

**INFLUENCE OF STRATEGIC INFORMATION SYSTEMS ON
PERFORMANCE OF COMMERCIAL BANKS IN NYERI COUNTY, KENYA**

BY

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DEDICATION

This thesis is dedicated to my parents Jacob and Grace Obonyo for their love, understanding and support during the many long hours when I had to juggle between work and study not forgetting my siblings for their kind words of encouragement.

ABSTRACT

With increased competition, changing consumer needs, influence of globalization and employees' diversity, commercial banks are driven to adopt strategic information systems to enhance their competitiveness in the changing business environment. The main objective of this study was to establish the influence of strategic information system on performance of commercial banks in Nyeri County, Kenya. The study was guided by the following objectives; determine the influence of internet banking on performance, to establish the influence of mobile banking and to establish the influence of automated teller machines on performance. The technology acceptance theory underpins the study through describing how Commercial Banks adopt strategic Information Systems to influence their performance. The tendency of customers accepting or rejecting an innovation launched is high or low if the innovation is perceived to be complex and difficult to be used. The study was carried out in Nyeri County and targeted 10 commercial banks of which 1000 employees were the target population. This study adopted explanatory research design. The study used stratified random sampling methods of research. From the use of Yamane formula the study obtained 287 respondents for the study. The study tested validity of the instruments by carrying out pilot study in the neighbouring Embu town. The findings were further investigated to find out the Cronbach alpha internal consistency coefficient to test reliability. Data was collected using a questionnaire which adopted both open- ended and closed-ended questions and further analyzed using both descriptive and inferential statistics; it was done with the aid of Statistical Package for Social Sciences (SPSS). The analyzed data was presented in Tables and figures. A multiple regression model was used to explore the relationship between Strategic information systems (internet banking, mobile banking and automated teller machine) on performance. From the model, ($R^2 = .747$) showing that strategic information system account for 74.7% variation in performance. The study findings established that commercial banks determines positively internet banking ($\beta=0.166$, p value ≤ 0.05), mobile banking to improve their performance in terms of profits, customer satisfaction, minimize costs of production and compensate on return on investments. The study revealed that mobile banking services ($\beta=0.411$, p value ≤ 0.05) were adopted by consumers on a larger extent due to convenience of accessing financial information ranging from electronic financial statement and accessibility of banking services. The study also established that automated teller machine ($\beta=0.750$, p value ≤ 0.05) also had a large impact on the performance of commercial banks as it saves time and enhanced security. The study concluded that there was a positive relationship statistical relationship between independent variables and dependent variables of the study. Therefore, this study recommends that Commercial Banks should allocate adequate financial resources to create maximum awareness of their e-banking services and train their staff to enhance their performance in the changing business environment. The study will benefit directors, managers, policy makers and scholars to understand how strategic information system influences performance.

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ABBREVIATIONS AND ACRONYMS

ATM	Automated Teller Machine
CRM	Customer Relationship Management
CBK	Central Bank of Kenya
EFT	Electronic Funds Transfer
EFTPOS	Electronic Funds Transfer at Point of Sale
IT	Information Technology
ICT	Information, Communication and Technology
IS	Information Systems
SACCOS	Savings and Credit Co-operative
SIS	Strategic Information Systems

OPERATIONAL DEFINITION OF TERMS

- Strategic Information Systems:** These are systems that are developed and implemented by organizations with aim of achieving their corporate goal using the available resources. The systems focus on organization efficiency and effectiveness using modern technologies (Petter & DeLone, 2013).
- Information Systems:** This is a system that depends on people and information technology to process or interpret information (Behl, 2009).
- Information Technology:** This refers to the use of computers and telecommunications equipment to store, retrieve, transmit and manipulate data (Rao, 2009).
- E-commerce:** This refers to buying and selling of goods and services, or the transmitting of funds or data, over an electronic network (Ratan, 2008).
- Turn-around time:** This is the total amount of time taken from initiation to completion of a task or process (Bharadwaj, 2000).
- Mpesa:** This is mobile banking service that allows users to store and transfer money through their mobile-phones. It was originally introduced in

Kenya as an alternative way for the unbanked population of the country to have access to financial services (Safaricom, 2007). This is a mobile-phone based money transfer and microfinancing service launched in Kenya in 2007.

Internet Banking:

Refers to any transfer of funds initiated or processed using electronic techniques. EFT uses computers, smart phones and electronic technology in place cheques and other paper transactions. EFTs is initiated through devices like card or codes thus you and those you authorize, access your bank account (Rose, 2014).

Automated Teller Machines:

Is a computerized machine that provides the customers of Banks the facility of accessing their accounts for dispensing cash and to carry out other financial transactions without the need of actually visiting a Bank Branch (Iganiga, 2014).

Organizational Performance

The ability of the organization to achieve its intended objectives with minimal resources available (Laudon & Laudon, 2010).

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Understanding the financial state of any enterprise is determined by comprehensive analysis of financial records and reports. Besides that Gupta, Koshal and Koshal (2006) argue that the major goal of any firm from the shareholder perspective is the capacity of the firm to maximize profits and minimize costs. Firms should always evaluate their short term and long term liquidity, profitability and solvency levels. In the changing business environment, firms should adopt risk management models that will maximize stakeholder values (Panwala, 2009).

Organizational performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives). Norton and Kaplan (2006) assert that organizational performance describes a range of operational activities designed to minimize costs and maximize profits. He argues that integration of technology in the system will provide opportunities of enhancing efficiency and effectiveness in service delivery. Customers are likely to save time and make transactions from remote areas, use cashless means to pay for goods and services (Petter & DeLone, 2013).

Chandan and Urhuogo (2012) advocate that organizational performance can be determined by: financial perspective, which entails measuring whether the organization is generating profits from its core businesses; Customer perspective, that

entail customer satisfaction from goods and services; Internal business processes, that involves continuous improvement of services using modern technology and finally innovation and learning, that entails ability of organizations to develop new products and services thus team learning and co-partnerships in the industry.

Pearce and Robinson, (2013) assert that organizational performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives). It involves the ability of an organization to fulfill its mission through sound management, strong governance and a persistent rededication to achieving results. Effective nonprofits are mission-driven, adaptable, customer-focused, entrepreneurial, outcomes oriented and sustainable. Creating flexible, high-performing, learning organizations is the secret to gaining competitive advantage in a world that would not stand still. Performance measures can be financial or non-financial. Both measures are used for competitive firms in the dynamic business environment (Petter & DeLone, 2013).

Muraleedharan (2014) avers that aspects of performance of any organization should range from; effectiveness, efficiency, economy, quality, consistency behavior and normative measures. SIS has contributed to competitiveness of firms across industries including Commercial Banks. It allows the innovation of unique products which at times lead to first mover advantage, reduction in operation costs by increasing efficiency, developing strategic alliances with customers, suppliers, consultants and other companies, differentiation of products and services to serve a certain market,

improve business process and to increase quality of products offered to customers (Musangu, & Kekwaletswe, 2011).

Due to dynamic business environment, globalization, competition, changing consumer needs and influence of technology, modern competitive organizations adopt strategic information systems such as internet banking, mobile banking and automated teller systems to improve efficiency and effectiveness (Diez & McIntosh, 2009). The revolution in Information Systems (IS) has brought drastic changes in financial institutions in the global market. These systems have opened new horizons for business enterprises and have enabled them to carry out their commercial activities by use of advanced technologies.

According to Ferguson, Finn and Hall, (2004) argue that SIS has been the key driver of organizational performance in the dynamic business environment. Organizational performance of competitive firms has been associated by adoption of Strategic Information Systems. Increased profits, increased efficiency and effectiveness and improved customer service are indicators of systems that adopt Strategic Information Systems (Teymouri & Ashoori, 2011). Also, Kudyba and Diwan (2001) assert that there is positive correlation between Strategic Information Systems and performance of organizations in the changing business environment. Bidgoli (2011) suggest that SIS can help organization reduce the cost of products and services and even assist with differentiation and focus strategies which improves performance. The era of technological development began about a decade ago when different sectors of the economy in developed countries diverted their investment preferences towards

information technology tools, information processing equipment's and communication media. In the service industry, the banking sector is one of the largest investors in SIS

Muraleedharan (2014) asserts that adoption of strategic information systems by organizations in the changing business environment has resulted to capabilities that give a company strategic advantages over the competitive forces it faces in the global marketplace. This creates strategic information systems, that support or shape the competitive position and strategies of an enterprise (Gheorghe, 2008). SIS plays a major role in giving an organisation a competitive edge. SIS enhances firm performance through means such as; allowing the innovation of unique products which at times lead to first mover advantage, reduction in operation costs by increasing efficiency, developing strategic alliances with customers, suppliers, consultants and other companies, differentiation of products and services to serve a certain market, improve business process and to increase quality of products offered to customers (Alipour & Mahdi, 2010).

Subsequently, Teymouri and Ashoori (2010) assert that there is a positive correlation between SIS and organizational performance. The benefits brought by SIS such as improved efficiency, growth in market share and expansion into new markets have seen more firms embrace these systems. It has opened new horizons allowing business enterprises to carry out commercial activities through advanced technologies. It has not only improved organizations competitive advantage but has also improved the effectiveness of risk management in these organizations by

identifying, measuring, monitoring and controlling the risks faced . Further, it has been driven by huge investments in Information Technology that began about a decade ago when various industries in developed countries started making investment preferences towards information technology tools and equipment (Kudyba & Diwan, 2001).

Additional, Ferguson et al. (2004) posits that electronic banking practices by commercial banks has become a value addition practice which has led to reduced operational costs, improved customer experience, and also provided opportunities of product innovation and continuous improvement in the system (Muraleedharan, 2014). Kharuddin, Ashhar and Nassir, (2010) suggest that advances in IT has seen the introduction of electronic banking platforms through which customers are able to transact on their mobile phones and through the internet from the comfort of their offices or homes. Through SIS, an organization is able to increase its productivity in terms of increased market share, expanded product range, customized products and better response to client demand.

Strategic information systems can be regarded to as information systems developed in response to corporate business initiative (Pant & Hsu, 1995). They are mainly intended to give competitive advantage to the organization thus improving or increasing performance. Through SIS, an organization may be able to deliver products or services at a lower cost, products that are differentiated or even focus on a particular market segment. SIS may also be defined as information technology which

interrelates with business strategies to support corporate missions (Diez et al, 2009). In the contemporary information era, one of the key factors in search for higher levels of competitiveness and better performance is information technology (IT) which forms part of information systems.

Moreover, Muraleedharan (2014) argues that SIS is the firms' total investment, expenditure, and know-how in computing. He further argues that it involves hardware, software, processes and people dedicated to providing services. SIS affects the management system and the organizational structure by changing the methods and capability of its users to search, capture, store and transfer information. Strategic Information Systems have become an important aspect in the future development of financial services industry and especially the banking industry (Alipour & Mahdi, 2010).

Commercial banks are financial intermediaries that serve as financial resource mobilization points in the global economy. They channel funds needed by business and household sectors from surplus spending to deficit spending units in the economy. A well-developed efficient banking sector is an important prerequisite for saving and investment decisions needed for rapid economic growth (Misati et al., 2010). A well-functioning banking sector provides a system by which a country's most profitable and efficient projects are systematically and continuously funded. The role of banks in an economy is paramount because they execute monetary policy and provide means for facilitating payment for goods and services in the domestic and international trade. Commercial banks are custodians of depositor's funds and operate

by receiving cash deposits from the general public and loaning them out to the needy at statutorily allowed interest rates.

Kenyan commercial banks have exponentially embraced the use of information and communication technologies in their service provision. They have invested huge amounts of money in implementing the self and virtual banking services with the objective of improving the quality of customer service. Some of the ICT-based products and services include the introduction of Mobile Banking, ATMs, Internet Banking, Core banking solution, Electronic clearing systems and direct debit among others (Kihumba, 2008).

Subsequently, Behl (2009) posits that the ability of SIS to enhance the performance of a firm largely depends on the basis on which the technology has been chosen and the extent to which it has been aligned to the firm's strategy. Strategic information systems have played a major role in meeting the increasing dependency for high quality information for decision making. Managements need assurance that they are obtaining relevant and reliable information at the right time with a reasonable cost (Petter & DeLone, 2013). On balance, timely and accurate decision making is key to increased organization performance. Banks have embraced SIS such as electronic commerce as a means of doing business, because it as a way of improving efficiency, growing market share and expanding into new markets (Bharadwaj, 2000).The SIS that this study sought to investigate their effect on the performance of Commercial Banks were: internet banking, mobile banking and automated teller machines.

1.2 Statement of the Problem

A study by the KIPPRA (2015) established that 72% of the Commercial Banks in developing countries faced challenges of integrating appropriate SIS to enhance performance due to internal factors like employee resistance and lack of management support. SIS was established to be the key driver of performance among commercial banks around the globe despite the change of capacity development and change management among organizations. It was noted that SIS were likely to reduce their operational costs by 38%.

Kariuki (2005) on the effect of technology adoption on agency banking among commercial banks in Kenya established that there is a positive relationship between SIS and performance despite the challenge of adopting new technologies to enhance service delivery among commercial Banks in Kenya. Njenga (2009) on mobile phone banking on performance of Commercial Banks in Kenya revealed that a number of challenges are experienced by Commercial Banks in Kenya during adoption of SIS to gain competitiveness.

Aduda (2012) on the relationship between electronic banking and financial performance among commercial banks in Kenya established that investments in information systems has a positive relationship with the performance of Kenya banks commercial banks in Kenya have been investing in SIS in order to increase efficiency and to reduce errors which are a result of insufficient or wrong data. The banks focus

on embracing the latest technology in carrying out their operations efficiently and effectively and also in creating competitive products.

Banks are facing challenges in several areas, but there are four that stand out in today's market: Not making enough money, consumer expectations, increasing competition from financial technology companies and regulatory pressure. These challenges continue to escalate, so traditional banks need to constantly evaluate and improve their operations in order to keep up with the fast pace of change in the banking and financial industry today. It is against this backdrop of limited empirical research that this study seeks to provide empirical evidence on the influence of strategic information systems on the performance of Commercial Banks, A case of Nyeri County, Kenya.

1.3 Research Objectives

The general objective of the study was to determine the influence of Strategic Information Systems on performance of Commercial Banks in Nyeri County, Kenya.

1.4 Specific Objectives

The research Objectives of this study were:

- i. To establish the influence of internet banking on the performance of Commercial Banks in Nyeri County.
- ii. To determine the influence of mobile banking on the performance of Commercial Banks in Nyeri County.
- iii. To determine the influence of Automated Teller Machines on the performance of Commercial Banks in Nyeri County.

1.5 Research Hypotheses

The following hypotheses which are stated in their null form were tested to answer the research questions:

- i. **H₀₁** there is no significant influence of internet banking on performance of commercial banks operating in Nyeri County, Kenya.
- ii. **H₀₂** there is no significant influence of mobile banking on performance of commercial banks operating in Nyeri County, Kenya.
- iii. **H₀₃** there is no significant influence of automated teller machines on performance of commercial banks operating in Nyeri County, Kenya.

1.6 Significance of the Study

Banking Industry would identify the influence of strategic information systems on performance and thus the study would enable these banks to come up with ways and means to exploit these systems so as to improve their performance. The study would come in hand to support the government as a regulator in its quest to streamline operations in the banking industry putting in mind that the economy as a whole relies on how the banking sector performs.

Policy makers in other organizations would equally benefit from the findings of this research study. The results of the study provide a pool of knowledge on the role and contribution of SIS in building and sustaining competitive advantage in the banking industry. This knowledge if well harnessed would result in above average performance of banks in the financial industry. Furthermore, scholars would also

benefit from the study as the findings add to the existing body of knowledge. Moreover the results of the study would underscore the fundamental role of utilization of strategic information systems in order to leverage on commercial banks performance

1.7 Scope of the Study

The study was delimited to all commercial banks operating in Nyeri County to establish the influence of strategic information systems on their performance. Commercial banks were chosen because they are knowledge Intensive (Shih *et al.*, 2010) and as such they are at the “cutting edge” of knowledge management in Kenya. The study adopted simple random sampling approach where information was sought to establish the problem under investigation. Simple random sampling where respondents were grouped into clusters and respondents from the group were all given an equal chance to be part of the research. Respondents of the study were; Branch managers, Operations Managers, Credit Officers and Accountants. The variables of the study were internet banking, mobile banking and Automated Teller machines. The study was carried out from February 2018 - August 2018. The study targeted employees from the 10 commercial banks, the target population was 1000 and from the Yamane formula the study obtained a sample size of 287.

1.8 Limitations of the Study

This study sought to investigate the influence of strategic information systems on performance of commercial banks, a case of Nyeri County, Kenya. In carrying out

this study the researcher experienced difficulties in accessing the target respondents particularly due to policy requirements and the nature of their positions. This limitation was mitigated through the use of the research permit from National Commission for Science Technology and innovation (NACOSTI), seeking consent from commercial banks and placing appointments with the concerned managers. The researcher also encountered a challenge as a result of the sensitive and strategic nature of some information needed. Nevertheless, the challenge was mitigated by reassuring the respondents of confidentiality in handling the research data which was upheld through the use of codes in place of individual respondents and commercial banks.

In addition, the researcher experienced difficulties in reviewing empirical literature owing to the fact that the area of focus is not adequately researched in developing countries and more so in the local setting. However, this limitation was mitigated through review of similar empirical work in other sectors and developed countries.

Chapter Summary

This thesis comprises of the preliminary and five chapters. Chapter one discusses the background of the study, strategic information system, organizational performance, performance of commercial banks in Nyeri County, statement of the problem, research objectives, research questions, scope of the study, significance and limitations of the study.

Chapter two outlines theories that informed the study and include; technology acceptance theory, resource based view theory and dynamic capability theory, related empirical studies carried out locally and internationally are discussed, summary of conceptual, contextual and methodological knowledge gaps are also discussed and finally critique of literature and conceptual framework.

Chapter three discusses the methodology that was utilized by the study and including; the research design, target population, sample size and sampling procedure, data collection instruments, validity and reliability of the instrument and data analysis techniques.

Chapter four presents the results of statistics analysis, presentation, interpretation and discussion. Chapter Five represents summary of the findings according to the objectives of the study also conclusions and recommendations for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1 The Concept of Performance in Commercial Banks

Performance encompasses financial performance (profits, return on assets, return on investment, etc.); product market performance (sales, market share, etc.); and shareholder return (total shareholder return, economic value added, etc.) (Richard et al. 2009). In their study, Papadakis et al (1998) used two objective measures of performance. These were return on assets (ROA) and growth in profits.

Zahra and Bogner (2000) measured firm's performance using sales growth, employment growth, and pretax net profit percentage of total sales. Baum and Wally (2003) in their study measured firm performance as growth and profit. In the study, self-reported objective measures were used where the respondents were asked in a questionnaire to fill in the figures for total sales and the number of employees for two years as well as profit for the year.

In a study by Zehir and Ozsahin (2008), a Likert Response Format (LRF) was used to measure innovation performance. A five point Likert scale was used where the respondents scored their choices on various questions relating to innovation performance in a structured questionnaire. Souitaris and Maestro (2010) measured new venture financial performance using return on total assets (ROTA) and return on sales (ROS) based on archival objective measures. Hsu and Huang (2011) measured performance using subjective measures. Five self-reported items were evaluated by respondents on a 7- point Likert scale

Organizational performance comprises the actual output or results of an organization as measured against its intended outputs (or goals and objectives). According to Richard et al. (2009) organizational performance encompasses three specific areas of firm outcomes: (a) financial performance (profits, return on assets, return on investment, etc.); (b) product market performance (sales, market share, etc.); and (c) shareholder return (total shareholder return, economic value added, etc.).

In recent years, many organizations have attempted to manage organizational performance using the balanced scorecard methodology where performance is tracked and measured in multiple dimensions such as: financial performance (e.g. shareholder return); customer service social responsibility (e.g. corporate citizenship, community outreach); employee stewardship.

2.2 Strategic Information System

Strategic information systems (SIS) are information systems that are developed in response to corporate business initiative. They are intended to give competitive advantage to the organization. They may deliver a product or service that is at a lower cost, that is differentiated, that focuses on a particular market segment, or is innovative. According to (Petter & DeLone, 2013) these are systems that are developed and implemented by organizations with aim of achieving their corporate goal using the available resources. The systems focus on organization efficiency and effectiveness using modern technologies. In this study the strategic information system measures are internet banking, mobile banking and automated teller machines as discussed.

2.2.1 Internet Banking

The implementation strategic information systems in commercial banks in Kenya established that banks are providing state-of-the-art services to customers leading to rapid growth and increased bank's performance in a very competitive marketplace. The investments in internet banking by these banks have mainly been influenced by rapid geographical expansion where the banks invest in systems that allow inter linkage between branches and head office. Further Kanini (2008) avers that Strategic Information Systems have contributed to business process re-engineering aimed at reducing expenses and thus increasing profitability; lack of compatibility between the old systems and the strategic necessity of integrating new technologies like automated teller machine, tele-banking, e-commerce in order to provide the high quality services to the customers and competing on the same level with the foreign banks. However, data analysis method adopted in this study was multiple regression intended to establish a relationship between variables of the study.

Jayawardhena and Foley (2000) on changes in the banking sector-the case of internet banking in the UK, established that majority of the banks have invested in internet banking in a bid to tap into tech savvy customers who can transact through the internet. Internet banking can be viewed as a delivery channel which helps to overcome the inherent disadvantages of a traditional mortar and brick branch. The use of internet banking to carry out transactions has a positive influence on bank performance.

Kanini (2008) avers that adoption of internet banking as a delivery channel gradually reduces overhead expenses and in turn leading to increased profits. The study adopted factor analysis method that was not appropriate for this study and had quantitative weaknesses. Contextual and ethical considerations were some of the limitations of the study.

Muriuki (2011) on effect of technology adoption on agency banking Among Commercial Banks in Kenya established that banking industry has been embracing new strategic information systems in order to fulfill the dreams of their customers and to create healthy competition. The new banking environment is all about differentiating banking products, increased choices, security and accessibility. Strategic information systems have led to improved delivery of service to customers.

Customers have a wide range of alternative service channels to choose from. This has reduced the dependence on the branch network as a core delivery mechanism. The study adopted descriptive research design and regression analysis as a data analysis method. The limitation of the study was that the researcher used a large sample of 2300 respondents that was unrealistic to analyze. Continuous changing customer needs and wants has led banks to explore ways of differentiating products, increasing variety of choices for the customers and ensuring accessibility to the customers which has led to investments in strategic information systems.

Salwe, Ahmed, Aloufi, Kabir, (2010) on strategic information systems alignment with business strategy found out that through increased service channels, SIS has also contributed to an increased market share as more customers continue to enroll for these services. The study recommended that there is need to understand the changes

that technology was causing on the banking sector in order to examine in detail how the recent and foreseeable advances in technology is affecting the various aspects of the banking sector.

2.2.2 Mobile Banking

Musangu and Kekwaletswe (2011) on strategic information systems planning and environmental uncertainty: the case of South African small micro and medium enterprises established that mobile banking is a service which allows customers of a bank to access a number of banking services such as making financial transactions and inquiries through a mobile device. Mobile banking offers commercial banks an opportunity to reach their customers through branchless banking. The services are offered both on Smart and non-smart devices. The study concluded that mobile banking has been a key method of reaching the unbanked population who for a long time has not accessed banking services offered through traditional brick and mortar banking.

Nakhumwa (2013) on adoption of e-commerce payment systems by Commercial Banks in Kenya established that there is a statistical relationship between SIS and performance of banks. The study observed that SIS provide opportunities to top level managers to make timely decision to support activities such as goal setting, planning, forecasting and tracking performance. Through SIS, an organization is able to improve quality of management in the organization through new type of technology and techniques that allow extracting, transforming, processing and presenting data that is used for strategic decisions.

It is concluded by their study that SIS is of great value to organizational performance despite the implementation challenges. Descriptive research design was adopted in this study. The weakness of this study was that respondents were not willing to give intended information due to insecurity of their jobs. However, the sample of the study was not adequate to be generalized. The summary of the findings were not supported by literature.

Njenga (2009) on mobile phone banking and usage experiences in Kenya revealed that adoption of SIS has influenced competition and the degree of contestability in banking industry. Entry barriers have declined leading to new entrants and stiffer competition. This has led to banks coming up with more innovative products and thus attracting more customers. Solutions such as internet banking have eliminated time and distance as barriers to banking as customers can access the service each day, any time of the day. These solutions have helped reduce banks operating costs resulting in cheaper transaction costs for customers.

A study by Siami (2006) also revealed that SIS has benefited banks by allowing innovation of products and service that the customer needed but maybe never asked for. Such services include online bill payments which allow a customer to pay their bills online at their own time. Through this feature a customer can schedule the bill payments in advance, set up recurring payments on regular bills and even view the payment history. The study adopted descriptive research design and a multiple regression method as a data analysis method. Ethical issues on respondents were not addressed by the study.

2.2.3 Automated Teller Machines (ATM)

Teymouri Ashoori (2010) on the impact of information technology on risk management established that ATMs provide convenience to customers as one is able to access their account throughout the ATM network. Wajid, Omar, Sultan and Ehsan (2012) on the impact of information Technology on efficiency of Banks in Pakistan established that Banks have increased the number of ATM locations while majority have linked their networks to networks of other banks.

In addition, their study noted that ATM services were enhancing operations and customer satisfaction in terms of flexibility of time; add value in terms of speedy handling of voluminous transactions which traditional services were unable to handle efficiently. These machines allow customers to deposit and withdraw cash at more convenient time and places than during banking hours at branch. Cross sectional research design was adopted. Data was analyzed using inferential statistics. The limitation of the study was that recommendations were not accurate and ethical considerations were not valued.

Ratan (2008) on using technology to deliver financial services to low-income households in Equity Bank in Kenya established that effective service delivery through ATMs guarantees quality excellence and superior performance and provides independence to the customers. Customer focused ATM delivery systems that fulfil the customers' needs and maximize operational performance are an essential dimension for bank to achieve and sustain competitive advantage.

Furthermore, their study revealed that a bank can benefit through cross selling products more effectively, help sales staff close deal faster, provide better customer

service and increasing revenue from customers. Investing in Ecommerce help strengthen customer relations and create opportunities to sell products. The research design adopted was longitudinal. Regression data analysis method was adopted. The limitation of the study was that the researcher over relied on journals rather than textbooks.

Nakhumwa (2013) on adoption of e-commerce payment systems by Commercial Banks in Kenya established that banks support the contention that investments in electronic commerce create value for shareholders. Excess returns are generated in the period leading up to the announcement by the bank of an investment in unique electronic commerce. Electronic commerce investments made during the subsequent decade are likely to provide relatively lower benefits to first movers, sufficient to reduce average excess returns to zero.

The results of their study support the proposition that the market values investments in non-innovative electronic commerce projects and, in doing so, provides some evidence that these types of investments are seen as being consistent with a firm's information technology capabilities. However, it was noted that the study had a number of weaknesses. The studies adopted descriptive research design. Inferential statistics was used to analyze data. Therefore, inability to adopt relevant theories by the study was the limitation of the study.

Bhatnagar (2012) on customer relationship management in banking need for a strategic approach revealed that mere investment in IT will not result in superior

performance, but the organization must work and identify innovative ways to create firm-wide IT capability. The benefits from IT are usually implicit in that it improves product design, better customer satisfaction, increased market responsiveness, so synergy across organizational units and with suppliers and customers is necessary, to grab the potential of IT. However, it was noted that the study had a number of limitations. For instance, cross sectional design was adopted and content analysis method. Theories adopted in this study did not reflect the topic thus posing conceptual limitations. The study was too wide in scope and the representative sample was difficult to choose. The methodology of data analysis was not appropriate. Multiple regression was to be adopted to establish the relationships between variables.

Aduda and Kingoo (2012) on the relationship between electronic banking and financial performance among Commercial Banks in Kenya revealed that investment in e-banking has a positive relationship with bank performance at 1% level. Investments in SIS has had a strong influence on the structure and the activities of the banking sector as it allows transactions to be conducted more efficiently, technology allows banks to market their products more effectively.

Their study concluded that as banks build up sophisticated databases containing information about their consumers, and through data mining they are then able to target their commercial efforts more precisely, knowing which range of products individual consumers might be interested in buying. Some of the limitations of this

study were; too little sample used to generalize the total population, the study looked independent variables from a holistic perspective rather than independent view.

2.3 Theoretical Review of the Study

2.3.1 Technological Acceptance Theory

The study adopted Technological Acceptance Theory. The Technology Acceptance theory was initially proposed by Davis (1989). The main elements of the theory as proposed by Davis are; perceived usefulness, perceived ease of use, attitude toward using technology, and behavioral intention. The attitude of customers toward adoption of new ideas will dictate the adopter's positive or negative behavior in the future concerning new technology. The theory suggests that perceived usefulness and perceived ease of use determine an individual's intention to use a system with intention to use serving as a mediator of actual system use.

Perceived usefulness is also observed as being directly impacted by perceived ease of use (Ravichandran & Lertwongsatien, 2005). The Technology Acceptance theory suggests that perceived usefulness and perceived ease of use are the two most important individual beliefs about using an information technology. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". The definition of perceived usefulness is based on the expectancy-value model underlying the Theory of Reasoned Action.

Chandan and Urhuogo (2012) argue that perceived ease of use involves the degree to which a person believes that using a particular system would be free of effort". These two behavioral beliefs, perceived usefulness and perceived ease of use, then lead to

individual behavior intention and actual behavior. Davis finds that perceived usefulness is the strongest predictor of an individual's intention to use an information technology (Reddy, Srinivasu, Rikkula & Rao, 2009). The technology acceptance theory underpins the study through describing how Commercial Banks adopt strategic Information Systems to influence their performance.

Kanini (2008) suggests that the tendency of customers accepting or rejecting an innovation launched is high or low if the innovation is perceived to be complex and difficult to be used. The perceived use of the innovation or ICT practice by Commercial Bank customers will contribute to positive or negative performance of the bank. Adequate awareness and orientation of customers with new technologies used by Commercial Bank will minimize the perceived change thus increased adoptability rates of innovation in the banking sector.

The technology acceptance theory underpins the study through describing how Commercial Banks adopt strategic Information Systems to influence their performance. The tendency of customers accepting or rejecting an innovation launched is high or low if the innovation is perceived to be complex and difficult to be used. The perceived use of the innovation or ICT practice by Commercial Bank customers will contribute to positive or negative performance of the bank. Adequate awareness and orientation of customers with new technologies used by Commercial Bank will minimize the perceived change thus increased adoptability rates of innovation in the banking sector.

2.3.2 Transaction Cost Theory

The transaction cost theory was developed by Ronald Coase as part of the theory of the firm to explain why firms exist. The model shows institutions and market as a possible form of organization to coordinate economic transactions. When the external transaction costs are higher than the internal transaction costs, the company will grow hence improve its performance. It presented an explanation of the firm consistent with constant returns to scale, rather than relying on increasing returns to scale (Archibald, 2008). The theory notes that a firm's interactions with the market may not be under its control, for instance because of sales taxes, but its internal allocation of resources are within a firm's control. Market transactions are eliminated and the place of the complicated market structure with exchange transactions is substituted with an entrepreneur who directs production. In the banking sector, the cost of the traditional brick and mortar branches and the ensuing contracts from the same, related transaction cost as well as the cumulative cost of a customer to perform a single transaction informs the success or otherwise of the agency model, so organizations must find ways to minimize transaction costs as much as possible to create a competitive advantage hence improve on its performance.

2.4 Critique of Literature

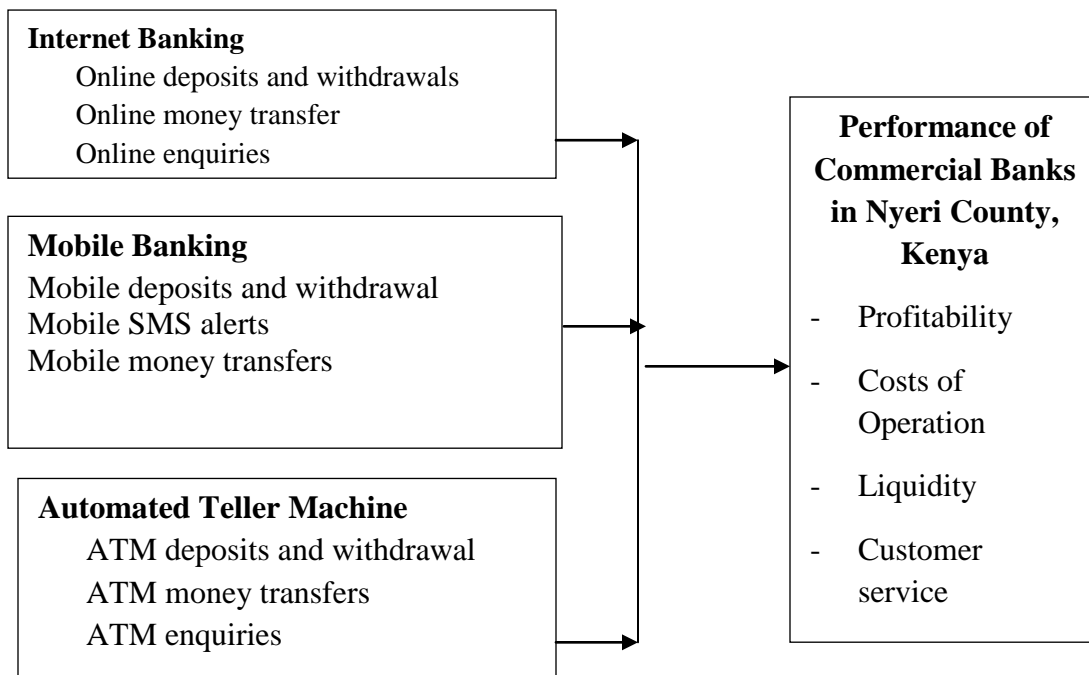
From the previous empirical studies conducted locally and internationally by; (Nakhumwa, 2013; Nakhumwa, 2013; Bhatnagar, 2012; Aduda and Kingoo 2012; Wajid, Omar, Sultan, Ehsan, 2012; Muriuki, 2011; Musangu and Kekwaletswe, 2011; Teymouri Ashoori, 2010; Salwe, Ahmed, Aloufi, Kabir, 2010; Njenga, 2009; Ratan, 2008; Kanini, 2008; Siami, 2006; Jayawardhena and Foley, 2000) it evident that

conceptual, contextual and methodological gaps do exist. Firstly, most of the studies focused on different variables like Technology, efficiency, e-commerce and change management but not variables of this study.

Secondly, some of the studies were carried in different countries like Pakistan, United States and Nigeria and cannot be compared to the Kenyan context. Local studies carried out focused in different sectors and did not specifically address the influence of Strategic Information System on the performance of Commercial Banks in Nyeri County, Kenya. Thirdly, the methodologies of data analysis by different researchers varied and cannot be relied in this study. Therefore, it is for this reason this study was geared towards investigating the influence of Strategic Information System on the performance of Commercial Banks in Nyeri County, Kenya.

2.5 Conceptual Framework

According to Sekeran (2011), a conceptual framework is a group of concepts that are broadly defined and systematically organized to provide a focus, a rationale, and a tool for the integration and interpretation of information. The framework describes the interrelationship between the independent variables and dependent variable using concepts of the already existing theories to solve the problem under investigation.

Independent variable**Dependent variable****Strategic Information Systems****Figure: 2.1 Conceptual Framework****Source: Author (2018)**

It was established as shown in Figure 2.1 above that internet banking; mobile banking and ATM had a positive significant effect on performance of Commercial Banks in Nyeri County, Kenya. It was revealed that Commercial Banks are experience improved performance by embracing internet banking practices. Internet banking enhanced online deposit and withdrawals, and customer enquiries.

Online banking through traditional banks enabled customers to perform all routine transactions, such as account transfers, balance inquiries, bill payments, and stop-payment requests, and some even offered online loan applications. Customers also accessed their account information at any time, day or night, and this was

done from anywhere. Mobile banking also enhanced mobile deposit and withdrawals, SMS alerts and money transfer services among customers thus efficiency and effectiveness.

The scope of offered services included facilities to conduct bank and stock market transactions, administer accounts and to access customized information. Automated Teller Machines also promoted deposit and withdrawal services, money transfer services and enquiries. It significantly improved customer convenience and reducing costs and this led to improved efficiency and profitability in service delivery of the Commercial Banks.

2.6 Chapter Summary

The chapter reviewed literature on strategic information systems and performance of commercial banks. It explored at length the measures of strategic information systems and performance. It has also looked at theoretical review related to the Strategic information systems and also the conceptual framework on the relationship of the study variables. The next chapter presents and discusses the research methodology adopted by the study.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

According to Orodho (2008), research design is a comprehensive plan for data collection and analysis. The researchers' beliefs and understanding of the world influence the research design. The study adopted explanatory research design to establish strategic information systems on performance of commercial banks. A case of Nyeri County, Kenya which was mixed mode research approach that is qualitative and quantitative. Kothari (2004) regard the research design as an arrangement of conditions for collection and analysis of data in a manner that aimed to combine relevance to the research purpose with economy in procedures. The descriptive study method was appropriate because it explores and describes the relationship between variables in their natural setting without manipulating them.

Kumar (2012), define quantitative research as a formal, objective, systematic process to describe and test relationships and examine cause and effect interaction among variables. Surveys may be used for descriptive, explanatory and exploratory research. A descriptive survey is necessary because it provides an accurate portrayal or account of the characteristics. Qualitative research on the other hand, involves the interpretation of phenomenon without depending on the numerical measurements or statistical methods. It is mainly concerned with observing, listening and interpreting phenomenon (Zikmund et al., 2010).

According to Mugenda and Mugenda (2003), the advantages of this design are: it is an efficient way to collect information about a large group of people, it is flexible medium that is standardized, so less susceptible to error, easy to administer and finally it can be tailored exactly to the phenomena the researcher wish to study. This design had been used successfully by the following scholars: Muo and Omwenga (2017) Gathenya (2012), Machuki (2011), Murgor (2014) and Ongeti (2014) in their PhD degree dissertations.

3.1.1 Research Philosophy

A research philosophy is a belief about the way in which data about a phenomenon should be gathered, analyzed and used. This study adopted positivist research philosophies/approaches. On one hand, positivists claim there is a single, objective reality that can be observed, measured and generalized without bias using standardized instruments (Rubin & Rubin, 2011). This approach required the use of questionnaires for data collection and analytical, statistical analysis such as hypotheses testing and random sampling (Rubin & Rubin, 2011). This philosophy was successfully used by Muriithi, (2016) in his Ph.D. dissertation. On the other hand, interpretivists contend that only through the subjective interpretation of an intervention, in reality, can that reality be fully understood (Cooper & Schindler, 2014). They suggested the study of phenomena in their natural environment, together with the acknowledgment that social scientists cannot avoid affecting those phenomena they studied. This philosophy was successfully used by Kyambi, (2015); Habarurema, (2016) in their Ph.D. dissertations. Both philosophies had also been used successfully by Kandiri, (2014) in his Ph.D. dissertation

3.2 Target Population

Population refers to an entire group of persons or elements that have at least one thing in common (Yin, 2013). Donald and Delno (2006), Target population is defined as “the population about which information is wanted” or the “totality of elements which are under discussion and about which information is desired”. The word “target” emphasizes, however, that this population is not necessarily the same as the one that we end up sampling (Greenland, 2005). In this study, the target population comprised 1000 employees selected from 10 commercial banks operating in Nyeri County, Kenya. A list that contains the number of all employees was sourced from the human resource department of each commercial bank headquarter this was used as a sampling frame to identify every single element in the target population

Table 3.1 Target Population

Name of the Bank	Target Population
Barclays Bank of Kenya Limited	110
Co-operative Bank of Kenya Limited	100
Credit Bank Limited	90
Diamond Trust Bank Kenya Limited	70
Sidian Bank Ltd	80
Equity Bank Kenya Limited	130
Family Bank Limited	100
KCB Bank Kenya Limited	120
National Bank of Kenya Limited	110
NIC Bank Limited	90
Total	1000

Source: Researcher (2018)

3.4 Sampling Size

A sample is part of the target population that has been procedurally selected to represent it (Desu, 2012). The sample of respondents was determined using the formula adopted from Yamane's formula of sample size with an error 5% and with a confidence coefficient of 95% (Yamane, 1967),

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size,

N is the population size which is...1000

the level of precision, which is. 0.05

The sample size will be;

$$n = 287$$

Table 3.2 Sample size

Name of the Bank	Target Population	Sample size
Barclays Bank of Kenya Limited	110	30
Co-operative Bank of Kenya Limited	100	35
Credit Bank Limited	90	27
Diamond Trust Bank Kenya Limited	70	20
Sidian Bank Ltd	80	25
Equity Bank Kenya Limited	130	45
Family Bank Limited	100	37
KCB Bank Kenya Limited	120	40
National Bank of Kenya Limited	110	28
NIC Bank Limited	90	25
Total	1000	287

Source: Researcher (2018)

3.5 Sampling Techniques and frame

A sample is a set of observations drawn from a population by a defined procedure. The sample represents a subset of manageable size (Kinyanjui, 2014). In this section, the study scrutinized sampling technique, sampling procedures, sampling frame as well as derivation of the sample size. The study adopted stratified random sampling which involved sampling from the partition of a population into smaller groups known as strata. Westfall (2009) stated that random sampling is used when representatives from each subgroup within the population need to be represented in the sample. The first step in stratified sampling is to divide the population into subgroups (strata) based on mutually exclusive criteria. Random or systematic samples are then taken from each subgroup. The sampling fraction for each subgroup may be taken in the same proportion as the subgroup has in the population. In view of Mugo (2002), stratified sample is obtained by independently selecting a separate simple random sample from each population stratum. According to Kothari (2004), a population is stratified based on different features of the population and a random sample is picked from each stratum.

3.6 Research Instruments

Primary data was collected from respondents by the use of questionnaires as the instrument of data collection (Cooper & Schindler, 2006). In this study, structured questionnaires that comprised of closed and open-ended questions were used to collect data from all employees who worked in 10 Commercial Banks operating in Nyeri County. Respondents of the study were employees of commercial banks which are operating in Nyeri County, Kenya.

Questionnaires were administered to respondents by the researcher during working hours. Drop and pick later method was applied where respondents had no time to respond immediately. Sekaran (2011) asserts that questionnaires are preferred instruments of data collection in scientific studies because of their opportunity to capture respondent opinions in a structured manner and in written form for future reference.

Questionnaires assisted in the translation of the research objectives into research hypothesis which motivated the respondents to provide the information being sought. They also enabled the respondents to answer questions freely and frankly even on sensitive issues because they were not required to reveal their identity, this increased the likelihood of getting accurate information. Finally, they offered an opportunity of uniformity in answering questions allowing a great degree of comparison because the items were framed in the same format.

3.7 Validity and Reliability of Research Instruments:

3.7.1 Validity of the Research Instrument

The validity of the instrument was determined by the researcher through seeking opinions of experts in the field of study especially the researcher's supervisor and industry strategic management consultants. Validity entails the appropriateness, meaningfulness and usefulness of inferences a researcher makes based on the data collected (Saunders, Lewis & Thornhill, 2009). An appropriate inference was one that was relevant to the purpose of the study while a meaningful inference was one which said something about the meaning of the information obtained through the use of the

instruments. Content, criterion, and construct related validity were measured using the research instrument.

3.7.2 Reliability of the Research Instrument

Reliability involves the extent to which a measuring device is consistent in measuring whatever it measures (Saunders, Lewis & Thornhill, 2009). It involves a measure of the degree to which a research instrument yields consistent research or data after repeated trials. Reliability of the instruments is influenced by random error which is a deviation from a true measurement due to factors that have not effectively been addressed by the researcher. Cooper and Schindler (2006) suggest that the reliability of each construct was examined to ensure the items collectively measured their intended constructs consistently as recommended.

In this study pilot method was used which is an initial run-through of the procedures to be used in an investigation; Embu town it involves selecting a few people and trying out the study on them. The research instruments were distributed to few respondents not participating in the real study. Scores for each subject was computed. The researcher used the computer programs the statistical package for social sciences Windows and compute the Cronbach's alpha which is a measure of internal consistency, that is, how closely related a set of items are as a group. In this study a correlation coefficient of reliability of 0.7 and above was accepted as a good measure of reliability and considered high enough to judge the instrument reliable for the study.

Table 3.3 Reliability

Scale	Cronbach's Alpha	Number of Items	Comment
Internet banking	0.777	11	Acceptable
Mobile banking	0.697	14	Acceptable
Automated teller machine	0.756	12	Acceptable

Source: Researcher (2018)

Cooper& Schindler (2004) has shown 0.7 to be an acceptable reliability coefficient.

Table 3.3 demonstrates that internet banking had the most astounding dependability ($\alpha=0.777$) trailed by automated teller machine ($\alpha=0.756$) and mobile banking ($\alpha=0.697$). This delineates all the three scales were dependable as their unwavering quality qualities surpassed the endorsed limit of 0.7

3.7.3 Regression Assumption

Regression assumptions tested in the research included: Linearity; Homoscedasticity; Multicollinearity and Normality.

To detect violation of linearity, scatter plots diagrams of the residuals versus individual independent variables were plotted. The points should be symmetrically distributed around horizontal line, with a roughly constant variance.

The assumption of homoscedasticity was checked by visual examination of a plot of the standardized residuals by the regression standardized predicted value.

The coefficients of determination, R^2 , was used to diagnose multicollinearity correlation matrix of the predictor variables and should be less than 80%, while the

variance inflation factors (VIF) was used to measure the Eigen values of the data matrix.

Normality was checked through histograms of the standardized residuals and normal probability plots.

3.8 Data Collection Procedures

Permission to collect data from Commercial Banks was sought before data collection. As proposed by Cooper and Schindler (2006), it is ethical to seek permission when conducting scientific studies. Relevant stakeholders that the study affected were informed of the objective of the study and confidentiality of the information given. The questionnaires were self-administered to the respondents. The questionnaire was designed based on the deductive arguments of the theories discussed in the literature review.

3.9 Ethical Consideration

The researcher sought permission from University of Eldoret. A research permit was also obtained from National Commission for Science and Technology Institute (NACOSTI) to conduct the research from the financial institutions. Responsibility to the respondents included voluntary participation and informed consent prior to participation. To ensure the participants were not prejudiced, simple language and statements were used to describe the aim of the research and its procedures.

Responsibility to the profession included accuracy in analysis, presentation and reporting of the study findings. Confidentiality and anonymity of the respondents was guaranteed. As noted by Kothari (2004) it is appropriate to seek permission from

relevant stakeholder before data collection in any scientific research. For objectivity purposes of scientific research, stakeholders should be informed and the objective of the research explained to enhance willingness and high response rates from the respondents.

3.10 Data Analysis and Presentation

To analyze the data, the Statistical Package for Social Sciences, (SPSS version 22) software was used. The data collected was edited, coded and classified on the basis of similarity and then tabulated. Cooper and Schindler (2001) assert that the core function of the coding process was to create codes and scales from the responses, which could be then summarized and analyzed in various ways. To permit quantitative analysis, data was converted into numerical codes representing attributes or measurement of variables.

Correlation and Multiple regression methods were adopted to determine the statistical relationship between variables. The three independent variables were regressed against the dependent variable to determine the quantitative effect created on the dependent variable. Descriptive and inferential statistics like mean, standard deviation, frequency distributions and percentages were used to summarize and relate variables which were attained from the administered questionnaires. The analyzed data was presented in form of tables. Correlation and Regression data analysis methods were conducted at 95% confidence level ($\alpha = 0.05$). Specifically the regression model was of the form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where;

Y= Performance of Commercial Banks in Nyeri County

β_0 = Y intercept

β_1 to β_3 = régression coefficients

X_1 = Internet Banking

X_2 = Mobile Banking

X_3 = Automated Teller Machines

ϵ = Error term

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSIONS

4.1 Chapter Overview

This chapter presents the data findings, analysis, presentation, interpretation and discussion about data collected from commercial bank in Nyeri County, Kenya to ascertain the influence of Strategic Information Systems on the performance of Commercial Banks in Nyeri County, Kenya, under the key objectives of the assess the influence of internet banking, mobile banking, Automated Teller Machines on the performance of Commercial Banks in Nyeri County. The first section in this chapter is on the response rate of the respondents. The second section of this chapter presents the demographic information of the respondents. The third section presents findings on the study objectives.

4.2 Response Rate

The total number of questionnaires distributed was two hundred and eighty seven 287. These questionnaires were self-administered to employees of Commercial Bank in Nyeri County, Kenya. A total of 250 questionnaires were significantly returned properly completed as shown below, 30 of them were not returned due to absenteeism in relation to their job related duties. This represented an overall response rate of 87.1 % as shown in Table 4.1. According to Kothari (2007), a response rate of 50 percent is acceptable to analyze and publish, 60 percent is good, 70 percent is very good and beyond 80 percent is an excellent response rate. Saunders, et al., (2003) on the other

hand indicate that 30% to 50 % response rate is reasonable enough for statistical generalizations. Therefore, this good response rate 87.1% was attributed to the data collection procedure, where the' researcher personally administered questionnaires to the respondents who filled them. The researcher collected the filled questionnaires later. This response rate demonstrated willingness to respond to study.

Table 4.1: Response rate

Response rate	Sample size	Percent
Returned questionnaires	250	87.1
Unreturned questionnaires	37	12.9
Total	287	100.0

Source: researcher, (2018)

4.3 Demographic Information

In this part of research presents the background information of the respondents which included gender, age, highest level of education and number of years in business.

4.3.1 Gender of Respondents

The study sought to establish the gender distribution of the respondents and the findings are presented in Table 4.2. From the results, both male and female respondents participated in the study and results show that 66.4% (166) were male, 33.6% (84) were female. The results clearly show that the two genders were adequately represented in this study.

Table 4.2 Gender Distribution of the Respondents

		Frequency	Percent
Valid	Male	166	66.4
	Female	84	33.6
	Total	250	100.0

Source: researcher, (2018)

4.3.2 Position in the company

The findings of the study established that 10(5%) were the branch managers, 40(16%) of them were operation officers, 60(25%) of them were credit officers, 46(18.4%) were tellers, 36(14.4%) were customer care officers, 16(6.4%) were ICT officers and 42(16.8%) of them were business relationship officers as shown in Table 4.3

Table 4.3 Position in the company

		Frequency	Percent
Valid	Branch Managers	10	5.0
	Operation managers	40	16.0
	Credit officers	60	25.0
	Tellers	46	18.4
	Customer care officers	36	14.4
	ICT officers	16	6.4
	Business relationship officers	42	16.8
	Total	250	100.0

Source: researcher, (2018)

4.3.3 Respondents' Number of Working years

The findings showed that 40(16%) of the respondents had worked for less than a year, 95(38%) had worked for a period of between 1 and 5yrs, 85(34%) had worked for a period of 6 to 10 yrs and 30(12%) had worked for over 10yrs as shown in Table 4.4

Table 4.4 Number of years working in the Bank

	Frequency	Percent
Less than a year	40	16.0
Between 1 and 5 yrs	95	38.0
Between 6 and 10 yrs	85	34.0
Above 10 yrs	30	12.0
Total	250	100.0

Source: researcher, (2018)

4.3.4 Level of Education

The findings showed that 91(36.4%) majority of respondents had acquired Diploma level 89(35.6%) of the respondents had acquired University education, 36(14.4%) were graduates and 34(13.6%) had acquired master's degree level. This result can justify that there exist a close and professionalism between the individuals performing the jobs in various department and their professions as shown in Table 4.5

Table 4.5 Level of Education

	Frequency	Percent
Diploma	91	36.4
Undergraduate	89	35.6
Graduate	36	14.4
Masters	34	13.6
Total	250	100.0

Source: researcher, (2018)

4.3.5 Strategic Information Systems

As shown in table 4.6 the findings showed that 200(80%) of the respondents agreed that the bank had strategic information systems while 50(20%) disagreed with the statement.

Table 4.6: Strategic Information Systems

	Frequency	Percent
Yes	200	80.0
No	50	20.0
Total	250	100.0

Source: researcher, (2018)

4.2 Descriptive analysis

Information was obtained on the study according to objectives. Likert based responses were in form of very large extent, large extent, moderate extent, little extent and not at all rated 1-5 in that order. Descriptive analysis was used to calculate mean to explain the results of this objective. It must be noted that the mean is the average value of response for each item on the Likert scale. This is simply the sum of the values divided by the number of values. The implication is that the item with the highest mean is the one which most of respondents chose or rated highly and vice versa.

4.2.1 Effect of internet banking on Performance

Table 4.7 Effect of internet banking on Performance

Internet banking	Very large extent		Large extent		Moderate extent		Little extent		Not at all		Mean
	F	%	F	%	F	%	F	%	F	%	
Customers receive balance enquiry alerts through their phone	25	10.0	80	32.0	100	40	20	8.0	25	10.0	3.240
Customers receive SMS alert on new banking products and services	45	18.0	75	30.0	84	33.6	16	6.4	30	12.0	3.356
Customers make enquiries about their account through phone	50	20.0	80	32.0	75	30.0	20	8.0	25	10.0	3.440
Customers can make money transfers from their phone	30	12.0	30	12.0	45	18.0	79	31.6	66	26.4	3.460
Customers can deposit money to their account through phones	45	18.0	75	30.0	80	32.0	50	20.0	0	0	2.516
Customers receive periodical promotional messages on new banking products	25	10.0	50	20	80	32.0	75	30.0	20	8.0	2.940

Source: researcher, (2018)

The findings in table 4.7 showed that 25(10%) of the respondents agreed to a very large extent that customers receive balance enquiry alerts through their phone, 80(32%) agreed to a large extent, 100(40%) of them agreed moderate extent, 20(8%) of them agreed to a little extent and 25(10%) did not agree on any. According to customers receive SMS alert on new banking products and services 45(18%) of the respondents agreed with the statement at a very large extent, 75(30%) of them agreed at large extent, 84(33.6%) of them agreed on moderate extent, 16(6.4%) of them agreed at little extent and 30(12%) said not at all. 50(20%) of the respondents agreed to a very large extent that Customers make enquiries about their account through phone, 80(32%) agreed to a large extent, 75(30%) agreed moderate extent, while 20(%) agreed on little extent and 25(10%) did not all agree on any. 30(12%) of the respondents agreed at a very large extent that customers can make money transfers from their phone, 30(12%) of them agreed at large extent, 45(18%) of them agreed moderately and 79(31.6%) agreed to a little extent while 66(26.4%) did not have any to say. 45(18%) of the respondents agreed to a very large extent that Customers can deposit money to their account through phones, 75(30%) agreed to a large extent, 80(32%) agreed moderate extent while 50(20%) agreed little extent but none of them said not at all. 25(10%) agreed to a very large extent that customers receive periodical promotional messages on new banking products, 50(20%) agreed to a large extent, 80(32%) agreed moderately while 75(30%) agreed at little extent and 20(8%) did not have any to say.

The findings above shows that there are effects of internet banking on performance as shown by the means, the most use of internet banking presenting the highest mean

was customers can make money transfers from their phone. These findings corresponds with Creswell (2002) who argue that, investment in strategic information systems by firms has led to provision of state-of-the-art services to customers allowing rapid growth and increased firm performance in a very competitive marketplace. Further, Frenzel (1996) concurs that majority of the firms have invested in internet banking in a bid to tap into tech savvy customers who can transact through the internet. The internet banking can be observed as a delivery channel which helps to overcome the inherent disadvantages of a traditional mortar and brick branch.

4.2.2 Effect of mobile banking on Performance

Table 4.8 Effect of mobile banking on Performance

Mobile banking	Very large extent		Large extent		Moderate extent		Little extent		Not at all		Mean
	F	%	F	%	F	%	F	%	F	%	
Customers carry out their transaction through online services	25	10.0	50	20.0	64	25.6	91	36.4	20	8.0	2.876
Customers make online inquiry and transfers	25	10.0	85	34.0	50	20.0	70	28.0	20	8.0	3.100
Customers have access to online bill-pay	105	42.0	75	30.0	40	16.0	30	12.0	0	0	4.020
Customers access to online trust funds	25	10.0	39	15.6	50	20	100	40	36	14.4	2.668
Customers access online deposit accounts	69	27.6	105	42	20	8.0	36	14.4	20	8.0	3.668
Customers always are updated about their account information monthly through e-statement	50	20.0	105	42.0	20	8.0	55	22.0	20	8.0	3.440
Customers always give feedback through online	20	8.0	40	16.0	71	28.4	94	37.6	25	10.0	2.744

Source: researcher, (2018)

The findings in Table 4.8 showed that 25(10%) of the respondents agreed to very large extent, 50(20%) agreed to large extent that Customers carry out their transaction through online services, 64(25.6%) moderate extent, 91(36.4%) agreed to a little extent and 20(8%) said not at all. According to whether customers make online inquiry and transfers 25(10%) agreed to very large extent, 85(34%) agreed to large extent, 50(28%) agreed to moderate extent, 70(28%) agreed to a little extent and 20(8%) said not at all. 105(42%) of the respondents agreed to a very large extent that customers have access to online bill-pay, 75(30%) of them agreed to large extent, 40(16%) of them agreed on moderate extent and 30(12%) agreed to a little extent but none of them said not at all. 25(10%) of the respondents agreed to a very large extent that customers access to online trust funds, 39(15.6%) agreed to a large extent, 50(20%) agreement was to moderate extent while 100(40%) agreed to a little extent but 36(14.4%) did not agreed on any. According to whether customers access online deposit accounts, 69(27.6%) agreed to the statement to a very large extent, 105(42%) of them agreed to a large extent, 20(8%) agreed to a moderate extent, 36(14.4%) of them agreed to a little extent while 20(8%) said not at all. 69(27.6%) of the respondents agreed to a very large extent that customers access online deposit accounts, 105(42%) agreed to a large extent, 20(8%) agreed to moderate extent, 36(14.4%) agreed to a little extent and 20(8%) of them said not at all. 50(20%) of the respondents agreed to a very large extent that customers always are updated about their account information monthly through e-statement, 105(42%) of them agreed to a large extent, 20(8%) agreed to moderate extent, 55(22%) of them agreed to a little extent and 20(8%) said not at all. According to whether customers always give

feedback, 20(8%) of the respondents agreed to a very large extent, 40(16%) agreed to a large extent, 71(28.4%) agreed to a moderate extent while 94(37.6%) agreed to a little extent and 25(10%) said not at all.

According to the means observed in the findings, there are effects of mobile banking on performance in bank as shown by the high means of the variables above. Customers have access to online bill-pay was mostly agreed on as been the most use in mobile banking among the customers. These findings concurs with Haynes and Thompson (2000) who argue that mobile banking has been a key method of accessing the unbanked population who for a long time has not accessed banking services offered through traditional brick and mortar banking. Most Commercial Banks in Kenya have strategically partnered with telecommunication service providers to provide mobile banking services to customers more efficiently and effectively

4.2.3 Effect of Automated teller machines on Performance

Table 4.9 Effect of Automated teller machines on Performance

Automated teller machines	Very large extent		Large extent		Moderate extent		Little extent		Not at all		Mean
	F	%	F	%	F	%	F	%	F	%	
Customers prefer an ATM to withdraw money	100	40.0	95	38.0	55	22.0	0	0	0	0	4.180
Customers prefer an ATM due to minimal charges when transacting	100	40.0	109	43.6	41	16.4	0	0	0	0	4.236
Customers prefer an ATM to manage time	95	38.0	100	40.0	55	22.0	0	0	0	0	4.160
Customers prefer an ATM due to its convenience	75	30.0	75	30.0	80	32.0	20	8.0	0	0	3.820
Customers prefer an ATM for security purposes	59	23.6	70	28.0	50	20.0	41	16.4	30	12.0	3.348
Customers prefer an ATM for cashless transfers	30	12.0	39	15.6	75	30.0	86	34.4	20	8.0	2.892

Source: researcher, (2018)

The findings in table 4.9 showed that 100(40%) of the respondents agreed that customers prefer an ATM to withdraw money to a very large extent, 95(38%) agreed to a large extent, 55(22%) of them agreed moderately, but none of them agreed little extent or not at all. 100(40%) of the respondents agreed to a very large extent that

customers prefer an ATM due to minimal charges when transacting, 109(43.6%) of them agreed to a large extent while 41(16.4%) were moderate but none agreed little extent or not at all. 95(38%) of the respondents agreed to very large extent that customers prefer an ATM to manage time, 100(40%) of them agreed to large extent and 5(22%) agreed moderately but none agreed to little extent and not at all. 75(30%) of the respondents agreed to a very large extent that customers prefer an ATM due to its convenience, 75(30%) of them agreed to a large extent, 80(32%) agreed on the statement at moderate extent while 20(8%) agreed at little extent but none of them was against. 59(23.6%) of the respondents agreed to a very large extent that customers prefer an ATM for security purposes, 70(28%) agreed at the statement at large extent, 50(20%) of them agreed to moderate extent, 41(16.4%) agreed to little extend while 30(12%) did not at all. According to whether customers prefer an ATM for cashless transfers, 30(12%) of the respondents agreed to a very large extent, 39(15.6%) agreed to a large extent, 75(30%) agreed moderately, 86(34.4%) of them agreed to a it on little extent while 20(8%) of them said not at all.

According to the means of the findings, it shows that customers prefer an ATM due to minimal charges when transacting as this had the highest mean. These findings implied that majority of the customers preferred to transact with ATM cards compared to other means due to convenience of transacting. These findings correspond with Santha et al. (2001) who argue that the use of ATM has become exceptionally admirable and popular among customers as convenient mode of banking transactions. ATM provide customers the opportunity of saving time, cost and convenience when conducting transactions.

4.2.4 Performance indicators

Table 4.10 Performance indicators

Performance indicators	Very large extent		Large extent		Moderate extent		Little extent		Not at all		Mean
	F	%	F	%	F	%	F	%	F	%	
Adoption of SIS has contributed to increased profits among Banks	54	21.6	95	38.0	55	22.0	30	12.0	16	6.4	3.564
Adoption of SIS has contributed to minimal costs of operation of the Banks	45	18.0	70	28.0	75	30.0	44	17.6	16	6.4	3.336
Adoption of SIS has led to enhanced customer service delivery among Banks	75	30.0	70	28.0	50	20.0	30	12.0	25	10.0	3.560
Adoption of SIS has contributed to increased members of Banks	50	20.0	89	35.6	81	32.4	30	12.0	0	0	3.636
Adoption of SIS has contributed to penetration of Banks into new markets	45	18.0	125	50.0	48	19.2	16	6.4	16	6.4	3.668
Adoption of SIS enable Banks to penetrate global markets	20	8.0	48	19.2	66	26.4	91	36.4	25	10.0	2.788
Adoption of SIS enable Banks to increase its asset base	39	15.6	55	22.0	50	20.0	86	34.4	20	8.0	3.028

Source: Researcher, (2018)

Table 4.10 showed that 54(21.6%) of the respondents agreed to a very large extend that adoption of SIS has contributed to increased profits among Banks, 95(38%) agreed to a large extend, 55(22%) agreed to moderate extend, 30(12%) of the

respondents agreed to it on little extend and 16(6.4%) said not at all. 45(18%) of the respondents agreed to a very large extend that adoption of SIS has contributed to minimal costs of operation of the Banks, 70(28%) agreed to the statement at large extend, 75(30%) of them agreed on moderate extend, 44(17.6%) agreed on it little extend and 16(6.4%) said not at all. According to whether adoption of SIS has led to enhanced customer service delivery among Banks, 75(30%) agreed to the statement at a very large extend, 70(28%) agreed on it at a large extend while 50(20%) agreed on it moderate extend and 30(12%) agreed on it little extend but 25(10%) said not at all. 50(20%) of the respondents agreed to a very large extend that adoption of SIS has contributed to increased members of Banks, 89(35.6%) agreed on the statement at large extend, 81(32.4%) agreed on moderate extend while 30(12%) agreed to it on little extend but none said not at all. 45(18%) of the respondents agreed to a very large extend that adoption of SIS has contributed to penetration of Banks into new markets, 125(50%) of the respondents agreed to a large extend, 48(19.2%) moderately agreed while 16(6.4) agreed to a little extend but 16(6.4%) said not at all.

According to whether adoption of SIS enables Banks to increase its asset base, 39(15.6%) agreed to the statement to a very large extend, 55(22%) agreed to a large extend, 50(20%) of them agreed to moderate extend, 86(34.4%) agreed on little extend while 20(8%) said not at all. According to whether adoption of SIS enable Banks to penetrate global markets, 20(8%) of the respondents agreed on the statement at a very large extend, 48(19.2%) agreed to it at large extend, 66(26.4%) agreed to it on moderate extend, 91(36.4%) of the respondents agreed to the statement on little.

The study means shows that SIS affects performance of the bank as they presented high means showing that adoption of SIS has contributed to penetration of Banks into new markets as it had the highest mean.

4.3 Correlation Analysis on study Variables

The study did the correlation matrix in order to check whether there was association between variables. To achieve this Pearson's correlation was carried out. It was appropriate because all the variables were in interval scale. Correlation coefficient shows the magnitude and direction of the relationship between the study variables. The correlation coefficient varies over a range of +1 through 0 to -1. When r is positive, the regression line has a positive slope and when r is negative, the regression line has a negative slope. Table 4.11 showed correlation between the study variables. The study sought to find out the strength of the relationship between internet banking, mobile banking, automated teller machine and performance at commercial banks.

The findings indicated that there is a positive correlation between mobile banking and performance of commercial banks ($r=0.928$, $p<0.05$). Therefore, an increase in mobile banking increased the performance. Results of the study also showed that there is a significant positive correlation between internet banking and performance ($r= 0.847$, $p<0.05$), implying an increase in internet banking improved the performance. Also there was a significant positive correlation between automated teller machine and performance ($r= 0.859$, $p<0.000$), implying an increase in automated teller machine improved the performance.

Table 4.11 Correlation Analysis of the Variables

		Performance Indicators	Internet Banking	Mobile banking	Automated Teller Machines
Performance Indicators	Pearson Correlation	1			
	Sig. (2-Tailed)				
	N	250			
Internet Banking	Pearson Correlation	.847**	1		
	Sig. (2-Tailed)	.000			
	N	250	250		
Mobile banking	Pearson Correlation	.928**	.940**	1	
	Sig. (2-Tailed)	.000	.000		
	N	250	250	250	
Automated Teller Machines	Pearson Correlation	.859**	.927**	.924**	1
	Sig. (2-Tailed)	.000	.000	.000	
	N	250	250	250	250

** , Correlation Is Significant At The 0.01 Level (2-Tailed).

Source: Researcher (2018)

There is a positive relationship between performance of Commercial Banks in Nyeri County and internet banking, mobile banking and automated teller machines of magnitude 0.847, 0.928 and 0.859 respectively. The positive relationship indicates that there is a correlation between strategic information systems and performance of Commercial Banks in Nyeri County, Kenya. Mobile banking having the highest value and internet banking having the lowest correlation value. This notwithstanding, all the

factors had a significant p-value ($p < 0.05$) at 95% confidence level. This implies that mobile banking was the most significant factor, followed by automated teller machines and internet banking being the least significant.

4.3.1 Regression Assumptions

Before a regression analysis was performed, the assumptions concerning the data were made. According to Antonakis, & Deitz, (2011) ignoring the regression assumptions contribute to wrong validity estimates. When the assumptions are not met, the results may result in Type I or Type II errors, or over- or under-estimation of significance of effect size (Osborne & Waters, 2002). Multiple regressions are widely used to estimate the size and significance of the effects of a number of independent variables on a dependent variable (Neale, Eaves, Kendler, Heath, & Kessler, 1994). Multiple linear regressions require at least two independent variables, which can be nominal, ordinal, or interval/ratio level variables. The assumptions of multiple regressions that were considered during this study include normality, linearity, homoscedasticity and multicollinearity.

4.3.1.1 Normality

Multiple regressions assume that variables have normal distributions (Darlington, 1968; Osborne & Waters, 2002). This means that errors are normally distributed, and that a plot of the values of the residuals will approximate a normal curve (Keith, 2006). The researcher tests this assumption through visual inspection of normality plots (Osborne & Waters, 2002) as shown in Figure 4.1.

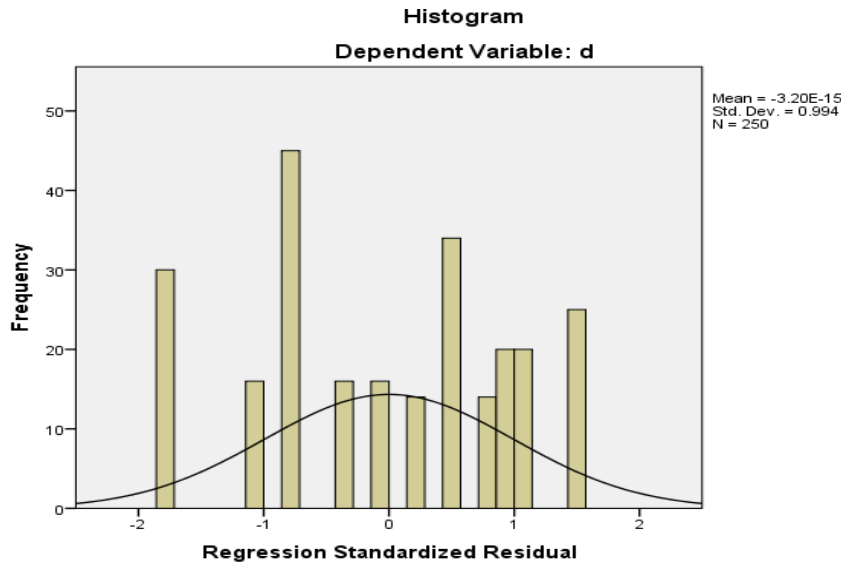


Figure 4.1 Histogram with normal distribution

The assumption was based on the shape of normal distribution and gave the researcher knowledge about what values to expect (Keith, 2006). Histograms are bar graphs of the residuals with a superimposed normal curve that show distribution was a histogram with normal distribution from the SPSS software.

4.3.1.2 Linearity

Linearity defines the dependent variable as a linear function of the predictor (independent) variables (Darlington, 1968). Multiple regressions accurately estimated the relationship between dependent and independent variables when the relationship is linear in nature (Osborne & Waters, 2002). Residual plots showing the standardized residuals vs. the predicted values and are very useful in detecting violations in linearity (Stevens, 2009). The residuals magnify the departures from linearity (Keith, 2006). If there is no departure from linearity you would expect to see a random scatter about the horizontal line. Any systematic pattern or clustering of the residuals

suggests violation (Stevens, 2009). When the relationship between the dependent and independent variables is not linear, the results of the regression analysis will under- or over- estimate the true relationship and increase the risk of Type I and Type II errors (Osborne & Waters, 2002). Figure 4.2 visually demonstrates both linear relationships. This is evident when the variance around the regression line is the same for all values of the predictor variable.

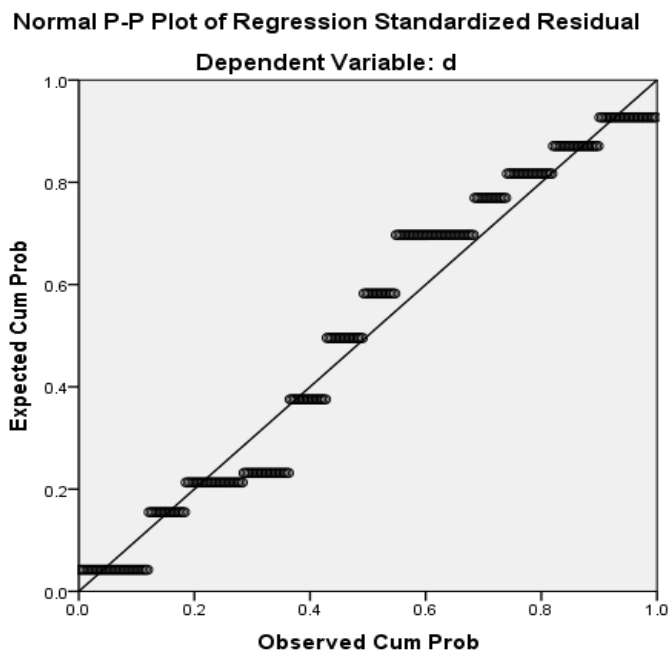


Figure 4.2. Normal P-Plot.

4.3.1.3 Homoscedasticity

The assumption of homoscedasticity refers to equal variance of errors across all levels of the independent variables (Osborne & Waters, 2002). Homoscedasticity was checked by visual examination of a plot of the standardized residuals by the regression standardized predicted value (Osborne & Waters, 2002). Homoscedasticity was checked using the standardized residual scatter plot. According to Huizingh (2007), the distribution of the residuals should be rectangular, with most of the scores

concentrated in the centre along the zero (0) point. The results in Figure 4.3 showed that standardized residuals were concentrated in the centre (around 0) and their distribution was rectangular. This is an indication that the variance of the residuals about the dependent variable scores were the same, an indication that homoscedasticity was not a problem.

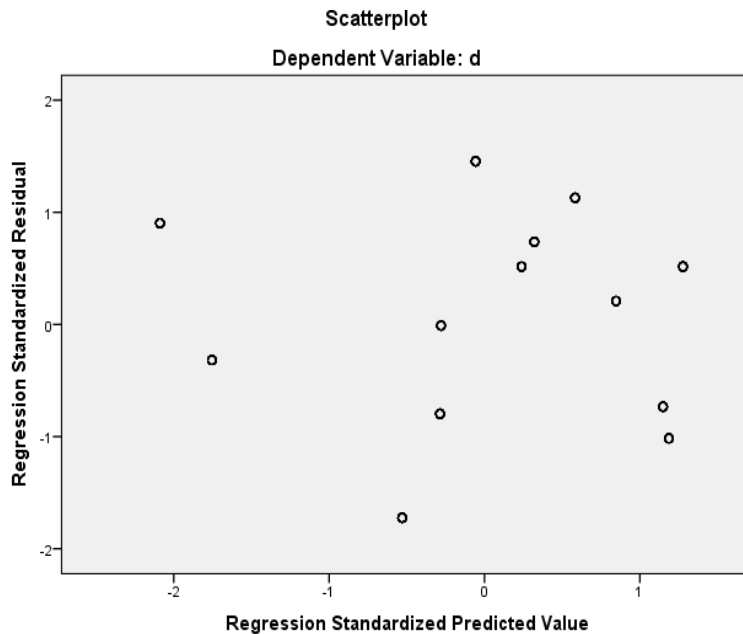


Figure 4.3: Standardized Residuals of the Homoscedasticity Test

4.3.1.4 Multicollinearity

Multicollinearity refers to the assumption that the independent variables are uncorrelated (Keith, 2006). Multicollinearity occurs when several independent variables correlate at high levels with one another, or when one independent variable is a near linear combination of other independent variables (Keith, 2006). The more variables overlap (correlate) the less able researchers can separate the effects of variables. Tolerance and variance inflation factors (VIF) statistics were used to carry out the diagnosis. The results of the multicollinearity test in Table 4.13 reveal that the

tolerances of the three constructs ranged from 0.482 to 0.767. VIF scores ranged from 1.30 to 2.07. For this model, VIF values are all below 10 and tolerance statistics are all well above 0.2 and we can conclude that there was no Collinearity (Bowerman & O'Connell, 1990). This implies that the variation contributed by each of the independent factors was significantly independent and all the factors should be included in the prediction model. The results indicated that multicollinearity was not present among the explanatory variables. The assumption on multicollinearity was deemed to have been met as shown in Table 4.12.

Table 4.12 Collinearity statistics

	Tolerance	VIF
1 (Constant)		
Internet banking	.909	1.103
Mobile banking	.876	1.141
Automated teller machine	.922	1.084

4.4 Regression Analysis

In addition, a multiple regression analysis was conducted so as to test the statistical relationship among variables (independent) on performance of commercial banks. The statistical package for social sciences (SPSS version 22) was applied to code, enter and compute the measurements of the multiple regressions for the study.

4.4.1 Hypotheses testing

The study intended to investigate whether there was a significant relationship between strategic information systems and performance of commercial banks in Nyeri County. Basing on the three independent study variables, the researcher aimed at establishing its relationship (internet banking, mobile banking and automated teller machines on performance (dependent variable). The study was guided by three research hypotheses which were;

H₀₁ there is no significant influence of internet banking on performance of commercial banks operating in Nyeri County, Kenya.

The study findings indicated that there was a positive significant relationship between Internet banking and performance ($\beta=0.166$ and p value= 0.0050). Therefore, a unit increases in Internet banking led to an increase in performance by 0.166, since the p -value was less than 0.05 as shown in table 4.13. These findings are in agreement with Jayawardhena and Foley (2000) who asserted that internet banking can be viewed as a delivery channel which helps to overcome the inherent disadvantages of a traditional mortar and brick branch hence use of internet banking to carry out transactions has a positive influence on bank performance.

H₀₂ there is no significant influence of mobile banking on performance of commercial banks operating in Nyeri County, Kenya.

The study findings depicted that there was a positive significant relationship between mobile banking on performance ($\beta=0.411$ and p value= 0.001) as shown in Table 4.13. Therefore, a unit increase in mobile banking leads to an increase in performance by 0.411. These findings are in line with the findings of Njenga (2009) who established

that adoption of mobile banking has influenced competition and the degree of contestability in banking industry. It has led to banks coming up with more innovative products and thus attracting more customers.

H₀₃ there is no significant influence of automated teller machines on performance of commercial banks operating in Nyeri County, Kenya.

The study findings indicated that there was a positive significant relationship between automated teller machine and performance ($\beta=0.750$ and p value= 0.000). Therefore, a unit increase in automated teller machine led to an increase in performance index by 0.750 , since the p -value was less than 0.05 as shown in Table 4.13. The findings are in line with findings of Ratan (2008) who established that effective service delivery through automated teller machine guarantees quality excellence and superior performance and provide independence to the customers.

Table 4.13 Regression Coefficients

a. Dependent Variable: performance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	-.056	.565		.778	.437		
Internet banking	.166	.054	.107	1.791	.005	.909	1.103
Mobile banking	.411	.117	.213	3.516	.001	.876	1.141
ATM	.750	.121	.367	6.209	.000	.922	1.084

Source: researcher, (2018)

4.4.2 Strategic information systems and performance regression model

Model summary

A multiple regression model was used to explore the relationship between Strategic information systems (internet banking, mobile banking and automated teller machine) on performance. The R^2 represented the measure of variability in performance at commercial banks that strategic information systems are accounted for. From the model, ($R^2 = .74.7$) showing that strategic information system account for 74.7% variation in performance. The strategic information systems predictor used in the model captured the variation in the performance at commercial banks in

Table 4.14 Overall model summary

R	R square	Adjusted R Square	Std. Error of the Estimate
.864 ^a	.747	.729	.12959

Source: Researcher (2018)

4.4.3 ANOVA Model

The analysis of variance was used to test whether the model could significantly fit in predicting the outcome than using the mean as shown in (Table 4.15). The regression model with strategic information system as a predictor was significant (F=21.219, p value =0.000) shows that there is a significant relationship between strategic information system and performance. Thus, reject the null hypothesis that there is no significant relationship between strategic information system and performance.

Table 4.15: ANOVA Model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	36.829	3	12.276	21.219	.000 ^b
	Residual	142.327	246	.579		
	Total	179.156	249			

a. Dependent Variable: d
b. Predictors: (Constant), c, a, b

Source: Researcher (2018)

4.5 Discussions

In addition, the β coefficients for strategic information system as independent variable were generated from the model, in order to test the hypotheses of the study. The t-test was used as a measure to identify whether the strategic information system as

predictor is making a significant contribution to the model. Table 4.25 gave the estimates of β -value and the contribution of the each predictor to the model. The β -value for internet banking, mobile banking and automated teller machine had a positive coefficient, depicting positive relationship with performance as summarized in the model as:

$$Y = -.056 + 0.166X_1 + 0.411X_2 + .750X_3 + \varepsilon_1 \dots\dots\dots \text{Equation 4.1}$$

Where: Y = performance, X_1 = internet banking, X_2 = mobile banking, X_3 = automated teller machine, ε_1 = error term

From the findings the t-test associated with β -values was significant and the strategic information system as the predictor was making a significant contribution to the model. The coefficients results showed that the predicted parameter in relation to the independent factors was significant. The study findings depicted that there was a positive significant relationship between strategic information system and performance with automated teller machine making the highest impact.

4.5.1 Effect of mobile banking on performance

The study established that majority of the respondents used mobile banking. The study found out that the customers made use of mobile banking by carrying out online transactions, online bill pay and also while managing their accounts. Most of them agreed that they preferred use of mobile banking as it is convenient and timely despite the challenges of network and at times some delays are experienced. These findings corresponds with Haynes and Thompson (2000) who argue that mobile banking has been a key method of reaching the unbanked population who for a long time has not accessed banking services offered through traditional brick and mortar banking. Most

commercial banks in Kenya have strategically partnered with telecommunication service providers to provide mobile banking services to customers more efficiently and effectively

4.5.2 Effects of internet banking on performance

The study found out that majority of the respondents were making use of internet banking these was reflected in that most of them agreed that customers receive balance inquiry alerts through their phones and also the customers could make online transaction using their phones. These findings are in agreement with Frenzel (2006) who found out that majority of the firms have invested in internet banking in a bid to tap into tech savvy customers who can transact through the internet. The internet banking can be viewed as a delivery channel which helps to overcome the challenges facing customers with limited time and long distance.

4.5.3 Effect of Automated teller machines on Performance

The study also found out that Automated teller machines had an impact on Performance of the bank. Majority of the respondents agreed that customers prefer an ATM due to minimal charges when transacting and also they prefer an ATM to withdraw money. These findings are in line with the findings of Santha *et al.* (2001) who argue that the use of ATM has become exceedingly admirable and popular among customers as convenient mode of banking transactions. ATMs provide customers the opportunity of saving time, cost and convenience when conducting transactions

4.5.4 Performance indicators

The study established that SIS has an impact on the performance of commercial banks. The study found out that adoption of SIS has contributed to penetration of Banks into new markets and also increased members of Banks. The findings are in line with the findings of Siami (2006) also revealed that SIS has benefited banks by allowing innovation of products and service that the customer needed but maybe never asked for. Such services include online bill payments which allow a customer to pay their bills online at their own time. Through this feature a customer can schedule the bill payments in advance, set up recurring payments on regular bills and even view the payment history.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This major objective of this chapter provides a summary of the major results findings of this study, offer conclusions and make recommendations for practice and suggestions for further research based on the results of this study.

This chapter presents summary and limitations of the study findings as per the study objectives. Due to issues of SIS among Commercial Banks in Kenya, the study sought to establish the influence of internet banking, mobile banking and Automated teller machines on the performance of Commercial Banks in Nyeri County. To establish the problem data was analyzed using correlation and regression methods to establish the relationship effect between variables of the study.

5.2 Summary of Major Findings

The main objective of this study was to determine the influence of Strategic Information Systems and performance of Commercial Banks in Nyeri County, Kenya. In particular the study sought to establish the influence of internet banking on the performance of Commercial Banks in Nyeri County, determine the influence of mobile banking on the performance of Commercial Banks in Nyeri County. And finally to determine the influence of Automated Teller Machines on the performance of Commercial Banks in Nyeri County.

5.2.1 Influence of Internet Banking on the Performance

After conducting the data analysis, it was revealed that customers of Commercial Banks in Nyeri County adopted internet banking practices on a large extent despite

challenges of consumer awareness on how to use electronic services. Most of the customers preferred internet banking services due to its security, provided twenty four hour access of their accounts, accessed their accounts from virtual location and accessed a variety of information concerning loans, investments and interest rates through online.

However, on the other hand, it emerged that some consumers were highly dogmatic in nature to adopt the new ideas introduced by the Commercial Banks. It was identified that some of the customers were rigid to traditional banking services that provided the opportunity to them to interact with employees of the Commercial Banks for more clarification.

5.2.2 Influence of Mobile Banking on the Performance

The complexities of the system and internet accessibility by customers of the banks were the challenges pointed out. The study also revealed that mobile banking services adopted by consumers at a large extent due to a number of opportunities ranging from payments of bills, transfer of funds, confirmation of account balance and review of their transaction.

However, on the other hand, it emerged that some of the customers were unable to their accounts using their phones due to system challenges. Commercial Banks systems were too slow to deliver instant information to customers. It was established that internal business processes of Commercial Banks were not upgraded to send electronic SMS to customers with regard to new products and general account information. This was due inappropriate technology that was used by Commercial Banks in customer service delivery.

5.2.3 Influence of Automated Teller Machines on the Performance

The study established that majority of the respondents preferred conducting their financial transactions using an Automated Teller Machine Services due to their convenience, security, efficiency and effectiveness. The customers preferred the ATM mode due to less charges associated when withdrawing cash and making payments using debit cards. However, on the other hand, it was further established that customers did not make enquiries through websites due to lack of internet accessibility. The Commercial Banks automated all their departments despite the challenge of training staff and customers.

Some of the customers received account information through SMS Alert after withdrawing and depositing money. The study found out that customers did not have access to online account opening facility since the system did not allow customers to post their passports through online. Despite satellite branches internet connectivity, it was established that customer queued for long periods due to system delays. Most of the customer information was not reflected at the branch level due to system errors that were experienced occasionally. The study finally established that there was a positive relationship between independent variables (internet banking, mobile banking, and automated teller machines) and dependent variable (performance of Commercial Banks in Nyeri County, Kenya).

5.3 Conclusions

Based on the findings of the study, it can be concluded that internet banking has remained a competitive drive in the banking industry performance. It can be argued that most of the bank customers preferred internet banking services due to its security,

provided twenty four hour access of their accounts, accessed their accounts from virtual location and accessed a variety of information concerning loans, investments and interest rates through online.

Further, it was concluded that mobile banking had resulted to drastic decline of employee costs, marketing costs and international transactions. In addition, it provides a platform of accessing financial information more efficiently and minimized costs associated to fraud cases and customer borrowing costs.

Adoption of automated teller machines platforms by commercial banks had led to reduced operational costs, increased profitability, improved customer service delivery, new product development, employee motivation and information access. The backbone of any developing or developed economy is aspects of globalization, deregulation, competition, costs of operation, changing customer trends are aspects that have contributed to adoption of strategic information systems among Commercial Banks in Kenya. Furthermore, Commercial Banks to gain competitive edge and contribute to social economic developments in a country, the Government should support research and developments activities through internet connectivity to empower both large and small firms in the market.

Reduction of levies of electronic products by the Kenya Revenue Authority in the Kenya market will promote financial services of Commercial Banks both in the local and global markets. Therefore, it can be concluded that, for Commercial Banks to achieve their goals using SIS practices, they should conduct awareness campaign intended to change the attitude and perceptions of customers in the market with regard to new technology.

5.4 Recommendations

The study established that the extent of internet banking services was large despite the challenges of customer awareness. Therefore, this study recommends that Commercial Banks should allocate adequate financial resources to create maximum awareness of their internet banking services and training their internal and field staff. Gradual change approaches should be adopted by Commercial Banks in managing the transition of traditional banking practices to modern banking practices. Attitudes, perceptions and motivations of customers should be managed using social marketing campaigns intended to influence customers change their attitudes towards new technology.

The study found that mobile banking services had a significant influence on performance of Commercial Banks despite the challenges of system accessibility by customers. Therefore, this study recommends that Commercial Banks should upgrade their systems in order to encourage customers to access their accounts using their mobiles. Customers should be encouraged through social marketing campaigns in partnership with mobile phone companies to adopt phones that will enable them to access their account information.

Furthermore, the study established that majority of the respondents preferred conducting their financial transactions using an Automated Teller Machine Services due to their convenience, security, efficiency and effectiveness. Therefore, this study recommends that Commercial Banks should improve or upgrade their debit cards to provide an opportunity of accessing a variety of services by customers. Opening more

outlets in the country will enhance the penetration of electronic services and expansion of the market share.

The study also established that despite satellite branches internet connectivity, it was established that customer queued for long periods due to system failure. Therefore, this study recommends that Commercial Banks should adopt the fiber optic cable internet to increase the speed of services delivery to customers thus efficiency and effectiveness. It is therefore important that Commercial Banks constantly improve and upgrade their e-banking system's security.

In order to change the perception, the Commercial Banks will be required to post security provisions on their websites so as to increase confidence and improve trustworthiness of the e-banking systems. It can be concluded that Commercial Banks should invest in Information technology infrastructure for their competitive advantage in the market. With the changing business environment, the only driver of Commercial Banks against globalization and competition challenge is to institutionalize technological culture in the system to enhance efficiency and effectiveness.

5.5 Suggestions for Further Research

Future studies should explore the reasons behind the influence of strategic information systems on performance of Commercial Banks by focusing on different variables like e-commerce, continuous improvement and business process re-engineering. Researchers should go ahead and establish the reasons behind the failure of SIS practices among Commercial Banks. Future studies should seek to minimize the challenges experienced by Commercial Banks when trying to adopt SIS.

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APPENDICES

Appendix I: Summary of Knowledge Gaps

Author	Focus of the Study	Findings	Knowledge Gaps	Focus on the Current Study
Nakhumwa (2013)	Adoption of e-commerce payment systems by Commercial Banks in Kenya	Established that banks support the contention that investments in electronic commerce create value for shareholders	Focused on E-commerce but not SIS	To establish the effect of ATM on performance of Commercial Banks in Nyeri County
Nakhumwa (2013)	Adoption of e-commerce payment systems by Commercial Banks in Kenya	established that there is a statistical relationship between SIS and performance of banks	Focused on E-commerce but not SIS	To establish the effect of mobile banking on performance of Commercial Banks in Nyeri County
Bhatnagar (2012)	Customer relationship management in banking need for a strategic approach	Revealed that mere investment in IT will not result in superior performance, but the organization must work and identify innovative ways to create firm-wide IT capability	Focused on Customer Relations Management but not SIS	To establish the effect of ATM on performance of Commercial Banks in Nyeri County
Aduda and Kingoo (2012)	The relationship between electronic banking and financial performance among Commercial Banks in Kenya	Revealed that investment in e-banking has a positive relationship with bank performance at 1% level.	Focused on electronic banking and financial performance but not the effect of SIS on performance of Commercial Banks	To establish the effect of ATM on performance of Commercial Banks in Nyeri County
Wajid, Omar, Sultan, Ehsan (2012)	the impact of information Technology on efficiency of Banks in Pakistan	Established that Banks have increased the number of ATM locations while majority have	The study was conducted in Pakistan and efficiency of banks	To establish the effect of ATM on performance of Commercial Banks in Nyeri County

		linked their networks to networks of other banks.		
Muriuki (2011)	Effect of technology adoption on agency banking Among Commercial Banks in Kenya	Established that banking industry has been embracing new strategic information systems in order to fulfill the dreams of their customers and to create healthy competition.	Focused technology and agency banking	To establish the effect of internet banking on performance of Commercial Banks in Nyeri County
Musangu and Kekwaletswa (2011)	Strategic information systems planning and environmental uncertainty: the case of South African small micro and medium enterprises	Established that mobile banking is a service which allows customers of a bank to access a number of banking services such as making financial transactions and inquiries through a mobile device.	Focused on Small Medium Enterprises in Africa but not Commercial Banks in Kenya	To establish the effect of mobile banking on performance of Commercial Banks in Nyeri County
Teymouri & Ashoori (2010)	The impact of information technology on risk management	Established that ATMs provide convenience to customers as one is able to access their account throughout the ATM network.	Focused on Information Technology on risk management but not SIS on performance	To establish the effect of mobile banking on performance of Commercial Banks in Nyeri County
Salwe, Ahmed, Aloufi, Kabir, (2010)	Strategic Information Systems alignment with business strategy	Found out that through increased service channels, SIS has also contributed to an increased market share as more customers continue to enroll for these services.	Focused on alignment of SIS but not the effect of SIS on performance of Commercial Banks	To establish the effect of internet banking on performance of Commercial Banks in Nyeri County
Njenga (2009)	Mobile phone banking and usage experiences in Kenya	Revealed that adoption of SIS has influenced competition and the degree of contestability in banking industry	Focused on mobile phone banking and usage but not SIS on performance of Commercial Banks	To establish the effect of mobile banking on performance of Commercial Banks in Nyeri County

Ratan (2008)	Using technology to deliver financial services to low-income households in Equity Bank in Kenya	established that effective service delivery through ATMs guarantees quality excellence and superior performance and provides independence to the customers	Focused on use of technology but not SIS on performance of Commercial Banks	To establish the effect of ATM on performance of Commercial Banks in Nyeri County
Kanini (2008)	Implementing strategic information systems in commercial banks in Kenya	Established that investment in SIS by Commercial banks has led to provision of state-of-the-art services to customers allowing rapid growth and increased bank's performance in a very competitive marketplace.	Focused on implementation of strategic information systems and different variables like training, culture and policies but not variable of this study	To establish the effect of internet banking on performance of Commercial Banks in Nyeri County
Siami (2006)	Role of electronic banking services on the profits of Jordanian banks	Revealed that SIS has benefited banks by allowing innovation of products and service that the customer needed but maybe never asked for.	Focused on the role of electronic banking but not SIS on performance of Commercial Banks	To establish the effect of mobile banking on performance of Commercial Banks in Nyeri County
Jayawardhena and Foley (2000)	Changes in the banking sector- the case of internet banking in the UK	Established that majority of the banks have invested in internet banking in a bid to tap into tech savvy customers who can transact through the internet.	Focused on the Banking sector in the UK but not Commercial Banks in Nyeri County, Kenya	To establish the effect of internet banking on performance of Commercial Banks in Nyeri County

Appendix II: Introductory Letter

**Salome Achieng,
University of Eldoret,
Kenya.**

TO WHOM IT MAY CONCERN

Dear Respondent,

REF: MBM RESEARCH STUDY

I am a student pursuing a Masters degree in Business Management (Strategic Management) at the University of Eldoret. In partial fulfillment of the requirements to the award of the Masters degree, I am required to carry out a study on **“Strategic Information Systems on Performance of Commercial Banks. A case of Nyeri County, Kenya”**

The choice is based on your strategic importance in the achievement of organizational goals according to vision 2030 of Kenya hence improved performance of the organization in terms of efficiency and effectiveness. I kindly request your assistance by availing time to respond to the questionnaire. Kindly read each question carefully and please tick and write as necessary. The information given will be treated with utmost confidentiality for the purpose of this study only. No specific reference will be made on your organization and only a summary of results will be made public.

Thank you in advance.

Appendix III: Questionnaire for Employees of Commercial Banks

SECTION A: Background Information

Name of the Bank.....

What is your designation?

1. For how long have you been working in the Bank?

Less than a year []

Between 1 and 5 years []

Between 6 and 10 years []

Above 10 years []

2. What is the level of your education?

Diploma level []

Undergraduate level []

Graduate level []

Masters []

Others

3. Does your Bank have Strategic Information Systems?

Yes [] No []

SECTION B: STRATEGIC INFORMATION SYSTEMS AND PERORMANCE OF COMMERCIAL BANKS IN NYERI COUNTY

Clearly Tick the following questions using the Likert scale as indicated below.

Key:

Very Large Extent [5 Points]

Large Extent [4 Points]

Moderate Extent [3 Points]

Little Extent [2 Points]

Not at All [1 Point]

4. To what extent do you agree with the following statements regarding the effect Mobile banking on the performance of your Bank?

MOBILE BANKING	Very Large Extent[5]	Large Extent [4]	Moderate Extent [3]	Little Extent [2]	Not at All [1]
Customers carry out their transaction through online services					
Customers make online inquiry and transfers					
Customers have access to online bill-pay					
Customers access to online trust funds					
Customers access online deposit accounts					
Customers always are updated about their account information monthly through e-statement					
Customers always give feedback through online					

5. How else does mobile banking influence performance of your Bank?
-

6. To what extent do you agree with the following statements regarding the effect of internet banking on performance of your Bank?

INTERNET BANKING	Very Large Extent[5]	Large Extent [4]	Moderate Extent [3]	Little Extent [2]	Not at All [1]
Customers receive balance enquiry alerts though their phone					
Customers receive SMS alert on new banking products and					
Customers make enquiries about their account through phone					
Customers can make money transfers from their phone					
Customers can deposit money to their account through phones					
Customers receive periodical promotional					

7. How else does internet banking influence performance of your Bank?

.....

.....

8. To what extent do you agree with the following statements regarding the effect ATM on performance of your Bank?

AUTOMATED TELLER MACHINES	Very Large Extent[5]	Large Extent [4]	Moderate Extent [3]	Little Extent [2]	Not at All [1]
Customers prefer an ATM to withdraw money					
Customers prefer an ATM due to minimal charges when transacting					
Customers prefer an ATM to manage time					
Customers prefer an ATM due to its convenience					
Customers prefer an ATM for security purposes					
Customers prefer an ATM for cashless transfers					

9. How else does ATM influence performance of your Bank?

.....

.....

10. To what extent do you agree with the following indicators mentioned as measures of performance by your Bank?

PERFORMANCE INDICATORS	Very Large Extent[5]	Large Extent [4]	Moderate Extent [3]	Little Extent [2]	Not at All [1]
Adoption of SIS has contributed to increased profits among Banks					
Adoption of SIS has contributed to minimal costs of operation of the Banks					
Adoption of SIS has led to enhanced customer service delivery among Banks					

Adoption of SIS has contributed to increased members of Banks					
Adoption of SIS has contributed to penetration of Banks into new markets					
Adoption of SIS enable Banks to increase its asset base					
Adoption of SIS enable Banks to penetrate global markets					

11. What are other factors that are used by your Bank to measure performance?

.....

.....

.....

12. What are your views about SIS on performance? Suggest ways of improving performance of your Bank.

.....

.....

Thank you for your Cooperation

Appendix IV: List of Commercial Banks in Nyeri County, Kenya

1. Barclays Bank of Kenya Limited
2. Co-operative Bank of Kenya Limited
3. Credit Bank Limited
4. Diamond Trust Bank Kenya Limited
5. Sidian Bank Ltd
6. Equity Bank Kenya Limited
7. Family Bank Limited
8. KCB Bank Kenya Limited
9. National Bank of Kenya Limited
10. NIC Bank Limited

Appendix V: Research Authorization



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: 020 400 7000,
0713 788787,0735404245
Fax: +254-20-318245,318249
Email: dg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref. No. **NACOSTI/P/17/99297/19564**

Date: **3rd November, 2017**

Salome Achieng Nyabola
University of Eldoret
P. O. Box 1125-30100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on *“Influence of Strategic Information Systems on performance of Commercial Banks. A case of Nyeri County, Kenya”* I am pleased to inform you that you have been authorized to undertake research in **Nyeri County** for the period ending **3rd November, 2018**.

You are advised to report to **the County Commissioner and the County Director of Education, Nyeri County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

**GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner
Nyeri County.

The County Director of Education
Nyeri County.

Appendix V: Research Permit

THIS IS TO CERTIFY THAT:
MS. SALOME ACHIENG NYABOLA
of UNIVERSITY OF ELDORET, 0-30100
ELDORET, has been permitted to conduct
research in Nyeri County
on the topic: INFLUENCE OF STRATEGIC
INFORMATION SYSTEMS ON
PERFORMANCE OF COMMERCIAL BANKS.
A CASE OF NYERI COUNTY, KENYA.
for the period ending:
3rd November,2018

Permit No : NACOSTI/P/17/99297/19564
Date Of Issue : 3rd November,2017
Fee Recieved :Ksh 1000



.....
Applicant's
Signature

Palawa
.....
Director General
National Commission for Science,
Technology & Innovation