongly disagreed and 9% were neutral as summarized in table 4.2

Table 4.2: Tangible ICT-based Product Innovation

Scale	Frequency	Percent
Strongly Disagree	4	9
Disagree	5	12
Neutral	4	9
Agree	15	35
Strongly Agree	15	35
Total	43	100.0

4.3.2 ICT-Based Product Innovation is Good for Banks

Respondents were asked to indicate whether ICT-based product innovation are good for the banks; (30%) strongly agreed, (28%) agreed, (14%) strongly disagreed, 14% disagreed, and 14% neutral as summarized in table

Table 4.3: ICT-based Product Innovation is Good for Banks

Scale	Frequency	Percent
Strongly Disagree	6	14
Disagree	6	14
Neutral	6	14
Agree	12	28
Strongly Agree	13	30
Total	43	100.0

4.3.3 Intangible ICT-based Product Innovations

When respondents were asked whether their respective banks had intangible ICT-based product innovations, (42%) strongly agreed, (40%) agreed, (9%) disagreed and 9% neutral as summarized in table 4.4

Table 4.4: Intangible ICT-based Product Innovations

Scale	Frequency	Percent
Disagree	4	9
Neutral	4	9
Agree	17	40
Strongly Agree	18	42
Total	43	100.0

4.3.4 Intangible ICT-based Product Innovations are Good for Banks

On the question on whether intangible ICT-based innovations are good for the banks, (42%) strongly agreed, (26%) agreed, (16%) disagreed, (11%) were neutral, while (5%) strongly disagreed as highlighted in table 4.5

Table 4.5: Intangible ICT-based Product Innovations are Good for Banks

Scale	Frequency	Percent
Strongly Disagree	2	5
Disagree	7	16
Neutral	5	11
Agree	11	26
Strongly Agree	18	42
Total	43	100.0

4.3.5 Management of ICT-based Product Innovations

When respondents were asked whether their respective organizations had mechanisms for managing ICT-based innovations, majority (51%) strongly agreed, (28%) agreed, (12%) disagreed, while (9%) were neutral as summarized in table 4.6

Table 4.6: Management of ICT-based Product Innovations

Scale	Frequency	Percent
Disagree	5	12
Neutral	4	9
Agree	12	28
Strongly Agree	22	51
Total	43	100.0

4.3.6 ICT-based innovations and Operational Performance

When respondents were asked whether ICT-based innovations enhance operations performance, (35%) agreed, (30%) strongly agreed, (14%) were neutral, (12%) disagreed, while the remaining (9%) strongly disagreed as indicated in table 4.7

Table 4.7: ICT-based Innovations and Operational Performance

Scale	Frequency	Percent
Strongly Disagree	4	9
Disagree	5	12
Neutral	6	14
Agree	15	35
Strongly Agree	13	30
Total	43	100.0

4.3.7 Management Support for ICT-based Innovations

On the question on whether organization management supports ICT based innovations, (42%) strongly agreed, (35%) agreed, (9%) were neutral, 9% disagreed, while the remaining (5%) strongly disagreed as indicated in table 4.8

Table 4.8: Management Support for ICT-based Innovations

Scale	Frequency	Percent
Strongly Disagree	2	5
Disagree	4	9
Neutral	4	9
Agree	15	35
Strongly Agree	18	42
Total	43	100.0

4.3.8 Employees Support for ICT-based Innovation

When respondents were asked whether employees from their respective organizations support ICT-based innovations, (39%) strongly agreed, (35%) agreed, (12%) were neutral, 12% disagreed, while the remaining (2%) strongly disagreed as highlighted in table 4.9

Table 4.9: Employees Support for ICT-based Innovations

Scale	Frequency	Percent
Strongly Disagree	1	2
Disagree	5	12
Neutral	5	12
Agree	15	35
Strongly Agree	17	39
Total	43	100.0

4.4 Influence of ICT-based Process Innovation on Operational Performance

This study sought to establish whether ICT-based process innovation influences operational performance of commercial banks. The findings are presented in the following section:

4.4.1 Banks ICT-based Process Innovation

On the question on whether commercial banks had ICT-based process innovations in place, (44%) of respondents strongly agreed, (30%) agreed, (14%) were neutral, (7%) disagreed while the remaining (5%) strongly disagreed as highlighted in table 4.10

Table 4.10: Banks ICT-based Process Innovations

Scale	Frequency	Percent
Strongly Disagree	2	5
Disagree	3	7
Neutral	6	14
Agree	13	30
Strongly Agree	19	44
Total	43	100.0

4.4.2 ICT-based Process Innovation is Good for Banks

Respondents were asked whether ICT-based process innovation was good for commercial banks, (44%) strongly agreed, (23%) agreed, (14%) were neutral (14%) disagreed, while remaining (5%) strongly disagreed as 4.11

Table 4.11: ICT-based Process Innovation is Good for Banks

Scale	Frequency	Percent
Strongly Disagree	2	5
Disagree	6	14
Neutral	6	14
Agree	10	23
Strongly Agree	19	44
Total	43	100.0

4.4.3 Managing ICT-based Process Innovation

Respondents were asked to indicate whether their organization has adequate mechanisms for managing ICT-based process innovation. The findings show that (32%) strongly agreed, (26%) agree, (16%) disagreed, (14%) were neutral, while the remaining (12%) strongly disagreed as highlighted in table 4.12

Table 4.12: Managing ICT-based Process Innovation

Scale	Frequency	Percent
Strongly Disagree	5	12
Disagree	7	16
Neutral	6	14
Agree	11	26
Strongly Agree	14	32
Total	43	100.0

4.4.4 ICT-based process Re-engineering

On the issue on whether ICT-based re-engineering help facilitate operational performance, majority (65%) strongly agree, (23%) agreed, (5%) strongly disagreed, 5% disagreed, while the remaining (2%) were neutral as highlighted in table 4.13

Table 4.13: ICT-based Process Re-engineering

Scale	Frequency	Percent
Strongly Disagree	2	5
Disagree	2	5
Neutral	1	2
Agree	10	23
Strongly Agree	28	65
Total	43	100.0

4.4.5 ICT-based Process Innovation and Customer Service

When respondents were asked whether ICT-based process innovation enhances customer service, (42%) strongly agreed, (30%) agreed, (12%) were neutral, (9%) disagreed, while the remaining (7%) strongly disagreed as indicated in table 4.14

Table 4.14: ICT-based Process Innovation and Customer Services

Scale	Frequency	Percent
Strongly Disagree	3	7
Disagree	4	9
Neutral	5	12
Agree	13	30
Strongly Agree	18	42
Total	43	100.0

4.4.6 ICT-based Process Innovations and Operational Performance

On the question on whether ICT-based process innovations enhance operation performance, (49%) strongly agreed, (37%) agreed, (7%) were neutral, (5%) disagreed, while the remaining (2%) strongly disagreed as indicated in table 4.15

Table 4.15: ICT-based Process Innovation and Operational Performance

Scale	Frequency	Percent
Strongly Disagree	1	2
Disagree	2	5
Neutral	3	7
Agree	16	37
Strongly Agree	21	49
Total	43	100.0

4.4.7 Employees Support ICT-based Process Innovations

When asked whether employees do support ICT-based process innovations, (53%) strongly agreed, (21%) agreed, (14%) were neutral, (7%) strongly disagreed, while the remaining (5%) disagreed as summarized in table 4.16

Table 4.16: Employees Support ICT-based Process Innovation

Scale	Frequency	Percent
Strongly Disagree	3	7
Disagree	2	5
Neutral	6	14
Agree	9	21
Strongly Agree	23	53
Total	43	100.0

4.4.8 ICT-based Process Innovation Link to Customers

On the issue on whether ICT-based process innovation creates adequate links with customers, majority (51%) agreed, (40%) strongly agreed, while (9%) were neutral as indicated in table 4.17

Table 4.17: ICT-based Process Innovation Link to Customers

Scale	Frequency	Percent
Neutral	4	9
Agree	22	51
Strongly Agree	17	40
Total	43	100.0

4.4.9 Recommending ICT-based Process Innovation

When respondents were asked on whether they could recommend ICT-based process innovation, (35%) agreed, (33%) strongly agreed, (13%) disagreed, (12%) were neutral, while the remaining (7%) strongly disagreed as indicated in table 4.18

Table 4.18: Recommending ICT-based Process Innovation

Scale	Frequency	Percent
Strongly Disagree	3	7
Disagree	6	13
Neutral	5	12
Agree	15	35
Strongly Agree	14	33
Total	43	100.0

4.5 Influence of ICT-based Market Innovation on Operational Performance

This study sought to determine whether ICT-based market innovations influence operational performance. The findings are highlighted in the following section:

4.5.1 ICT-based Marketing Innovation

On the question on whether respondents' respective banks had ICT-based marketing innovation, majority (72%) strongly agreed, (19%) agreed, while the remaining (9%) disagreed as highlighted in table 4.19

Table 4.19: ICT-based Marketing Innovation

Scale	Frequency	Percent
Disagree	4	9
Agree	8	19
Strongly Agree	31	72
Total	43	100.0

4.5.2 ICT-based Market Innovations Good for Banks

When respondents were asked whether ICT-based market innovations are good for commercial banks, (49%) agreed, (46%) strongly agreed, while the remaining (5%) disagreed as indicated in table 4.20

Table 4.20: ICT-based Market Innovation are Good for Banks

Scale	Frequency	Percent
Disagree	2	5
Agree	21	49
Strongly Agree	20	46
Total	43	100.0

4.5.3 Managing ICT-based Innovations

On the question on whether banks had mechanisms for managing ICT-Based innovations, majority (51%) agreed, (46%) strongly agreed, while (3%) disagreed as indicated in table 4.21

Table 4.21: Managing ICT-based Market Innovations

Scale	Frequency	Percent
Disagree	1	3
Agree	22	51
Strongly Agree	20	46
Total	43	100.0

4.5.4 ICT-based Market Innovation and use of Facebook

On the question on whether respondents' ICT-based market innovation includes use of Facebook, (46%) strongly agreed, (35%) agreed, (7%) were neutral, 7% disagreed, while the remaining (5%) strongly disagreed as indicated in table 4.22

Table 4.22: ICT-based Market Innovation and use of Facebook

Scale	Frequency	Percent
Strongly Disagree	2	5
Disagree	3	7
Neutral	3	7
Agree	15	35
Strongly Agree	20	46
Total	43	100.0

4.5.5 ICT-based Marketing Innovation and use of Twitter

On the question on whether ICT-based market innovation included the used of Twitter, (37%) strongly agreed, (33%) agreed, (12%) disagreed, (9%) were neutral and (9%) strongly disagreed respectively as summarized in table 4.23.

Table 4.23: ICT-based Market Innovation and use of Twitter

Scale	Frequency	Percent
Strongly Disagree	4	9
Disagree	5	12
Neutral	4	9
Agree	14	33
Strongly Agree	16	37
Total	43	100.0

4.5.6 ICT-based Marketing Innovation and use of LinkedIn

When respondents were asked whether ICT-based market innovations included the use of LinkedIn, (46%) agreed this to be the case, (42%) strongly agreed, (7%) were neutral, while (5%) disagreed as highlighted in table 4.24

Table 4.24: ICT-based Market Innovation and use of LinkedIn

Scale	Frequency	Percent
Disagree	2	5
Neutral	3	7
Agree	20	46
Strongly Agree	18	42
Total	43	100.0

4.5.7 ICT-based Market Innovation and use of YouTube

When respondents were asked whether their organization did use YouTube as part of ICT-based market innovation, majority (56%) agreed, (25%) strongly agreed, (7%) strongly disagreed, (7%) were neutral while (5%) disagreed as highlighted in table 4.25

Table 4.25: ICT-based Market Innovations and use of YouTube

Scale	Frequency	Percent
Strongly Disagree	3	7
Disagree	2	5
Neutral	3	7
Agree	24	56
Strongly Agree	11	25
Total	43	100.0

4.5.8 ICT-based Marketing Innovation and Operational Performance

On the question on whether ICT-based market innovation enhances operations performance, (44%) strongly agreed, (44%) agreed, (5%) disagreed, (5%) neutral, while (2%) strongly disagreed as indicated in table 4.26

Table 4.26: ICT-based Market Innovation and Operational Performance

Scale	Frequency	Percent
Strongly Disagree	1	2
Disagree	2	5
Neutral	2	5
Agree	19	44
Strongly Agree	19	44
Total	43	100.0

4.5.9 Recommending ICT-based Market Innovations

When asked whether they would recommend the use of ICT-based market innovation to other commercial banks, (51%) strongly agreed, while (49%) agreed as indicated in table 4.27

Table 4.27: Recommending ICT-based Marketing Innovation

Scale	Frequency	Percent
Agree	21	49
Strongly Agree	22	51
Total	43	100.0

4.6 Correlations

Correlation analysis was conducted to determine whether there existed any relationships between the study variables. The findings show that the strongest correlation was between ICT-based product innovation and operational performance, $r(0.674)$; $p < 0.01$. This was followed by the relationship between ICT-based process innovation and operations performance, $r(0.582)$; $p < 0.01$; and finally, the relationship between ICT-based market innovation and operational performance, $r(0.522)$; $p < 0.01$. All the relationships were statistically significant as summarized in table 4.28

Table 4.28: Correlations

Variable		1	2	3	4
Operational performance	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	43			
ICT- Based Product Innovation	Pearson Correlation	.674**	1		
	Sig. (2-tailed)	.000			
	N	43	43		
ICT-Based Process Innovation	Pearson Correlation	.582**	.830**	1	
	Sig. (2-tailed)	.002	.000		
	N	43	43	43	
ICT-Based Market Innovation	Pearson Correlation	.522**	.473**	.460	1
	Sig. (2-tailed)	.000	.005	.000	
	N	43	43	43	43

** Correlation significant at (0.01)

4.7 Regressions

Since correlations established the existence of significant relationships between the variables, regression analysis was conducted to determine the level of significance between the study variables. The findings revealed a R square value of (0.351); which means that about 35% of operations performance is attributable to ICT-based product, process, and market innovations as indicated in table 4.29. The remaining 65% of factors that contribute to operations performance were not considered in this study.

Table 4.29: Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.460 ^a	.412	.351	.19518

a. Predictors: (Constant), ICT-Based Market Innovation, ICT-Based Process Innovation, ICT-Based Product Innovation

The study also revealed analysis of variance (ANOVA) $F_{(3, 39)} = 3.488$; p value = 0.25; which was less than 0.05, meaning the study variables were statistically significant as summarized in table 4.30

Table 4.30: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.399	3	.133	3.488	.025 ^b
	Residual	1.486	39	.038		
	Total	1.884	42			

a. Dependent Variable: Operational performance

b. Predictors: (Constant), ICT-Based Market Innovation, ICT-Based Process Innovation, ICT-Based Product Innovation

The study also revealed that ICT-based market innovation had the highest standardized Beta coefficient β (0.383); p value = 0.02; followed by ICT-based product standardized Beta coefficient β (0.359); p value = 0.18 and finally, the ICT-based process innovation standardized Beta coefficient β (0.306); p value = 0.40 as summarized in table 4.31

Table 4.31: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	3.296	.655		5.031	.000
ICT-Based Product Innovation	.206	.083	.359	2.481	.018
ICT-Based Process Innovation	.170	.080	.306	2.128	.040
ICT-Based Market Innovation	.252	.090	.383	2.802	.002

a. Dependent Variable: Operational performance

4.8 Chapter Summary

This chapter has presented results and findings on the influence of ICT-based product/services, ICT-based process, and ICT-based market innovations on operational performance. The major findings include the existence of a significant relationship between ICT-based product innovation and operational performance; the existence of a significant relationship between ICT-based process innovation and operations performance, and finally, the existence of a significant relationship between ICT-based market innovation and operational performance. The next chapter presents the discussion, conclusions, and recommendations of the study.

CHAPTER FIVE

5.0 DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

The study discussion, conclusions, and recommendation based on the study findings on the influence of ICT based product/services, ICT-based process innovation, and ICT-based market innovation on operational performance is presented in this chapter. Study summary is presented first, followed by discussion of research question, conclusions, and finally, the study's recommendations.

5.2 Summary

The purpose of this study was to establish whether ICT-based innovations influence operations performance of commercial banks in Kenya. The study was guided by the following research questions: How does ICT-based product/services innovations influence operations performance? How does ICT-based process innovation influence operations performance? How does ICT-based marketing innovations influence operations performance?

A descriptive survey research design was adopted for this study. The study had a population of 43 commercial banks operating in Kenya, out of which, all were sampled for the study. Purposive sampling was used to identify operations managers who took part in the study. Data was collected using closed-ended structured questionnaire. Data was analyzed for descriptive statistics (frequencies and percentages) and inferential statistics (correlations and regressions) using Statistical Package for Social Sciences (SPSS) version 22.

The first research question sought to establish whether ICT-based product innovations influenced operations performance. The findings show that there exists a significant relationship between ICT-based product innovations and operations management, r (0.674); $p < 0.01$. The relationship was statistically significant.

The second research question sought to establish whether ICT-based process innovation influences operations performance. The findings show that there exists a statistically significant relationship between ICT-based process innovations and operations performance, r (0.582); $p < 0.01$.

The third research question sought to establish whether ICT-based market innovations influence operational performance. The findings show the existence of a statistically significant relationship between ICT-based market innovations and operations performance, $r(0.522)$; $p < 0.01$

5.3 Discussion

5.3.1 Influence of ICT-based Product Innovation on Operational Performance

This study sought to determine whether ICT-based product innovations do influence operational performance. The findings of the study show that there exists a statistically significant relationship between ICT-based product innovations and operational performance, $r(0.674)$; $p < 0.01$. All the components of product innovations examined in this study including tangible products, intangible products, and management of these products were all important aspects of operational performance. This finding confirms study by Tidd and Hull (2015) that noted the existence of a significant relationship between the two variables. Thus, it could be argued that ICT based product innovations have the capability to enhance products design, conceptualization, functionality and usability of products. As such, this enhances value addition and utility that clients get out of a firm's products.

This study found that 70% of commercial banks in Kenya have ICT-based product innovations. This show the importance commercial banks have placed on the use of ICT to enhance operational performance. Tidd and Hull (2015) had argued that ICT-based product innovation have the ability to enhance product efficiencies. ICT facilitates the drive for innovations as it simplifies ways of doing things from traditional to mechanized processes. Thus, it could be argued that product innovations can enable commercial banks to achieve differentiation over competitors by creating new products or changing the design and use of market products, and enhancing competitive advantage that is essential for operational performance.

The finding of this study also established (70%) of commercial banks ICT-based products are focused on tangible products. Gallouj (2014) had noted that tangible products are still important since customers do focus on what they can see. As such, it is important that in developing ICT-based products, commercial banks should put emphasis on tangibility of products to the market place. In as much as this is the case, ICT-based product

innovations are not limited to tangible products such as ATMs, debits and credit cards, and organizational buildings, but also on intangible products.

The findings of this study revealed the existence of intangible ICT based products. About (82%) of commercial banks in Kenya indicated that they have ICT-based intangible products. This means that commercial banks find intangible ICT-based products of great significance to them. Tushman and O'Reilly (2013) had argued that intangible ICT products and services are basically the system of attitudes, communications, and experiences that cannot be expressed in a physical manner; however, their importance cannot be underestimated. This is to mean that ICT-based intangible products enhance the way organizations communicate and pass information that is critical to operational performance. Gallouj (2014) had also argued that intangible ICT based products and services are anchored on knowledge that is transmitted and the resultant effect of such knowledge to commercial banks bottom lines. ICT-based products and services can be accessed easier, faster, and quicker compared to traditional products. For instance, it is possible to change the service delivery on the spot by changing one's own responses to the behavior of others using a given product being advanced by a commercial bank. As such, Fitzsimmons and Fitzsimmons (2012), had argued that knowledge from innovation research, especially product innovations, can be used to transform product and service delivery that is essential for operations performance.

5.3.2 Influence of ICT-based Process Innovation on Operational Performance

This study sought to determine whether ICT-based process innovation did influence operational performance. The findings show that there exists a statistically significant relationship between ICT-based process innovation and operational performance, r (0.582); $p < 0.01$. All components that were examined under ICT-based process innovation including management support, re-engineering of commercial banks processes, and customer service were all important to operational performance. These findings collaborate the findings by Attaran (2014) who argued that ICT changes the way in which production and coordination processes are done within a firm. This includes how an organization processes data, communication and other critical aspects of organizational operations. As such, it could be argued that ICT reshapes the way in which business processes and practices are executed in work place environments. This includes

how commercial banks gather and analyze information, and how they collaborate this information to enhance product and services design processes and execution processes.

The findings of this study have also revealed that (58%) of commercial banks in Kenya have adequate management support structure and mechanisms for enhancing ICT-based process management. Hammer and Champy (2013) posited that having management support in advancing ICT-based process innovation is essential not only for the success of process innovations, but also for organizations operations performance and organizations overall profitability. Nah et al. (2013) find the elements of top management support, project champions, ERP teamwork and composition, project management, change management programs, and culture are critical to the success of process efficiency in commercial banks. This is a significant move from the traditional banking where decisions are made in bank headquarters and passed down the chain without considerations on how local units need to innovate to serve their market. Kang *et al.*, (2011) argued that standardization and centralization based integration, characterized by clarity of objectives, coordination and control of activities of different business units, is critical for successful implementation of process efficiency. However, Hammer and Champy (2013) argued that standardization and centralization cannot work in the era of ICT since it invalidates the ability for local bank units to localize their processes to their local niche markets

The findings of this study also revealed that (88%) of commercial banks in Kenya utilize process re-engineering as a way of enhancing operations performance. Hammer and Champy (2013) argued that improving the quality of service was one of the major factors that enhance operational performance. To do this, there is need to ensure that organizational process undergo re-engineering from time to time. The other importance of re-engineering of processes is that it ensures minimal disruption in current work structure, while at the same time enhancing performance elements such as costs, quality, service delivery and competitive advantage.

The finding of this study further revealed that (91%) of commercial banks in Kenya link ICT-based process innovation to customer service delivery. Lewis, (2011) had noted that ICT makes it easier for commercial banks to reach customers in different dimensions. This includes easy and quick communications using channels like emails, and web blogs that transmit organizations information on constant basis. In a survey that was conducted

on 100 professionals from *Fortune* 500 companies by Flynn (2015), customer service was ranked the third highest benefit of BPR at 40 percent. This means that in developing organizational strategies based on ICT- processes, it is important to incorporate linkages that offer value to customer service delivery.

5.3.3 Influence of ICT-based Market Innovations on Operational Performance

This study sought to establish whether ICT-based market innovation influences operational performance in commercial banks in Kenya. The study findings revealed the existence a statistically significant relationship between ICT-based market innovations and operation performance, $r (0.522)$; $p < 0.01$. All components of ICT-based market innovation including use of Facebook, Twitter, YouTube and LinkedIn significantly contributed to operational performance of commercial banks. Berger and Mester (2013) had argued that in the 21st century, social media platforms had gained their relevance and had been adopted by commercial banks as a way of transmitting information on products and services that was essential to the performance of the commercial banks. Mothe (2012) had described social media as the computer based social networks that allow the sharing and dissemination of information over different online computer based social platforms. As such, these platforms enable members of a given group to easily access and share information with one another in a faster, quicker and efficient manner. Similarly, Palmer and Lewis (2009) had argued that there exists a significant relationship between adoption of social media platforms and creation of ICT-based social media platforms that is essential for enhancing operational performance.,

The findings of this study also revealed that (81%) of commercial banks in Kenya do use facebook as a marketing tool for their product and services. As such, it could be argued that commercial banks perceive Facebook as being important to operational performance and bank's bottom lines. Ingram et al., (2011) had argued that the current trends in information technology means that organizations can easily use Facebook platform to continuously reinvent themselves to fit within the trends that can enhance their chances of creating brand awareness, which is critical to organizational operational performance. A study that was conducted by De Young (2010) in the USA revealed the existence of a significant relationship between Facebook advertising and brand awareness, which, was important to the firms' performance. Thus, in this era, it is feasible to argue that adopting

social medial platforms like Facebook is essential to organizational operational performance.

As such businesses that want to create brand awareness do utilize twitter as the platform to inform followers on new products, changes to existing products, product promotions, and even advertising. De Young (2010) argues that businesses have the opportunity to disseminate and share information or news in a faster manner to a lager global audience at a cheaper cost compared to the previous traditional means of marketing

The findings of this study revealed that commercial banks (88%) use LinkedIn platform to enhance operational performance. Commercial banks have access to a wealth of user information provided when a user is creating their profile on LinkedIn (Lorenz, 2011). Information provided by the user is usually accessed by companies seeking to target specific profile of users who they believe have the right set of traits as their potential client. This kind of targeting is important in that it helps organizations eliminate users who currently might not be of value to them (De Young, 2010). As has been demonstrated by this study, commercial banks should endeavour to enhance use of LinkedIn to scout for talent in the banking sector, and use this talent to pursue organizational strategic objectives. These findings also collaborate Travis, (2012) on Cathay Pacific Airways that utilized LinkedIn to send marketing information through both LinkedIn and Twitter, and as such, enhance not only their operational performance but also profitability.

5.4 Conclusion

5.4.1 Influence of ICT-based Product Innovation on Operational Performance

This study sought to establish whether ICT-based product innovations influenced operational performance. The study findings have revealed the existence of a statistically significant relationship between ICT-based product innovation and operations performance. Therefore, this study concludes that all components examined in this study including tangible products, intangible products and management support were all essential in determining operational performance of commercial banks. Tangible products provided clients with aspects of the organization they could relate to, whereas intangible products were essential in enhancing communication, quality, and speed of service delivery essential to operations performance.

5.4.2 Influence of ICT-based Process Innovation on Operational Performance

This study sought to determine whether ICT-based process innovations influenced operations performance. The findings revealed the existence of a statistically significant relationship between ICT-based process innovations and operational performance. Therefore, this study concludes that management support, process re-engineering, and customer service delivery all contribute to enhancing operational performance of commercial banks. Process re-engineering is significantly important as it enables commercial banks to continuously reinvent different mechanisms of delivering products and services to their clients, and as such, do enhance operational performance.

5.4.3 Influence of ICT-based Market Innovation on Operational Performance

This study sought to determine whether ICT-Based market innovation influenced operation performance for commercial banks. The findings show that there exists a statistically significant relationship between ICT-based market innovations and operations performance. This study concludes that Facebook, Twitter, LinkedIn and YouTube social media platforms significantly contribute to commercial banks operational performance by advancing banks performance agenda, strategic operational objectives, and acquisition of new clients.

5.5 Recommendations

This section provides recommendations for improvement and future studies.

5.5.1 Recommendations for Improvement

This section provides recommendations for improvement

5.5.1.1 Influence of ICT-based Product Innovation on Operational Performance

Since this study has established the existence of a statistically significant relationship between ICT-based product innovations and operation performance, the study recommends that management in commercial banks should develop ICT incubation centers within the banks that have the mandate to develop product innovations. This will not only enhance the bank's competitive advantage, but also operational performance. There is also need for commercial banks to invest more in ICT-based products that are tangible, as much as intangible products. This will ensure that all cadre customers are

taken care of. Thus, this could enhance customer loyalty that is essential for operation performance

5.5.1.2 Influence of ICT-based Process Innovation on Operational Performance

The findings of this study have established the existence of a significant relationship between ICT-based process innovations and operation performance. This study recommends that management in commercial banks should explore mechanisms for enhancing the use of process re-engineering particularly to old processes and products. This will not only revitalize banks products and processes, but also act as a form of organizational branding that is essential for performance. There is also need to have commercial banks enhance customer care delivery channels in a manner that is consistent, less costly, and more agile. This can only be enhanced by use of ICT-based processes within organizations.

5.5.1.3 Influence of ICT-based Market Innovation on Operational Performance

The findings of this study have established the existence of a significant relationship between ICT-based market innovations and operations performance. Therefore, this study recommends that commercial banks should invest more resources in developing robust content for engaging social media platforms such as Facebook, Twitter, YouTube and LinkedIn. Facebook has millions of users daily; thus, enhancing use of Facebook means that more potential clients could be reached with the banks advertising and other relevant information necessary for operations performance. There is also need for commercial banks that have not fully embraced the use of online platforms and social media to do so.

5.5.2 Recommendations for Future Studies

This study examined the influence of ICT-based innovations on operational performance of commercial banks. The study variables were limited to ICT-based products/services, ICT-based process, and ICT-based market innovations. These variables are not exhaustive in explaining commercial banks operational performance. There is need for future researchers to explore factors not considered under this study.

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APPENDICES

APPENDIX I: COVER LETTER

Eunice Mbogo
P.O.BOX
Nairobi

Dear Respondent,

RE: RESEARCH QUESTIONNAIRE

I am a graduate student pursuing Masters of Business Administration (MBA). I am currently undertaking a research on “Influence of ICT-Based Innovations on Operational Performance of Commercial Banks in Kenya. This is a requirement in partial fulfilment of my MBA degree at United State International University Africa (USIU).

This study seeks to explore the how ICT-based product innovation, ICT-based process Innovation, and ICT-based marketing innovation influence performance operations of commercial banks in Kenya. This is an Academic research and confidentiality shall strictly be adhered to. Your name will not appear anywhere in the report. Kindly spare at least 30 minutes to complete four sections of the questionnaire attached.

Yours faithfully

Eunice Mbogo

APPENDIX II: RESEARCH QUESTIONNAIRE

1.0 SECTION A: Demographic Information

Kindly respond to the following questions by checking on the appropriate box (X)

1. What is your gender?

Male Female

2. How old are you?

18-25 26-34 35-54

55-64 65 or over

3. What is your current marital status?

Single Married Divorced

Separated Widow (er)

4. What is your highest level of education?

High School College University Others _____

5. How many years have you been with the bank?

less than 1 year 2-3 years 4-10 years Above 10 years

SECTION B: Influence of ICT-Based Product Innovation on Performance of Commercial Banks

Directions: Please indicate/Place an "X" mark in the box of your answer. The scale: (1) Strongly Disagree, (2) Disagree, (3) Neutral (4) Agree (5) Strongly agree

	Statements	1	2	3	4	5
6	Your bank has tangible ICT based product innovations					
7	Tangible ICT-based product innovations are good for your bank					
8	Your bank has intangible ICT based product innovations					
9	Intangible ICT based product innovations are good					

	for your bank					
10	Your bank has mechanisms for managing ICT Based tangible product innovations					
11	The ICT based product innovations are good rot the bank					
12	The ICT based product innovations enhance operational performance					
13	Management supports ICT based product innovation as a way of enhancing operational performance					
14	Employees supports ICT based product innovation as a way of enhancing operational performance					

SECTION C: Influence of ICT-Based Process Innovation on Performance of Commercial Banks

Directions: Please indicate/Place an "X" mark in the box of your answer. The scale is: (1) Strongly Disagree, (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree.

	Competencies	1	2	3	4	5
15	Your bank has ICT based process innovation					
16	ICT based process innovations is good for the bank					
17	Your bank has mechanisms for managing ICT Based process innovations					
18	ICT based process innovation includes process reengineering at the bank					
19	ICT based process innovation includes customer service management processes					
20	The ICT based process innovations enhance operational performance					
21	Management supports ICT based process innovation as a way of enhancing operational performance					
22	Employees supports ICT based process innovation as a way of enhancing operational performance					
23	Your Customers appreciate ICT based process innovation at your bank					
24	You can recommend ICT based process innovation to other banks					

SECTION D: Influence of ICT-Based Marketing Innovation on Operational Performance of Commercial Banks

Directions: Please indicate/Place an "X" mark in the box of your answer. The scale is: (1) Strongly Disagree, (2) Disagree, (3) Neutral (4) Agree (5) Strongly Disagree.

	Competencies	1	2	3	4	5
25	Your bank has ICT based marketing innovation					
26	ICT based marketing innovations is good for the bank					
27	Your bank has mechanisms for managing ICT Based marketing innovations					
28	ICT based marketing innovation includes using Facebook					
29	ICT based marketing innovation includes using Twitter					
30	ICT based marketing innovation includes using LinkedIn					
31	ICT based marketing innovation includes using You Tube					
32	Management support ICT based marketing innovation at the bank					
33	ICT based marketing innovation has enhanced the banks operational performance					
34	You would recommend ICT based marketing innovation to other banks					

THANK YOU FOR YOUR TIME and OPERATION