MANAGEMENT INFORMATION SYSTEM AGILITY AND PERFORMANCE OF COMMERCIAL BANKS IN NAIROBI CITY COUNTY, KENYA

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A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (MANAGEMENT INFORMATION SYSTEMS) OF KENYATTA UNIVERSITY

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DECLARATION

This research project is my original work which has not been submitted for a degree award in any other university. The project should not be reproduced without the permission of the author and or Kenyatta University.

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D53/CTY/OL/27850/2018

Declaration by supervisor:

I confirm that the work in this project was completed by the candidate under my/our supervision

Signature: _____ **Date_____**

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DEDICATION

I dedicate this work to Alimghty God, to my husband and children. My gratitude goes to my family for their encouragement and patience throughout the years of my learning.

ACKNOWLEDGMENT

I sincerely thank Dr. Josphat Kyalo, for his professional guidance, advice and support to meet the required standards of this work. I thank the panel, secretariat and the graduate school for their guidance and leadership through this journey. Lastly, I appreciate the support of my colleagues.

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OPERATIONAL DEFINITION OF TERMS

Business Performance	Process improvement, profitability and the operational growth of banks
Service quality	The support level, responsiveness, availability and training opportunities that are offered by the information system department of an organization
ICT Literacy	The understanding of computer capabilities, characteristics and applications
System Security	The availability, integrity and confidentiality of information systems
Information storage	The collection of data for storage in databases for processing and access or display on request of a system user
MIS Agility	Response by businesses to changes in their tools that support processes, procedures, intelligence and IT

LIST OF ABBREVIATIONS AND ACRONYMS

ICT	Information and Communications Technology
IS	Information Systems
MIS	Management Information Systems
NACOSTI	National Commission for Science, Technology and Innovation
NIM	Net Interest Margin
R&D	Research and Design
RBV	Resource Based View
ROA	Return on Asset
ROE	Return on Equity
TTF	Task-technology Fit
VRIO	Valuable, Rare, Imitability and Value

ABSTRACT

The purpose of this research was to study Management Information Systems agility and the performance of commercial banks in Nairobi city County, Kenya. Commercial banks in Nairobi County have been performing poorly and therefore this study sought to investigate various parameters that can be used to enhance performance. The objective of this study was to determine the effect of service quality, ICT literacy, system security and information storage on the performance of commercial banks in Nairobi County Kenya. Descriptive design was applied in this study. The target population was 430 employees from 43 commercial banks in Nairobi County Kenya and purposive sampling was used to draw a sample size of 86 ICT specialists as respondents. Primary data was collected through questionnaires. This study was also founded on the following theories; Resource based view of the firm (RBV), the absorptive capacity theory by Cohen and Levinthal, Task Technology Fit Theory and Information System Success Model. Data was analyzed using descriptive, relational, and inferential analysis through the use of regression model. The study found out that service quality, ICT literacy, system security, information storage were significant and had positive effect on performance of commercial banks. The study concluded that management information system agility has influence on the performance of commercial banks. The study recommended that commercial banks should formulate strategies that will enhance performance of commercial banks based on service quality, ICT literacy, systems security and information storage in their organizations.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

With regards to commercial banking, the industry is characterized by intense competition as there is intense battle for customers and where selective growth strategies have been identified and developed because of the need to grow in volume (Lilly & Juma, 2014).To succeed in this highly intense competitive sector, banks require robust and reliable information systems that they need to utilize in the measurement of customer profitability. The financial and banking sector is greatly influenced by information systems because of the connectivity of computers to one another and the computers to the customers who need instant services at the comfort of their locations. Banks have vast amounts of customer data such as personal information and the transactions that they process for their customers daily. The data handled by banks is sensitive and the infrastructure for handling the data is becoming more complex therefore making the sector entirely dependent on information systems (Lilly & Juma, 2014).

Along with banking sector developments and increase in customer requirements, performance and transactional efficiency, banking information systems have known a continuous evolution. Currently, information system requirements have to meet very high standards (Pilarczyk, 2016). To effectively compete, banks need to have more product offers that are sophisticated and require IT solutions. Therefore, banks need to be more agile so that they can better understand market dynamics, understand customer needs better, introduce or modify products or services in a timely manner (Georgescu & Jeflea, 2015).

Management information systems can be defined as formal systems that give management timely information that is required for efficient decision-making. The type of information obtained from these system is on the past, present, and future forecasts and other intrinsic and extrinsic organizational developments (Mohammed & Wang, 2015). There has been an increase in the banking and financial industry as technology has progressed throughout the world. The amount of sensitive data, consumer and market demands and new technology have necessitated the need to have more complex IT solutions to enhance the development of the banking industry (Almaryani & Sadik, 2012).

1.1.1 Global Perspective

Several studies have been done globally on the role of Management information systems agility in the banking sector. In a study on the importance of Management information systems in the banking sector, Pilarczyk (2016) notes that failure in information systems have the potential to cripple the operational performance of a bank. Such a case was witnessed in the Royal Bank of Scotland in 2012 where a failure in banking systems crippled banking operations for a few hours that translated into massive losses of approximately $286million due to outdated management software (Pilarczyk, 2016). In a survey Conducted by Sainsbury on customers are more willing to trust a bank with the right technology in place. Investment in more advanced Management information systems is thereby require to boost overall performance in the sector.

1.1.2 Regional Perspective

Regional evidence continues to highlight the importance of management information systems in the banking sector. A study in Nigeria on the role of MIS on the banking sector a case of Ecobank notes that the use of specialized information technology has been critical to the performance management concept. It is the life wire of performance of banks in Nigeria and therefore remains a pre-requisite need for overall performance improvement (Oladepo, 2015).

1.1.3 Local perspective

Locally, a study by Ngelechei & Olweny (2016) was done to determine the role MIS plays in sustaining competitive advantage a case study of the Kenya Commercial Bank was done. Findings showed that enhancement of MS enables knowledge sharing within the bank and therefore was critical to improving bank performance.

1.1.1.1 Performance of Commercial Banks

Performance can either be operational or business performance (Gorlca, Somcers, & Wong, 2010). Operational performance includes; cycle times in productions, reliability, cost savings, efficiency, speed and quality. The operational performance of an organization directly influences its business performance which include customer satisfaction, market share and profitability. Companies strive for performance and performance improvement as a positive impact on its competitive position in its operating environment (Gorlca, Somcers, & Wong, 2010). According to Makau, Lagat, & Bonuke (2017) if a company has the ability to offer products or services of high value compared to its competitors to its customers at competitive prices, they will achieve higher levels in customer loyalty and

satisfaction. This translates into an increase in profitability and market share (Gorlca, Somcers, & Wong, 2010).

The commercial banking sector is characterized by intense competition as there is intense battle for customers and where selective growth strategies have been identified and developed because of the need to grow in volume (Wachinga, 2010). To succeed in this highly intense competitive sector, banks require robust and reliable information systems that they need to utilize in the measurement of customer profitability. The financial and banking sector is greatly influenced by information systems because of the connectivity of computers to one another and the computers to the customers who need instant services at the comfort of their locations. Banks have vast amounts of customer data such as personal information and the transactions that they process for their customers daily. The data handled by banks is sensitive and the infrastructure for handling the data is becoming more complex therefore making the sector entirely dependent on information systems (Lilly & Juma, 2014).

Kenyan banks are crucial stakeholders in allocation of economic resources in the country as they play a role in directing funds from depositors to investors. The banks however can meet their role by generating income that is sufficient enough to cover the operational costs that they incur. The ultimate goal of commercial banks is to make profit therefore every strategy and activity performed are designed to achieve this major goal apart from the social and economic goals.

Statistically, ICT strategies influences income, profitability and customer deposits of commercial banks in Kenya significantly (Wasilwa & Omwenga, 2016). Mobile phones

have a high effect than internet services on ICT strategies of commercial banks in regard to influencing performance of Kenyan banks positively. From the findings from the study of Wasilwa & Omwenga (2016), Kenya's commercial bank performance is positively influenced by ICT strategies. A recommendation is made that the government and the management of banks should explore and implement collaborations that are sustainable with mobile phone service providers and internet service providers so as to accelerate the penetration of ICT as this will in the long run result into desired impacts in the economy.

Banks have adopted various ICT innovations which have led to the development of information systems for example ATMS (automated teller machines), mobile and internet banking, point of sale (POS) terminals, debit and credit cards and electronic funds transfer. These have led to a positive response from banks' customers in terms of customer deposits and the total income from commission fees and interest (Kamau, 2015). The banking information systems have expanded the income generating potential of commercial banks therefore enhancing performance. The use of ICT products and innovations have led to positive return on assets for commercial banks. ICT can be developed in various ways to design banking products that increases organizational performance (Kamau, 2015).

There is debate on the adoption of ICT and its improvement of bank performance notwithstanding the potential advantages of ICT in e-commerce (Mwangi, 2012). An investment on information systems and ICT infrastructure is a vital element in growth and productivity in the banking industry as it enables banks to offer several services to clients (Mwangi, 2012). ICT is the core of electronic banking in Kenya and information systems through ICT innovations play key roles in improving banking efficiencies. Service delivery

standards in banks have improved because of technological advancements such as ATMs which allow customers to perform banking transactions even beyond banking hours and from their respective remote locations without going to banking halls (Mwangi, 2012). New ICT based processes and technologies lead to improvement in banks' operating efficiencies and customer service levels. There is a positive effect of ICT on the performance of a firm in terms of market value, profitability, productivity, market share, process efficiency, cost savings, customer satisfaction, service quality, process flexibility and general organizational flexibility (Mwangi, 2012).

According to the study by Juma (2012), ICT improves the operations, liquidity and the asset quality of Kenyan banks. The study shows that commercial banks not only increases competitiveness in the market but also increases their market share. Management information system improves the quality of service that is offered by banks (AL-Adwan, 2016). In this study by AL-Adwan (2016), it is recommended that policies should be drawn to uplift management information systems because it improves customer service quality satisfaction. In a study to establish whether ICT innovations impacts operational performance Kenyan banks, it was found that management support, process re-engineering and customer service delivery enhance the performance of commercial banks through enhancement of acquisition of new clients, strategic operational objectives and improved performance agenda (Mbogo, 2017). Commercial banks are investing in ICT innovations in order to remain competitive and sustainable. The operational performance of banks is achieved by accomplishing specific outputs in regard to expected outcomes. These outcomes are based on speed of product delivery, quality of service, quality of products, dependability and flexibility (Mbogo, 2017). Commercial banks are enhancing operational

performance by consistently establishing different delivery methods of products and services to their customers.

1.1.1.2 Management Information System Agility

This is the independent variable in this study because its variation is not dependent on any other variable in this research. Management information systems (MIS) agility refers to the integration of a certain degree of strategic intent with the coordination of business activities (Koech, Gichunge, & Thuo, 2016). Information systems play a very important role in organizations in the current work environment where managers need to process and analyze so much information in decision making, new product and development, gaining competitive advantage, improve customer and supplier intimacy with the organization and most importantly survival in the highly competitive work environment (Koech, Gichunge, & Thuo, 2016). Agility is the speed with which a firm reacts or responds to the requests of customers, customer demands, the dynamics of the markets and technological changes and solutions that are constantly emerging and changing (Seo, Miranda, & La Paz, 2010). Business performance of firms increases through the adoption of information systems that support the fast response to these changes in the dynamic market environment. Agile information systems speed up data analysis, data processing and communication. The ability of an information system to identify, diagnose, select and respond in real time is agility. Information systems can store, integrate, share and distribute fast flowing and current information. On this account, they are needed for the agility and increased performance of organizations (Johansson, Sudzina, & Pucihar, 2014).

According to the study of Zelenkov (2018), organizations in the modern world are operating in an environment that is highly turbulent hence the need for organizations to

invest in agile information systems. Agility refers to the ability of an organization to quickly detect changes in the environment and respond to the changes efficiently. Agility also means the gradual improvements in existing systems employee involvement in ways which the competitors cannot easily decode and reproduce (Chowdhury & Salahuddin, 2017). In the study of Zelenkov (2018), on the agility of enterprise information systems, it is concluded that a rigid information system limits the ability of an organization to transform itself because an agile information system impacts capability levels significantly.

Agility is the core of business strategy and is a representation of the ability to grow in an environment that has unpredictable and continuous changes Zelenkov (2018). This has led to the development of strong need for organizations to integrate agility in their strategic intent. The enablers and facilitators of firms' agility are the information systems that are implemented by these organizations. They make up the backbone of the organizations as they support and align the business to their strategies. The competitiveness of companies in the current world are dependent on complex information technology and systems, new transformations for example big data, mobile applications, cloud computing and digital enterprises (Chowdhury & Salahuddin, 2017). In banking information systems can embed a business process such as internet banking where a customer comfortably gives the systems commands depending on their needs from the comfort of their location (Pilarczyk, 2016). They can bank conveniently without visiting the bank premises and queuing before they can experience services. Most businesses use information system as a core resource in managing, supporting, facilitating and executing their processes and production. These processes can only change when the information systems change therefore companies

require an agile information system to keep up with the dynamic environment (Koech et al., 2016).

1.2 Statement of the Problem

There has been an immense improvement in the effectiveness with which information is handled in Kenyan banks and as such, this has had a positive effect on their performance in regards to the effectiveness with which customers are served and the resulting revenue and profitability (Muriithi & Louw, 2017). Because of this, the Kenyan banking sector is regarded as being more mature and growing faster than others in the East African region. However, its performance is still challenged by a wide range of factors which are both local and global and these include weakness of internal and external control systems, the growth of Fintech companies, non-performing loans, poor governance and leadership and unprecedented financial crises (Carè, 2018). To achieve better results therefore, one of the strategies that is seen as effective and relevant in the present day is improving how data and information is handled and processed. Banks in Kenya handle a vast amount of information that they obtain from their customers' details and the numerous transactions that they process (Benaben & Vernadat, 2017). Therefore, they require technologies and information systems for managing customer data. However due to the complexity and dynamic nature of the industry, technological advances are constantly being rolled out and the needs and demands of clients are constantly changing as well. It is therefore important to identify the issues that affect how information systems of banks is managed in order to keep up with the market and aid the banks in achieving their performance strategies more effectively and efficiently.

A shift towards agile banking information systems is now a requirement for banks because of the advanced and highly sophisticated banking technologies to meet the changing demands of customers such as high need for product value with decrease in costs and enhanced convenience (Chowdhury & Salahuddin, 2017). The growth of agile information systems in banking is under strict government supervision through its regulations and policies (Benaben & Vernadat, 2017). Commercial banks therefore need to incorporate the regulations on their operational and service systems. If Kenyan commercial banks do not manage the challenges they face in uncertain operating environment and changing customer demands, their information systems will fail and the desired value in terms of operational and business performance from the systems might not be achieved despite the high cost of implementation. Commercial banks in Nairobi County have been performing poorly because of poor service quality, insufficient ICT literacy of bank employees, information system insecurity, inadequate information storage and government regulations. Government regulations range from privacy, copyright, pricing and market entry. Government regulations are put in place to make markets more competitive. The study hence sought to investigate the best way service quality, ICT literacy, system security, information storage and government regulations can be used to enhance commercial banks' performance in Nairobi County.

1.3 Objectives of the Study

1.3.1. General Objective

The general objective of the study was to determine the effect of Management Information Systems agility on the performance of commercial banks in Nairobi city County, Kenya.

1.3.2 Specific Objectives

The objectives of the study is to;

1. Evaluate the effect of service quality and performance of commercial banks in Nairobi county
2. Determine the influence of ICT literacy on performance of commercial banks in Nairobi county
3. Assess the role of system security on performance of commercial banks in Nairobi county
4. Analyze the relevance of information storage on performance of selected commercial banks in Nairobi county

1.4 Research Questions

The study had the following research questions;

1. What is the effect of service quality on the performance of commercial banks in Nairobi county Kenya?
2. How does ICT literacy influence the performance of commercial banks in Nairobi county Kenya?
3. What role does system security play on the performance of commercial banks in Nairobi county Kenya?
4. What is the relevance of information storage on the performance of commercial banks in Nairobi county Kenya?

1.5 Significance of the study

The knowledge achieved will enable the bank's stakeholders to develop more achievable and effective information systems strategies for the benefit of the bank and the benefit of

their customers. The study will in addition enable the identification of the current customer demand and needs in regards to banking. This will create opportunities for the banks in their bid to meet the needs of the customers which consequently results in better customer satisfaction and new customer acquisition.

The study will enable banks to be more global oriented and tap into the other geographical markets because of more focus on successful alignment of their information system resources to strategies which improves global communication and trust. The focus of this study is important as it contributes to the business world and literature in terms of coming up with solutions that might contribute to the enhancement of organizations utilization of information systems to achieve higher market value.

1.6 Scope of the study

The focus of the study was on the information systems agility and performance of banking sector of Kenya, Nairobi County. Forty three commercial banks from Nairobi County formed the target population from which collection of data was conducted among management information systems specialists to build the analysis and discussion of this study in order to reach conclusions.

1.7. Limitations of the Study

Whilst it was anticipated that that the research objectives would be effectively met, there were a range of anticipated limitations. One of these is the challenge of banks allowing their staff members to take part in the research exercise, which may reduce the total research sample that was recruited to take part in the study. There are also many commercial banks in Nairobi County, which is quite geographically vast. In order to select

the 43 commercial banks that would be focused upon in the study, it was necessary to select them from different parts of Nairobi County, which required a lot of time and resources to achieve.

1.8 Organization of the Study

This research project is divided into five chapters. Chapter one is the introduction and background to the study clearly discussing the dependent and independent variables. It also presented the research problem and objectives and questions to be answered. Chapter two presented the literature review of literature was presented which involved making reference to previously published studies on management information systems and their effects on banks with the objective of obtaining and in-depth and critical insights about these phenomena. Chapter three discussed the study methodology employed including the population to be studied, sampling techniques and analysis methods. Chapter four of the study contains the findings of the study from the data analysis. The final chapter summarized the findings, conclusions and recommendations from the study. Additionally, contains the limitations of the study and suggests areas for future research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

On this chapter, a discussion is done on the theories that were formulated and analyzed by other researchers. It also discusses the research work done by various researchers on information systems agility and performance in organizations.

2.2 Theoretical Review

In this section, four different theories were addressed; namely Resource based view of the firm (RBV), absorptive capacity theory, task technology fit theory and information system success model.

2.2.1 Resource Based View of the firm

Resource based view of the firm (RBV) is an information system theoretical framework that is used to identify and or analyze the resources that a firm can explore so as to achieve competitive advantage (Barney, 1991). The focus of resource based view theory is on the internal organizational resources that are exploited to undertake and manage processes to gain competitive advantage through higher performance. It suggests that a firm's specific and unique core competencies should be developed by firms to enhance performance.

A subset of the firm's resources are enablers of sustainable competitive advantage while the other subset of the resources are enablers of superior long-term performance. The resources that an organization possesses and the way in which these resources are used have to change constantly to continuously achieve competitive advantage. This theory supports the identification and exploitation of opportunities through the use of resources, potential and competencies that are readily available than acquisition of new skills for

every new opportunity (Chowdhury & Salahuddin, 2017). Two types of resources or assets exists; tangible and intangible. Tangible resources are physical for example products, capital and land. They are easily available and can be acquired easily from the market. Intangible assets on the other hand refer to substances of no physical value but are owned or claimed by an organization for example; intellectual property or trademarks.

This theory posits that resources have to significantly vary from one organization to the other. If companies have similar resources, they cannot compete with one another through different or varying strategies. Another assumption by this theory is that resources are immobile therefore cannot be moved from one company to another company freely over a short term. Resources can therefore not be quickly replicated by rival organizations. The key resources that organizations should exploit should follow the VRIO framework that is; Valuable, rare, have low imitability and organized to capture value. A valuable resource increases the value of a product or service to the customers of an organization (Chowdhury & Salahuddin, 2017). This can be achieved by differentiation for instance in information systems. A rare resource either tangible or intangible can only be possessed by one organization or a few organizations in the market. The resources should be very difficult to copy or acquired by other organizations. The resources of the organization should be organized to capture value by designing its systems to achieve full resource exploitation; for example, deploying the correct skills to the correct department and the correct information systems to the correct roles. Only when these framework factors met, can an organization innovate and increase its performance in the market.

The ICT capabilities of an organization is its one of its most important resources. This includes investing in ICT literacy and training of employees and investing in ICT

knowledge management. In achieving higher or better performance through more agile information systems, ICT is a resource that is a primary determinant which gives an organization's unique characteristics to achieve competitive advantage over its competitors. This theory also resonates with this study as it informs banks on ways of exploiting their resources differently from competitors in order to achieve high standards of service quality, ICT innovations, system security and information storage.

2.2.2 Absorptive Capacity Theory

The absorptive capacity theory was introduced in 1990 by Cohen and Levinthal (Cohen & Levinthal, 1990). This theory discusses the limit or rate at which a firm can absorb technological or scientific information. There are four dimensions to the theory which are; acquisition, assimilation, transformation and exploitation. A firm can identify the value of external sources of information, capture it, assimilate and apply it in the achievement of their goals and commercial ends. Through absorption of new information and technological advancements, an organization has higher capabilities in being innovative, have high flexibility to changes in the environment and achieve higher performance levels. The theory purports that the organizations that apply external and new knowledge and information have competitive advantage over the organizations that do not adapt or apply new knowledge.

The absorptive capacity is dependent on prior knowledge and background diversity of an organization. The investment that a company makes in research and development (R&D) is core to the organization's model of absorptive capacity (Cohen & Levinthal, 1990). It is cumulative as an organization can invest on a constant basis. The absorptive capacity of an

organization is increased by the internal R&D as it is more appreciative of the value that is derived from new external information (Cohen & Levinthal, 1990).

This theory relates to the variables of this study since it focuses majorly on research and development of an organization to bring in value to a firm. The industry operates in certain ways in terms of regulator policies and regulations, changing technologies, innovations and market trends. The system security, service quality, information storage, ICT literacy and performance of commercial banks are all factors that are influenced by market operations and trends in the market. The absorptive capacity theory shows the need for an organization to first invest in the research and development in market trends, market changes and innovative capabilities and capacities. An organization can absorb and assimilate information from both internal sources and external sources to influence the system security, service quality, information storage, ICT literacy and the net benefits or performance of organizations. The research and development can be focused on sourcing information, analyzing and assimilating it on an organization's information systems to conform it to the frequent changes and making the systems adaptable to the constant changes hence meeting the demands and needs of customers.

2.2.3 Task Technology Fit Theory

Information technology (IT) impacts the performance of individuals positively and should be utilized if the IT capabilities and the tasks that is to be performed by the user of the system match (Goodhue & Thompson, 1995). The utilization and user attitude of technology leads to individual performance. This theory states that to achieve a positive impact from information system, technology should be exploited and must match with the tasks that it supports. This is referred to a task-technology fit (TTF). It recognizes user

involvement and performance; and how they impact one another. TTF shows technological extent of user task performance. Goodhue and Thomson in this theory developed eight factors as a measure of task technology fit. These include; quality, location, users' trust in the system and their capacity to get the information they need are among the factors to consider when selecting a data management solution (Goodhue & Thompson, 1995). Each of these dimensions are measured based on two and ten questions. The answers to the questions are done on a seven-point scale that range from strongly disagree to strongly agree. The TTF together with utilization predicts the improvement or non-improvement of job performance and effectiveness of the system (Goodhue & Thompson, 1995).

This theory resonates with ICT literacy in regards to giving employees the necessary skills dependent on their roles in the organization. The skills will be specific to the role they are supposed to undertake. This theory however only focuses on the roles of employees and the technology that they have in place to carry out their roles. It does not explore the different constructs that make up the information system's capacity and capability. In order to enhance performance in terms of agility, an information system should be viewed from the point of the users that is the employees and end users such as the customers, the services it offers, the quality of services it can provide, the convenience it gives its intended end users and the performance benefits it gives the firm through for example cost reduction and unique characteristics that achieves competitive advantage.

2.2.4 Information System Success Model

This is an information systems theory that gives a comprehensive explanation of the success that can be achieved from an information system (Dwivedi, Wade, & Schneberger,

2012). This is through the identification, description and discussion of the various relationships among the six dimensions of success on which information systems success is analyzed and evaluated. It is also known as DeLone and Mclean's model. This theory is based on a comprehensive information system assessment model which provides six major success factors of information systems namely; system quality, information quality, service quality, system use, user satisfaction and net system benefits (Dwivedi et al., 2012).

Information quality is the type and value of information that an information system (IS) can store, deliver and produce. The quality of information has an impact on the satisfaction of the user and intention of the user. Information quality impacts the yield benefits of the system to both the user of the system and the organization. System quality has an impact on the extent to which an IS achieves user satisfaction. System usage and intentions dimension is influenced by information and service quality. This affects the net benefits of the system directly. The degree to which a system user is satisfied with the information system is called user satisfaction. It is the level at which an end user's needs are met by the information system. Net system benefits that can be delivered by an information system is a key dimension to an organization. The benefits are determined by how the system is used use and user satisfaction. The six factors are as a result of a composition of diverse constructs and measures. DeLone and Mclean argue in their theory that when researchers measure the information system success, they should combine the six success categories in a systematic way (Dwivedi et al., 2012). They however state that additional research needs to be conducted to test the information system success model and selection of each of the dimensions.

The variables of this study are based on this theory as it comprises and explains the constructs that are meant to achieve information system success for an organization. The dependent variable of this study is performance of commercial banks which is characterized by process improvements, profitability through reduced system costs, organization growth and financial improvements. Through the reference and adoption of this theory, the performance of organizations can be effectively and efficiently enhanced through the adoption and manipulation of the following independent variables; service quality, information storage, ICT literacy and system security. The moderating variable entail government policies through the bank regulator which is the central bank of Kenya. This study will evaluate how the central bank's policies influences information systems and performance of banks.

This theory will be applied in this study because it explains the variables that are under this study. The success factors focus of the theory will be referred to in terms of effectiveness of information systems for employees as the end users. The independent variables for this study are service quality, ICT literacy, information storage, system security and government policies as the moderating variable. The information system success model will be used to analyze and explain the success factors for information systems and will enable the study to determine how much the success of an information system is as a result of any of the varying factors.

2.3 Empirical Review

This section discusses the study variables. Performance of financial institutions serves as the dependent variable, whilst service quality serves as one of the independent variables

which also include ICT literacy, system security, information storage and government regulations which represent the Management Information systems agility.

2.3.1 Performance of Commercial Banks

Performance can either be operational or business performance (Gorlca, Somcers, & Wong, 2010). Operational performance includes; cycle times in productions, reliability, cost savings, efficiency, speed and quality. The operational performance of an organization directly influences its business performance which include customer satisfaction, market share and profitability. Companies strive for performance and performance improvement as a positive impact on its competitive position in its operating environment (Gorlca, Somcers, & Wong, 2010). According to Makau, Lagat, & Bonuke (2017) if a company has the ability to offer products or services of high value compared to its competitors to its customers at competitive prices, they will achieve higher levels in customer loyalty and satisfaction. This translates into an increase in profitability and market share (Kamau, 2015).

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There is debate on the adoption of ICT and the enhancement of bank performance notwithstanding the possible advantages of ICT on e-commerce (Mwangi, 2012). An investment on information systems and ICT infrastructure is a vital element in growth and productivity in the banking industry as it enables banks to offer several services to clients (Mwangi, 2012). ICT is the core of electronic banking in Kenya and information systems through ICT innovations play key roles in improving banking efficiencies. Service delivery

standards in banks have improved because of technological advancements such as ATMs which allow customers to perform banking transactions even beyond banking hours and from their respective remote locations without going to banking halls (Mwangi, 2012). New ICT based processes and technologies lead to improvement in banks' operating efficiencies and customer service levels. There is a positive effect of ICT on the performance of a firm in terms of market value, profitability, productivity, market share, process efficiency, cost savings, customer satisfaction, service quality, process flexibility and general organizational flexibility (Mwangi, 2012).

According to the study by Juma (2012), ICT improves the operations, liquidity and the asset quality of Kenyan banks. The study shows that commercial banks not only increases competitiveness in the market but also increases their market share. Management information system improves the quality of service that is offered by banks (AL-Adwan, 2016). In this study by AL-Adwan (2016), it is recommended that policies should be drawn to uplift management information systems because it improves customer service quality satisfaction. In a study to establish whether ICT innovations impacts operational performance Kenyan banks, it was found that management support, process re-engineering and customer service delivery enhance the performance of commercial banks through enhancement of acquisition of new clients, strategic operational objectives and improved performance agenda (Mbogo, 2017). Commercial banks are investing in ICT innovations in order to remain competitive and sustainable. The operational performance of banks is achieved by accomplishing specific outputs in regard to expected outcomes. These outcomes are based on speed of product delivery, quality of service, quality of products,

dependability and flexibility (Mbogo, 2017). Commercial banks are enhancing operational performance by consistently establishing different delivery methods of products and services to their customers.

2.3.2 Service Quality and Performance of Commercial Banks

Service quality is the support level, responsiveness, availability and training opportunities that are offered by the IS department of an organization (El-Telbany & Elragal, 2014a). The customer behavioral or purchase intention of a product or a service is directly related to the service quality that an organization offers (El-Telbany & Elragal, 2014a). The five dimensions for accessing service quality include responsiveness, tangibles, reliability, empathy and assurance. Tangibles include physical facilities, equipment, communication materials and personnel appearance (Van Oosterhout, 2010). System reliability is the ability to perform services dependably and accurately. The willingness to give customers help and provide them with fast service is referred is responsiveness. Assurance is whereby employees use knowledge and courtesy to convey confidence and trust. Empathy refers to the ability of organizations to personalize care and attention to their customers (Kamau, 2015). One of the reasons why organizations are investing in information system is to improve on the level of service quality for their customers and stakeholders (Bahari & Mahmud, 2018). This study has shown that service sector performance has been substantially improved through the most important outcome of information system which is service quality. Despite this, most organizations still face challenges in evaluating how information system impacts service quality hence the need to analyze and understand IS in regard to quality of service and performance (Bahari & Mahmud, 2018).

In most researches on management information systems, it is discussed that the overall performance of an organization cannot be solely measured on information systems agility but also by other contributors such as brand quality, employee attitude and skills and customer satisfaction (Jonathan, 2018). The IS success model shows that in order for an information system to be successful and deliver organizational goals, it should deliver on various constructs such as information, service and, system quality together with added benefits. The study by Jonathan (2018) on the improvement of service quality through the use of information systems, it is shown that service quality impacts information system and performance both directly and indirectly whereby indirect is through individual level and directly is through the organizational level. It is explained that information system has an impact on an organizations performance at different levels which are; technical levels (information quality and system quality).

The individual level refers to the employee performance and these are impacted by a combination of employee IS characteristics, information quality and system quality. These factors making up the individual level influences the organization level as a whole through service quality. The study posits that employee attitude and skills of an IS, information quality and system quality influences performance almost equally. Information systems quality dimensions which include system quality, information quality, service quality and organizational impact result into a significant positive impact on the performance of an organization both directly and indirectly (Bahari & Mahmud, 2018).

2.3.3 ICT Literacy and Performance of Commercial Banks

There is constant change in the way data is captured, analyzed, stored and utilized by information users and professionals. These professionals need to keep up with the constantly changing skills, trends and new ways of working around information systems (Tanane et al., 2018). ICT refers to Information and Communication technology. The potential and opportunities available cannot be achieved or exploited in the era of information and information systems without the information and computer literacy (Tanane et al., 2018). In order to perform well in an organization and overall in the market an organization needs to retool and sensitize its employees on ICT (Tanane et al., 2018). According to Tanane et al (2018) there is a positive linear correlation between job performance and the level, complexity and scope of ICT skills. The findings of this study found and concluded that although there are many factors that govern the organizational performance, one of the most important factors is ICT literacy. An organization therefore should provide ICT infrastructure which enables employees to have access and increase their ICT skills hence an improvement in job performance.

ICT plays a big role in driving the economy. The competitiveness among commercial banks in the internet and e-web technologies is influenced by the availability and the utilization of ICT (Kamau et al., 2019). The performance, competitiveness and growth of banks relies on the how successful a bank is in applying new technologies. ICT training of employees is an important requirement because the ICT literacy of the people making decisions in organizations determines the kind of impact on customer satisfaction hence growth and performance of a firm. ICT literacy refers an understanding of capabilities and computer applications (Wageeh, 2016). It is the skillful use of computer knowledge and

applications. According to Van Oosterhout (2018), ICT literacy is the ability for an individual to use communication tools, digital technology and networks to solve information problems in an information society. The agility of systems and that of an organization can be improved with the availability and capability in IT and IT knowledge management capability (Van Oosterhout, 2018). The top priority for firms is the achievement of competitive advantage through leveraging of ICT and information technology. Most firms have a need for IT capability and ICT literate employees to become agile and grab market opportunities fast but at cost effective rates in order to achieve profitable outcomes (Van Oosterhout, 2018).

ICT literacy enables managers or the decision makers of an organization to make faster decisions, improve communication and quickly adapt or respond to the changing conditions in the market. According to (Kipyegon, Obura, & Oginda, 2018), IT skills and literacy not only improves the operational competencies but also the management efficiencies in the information systems of the organization. ICT improves systems in organizations as it improves the level of interaction that a company has with its customers. In order to achieve performance through agile information systems IT capability has to be highly implemented and sensitized throughout an organization and its employees (Makau et al., 2017).ICT literacy should be assessed as both technological knowledge at different levels and also the ability to apply this knowledge for the purpose of solving problems. The study by Zelenkov (2018) shows that if many employees lack sufficient ICT skills to perform their business as usual roles then they impact business productivity negatively.

2.3.4 System Security and Performance of Commercial Banks

Information systems have increasingly become an essential component in businesses and commerce. This has resulted an increase in attacks which leads to compromising the functionality and reliability of the system by its users. A system is secure if it meets the following security triad; availability, integrity and confidentiality (Akter, Ray, & D'Ambra, 2011). Confidentiality is the ability of an information system to restrict access of information to the people who are allowed to access the information. This is usually achieved through log in credentials that are specific to individuals who have the rights to specific information. Integrity is whereby the information in a system has not or cannot be altered by any party and is a representation of what the system is intended for. Malicious intent results from hackers who knowingly alter the contents in a system for own benefits hence making the system lose its integrity. In other instances, the integrity of an information system can be affected unintentionally for example through a power surge that may corrupt a file, wrong data entry or an accidental deletion or adjustment to a file by a person who has access to the information (Tanane et al., 2018). Availability refers to a state whereby information can be accessed by people who have the authority over the information in an appropriate time frame. This depends on the nature of information processing or transaction. For example, a customer requires to access information immediately they request for it. An employee requires information from the system as soon as they need it for reporting for instance (Tanane et al., 2018).

A system is secure if it meets the three dimensions aforementioned; availability, integrity and confidentiality. Companies achieve the three factors through authentication by giving user identifications, access control in terms of which user can access or alter information in

a system, data encryption, backup plans, information security policies, firewalls on networks and physical security for example locked doors and employee training (Akter, Ray, & D'Ambra, 2011). There is an equivalence in system security to technical communication level in an organization (Bahari & Mahmud, 2018). Its performance measurement is based on functionality, ease of use convenience, availability, confidentiality, data quality flexibility, integrity, importance and portability (Bahari & Mahmud, 2018).

System security shows reliability of information systems in terms of response time and the ease of usage by the end users of the system (Samuel, 2016). Oftentimes it is highly dependent or related to the degree of a customer's satisfaction. According to Steele et al (2016), customer satisfaction depends on their perception and satisfaction of the information system in place. The customers do a comparison of the how their expectations were met by a given system compared to the expectations on a different system. As discussed in Seo, Miranda, & La Paz (2017), service security measures the performance that an information system gives for example accuracy of information.

The success of information system is highly dependent on its system security as it impacts the efficiency of the system (Bahari & Mahmud, 2018). A measure of customer satisfaction through surveys should be conducted to determine the success level of an information system and how successfully an organization is providing their products and services in the market. An organization can maintain competitiveness and long term effectiveness by constantly realizing and implementing initiatives for security and product quality improvements (Bahari & Mahmud, 2018). This should however be carefully

monitored and managed through key decision making tools, the importance of the service security both from the perspective of the employees and the perspective of customers.

2.3.5 Information Storage and Performance of Commercial Banks

Information storage involves the collection of data for storage in databases for processing and access or display on request of a system user (Tanane et al., 2018). Data processing techniques and technological advancements have resulted in the possibility of automated data collection and high speed retrieval of information for various purposes. Data that is collected is sorted, processed and stored in computer databases to provide information that is required when it is required. Information storage in an organization is managed though records management system which is often electronic (Tanane et al., 2018). Information storage system is designed to acquire or capture data, process it, store it and retrieve information.

The methods of electronic information storage are constantly changing because of the constantly evolving technology (Kamau et al., 2019). An efficient and effective information storage reduces the chances of errors when capturing data and at the same time increases the speed of the storing process and retrieval. An organization not only requires internal information which is made of the organization's operations but also external information because of increasing competitive operational environment. Both internal and external information is needed by decision makers such as customers. Organizations use databases to store information. The databases are managed by systems software called database management systems and are made up of interrelated data that is shared across multiple applications and with many users who are given access(Karim, 2011)

.Information storage gained popularity globally because of the information-dependence in the 21st century whereby organizations, businesses and individuals need information on demand and on command. There is a high number of people with access to the internet and who search for information, access emails and use various applications for various needs. For people to access information, they have to be generated and uploaded to data centers through networks (Karim, 2011). This shows that individuals and businesses alike rely on reliable access to stored information for various uses.

Information storage is the safekeeping of data and information in a desirable format for access when required (Kamau et al., 2019). This could include perception of the information by customers who are the end users of the system, easy to read information, value, accuracy and sufficiency of detail. According to the study by Kuo et al (2018), health care professionals have measured improved capabilities in treatment plans, better diagnoses and provision of patient care through the utilization of information systems that produces quality information. Currently in the modern markets and operating environments, the background or reference to communication processes is based on the value of information storage. Information quality measurement attributes include; reliability, accuracy, timeliness and completeness (Kamau et al., 2019).

The study conducted by Mathiassen & Pries-Heje (2018) posits that information storage of an Information System is the most important precedent for user satisfaction and for the use of IS. It is explained that this is because availability and accuracy are some of the attributes for successful implementation of the system. System designers and developers therefore

require to fully utilize availability, accuracy, speed, speed of information in systems to not only increase user satisfaction but also the utility of the information system.

If users perceive value and high satisfaction of their needs from the systems, they become more motivated to use IS and this translates into better results for an organization both in terms of performance for the customers, for the employees and for organizational impact and goals (Tanane et al., 2018). According to Wageeh (2016), in organizations where there is greater investment in technology and changing characteristics of information storage, there is an increase in service quality hence higher organizational performance compared to organizations that have limited investment in information systems. An organization that maintains or keeps up with trends in IS storage options and security have high organizational development and performance (Wageeh, 2016). An organization should be agile through investment in technological infrastructure, higher development technologies and employ programmers and developers with high competence levels in information systems and technology to be able to acquire and safely store valuable data which is converted to useful information (Tanane et al., 2018). User perception and safety measures are important values when determining the information storage in a system. Information storage is emphasized on service quality and to be integral to the satisfaction of the end users of a given system. Information storage measures for information system success include information accuracy, information timeliness and information completeness (Karim, 2011).

2.4. Summary of Literature Review

From the review of literature presented in this section, it is evident that whereas a lot of research has been done on the performance of banks and management information systems, there are few studies that cover management systems agility and how it affects financial and non-financial measures of performance in the Kenyan banking sector. Carrying out this study therefore effectively contributes towards filling this gap.

Studies in the past have focused mainly on general ICT aspect, security of systems and client satisfaction in regards to management information systems influence on performance of banks in Kenya (Samuel, 2016), (Wageeh, 2016). Most studies have also focused on the influence of technological advancement and information systems on the competitive advantage of organizations, strategic direction and customer satisfaction (Jonathan, 2018), (Kamau et al., 2019) (Koech, Gichunge, & Thuo, 2016). Whilst these studies have provided a valuable insight into information systems in the banking sector, there still remains a gap in exploration of the impact of management information agility on commercial banks within Nairobi County. This research therefore seeks to address this existing research gap.

Table 2.1: Summary of Research Gaps

Author	Focus of Study	Methodology	Findings	Research Gap
Samuel (2016)	How strategic information systems influence performance of Microfinance institutions in Nairobi	Panel regression model	Strategic information systems positively influence performance	Focus on Microfinance institutions and cannot be generalized
Wageeh (2016)	Organizational Agility relationship with organizational Success	Panel regression model	Organizational Agility positively influences organizational success	Study done in Egypt. Findings cannot be generalized
Jonathan (2018)	How organizational structure influences Business-IT alignment	Literature Review	Inconclusive studies on effect of formal and informal organizational structure on IT alignment	Methodology applied by the study is different from the methodology to be used in this study
Kamau et al (2019)	Effect of IT Capacity on Competitive Advantage of the Kenyan Banking Sector	ordinary east square regression model	Strategic capabilities positively influence performance	Focus was on overall strategic direction of the organization
Koech, Gichunge, & Thuo, (2016)	Factors that influence the implementation of Strategic Information Systems in Parastatals	Multiple regression Analysis	Factors like management, technology services and training are crucial in strategic information systems implementation	Focus of study was on public sector and not on the banking sector

Source: Author (2020)

2.5 Conceptual framework

This section shows the framework of the study. It illustrates the independent variables (service quality, ICT literacy, system security and information storage) and dependent variable (performance).

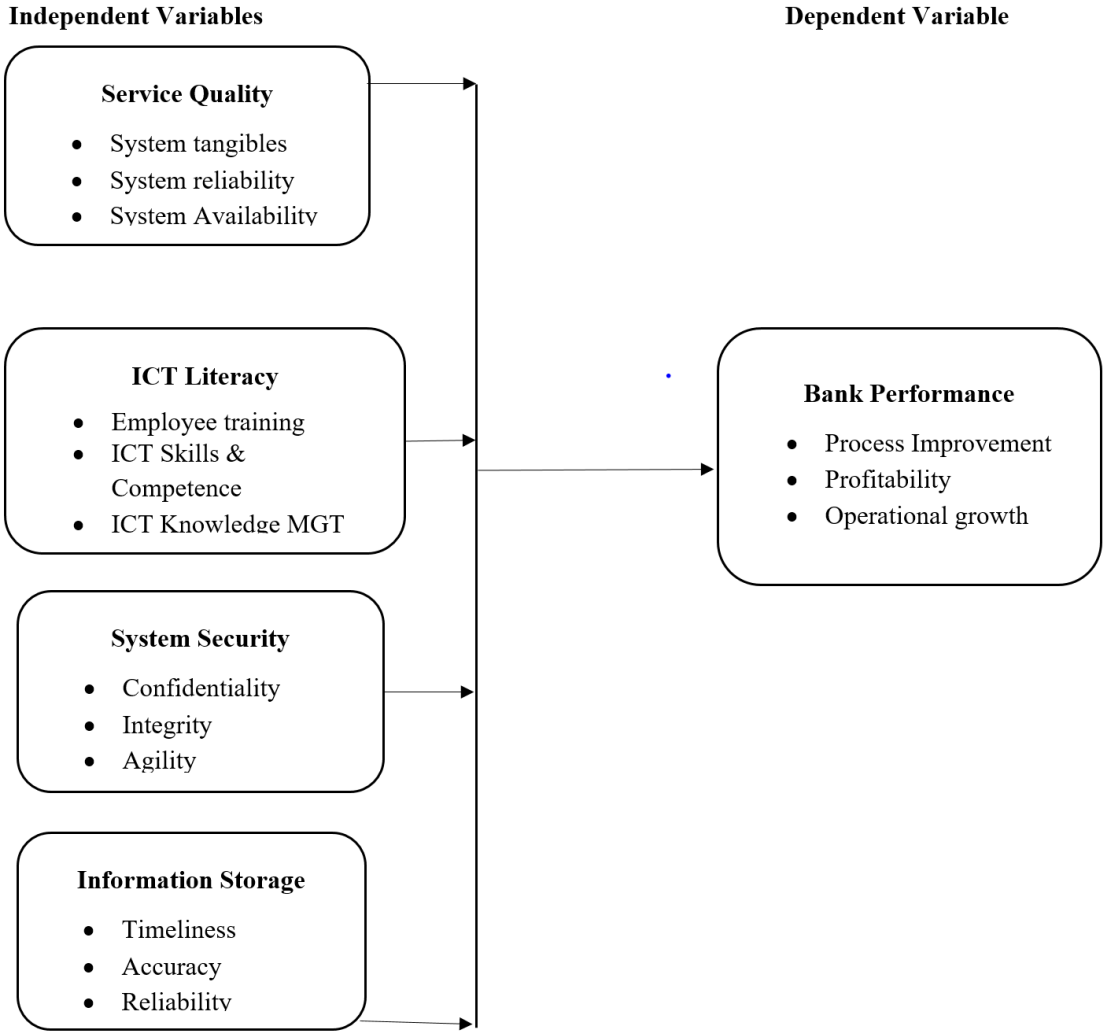

Figure 2.1: Conceptual Framework.

Source: Author (2020)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

In this section, the design and implementation of the study was discussed. The assumptions made from the research were outlined in regards to the data that is to be collected. It covered the nature of the research design, target population, the sample design, data collection methods, validity and reliability of data collection instruments and data analysis methods.

3.2 Research Design

The study design is a framework that answers research questions and works towards attaining research objectives (Walliman, 2014). Descriptive design was applied in this study. The descriptive research design is a research plan which determines and report the answers to the following questions; what is happening, how is it happening and why is it happening? (Mohajan & Mohajan, 2018) (Castillo, 2016). Descriptive research can either be qualitative or quantitative and entails various variables under one study which makes it a unique design. This research design is considered appropriate for the research because it provides flexibility for the research to explore phenomena being explored both qualitatively and quantitatively and as such, the findings provide and in-depth understanding of phenomena being explored and as well, produce data that can be generalized to the wider banking sector in Nairobi. According to Mohajan & Mohajan (2018), the descriptive research design capitalizes on data reliability and has provisions for protection from partiality.

3.3 Target Population

In order to make or draw conclusions from a research, inferences are made from research findings so as to identify the characteristics of the bigger population from the sample that is chosen (Castillo, 2016). Population in research refers to a set of people or events that is hypothetical and which a study researcher draws information from to get study results. According to Central Bank of Kenya (2020), there were 43 licensed commercial banks in Kenya. The target population for this study was 43 commercial banks as shown on Appendix V. The researcher selected the ICT specialists of the commercial banks.

3.4 Sample size and Method

This is the selection of a section of the larger research population from whom the data was collected (Castillo, 2016). There are two broad approaches to sampling and these are the random and purposive sampling techniques. For this study, the purposive sampling approach was used. This form of sampling involves selective or subjective sampling (Castillo, 2016). It is a non-probability form of sampling that involves selection of cases to include in the research based on their idealness in addressing the objectives of the research. It is therefore an effective approach because the research sample selected is usually equipped with the knowledge and information required to effectively address the research objectives. Two ICT employees from each bank were selected to participate as respondents for the study, therefore the sample size was 86 respondents. Purposive sampling was used because it has a major goal of focusing on specific characteristics of a population (Castillo, 2016).

3.5 Data Collection Instrument

Collection of Primary data was done using questionnaires. A questionnaire is a set of questions that are used to collect data (Mohajan & Mohajan, 2018). The set of questions are usually predetermined. It is related to the objectives of the research and records information on particular issues of interest. Survey method is one of the common methods of data collection in descriptive data design (Walliman, 2014). Through this method, the targeted population were administered with research questions captured in questionnaires. The questions were both open and close ended in order to attain a variety of responses which corresponds to a variety of variables of the study. The questionnaires were electronically distributed to the respondents through their emails. They were then requested to fill and resend them to the researcher within a 1-week period.

3.5.1. Pilot Test

A pilot test was done to test the proposed research. 5 questionnaires were distributed to the target group and collected once they were filled. The 5 questionnaires were electronically distributed to the respondents on email. This was conducted so that any issues that might come up in the larger scale are identified and addressed.

3.5.2. Validity of the Instrument

Validity of questionnaire is the degree to which the questions asked during data collection will measure what it purports to (Castillo, 2016). It is focused on the accuracy of the research results and findings. The validity of a research was assessed by analyzing how well research findings correspond to the established theories. Construct validity and content validity were both addressed. Content validity is addressed through the use of literature searches and reviews, expert opinions on information systems to tailor relevant

questions. Construct validity refers to the initial question, notion, hypothesis or concept that determines which data to collect and how to collect it (Castillo, 2016). This involves the application of a test to validate the research investigation by establishing an interplay between construct and data. If accurate results are obtained from a given test, then it means that they can be reproduced. If a research produces results that are correspondent to the real characteristics and variations in the physical world, it is said to have high validity (Walliman, 2014).

Data quality was ensured by making the questions will be short, clear and easy for the respondents to comprehend. The questions were constructed and tailored to answer the main research questions and research objectives to make sure that the questions are specific to the main purpose of the research. The questionnaire was standardized and based on established theories and existing knowledge. The sampling method to be used also ensured the validity of this research because the target population is clearly defined as bank employees who interact with the information systems in their organizations hence a good representative of the bigger population of bank employees.

3.5.3 Reliability of the Instrument

Reliability of a questionnaire refers to how much or the extent to which the results obtained from the questions asked can be replicated (Walliman, 2014). Its focus on the consistency of the research findings. Reliability is assessed and confirmed by analyzing the how results are consistent across time, across different participants or observers and across the various tests conducted. The data from the pilot study was then analyzed to test for reliability by using the Cronbach's Alpha test on SPSS. Cronbach's alpha is a function that tests scale reliability. The alpha of 0.6 is the generally accepted rule of reliability

(Walliman, 2014). The consistency was based on the correlation between the different items. The Cronbach's Alpha internal consistency varies between zero (0) and one (1). A coefficient of 0.6 and above was the acceptable range of reliability and was used in this study. If the value of Cronbach's Alpha obtained was less than 0.6 some questions suggested by SPSS will be removed to ensure that that the expect value is attained.

3.6 Data Analysis and Presentation

Data analysis and presentation is the process whereby the data collected is reviewed, cleaned, converted and modelled with the purpose of drawing conclusions (Walliman, 2014). Data analysis was conducted through descriptive data analysis and through the regression model analysis. Descriptive and inferential data analysis was conducted to identify the shapes and distributions that will show the relationships among the independent variables and dependent variable. Descriptive data analysis was done through data reduction method which is the simplification, summarizing and conversion of written data. Themes and categories were established and organized into understandable forms. Conclusions on the research issues were drawn by the researcher in this step.

Regression data analysis is a relational statistical technique that shows the relationship between a dependent variable which is the target and independent variables which is the predictor (Mohajan & Mohajan, 2018). It finds the causal effect relationship between variables and is used in forecasting. It will be presented by linear regression equations and their corresponding graphs. Apart from showing how the independent and dependent variables relate, regression analysis is also used to indicate the strength or the impact that multiple independent variables have on a dependent variable. This technique channeled the study towards evaluating the best variable mix that will create best performing predictive

model. This is achieved through the development of a regression equation models as shown below.

$$\mathbf{Y=\beta_0+\beta_1X_1+\beta_2\ X_2+\beta_3X_3+\beta_4X_4+\ \mu}$$

Figure 2.2 : Regression Equation

Where Y = Performance of the selected commercial banks

X_1= Service Quality

X_2= ICT Literacy

X_3= System Security

X_4= Information Storage

μ =Error term

3.7 Ethical Considerations

Ethics in research studies is a set of governing principles that influences the choices and actions of people (Mohajan & Mohajan, 2018). Permission letters were sought from the selected commercial banks and data collection undertaken with regard to their rules. An authorization letter from Kenyatta University was acquired to ensure data confidentiality and protection of respondents. The researcher applied for a research permit approval from National Commission for Science, Technology and Innovation (NACOSTI) before undertaking the data collection from the selected banks.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents study results. In addition, the chapter provides response rate then the demographic characteristics, descriptive statistics, correlation analysis and finally multiple regression analysis.

4.2 Sample characteristics

4.2.1 Response rate

The researcher administered 86 questionnaires to ICT staff of banks. Table 4.1 highlights this response rate.

Table 4.1: Response Rate

Questionnaires	Frequency	Percent
Returned	77	90
Unreturned	9	10
Total	**86**	**100**

Source: Survey Data (2021)

The response rate for the study was 90%. This was based on 77 of the 86 questionnaires that respondents filled completely and returned.

4.2.2 Demographic Information

The demographical information entailed that of gender, age, duration working in the banks, academic qualifications and departments they worked in.

Table 4.2: Respondents Gender

Gender	Frequency	Percent
Male	44	57
Female	33	43
Total	77	100

Source: Survey Data (2021)

Results showed that out of the 77 respondents 44 (57%) were male while only 33 (43%) were female. This showed that the ICT staff of banks are majorly male.

Table 4.3: Age

Age	Frequency	Percent
up to 30 Years	10	13
31-40 years	41	53
41-50 years	12	14
Above 50 years	14	20
Total	77	100

Source: Survey Data (2021)

The responses concerning age of respondents showed that those in the 31-40 years' age bracket were the majority at 53% followed by those aged above 50 years at 20% then those aged 41-50 years (14%) while those aged 30 years and less were the least at 13%. This implied that most of those working as ICT staff of banks are not elderly.

Table 4.4: Academic Qualifications

Academic qualification	Frequency	Percent
Certificate/Diploma	10	12
Bachelors' Degree	49	64
Masters	15	20
PhD	3	4
Total	77	100

Source: Survey Data (2021)

Regarding the highest academic qualifications for the respondents, the bulk of them (64 percent), it was discovered, possessed a bachelor's degree. Those with masters followed at 20 percent then those with certificates or diplomas at 12 percent while those with PhD represented only 4 percent. This indicated that the staff were qualified to work as staff in the banks and were also able to read and understand the questionnaire hence provided trustworthy responses.

Table 4.5: Duration worked as Banks employee

Duration as an Employee	Frequency	Percent
1- 5 Years	7	10
6-10 years	29	37
11- 15 years	29	37
16-20 years	5	6
Above 20 years	7	10
Total	**77**	**100**

Source: Survey Data (2021)

Concerning duration that respondents had worked as employees in their specific banks it was revealed that most of them had worked for either 6-10 years or 11-15 years representing 37 percent in each category. Those who had been employees in there banks for 1-5 years and above 20 years represented 10 percent each while only 6 percent had worked for 16-20 years. This implied that most of the employees had worked for more than five years which gave them experience needed to understand the information management system agility.

4.3 Descriptive Results

Descriptive statistics were conducted in order to summarize the responses not data that is easy to interpret.

Table 4.6: Descriptive statistics for Performance of Banks

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
Service quality leads to process improvements in the organization	8%	7%	7%	33%	45%	4.03	1.22
ICT literacy has increased the growth of the organization	4%	5%	5%	44%	42%	4.14	1.01
System security of the organization has increased its profitability	4%	3%	3%	35%	55%	4.35	0.96
The information storage measures of the organization has increased organizational growth	4%	3%	2%	52%	39%	4.19	0.92
Average						**4.18**	**1.03**

Source: Survey Data (2021)

From the results in the Table 4.6 it was showed that for most of respondents (78%) service quality leads to process improvements in the organization. The results also depict that according to most of the respondents representing 86% ICT literacy has increased the growth of the organization. More so the results revealed that as per most of the respondents (90%) system security of the organization has increased its profitability. Finally results revealed that for the majority of respondents who represented 91% the information storage measures of the organization have increased organizational growth. The results were also supported by a mean of 4.18 which from a 5-point scale indicated that majority of respondents agreed to most of these statements.

The findings agreed with those of Bahari and Mahmud (2018) who found that service sector performance has been substantially improved through the most important outcome of information system which is service quality and that in order to perform well in an organization and overall in the market an organization needs to retool and sensitize its

employees on ICT (Tanane et al., 2018). More so Bahari and Mahmud (2018) also asserted that the success of information system is highly dependent on its system security as it impacts the efficiency of the system further confirming the results of the study. The findings also agree with those by Wageeh (2016) who established that in organizations where there is greater investment in technology and changing characteristics of information storage, there is an increase in service quality hence higher organizational performance compared to organizations that have limited investment in information systems.

Table 4.7: ICT infrastructure or equipment integrated to provide ICT solutions

ICT infrastructure or equipment integrated to provide ICT solutions	Frequency	Percent
Information systems platforms	18	23
Telephone Connections	11	14
Networks to support functions	48	63
Total	**77**	**100**

Source: Survey Data (2021)

Results revealed that for most of the organizations representing 63% they had integrated a networks to support functions. The organizations that had integrated an information systems platforms to provide ICT solutions represented 23% and those with Telephone Connections represented 14%.

Table 4.8: Descriptive Statistics for ICT infrastructure and Service Quality

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
Enhanced and improved Communication	2%	3%	3%	45%	47%	4.31	0.86
More efficient business processes and functions	3%	4%	3%	42%	48%	4.31	0.91
Increased products and market innovations	4%	4%	3%	39%	50%	4.29	0.99
Higher Customer engagement on information system platform	5%	4%	3%	35%	53%	4.25	1.07
Average						**4.29**	**0.96**

Source: Survey Data (2021)

As per results in Table 4.8 it was showed that for most of respondents (92%) there's enhanced and improved Communication. The results also depict that according to most of the respondents representing 90% there's more efficient business processes and functions. More so the results revealed that as per most of the respondents (89%) there's increased products and market innovations. Finally results indicated that for majority of respondents who represented 88% there's higher customer engagement on information system platform. The results were also supported by a mean of 4.29 which from a 5-point scale indicated that majority of respondents agreed to most of these statements.

Table 4.9: Descriptive Statistics for Service Quality

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
Reliable information systems are in place at the company	3%	3%	4%	46%	44%	4.26	0.89
The organization has efficient and updated network platforms and support	2%	4%	5%	39%	50%	4.29	0.93
Existing systems support ICT integration to business processes	1%	5%	8%	39%	47%	4.25	0.91
The existing system infrastructure enables efficient communication and quality service delivery to our customers	8%	5%	10%	37%	40%	3.96	1.20
Customers can access the organization's information systems when they need banking services	2%	7%	1%	40%	50%	4.16	1.05
Average						**4.18**	**1.00**

Source: Survey Data (2021)

According to results in the Table 4.9 it was revealed that for most of respondents (90%) the organization has reliable information systems. The results also depict that according to most of the respondents representing 89% the organization efficient and updated network platforms and support. More so the results revealed that as per most of the respondents (86%) existing systems support ICT integration to business processes. Further most of the respondents who represented 77% agreed that the existing system infrastructure enables

efficient communication and quality service delivery to our customers. Finally results revealed that for majority of respondents who represented 90% customers can access the organization's information systems when they need banking services. The results were also supported by a mean of 4.18 which from a 5-point scale indicated that majority of the respondents agreed to most of these statements. This was in line with Wageeh (2016) who asserted that the five dimensions for accessing service quality include responsiveness, tangibles, reliability, empathy and assurance. Findings also agreed with those by Bahari and Mahmud (2018) who found that factors making up the individual level influences the organization level as a whole through service quality.

Table 4.10: ICT skill and Knowledge Level

ICT skill and knowledge level	Frequency	Percent
Average	12	16
Good	52	68
Excellent	13	16
Total	**77**	**100**

Source: Survey Data (2021)

It was further revealed that majority (68%) of respondents had a good ICT skill and knowledge level 16% had an excellent ICT skill and knowledge level and for 16% their ICT skill and knowledge level was average.

Table 4.11: Descriptive Statistics for ICT Knowledge

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
Every employee in the department has strong ICT skills	4%	7%	53%	25%	11%	3.34	0.91
The organization's staff is competent to develop information systems for better operations	5%	4%	1%	45%	45%	4.19	1.03
The staff can develop information systems for better customer processing	5%	8%	3%	32%	52%	4.18	1.14
There is frequent mandatory ICT training schedules for every staff in the department	1%	4%	8%	44%	43%	4.23	0.86
The organization has ICT management framework	1%	6%	3%	33%	57%	4.38	0.92
Average						**4.06**	**0.97**

Source: Survey Data (2021)

Results in the Table 4.11 revealed that for most of respondents (53%) they were not sure of the statement that every employee in the department has strong ICT skills. The results also depict that according to most of the respondents representing 90% the organization's staff is competent to develop information systems for better operations. More so the results revealed that as per most of the respondents (84%) the staff can develop information systems for better customer processing. Further most of the respondents who represented 87% agreed that there are frequent mandatory ICT training schedules for every staff in the department. Finally results revealed that for majority of respondents who represented 90% the organization has ICT management framework. The results were also supported by a mean of 4.06 which from a 5-point scale indicated that majority of the respondents agreed to most of statements. Findings concurred with those by Wageeh, 2016) who establsshed that ICT training of employees is an important requirement because the ICT literacy of the

people making decisions in organizations determines the kind of impact on customer satisfaction hence growth and performance of a firm.

Table 4.12: Information System Security Policy Implemented

Information system security policy implemented?	Frequency	Percent
Yes	62	80
No	15	20
Total	77	100

Source: Survey Data (2021)

The results revealed that for most of the organizations (80%) they had implemented an Information system security policy while 20% had not.

Table 4.13: Policy contributed to the Satisfaction of Customers with System Operations

Policy contributed to the satisfaction of customers with your system operations?	Frequency	Percent
Yes	61	79
No	16	21
Total	**77**	**100**

Source: Survey Data (2021)

It was revealed that the Information system security policy contributed to the satisfaction of customers with system operations in most of the organizations (79%) while for 21% they did not find customer satisfaction through the policy.

Table 4.14: Descriptive Statistics for System Security

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
The management in my organization supports ICT security policy	0.00	7%	6%	43%	44%	4.23	0.87
Organizational data stored in information systems is confidential	3%	5%	9%	37%	46%	4.18	0.98
Organizational data stored in information systems is available for access by authorized people	4%	6%	7%	40%	43%	4.12	1.05
Data is stored in the organization's systems with integrity	4%	5%	9%	33%	49%	4.18	1.06
Customers of the organization are satisfied with the system security of the organization's systems	6%	4%	7%	32%	51%	4.18	1.14
Average						**4.18**	**1.02**

Source: Survey Data (2021)

Results in the Table 4.14 revealed that for majority of respondents (87%) indicated that the management in my organization supports ICT security policy. The results also depict that according to most of the respondents representing 83% organizational data stored in information systems is confidential. More so the results revealed that as per most of the

respondents (83%) organizational data stored in information systems is available for access by authorized people. Further most of the respondents who represented 82% agreed that data is stored in the organization's systems with integrity. Finally results showed that for the majority of the respondents who represented 83% customers of the organization are satisfied with the system security of the organization's systems. The results were also supported by a mean of 4.18 which from a 5-point scale indicated that most the respondents agreed to most of the statements. This concurred with Akter, Ray, and D'Ambra, (2014) who asserted that a system is secure if it meets the three dimensions of availability, integrity and confidentiality and that companies achieve the three factors through authentication by giving user identifications, access control in terms of which user can access or alter information in a system, data encryption, backup plans, information security policies, firewalls on networks and physical security for example locked doors and employee training.

Table 4.15: Descriptive Statistics for Information Storage

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
Information can be accessed as and when needed by authorized systems' users	4%	10%	10%	43%	33%	3.9	1.10
Information stored by the organization is accurate	1%	10%	12%	43%	34%	3.97	1.00
Information stored by the organization is reliable	1%	5%	9%	36%	49%	4.25	0.92
There is adequate data storage and management systems architecture in the organization	1%	5%	9%	37%	48%	4.25	0.92
There is clear back up plan of information storage systems in the organization	3%	4%	6%	45%	42%	4.19	0.92

Source: Survey Data (2021)

Results in Table 4.14 revealed that for most of the respondents (76%) information can be accessed as and when needed by authorized systems' users. The results also depict that according to most of the respondents representing 77% information stored by the organization is accurate. More so results showed that as per most of respondents (85%) information stored by the organization is reliable. Further most of the respondents who represented 85% agreed that there is adequate data storage and management systems architecture in the organization. Finally results revealed that for majority of respondents who represented 87% there is clear back up plan of information storage systems in the organization. The results were also supported by a mean of 4.19 which from a 5-point scale indicated that most of respondents were in agreement to most of the statements. This was in agreement with Kamau et al. (2019) who established that an efficient and effective

information storage reduces the chances of errors when capturing data and at the same time increases the speed of the storing process and retrieval.

Table 4.16: Kenyan government ICT regulations affected organization

Kenyan government ICT regulations affected your organization?	Frequency	Percent
Yes	24	31
No	27	35
Not Sure	26	34
Total	**77**	**100**

Source: Survey Data (2021)

The results revealed that for most of the respondents (35%) the Kenyan government ICT regulations have not affected their organization 34% were not sure of any effect while for 31% Kenyan government ICT regulations have affected their organization.

Table 4.17: How Government Regulations Affected Organization

How government regulations affected your organization?	Frequency	Percent
Through license	30	39
Through tax	28	36
Through training	19	25
Total	77	100

Source: Survey Data (2021)

As per the results according to 39% the government regulations had affected their organization through license for 36% through tax and for 25% through training.

Table 4.18: Adequate Enforcement of ICT Regulations by the Government

Is there adequate enforcement of ICT regulations by the government	Frequency	Percent
Yes	20	26
No	26	34
Not Sure	31	40
Total	**77**	**100**

Source: Survey Data (2021)

Most of the respondents (40%) indicated that they were not sure if there was adequate enforcement of ICT regulations by the government. According to 34% the enforcement of ICT regulations by the government was not adequate. Finally, for 26% there was adequate enforcement of ICT regulations by the government.

4.4 Inferential results

The inferential statistics were conducted to show the relationship between the independent variables and dependent variable.

4.4.1 Correlation analysis

The correlation analysis results were as in Table 4.19.

Table 4.19: Correlation Matrix

		Performance of Banks	Service quality	ICT Knowledge	System Security
Performance of Banks	Pearson Correlation				
	Sig. (2-tailed)				
Service quality	Pearson Correlation	.681**			
	Sig. (2-tailed)	0.000			
ICT Knowledge	Pearson Correlation	.712**	.547**		
	Sig. (2-tailed)	0.000	0.000		
System Security	Pearson Correlation	.759**	.611**	.618**	
	Sig. (2-tailed)	0.000	0.000	0.000	
Information Storage	Pearson Correlation	.752**	.614**	.714**	.690**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000

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

Source: Survey Data (2021)

The results for correlations showed that relationship between service quality and performance of banks is both positive and significant (r=0.752 p=0.000). The results also revealed that relationship between ICT knowledge and performance of banks is positive and also significant (r=0.614 p=0.000). Further results indicated that relationship between system security and performance of banks is both positive and significant (r=0/714 p=0.000). Finally results revealed that the relationship between information storage and performance of banks is positive that there is positive correlation between job performance and level, complexity and scope of ICT skills.

4.4.2 Multiple Regression Analysis

The regressions analysis results were as in Table 4.20, 4.21 and 4.22.

Table 4.20: Model Fitness

R	R Square	Adjusted R Square	Std. Error of the Estimate
.855a	0.731	0.716	0.28489

Source: Survey Data (2021)

The model of fitness results showed that the adjusted r square for the relationship between management information system agility and performance of commercial banks in Nairobi county Kenya was 0.716. This indicated that the variables service quality ICT Knowledge system security and information storage explain 71.6% of the variation in the variable performance of banks.

Table 4.21: ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	15.888	4	3.972	48.94	.000b
Residual	5.844	72	0.081		
Total	21.732	76			

Source: Survey Data (2021)

ANOVA results revealed that the whole model used to describe the relationship between management information system agility and performance of commercial banks in Nairobi city county Kenya was significant (p=0.000).

Table 4.22: Regression Coefficients Results

	Unstandardized Coefficients		Standardized Coefficients FOR EQ	t	Sig.
	B	Std. Error	Beta		
(Constant)	-0.377	0.34		-1.108	0.271
Service quality	0.242	0.093	0.215	2.598	0.011
ICT Knowledge	0.267	0.108	0.224	2.466	0.016
System Security	0.346	0.096	0.328	3.602	0.001
Information Storage	0.242	0.104	0.234	2.321	0.023

a Dependent Variable: Performance of Banks

Source: Survey Data (2021)

Regression of coefficients results showed that there is a positive and significant relationship between service quality and banks performance (β=0.215 p=0.011). Results further showed that there exist positive and significant relationship between ICT Knowledge and banks' performance (β=0.224 p=0.016). Further results revealed that there's a positive and significant relationship between System Security and banks' performance (β=0. 328 p=0.001). Finally results revealed that there's a positive and significant relationship between information storage and banks' performance (β=0.234 p=0.023). Findings were in agreement with those by Jonathan (2018) who found that the service quality impacts information system and performance both directly and indirectly whereby indirect is through individual level and directly is through the organizational level. More so results concurred with those of Makau et al. (2017) who established that in order to achieve performance through agile information systems IT capability has to be highly implemented and sensitized throughout an organization and its employees. The findings were also in line with Bahari and Mahmud (2018) who asserted that an organization can maintain competitiveness and long term effectiveness by constantly

realizing and implementing initiatives for security and product quality improvements. The linear regression equation was confirmed as;

Performance of Commercial Banks = -0.377 + 0.215 Service Quality + 0.224 ICT Literacy + 0.328 System Security + 0.234 Information Storage

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a discussion of the findings the conclusions of the study recommendation for policy and suggestions for further research.

5.2 Summary of the Study

The study aimed at assessing effect of management information system agility on performance of commercial banks in Nairobi county, Kenya. Specifically, the study sought: To evaluate the effect of service quality and performance of commercial banks in Nairobi county; To determine the influence of ICT literacy on performance of commercial banks in Nairobi county; To assess the role of system security on performance of commercial banks in Nairobi county and; To analyze the relevance of information storage on performance of selected commercial banks in Nairobi county. The study was conducted among the 43 commercial banks in Kenya. Data was collected from 86 ICT employees from each bank using a questionnaire. Analysis of data involved the use of descriptive statistics correlation analysis and regression analysis.

Descriptive statistics revealed that for all study variables most of the respondents were agreeing to the statements connected to the study variables. Regarding the variable service quality, it was revealed that according to the responses there was availability of systems equipment which were also reliable. The systems were efficient and updated and enables efficient communication and customers access to information systems services. The findings also revealed that there was training of staff for ICT sills and also presence of management framework for ICT. Further it was established that the system security is available which ensures confidentiality and integrity in matters of information management

systems. Furthermore, it was established that regarding information storage the aspects of timeliness accuracy and reliability.

Correlation analysis established that the relationship between the variables service quality ICT literacy system security information storage and performance of commercial banks was positive and significant as they all depicted a positive correlation coefficient. This indicated that for all the variables a unit change in the independent variables would results into a positive change in performance of commercial banks. More so regression analysis revealed that the model used to describe the relationship between the independent variables service quality ICT literacy system security information storage and performance of commercial banks was significant. The results also revealed that there's a positive and significant relationship between service quality and performance of banks. Results also revealed that there's a positive and significant relationship between ICT Knowledge and performance of banks. More so it was established that there's a positive and significant relationship between System Security and performance of banks. Finally, it was established that there's a positive and significant relationship between information storage and performance of banks.

5.3 Conclusion

Findings indicated that commercial banks have reliable systems equipment which help in proper communication and also for access of information systems by customers. More so the relationship between service quality and performance of banks is positive and significant which implied that a positive change in service quality would result in a positive change in the performance of banks.

The study therefore concludes that an increase in the quality of information systems service will result into an increase in the performance of commercial banks. With the enhancement of service quality of the information systems of bans customers will feel satisfied and hence increase the use of the bans services. This n turn will increase the performance of commercial banks. Systems that have equipment the communication materials and personnel that are always available will attract more customers. More so system reliability is an aspect of encouraging more customers in the use of information system. This will in turn lead to increased performance of commercial banks.

According to the findings it was established that ICT literacy has a positive and significant relationship with performance of commercial banks. This implied that a positive change in ICT literacy would results in a positive change in performance of commercial banks. This study therefore concludes that an increase in the ICT literacy of the staff will result in an increase in performance of commercial banks. In keeping up with the improvements in the use of and the performance of ICT commercial bans employees will be more effective in their work and hence attract in improvement in the bank's performance. Banks with staff who are literate of ICT will have a higher performance than banks with staff who are poor in ICT skills. More so updating the skills of staff in line with the changing tools of ICT will improve the performances further.

The study established that System Security has a positive and significant relationship with performance of commercial banks and hence a positive change in System Security will lead to a positive change in the performance of commercial banks. The study hence concludes that increased security system will result in increased performance of

commercial banks. Commercial banks with secure information systems will attract satisfaction form customers which will consequently lead to an improvement in the performance of commercial banks. Making the information systems available to specific individuals who are entitled to whenever they require it providing confidentiality in terms of logging in credentials and making the systems reliable will lead to increased banks performances.

According to the study findings information storage has positive and significant relationship with performance of the commercial banks and hence a positive change in information storage will lead to a positive change in performance of commercial banks. Commercial banks with an information storage system that will enable easy retrieval and access of databases will have a high performance. Proper collection processing and storage of database for commercial banks will make the data easily accessed and retrieved by system users whenever needed hence an increased banks performance.

5.4 Recommendations

Based on this study finding that service quality has positive relationship with commercial banks performance, this study recommends that the commercial banks should find ways to boost the service quality of their information systems. Commercial banks should come up with polices which will enable then to have an information system department that have a high level of support both to customers and employees of banks that is response and that makes training opportunities available to employees. They should have properly installed tangibles such as ICT equipment and communication materials. The banks ICT department should have staff who are willing to provide help to customers and also provide fast

services. More so they should have employees who are trustworthy and whom customers will have confidence in and who will provide personalized care and attention to customers.

The findings that ICT Literacy has positive relationship with commercial banks performance leads to recommendation that the commercial banks should keep up with recent trends in CT skills. They should provide training that is in line with the recent tools used in the information systems. The commercial banks should formulate polices and guidelines that will help cultivate a learning culture in their employees. The polices should guide the employees on how to gain the ICT skills that are in the market.

For commercial banks to improve on their systems security they are recommended to formulate polices and strategies that will enable confidential and reliable use of information system for the banks. They should formulate polices that will ensure that the information systems security does not give access of information systems data to unintended persons. The security systems should also be reliable hence does not allow for any alteration of the data.

Commercial banks are recommended to have techniques for data collection data processing and storage that will ensure proper storage and retrieval of data when required. This can be achieved by adopting the recent data collection processing and storage tools which will make the banks to be up to date with the recent technology. The data collection processing and storage techniques should also be free of errors which will make the data to be reliable.

5.5 Suggestion for Further Research

The study was conducted to assess relationship between management information system agility and performance of commercial banks in Nairobi county, Kenya. However according to the findings there are some aspects of management information system agility that have not been fully implemented in commercial banks in Nairobi county Kenya. This study therefore suggests that future researchers should focus on investigating the individual aspects of management information system agility such as the ICT literacy Information Storage System Security and service quality among other organizations which will provide more knowledge in this field. More so the study recommends that future researchers should assess other aspects of management information system agility that would contribute to the remaining variation on the performance of commercial banks since the concepts assessed in the study did not account for a hundred percent variation.

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APPENDICES

Appendix I: Introduction Letter

Dear Respondent,

RE: FILLING OF QUESTIONNAIRE

My name is Trezah Awuor Odindo. I am a student at Kenyatta University pursuing post graduate studies in MBA. I am required undertake a study that will add value to the knowledge base of the study theme. I am undertaking a study on **"Management Information System agility and performance of commercial banks in Nairobi County Kenya**"

The study requires data collection on the topic. I request you to assist in answering the questions in the questionnaire in order to meet the requirements of this study. The information you will provide on the questionnaire will be anonymous and confidential and will only be used for academic purposes. Your identity will not be required in this study.

Thank you for your cooperation

Trezah Awuor Odindo

Appendix II: Questionnaire

Instructions: Kindly answer the questions as appropriately as possible. Fill in tick ☑ where appropriate.

A: Demographic Information

1. Gender

   a) Male ☐ b) Female ☐

2. Please select your age bracket

a) Below 30 Years ☐

b) 31 – 40 Years ☐

c) 41 – 50 Years ☐

d) Above 50 Years ☐

3. Please select your highest level of academic qualification from the below.

   a) Certificate/Diploma ☐

   b) Bachelors' Degree ☐

   c) Masters ☐

   d) PhD ☐

   e). Other (Please specify) .....

4. For how many years have you been an employee in the bank? Please select where appropriate.

a) 1-5 Years ☐

b) 5-10 Years ☐

c) 11-15 Years ☐

d) 16-20 Years ☐

e) Above 20 ☐

1. Please provide the department in which you work…….....

SECTION B: Performance of Banks

1. On a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree, please rate the below statements. Please mark against your answer ☑

Statements on Performance of banks	**1**	**2**	**3**	**4**	**5**
Service quality leads to process improvements in the organization					
ICT literacy has increased the growth of the organization					
System security of the organization has increased its profitability					
The information storage measures of the organization has increased organizational growth					

Section C: Service Quality

1. Which of the below ICT infrastructure or equipment has your organization integrated to provide ICT solutions?
   a) Information systems platforms ☐
   b) Telephone Connections ☐
   c) Networks to support functions ☐
   d) Others (please specify)…….....
2. How has the equipment above integrated changed your operations? Kindly agree on the scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree

Statements on ICT Infrastructure and Service Quality	1	2	3	4	5
Enhanced and improved Communication					
More efficient business processes and functions					
Increased products and market innovations					
Higher Customer engagement on information system platform					

3. On a scale of On a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree, please rate the below statements. Please mark against your answer ☑

Statements on Service quality	1	2	3	4	5
The organization has reliable information systems					
The organization efficient and updated network platforms and support					
Existing systems support ICT integration to business processes					
The existing system infrastructure enables efficient communication and quality service delivery to our customers					
Customers can access the organization's information systems when they need banking services					

Section D: ICT Literacy

1. Please select your ICT skill and knowledge level

a) Poor ☐

b) Average ☐

c) Good ☐

d) Excellent ☐

2. On a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree, please rate the below statements. Please mark against your answer ☑

Statements on ICT Knowledge	1	2	3	4	5
Every employee in the department has strong ICT skills					
The organization's staff is competent to develop information systems for better operations					
The staff can develop information systems for better customer processing					

There is frequent mandatory ICT training schedules for every staff in the department					
The organization has ICT management framework					

Section E: System Security

1. Does your organization have information system security policy implemented?
   a) Yes ☐
   b) No ☐

2. If yes, has the policy contributed to the satisfaction of customers with your system operations?
   a) Yes ☐
   b) No ☐

3. Which measures have been put in place by your organization to increase information system security in terms of data confidentiality, integrity and availability?

Please explain your answer below

……
……
……
……

4. On a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree, please rate the below statements. Please mark against your answer ☑

Statements on System Security	**1**	**2**	**3**	**4**	**5**
The management in my organization supports ICT security policy					
Organizational data stored in information systems is confidential					
Organizational data stored in information systems is available for access by authorized people					
Data is stored in the organization's systems with integrity					
Customers of the organization are satisfied with the system security of					

the organization's systems					

SECTION F: Information Storage

1. On a scale of 1 to 5 where 1 is strongly disagree, 2 is disagree, 3 is Neutral, 4 is agree and 5 is Strongly agree, please rate the below statements. Please mark against your answer ☑

Statements on Information Storage	**1**	**2**	**3**	**4**	**5**
Information can be accessed as and when needed by authorized systems' users					
Information stored by the organization is accurate					
Information stored by the organization is reliable					
There is adequate data storage and management systems architecture in the organization					
There is clear back up plan of information storage systems in the organization					

SECTION G: Government Regulations

1. Has the Kenyan government ICT regulations affected your organization?
   a) Yes ☐
   b) No ☐
   c) Not Sure ☐
2. How have the government regulations affected your organization?
   a) Through license ☐
   b) Through tax ☐
   c) Through training ☐
   d) Others (Please specify)

   …….....
3. Is there adequate enforcement of ICT regulations by the government?

a) Yes ☐

b) No ☐

c) Not Sure ☐

Thank You for Your Participation

Appendix III: Commercial Banks in Kenya

The 43 commercial banks in Nairobi County for this study are as below;

1. Standard Chartered Bank Kenya Limited
2. Barclays Bank of Kenya Limited (ABSA)
3. Stanbic Bank Kenya Limited
4. Kenya Commercial Bank Limited
5. Equity Bank Group
6. Cooperative Bank of Kenya
7. Commercial Bank of Africa Limited
8. Housing Finance Company Kenya
9. Sidian Bank Kenya
10. Jamii Bora Bank Limited
11. United Bank of Africa (UBA)
12. African Banking Corporation Limited
13. Bank of Africa Kenya Limited
14. Bank of Baroda Kenya Limited
15. Bank of India
16. Charterhouse Bank Limited
17. Chase Bank K Limited
18. Citibank Kenya
19. Consolidated Bank of Kenya Limited
20. Credit Bank Limited
21. Development Bank of Kenya Limited
22. Diamond Trust Bank Kenya Limited

23. DIB Bank Kenya Limited
24. Ecobank Kenya Limited
25. Family Bank Limited
26. First Community Bank Limited
27. Guaranty Trust Bank Limited
28. Guardian Bank Limited
29. Gulf African Bank Limited
30. Habib Bank A.G. Zurich
31. I & M Bank Limited
32. Imperial Bank Limited
33. Mayfair Bank Limited
34. Middle East Bank Kenya Limited
35. M-Oriental Bank Limited
36. National Bank of Kenya Limited
37. Paramount Bank Limited
38. Prime Bank Limited
39. Spire Bank Kenya Limited
40. Trans-National Bank Limited
41. Victoria Commercial Bank Limited
42. NIC Bank Kenya PLC
43. SBM Bank Kenya Limited

SOURCE: (Central Bank of Kenya, 2020)

Appendix IV: NACOSTI Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **175543**

Date of Issue: **08/November/2021**

RESEARCH LICENSE

This is to Certify that Ms.. Trezah Awuor Odindo of Kenyatta University, has been licensed to conduct research in Nairobi on the topic: MANAGEMENT INFORMATION SYSTEM AGILITY AND PERFORMANCE OF COMMERCIAL BANKS IN NAIROBI CITY COUNTY KENYA for the period ending : 08/November/2022.

License No: **NACOSTI/P/21/13784**

175543

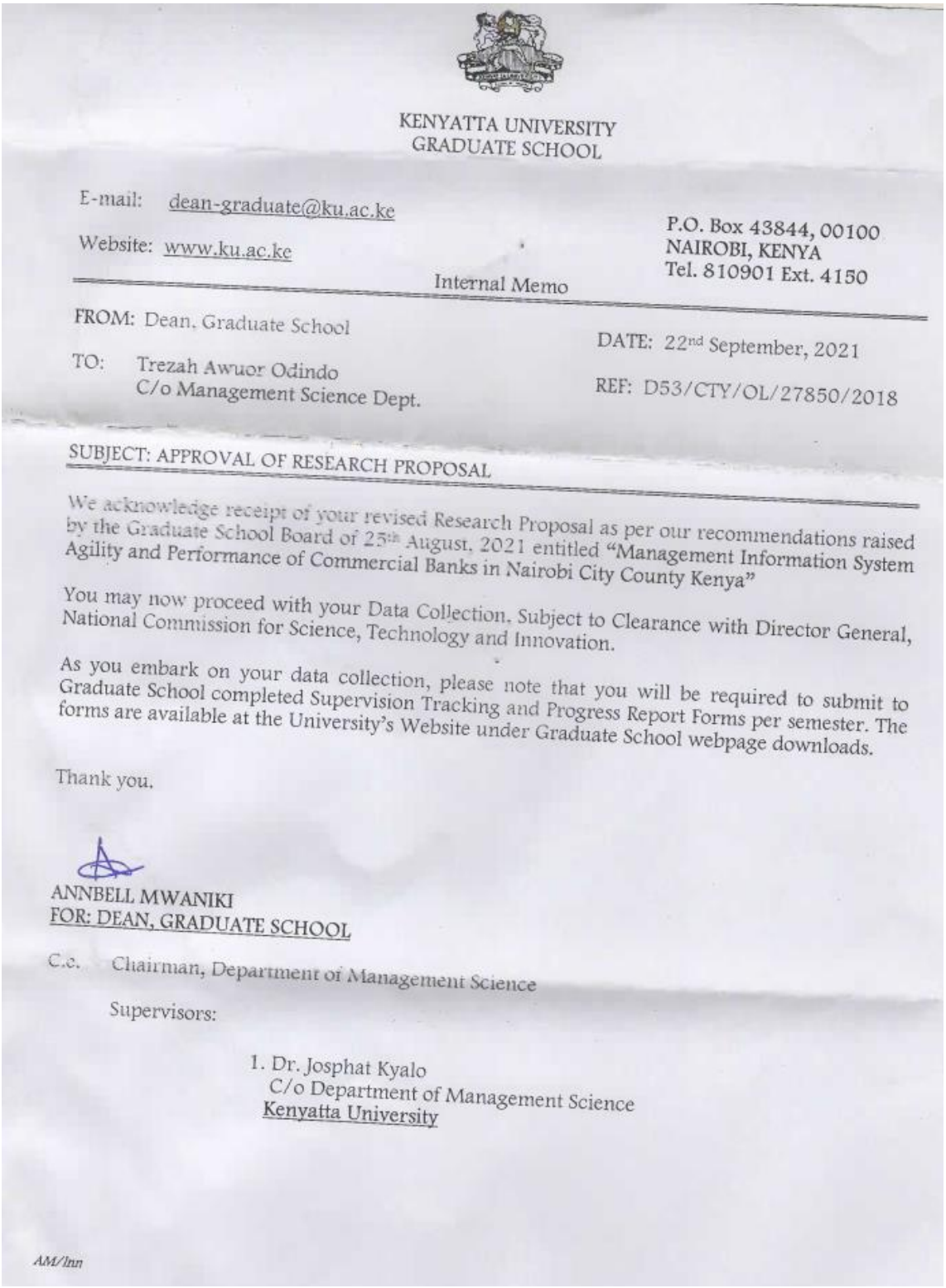
Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix V: Kenyatta University Research Approval Letter



KENYATTA UNIVERSITY
GRADUATE SCHOOL

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Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 4150

Internal Memo

FROM: Dean, Graduate School

DATE: 22nd September, 2021

TO: Trezah Awuor Odindo
C/o Management Science Dept.

REF: D53/CTY/OL/27850/2018

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

We acknowledge receipt of your revised Research Proposal as per our recommendations raised by the Graduate School Board of 25th August, 2021 entitled "Management Information System Agility and Performance of Commercial Banks in Nairobi City County Kenya"

You may now proceed with your Data Collection. Subject to Clearance with Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking and Progress Report Forms per semester. The forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

ANNBELL MWANIKI
FOR: DEAN, GRADUATE SCHOOL

C.c. Chairman, Department of Management Science

Supervisors:

1. Dr. Josphat Kyalo
C/o Department of Management Science
Kenyatta University

AM/lnn