

**INFLUENCE OF TECHNOLOGICAL CHANGE MANAGEMENT ON  
COMPETITIVE ADVANTAGE OF TIER 1 COMMERCIAL BANKS IN  
NAKURU, KENYA**

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**A Research Project Presented to the Institute of Post Graduate Studies of  
Kabarak University in Partial Fulfillment of the Requirements for the Award of  
the Master of Business Administration Degree (Strategic Management Option)**

**NOVEMBER 2019**

## DECLARATION

### Declaration by the Candidate:

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

Signature .....

Date .....

**Linda Matelong**

**GMB/NE/0450/05/17**

## **RECOMMENDATION**

**To the institute of Postgraduate Studies:**

The research project entitled **“INFLUENCE OF TECHNOLOGICAL CHANGE MANAGEMENT ON COMPETITIVE ADVANTAGE OF TIER 1 COMMERCIAL BANKS IN NAKURU, KENYA”** and written by **Linda Matelong** is presented to the Institute of Postgraduate Studies of Kabarak University. We have reviewed the research proposal and recommend it be accepted in partial fulfillment of the requirement for award of the degree of Master of Business Administration (Strategic Management Option), of Kabarak University.

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## **DEDICATION**

This work is dedicated to my family members as sign of love and appreciation to them. They have me so supportive throughout this work. May God bless you.

## ABSTRACT

Tier one commercial banks in Kenya operate under an extremely competitive environment in which there is competition for market share, customer numbers, loan clients, deposits and profitability levels. One of the strategies that have been adopted for the purposes of building competitive advantages is the adoption of new technologies. However, the manner in which change management is undertaken is critical in the commercial banks gaining competitive advantages given the context that these technologies are often similar across the banks. This study therefore sought to examine the role of technological change management on the competitive advantage of tier one commercial banks. This study sought examine the influence of mobile banking applications, internet banking, electronic queue management system and deposit taking ATMs on competitive advantages of tier one commercial banks in Nakuru town. This study was guided by the Dynamic Capability Theory, the Technology Acceptance Theory and . This study used descriptive research design targeting seven Tier 1 banks operating in Nakuru town from which the accessible population was their management teams from operations, IT and customer care service department. The study used a census approach and purposively selected the respondents. The study used a pre-tested structured questionnaire to collect data for the study. Data was analyzed using both descriptive and inferential statistics. The findings revealed that mobile banking ( $\beta = 0.366$ ,  $p \leq 0.05$ ), internet banking ( $\beta = 0.342$ ,  $p \leq 0.05$ ), electronic queue management ( $\beta = 0.382$ ,  $p \leq 0.05$ ) and deposit taking ATMs ( $\beta = 0.421$ ,  $p \leq 0.05$ ) were all significant factors to the competitive advantage of Tier 1 banks in the study area. The study, therefore, recommends that; the commercial banks should need to invest in the development of universal mobile phone applications; the banks need to develop more internet applications that can be easily integrated on popular visitor platforms like whatsapp, Facebook and PayPal; there is need for system developers to further integrate the electronic queue management to the banking services, such as, mobile phone alerts. Finally, there is need for the banks to embark on an awareness campaign on the capability of the deposit taking ATMs.

**Keywords:** *Deposit Taking ATMs, Electronic Queue Management System, Internet Banking, Mobile Banking, Tier 1 Commercial Banks*

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## **ABBREVIATIONS AND ACRONYMS**

<b>ATM:</b>	Automated Teller Machine.
<b>CBD:</b>	Central Business District.
<b>CBK:</b>	Central Bank of Kenya.
<b>HDFC:</b>	Housing Development Finance Corporation Limited.
<b>ICICI:</b>	Industrial Credit and Investment Corporation of India.
<b>ICT:</b>	Information and communication and Technology.
<b>I-CVI:</b>	Item Level Content Validity Index.
<b>KCB:</b>	Kenya Commercial Bank.
<b>NACOSTI:</b>	National Commission for Science, Technology and Innovations.
<b>SBI:</b>	State Bank of India.
<b>SPSS:</b>	Statistical Package for Social Sciences.

## DEFINITION OF OPERATIONAL TERMS

**Competitive Advantage:** The institution's acquisition of a set of attributes that allow it to outperform its competitors (Noorani, 2014). In this study, it means the ability of the Tier 1 banks to successfully overcome competition in the industry

**Deposit Taking ATMs:** This refers to automated teller machines that have the capacity to receive cash and cheque from customers and charges no ATM fees (Kumbhar, 2011). In this study, this refers to ATMs that help in cash deposit mobilization.

**Electronic Queue Management System:** This refers to wireless control of customer flow in a banking allow and it works in first come first serve (Agwaro, 2017). In this study, it refers to customized queue devices that management human traffic in the banking hall

**Internet Banking:** This refers to electronically making financial transaction in a bank account via internet (Mulwa, 2017). In this study, it refers to applications developed by the Tier 1 banks that enable their clients to do transactions with them online.

**Mobile Banking Applications:** This refers to the use of mobile phones or smartphones to access financial services of a banks (Kithaka, 2014). In the context of this study it refers to applications developed by the Tier 1 banks to enable their clients transact business with them using their mobile phones.

**Technological Change Management:** The procedures and techniques an organization takes to prepare and equip intended users of new and automated operations to meet desired objectives by the organization (Gobanga, 2012). In the context of this study, it refers to the approach the Tier 1 banks take when migrating to new technologies or to automate their processes.

**Tier 1 Commercial banks:** Refers to commercial banks that are considered safe by the Central Bank of Kenya (CBK) due to large number of customer deposits, net assets and loan facilities and they control almost 50% of the Kenyan banking market share (Central Bank of Kenya, 2014).

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background of the Study

Commercial banks operate under extremely competitive industry across the world. In Europe, Dunkley (2017) notes that the banking sector is extremely competitive due to the emergent threat from fintech companies. In 2015, Roberts (2017) notes that commercial banks in Europe expected to lose up to 22 billion euros in the payment industry due to new services by technology firms. In the United States, Roberts (2017) captured the competitive nature of US commercial banks competitive industry. Roberts (2017) noted that in the 2017 wells fargo with had been the largest US bank by customer deposit in Charlotte region lost the spot to Bank of America. The Wells Fargo continued its market decline from 15.21% in 2016 to 15.03% in 2017 within Charlotte region (Roberts, 2017). Nationally, the Bank of America which had been the largest commercial bank by customer deposits lost its spot to JP Morgan in 2017. In 2016, the JP Morgan had also surpassed wells Fargo by market capitalization aspects.

In Africa, the banking industry is extremely competitive across the continent. In Ghana, PriceWaterHouseCoopers., (2017) notes declining market share of UniBank Ghana Limited (UGL) one of the country's top performing banks which was attributed to high competition from new entrants in its core markets. In south Africa, (Jaadan, 2018) noted an increasing competitive market environment in terms of the market share as indicated by customer numbers. In this context, both the ABSA bank and standard bank had lost customers to the tune of three hundred thousand and while Capitec, and Nedbank had gained customer numbers for the 2017 financial years (Jaadan, 2018). In Kenya, there is an increasingly competitive competition amongst the large pier group of banks that is KCB bank, Equity Bank, Cooperative Bank, Barclays Bank, Standard Chartered Bank, Diamond Trust Bank, Commercial Bank of Africa, and Stanbic bank (Dzombo, Kilika, & Maingi, 2017). There are 43 registered commercial banks in Kenya whereby 28 of them have their branches in Nakuru Town. There are seven tier one commercial banks in Kenya and all of them have their branches in Nakuru County. These banks are Kenya Commercial Bank (KCB), Equity Bank, Barclays Bank, Standard Chartered Bank, Cooperative Bank, Stanbic Holdings andDiamond Trust Bank (Karanja, 2011).

Tier one commercial banks are defined to commercial banks that are considered safe by the Central Bank of Kenya (CBK) due to large number of customer deposits, net assets and loan facilities and they control almost 50% of the Kenyan banking market share. For the 2013 financial year, KCB had 12.83% market share, Equity bank (9.79%), Cooperative Bank (8.61%), Standard Chartered Bank (8.096%) and Barclays bank (7.65%) (Central Bank of Kenya, 2014). In the 2016 financial year, Central Bank of Kenya., (2017) noted that the market share of the banks to stand as follows: KCB (14.1% market share), Equity Bank (10.0% market share), cooperative bank of Kenya (9.9% market share), Barclays of Bank (7.00% market share), Standard Chartered bank (7.00% market share), Diamond Trust Bank (6.4% market share) and stanbic (5.10% market share) (Central Bank of Kenya., 2017). Due to the high competition within the banking the banking sector there is need for commercial banks to adopt strategies give them competitive advantages.

Competitive advantage refers to the leverage of superiority an organization or business has over its rivals (Noorani, 2014). It is also defined as the favorable market position an organization seeks in order to deliver more to a target market than what its competitors can provide (Awuah, 2011). Alokpo (2016) further argues that competitive advantages relates to the institution's acquisition of a set of attributes that allow it to outperform its competitors. Within the context of commercial banks, diverse metrics have been used to measure the concept of competitive advantages including; number of customers, superiority of bank products, quality of financial services and leadership in market (Karanja, 2011); customer numbers increase, new products development, customer retention, and increase in profitability (Thuo, 2015); product quality, market share, cost efficiency, and staff competences (Thagana, 2013).

The use of technology has been one of the main ways of achieving competitive advantages in diverse organizations. However, the adoption of these new technologies and ability to reap benefits from their usage may be influenced by change management aspects. Change management refers to set of strategies, principles and techniques applied to major change initiatives in an organization (Kilato, 2014). Change management has also been defined as control of drivers of transformation in an organization and observing the resultant attitudes and beliefs of people in the organization (Otiso, 2008). Tudor & Bisa, (2015) defines change management as the discipline that guides an organization on how to prepare and equip individuals in organization for successful transition in an event of change in operations.

Technology on the other hand is defined as knowledge in science put into practical use to solve a problem or to invent useful tools (Braaf, 2011). Braaf (2011) defines technology as an instrumental design that is used to automate operation and reduce uncertainty in achieving desired outcomes. Technological change management refers to the procedures and techniques an organization takes to prepare and equip intended users of new and automated operations to meet desired objectives by the organization (Gobanga, 2012). Technological change management relates to the deployment and adoption of new technologies and management of the processes involved in these processes in order to improve or enhance performance.

There are diverse ways in which the technological change management influences competitive advantages of organizations. These includes employee perceptions towards technological changes, employee competences on new technologies, management of technological change and functions of new technologies. Agboola (2014) indicates that employee perception towards technological changes influences competitive advantages of the organization through employees' perceived ease of use and perceived usefulness of the technology significantly. These two factors influence the adoption levels of the new technologies. Other aspects that can influence adoption of new technologies include fear of losing current jobs and uncertainty in technological change (Mohammed, 2013). Milimu (2016) further noted that employee attitude towards new technology often influence adoption levels and hence the ability to reap maximum benefits from the technology.

The employee competences on new technology is a critical component in gaining competitive advantages. Ng'eno (2012) indicates that employees required training to enable them utilize new technologies and those with a know-how in the use of the new technologies were utilized by the institutions. Mohammud (2016) noted that inadequacies in employee competencies in the use of the new technology which resulted to failure in meeting employees' expectations for their job. Mohd and Kassim (2013) noted that employees' skills and competencies had significant influences on organization's competitive advantages. Mwanza (2012) indicate that lack of enough employees with the required competences often overwork those in the know how aspects.

The management of technological changes is critical for leading to competitive advantages in organizations. Mutisya (2010) noted that managing change in technology is critical in leading to competitive advantage. This occurs through continuous communication on the technological changes, provision of feedback on change progress and coaching of people



involved in change programs. Mohammed (2013) further noted that management of technological changes led to addressing employee resistance in respect to the technology adoption aspects.

The technological change brings in new technologies which have the capacity to lead to competitive advantage. The functions of these new technologies are critical in leading to competitive advantage. Amongst the aspects of new technologies that can be applied include application in transaction and cheques imaging transmission, settlements of payment on a gross basis in real time, account opening process, loan approval process, credit card services, and sales force automation (Mbigura, 2012). Ng'ang'a (2014) noted that technological change can lead to competitive advantages reduction of operational costs and marketing aspects amongst others.

## **1.2 Statement of the Problem**

Tier one commercial banks in Kenya operate under an extremely competitive environment in which there is competition for market share, customer numbers, loan clients, deposits and profitability levels(Ouma, 2016). One of the strategies that have been adopted for the purposes of building competitive advantages is the adoption of new technologies(Kithaka, 2014). The technologies that have been adopted in the banking sector in Kenya include mobile banking, internet banking, deposit receiving ATMs, Queue Management Systems, and diverse core banking platforms(Mayieka, 2015). However, the manner in which technological change management is undertaken is critical in the commercial banks gaining competitive advantages given the context that these technologies are often similar across the banks. However, the aspect of technology change management has not been explored in previous studies. Other studies that have examined the role of change management include Meja (2009) who examined the role of change management practices at Equity bank; Olivia (2014) who examined the role of leadership on strategic change management in commercial bank and Arupe and Nairoti (2014) who examined strategic change management at National bank of Kenya. These studies did not address the role of technological change management on the competitive advantages of the tier one commercial banks. The present study, therefore, sought to fill the existent gaps on the role of technological change management on competitive advantage in banks through the variables; mobile banking applications, internet banking, electronic queue management system and deposit taking ATMs on competitive advantages of tier one commercial banks in Nakuru on competitive advantages of tier one commercial banks.

### **1.3 Purpose of the Study**

The general objective of the study was to examine the role of technological change management on competitive advantage of tier 1 commercial banks in Nakuru, Kenya.

### **1.4 Objectives of the Study**

This study sought to meet the following specific objectives;

- i. To examine the influence of mobile banking applications on competitive advantages of tier one commercial banks in Nakuru
- ii. To determine the influence of internet banking on competitive advantages of tier one commercial banks in Nakuru
- iii. To establish the influence of electronic queue management system on competitive advantages of tier one commercial banks in Nakuru
- iv. To determine the influence of deposit taking ATMs on competitive Advantages of tier one commercial banks in Nakuru

### **1.5 Research Hypotheses**

The study was guided by the following research questions;

**H<sub>01</sub>:** There is no statistically significant influence of mobile banking applications on competitive advantages of tier one commercial banks in Nakuru

**H<sub>02</sub>:** There is no statistically significant influence of internet banking on competitive advantages of tier one commercial banks in Nakuru.

**H<sub>03</sub>:** There is no statistically significant influence of electronic queue management system on competitive advantages of tier one commercial banks in Nakuru

**H<sub>04</sub>:** There is no statistically significant influence of deposit taking ATMs on competitive advantages of tier one commercial banks in Nakuru.

### **1.6 Significance of the Study**

The information generated in this study can enable various stakeholders in the banking sector and other allied sectors to come up with better approaches to manage changing technologies in the industry. Specifically, the outcome of the study is expected to guide tier 1 commercial banks in managing technological changes that are meant to improve their transaction processes in order to have a competitive advantage against other commercial banks in the market. Other stakeholders allied to the Tier 1 banks such as the financial services industry and the technology developers are expected to use the study findings to augment their efforts in making successful migration into new technologies and also considering change management challenges when developing new technologies. Policy makers in the banking

and allied services are also meant to benefit from the study findings as their operations are increasingly dependent on technology especially for the purposes of monitoring. Therefore, understanding technology change management would enable them to formulate policies that foster seamless migration into new technologies. Finally, the outcome of the study is meant to address the concerns of future researchers interested in expounding on areas that may require further investigations in this field. The study will contribute to the existing literature in the fields of strategic management, ICT.

### **1.7 Scope of the Study**

The study was carried out among 7 tier 1 commercial banks operating within Nakuru Town. The study focused on role of technological change management on competitive advantage of tier 1 commercial banks. The study targeted the management team of the 7 tier 1 commercial banks and whereby a sample size of 35 personnel from the management team of the banks was sampled. The study was carried out for a period of exceed 6 months as it is the stipulated period to carry out a study as this level of academic award. The study utilized a budget of Ksh. 48,000.

### **1.8 Limitations and Delimitations of the Study**

This study expected to meet some challenges in data collection. Due to the policies on information sharing within the commercial banks in Kenya, some of the respondents were hesitant in providing information sought in this study for fear of sharing the information obtained to their competitors. The study overcame this limitation by assuring the respondents that the information they provided for this study will only be used for academic purposes. In addition, the researcher showed them the introduction letter from Kabarak University and authorization letter from the National Commission for Science, Technology and Innovations (NACOSTI) that outlined the purpose of the study.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Chapter two gives the literature review. The chapter covers the following sections; the theoretical review, empirical review, knowledge gap and conceptual framework.

#### **2.2 Theoretical Review**

This study was guided by Dynamic Capability Theory, .

##### **2.2.1 Dynamic Capability Theory**

Dynamic Capability Theory was developed by Teece, Pisano, and Shuen in 1997 to explain how an organization adapts to internal and external changes in an organization(Nyaboke, 2014). It states that an organization purposively seeks to adapt to ever changing business environment. Dynamic Capability Theory focuses on the firm's ability to integrate changes in the environment using the resource base of the organization. The capability can be either within the management teams or management approaches or even within the functions of the change initiatives(Trkman, 2010). How an organization integrates the changes into the business creates differentiation that results into competitive advantage by the organization. Therefore, the Dynamic Capability Theory explains how an input can be translated into output and be able to have more gains and loses. This theory has been applied in organization adopting new changes such as technological changes to improve performance of the organization. This theory was used to guide the current study in regard to the role of technological change management on competitive advantage of tier 1 commercial banks in Nakuru, Kenya.

##### **2.2.2 Technology Acceptance Theory**

Technology acceptance theory was introduced by Davis (1989), is an adaptation of the theory of reasoned action specifically tailored for modeling user acceptance of information systems. The goal of the theory is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behavior across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified. Ideally one would like a model that is helpful not only for prediction but also for explanation, so that researchers and practitioners can identify why a particular system may be unacceptable, and pursue appropriate corrective steps. A key purpose of the theory, therefore, is to provide a basis for tracing the impact of external factors

on internal beliefs, attitudes, and intentions. Technology acceptance theory was formulated in an attempt to achieve these goals by identifying a small number of fundamental variables suggested by previous research dealing with the cognitive and affective determinants of computer acceptance.

The technology acceptance theory has also been used by researchers to explain why a particular system may or may not be acceptable to users. It hypothesizes that there are two beliefs, perceiving usefulness and perceiving ease of use, which are variables that primarily affect the user acceptance. The theory is relevant to the study because it suggests that the external variables indirectly affect individuals' attitude toward adoption of information communication technology acceptance by influencing perceived usefulness and perceived ease of use. External variables might include individual user attributes, social factors or those related to their job tasks. Therefore, the current study was adequately guided by Technology Acceptance Theory in regard to the role of technological change management on competitive advantage of tier 1 commercial banks in Nakuru, Kenya.

### **2.2.3 Kurt Lewin change theory model**

The Kurt Lewin change theory model was introduced by Lewin (1947). The model is based around a 3-step process (Unfreeze-Change-Freeze) that provides a high-level approach to change. It gives a manager or other change agent a framework to implement a change effort, which is always very sensitive and must be made as seamless as possible. The Kurt Lewin change theory or model can help a leader do the following three steps: Make a radical change; Minimize the disruption of the structure's operations, and; Make sure that the change is adopted permanently (Furst & Cable, 2008). Unfreezing means getting people to gain perspective on their day-to-day activities, unlearn their bad habits, and open up to new ways of reaching their objectives (Glew et al., 1995). Basically, the current practices and processes have to be reassessed in order for the wheels of change to be set in motion. In terms of change implementation, it is expected that once team members have opened up their minds, change can start. The change process can be a very dynamic one and, if it is to be effective, it will probably take some time and involve a transition period. In order to gain efficiency, people will have to take on new tasks and responsibilities, which entails a learning curve that will at first slow the organization down (Gong, Huang & Farh, 2009).

Change will only reach its full effect if it's made permanent. Once the organizational changes have been made and the structure has regained its effectiveness, every effort must be made to

cement them and make sure the new organization becomes the standard (Knights & Murray, 1994). Further changes will be made down the line, but once the structure has found a way to improve the way it conducts its operations, “re-freezing” will give the people the opportunity to thrive in the new organization and take full advantage of the change. This three-step model gives a manager or change agent an idea of what implementing change means when dealing with people. The 3 phases of the Kurt Lewin model provide guidance on how to go about getting people to change: a manager will implement new processes and re-assign tasks, but change will only be effective if the people involved embrace it and help putting it into practice it (Phaal, Farrukh & Probert, 2006).

Therefore, as the present study was concerned with managing changes in the technology sector, the Kurt Lewin change theory model was appropriate in providing a framework for understanding these changes.

## **2.3 Empirical Literature Review**

### **2.3.1 Technological Change Management**

Many companies experience disruptive changes when their core product or process technologies shift dramatically. Such shifts in technology present major management challenges. One thing most leaders can agree on: Adopting the right technology will ultimately help grow your business and (eventually) make everyone’s job easier, if they’re on board and the adoption is managed correctly. The rapid changes are very well witnessed in many industries recently. But there have been event when an organization faced failure due to misjudgment and miscalculation about how innovations and technologies should be presented and used. Mercedes Benz and Sony has born losses and because of new complex systems and failure to predict the technological demand from customer market. These situations were termed as disruptive technology and innovation by many authors. Samsung in its line of mobile phones and LED televisions has outclassed many others in innovations and customer oriented technology. Drew (2006) presented a scenario planning approach for industries which are experiencing disruption through technology. Analysis of technological innovation is becoming difficult because of different innovation types in product development (Garcia & Calantone, 2002; Jamali et al.,2014) many literature writers used radical, incremental, discontinuous and disruptive. It was classified that disruptive innovations into low-end disruption and new-market disruption.

The technical industry is sprouting on a daily basis and the altering environment is exhilarating globally. The challenge is for the organizations playing in the field to deal with the competition and to beat the rivals, it is necessary to face the issues like diversified or multi-cultured workforce, complex technology, disoriented strategies etc. Therefore it is required for the companies to incorporate changes in their structure (Rousseau & Stuck, 2012; Khoje et al., 2013). The procedure of change management at the multi-national corporations can be classified into local subsidiary MNCs and global MNCs. The change at local subsidiaries is conducted under the international, technological and economic aspects; for example: launch of new good, making of good, etc. While for global MNCs, the national particulars are influenced by the globalized schemes, strategies and framework of MNCs (Sorge et al., 2001).

The scenario planning approach is important for identifying potential disruptive technology, mapping out development path and using organizational capabilities to make use of opportunities behind them. It was suggested that use of scenario planning approach is suitable for innovation disruption. The managers were advised to take responsibility of their decision and use scenario planning method on other than disruptive innovations by making customization in it (Christensen et al. 2004; Zohoori et al., 2013).

### **2.3.2 Mobile Banking Applications and Competitive Advantages**

Mobile banking has been studied by many researchers with its influence in banking sector. Too, Ayuma, and Ambrose (2016) carried out a study to examine the effect of using mobile banking on the financial performance of commercial banks operating within Kapsabet Town in Kenya. The study specifically focused on the effect of mobile banking withdrawals, deposits, payment of bills, funds transfer and loans on financial performance of the commercial banks in Kapsabet Town. Descriptive research design was used by the study and a target population of 336 individuals, who comprised of the management team, head of departments, banks staff and customers. The study sample was 180 selected through stratified random sampling. Research questionnaires and interviews were used to collect data. Using regression analysis, the study found out that using mobile banking to withdraw and deposit cash (beta coefficient of -0.409), using mobile banking to obtain loans (beta coefficient of 0.296), making funds transfer using mobile banking (beta coefficient of -0.269), as well as payment of bills (beta coefficient of 0.704), cumulatively explained 32.6% of the variability in

financial performance of commercial banks in Kapsabet Town. This model was found to be statistically significant due to its p-value for the f-test value being below 0.05.

A study by Kithaka (2014) sought to examine the effect of mobile banking on the financial performance of commercial banks in Kenya. The study focused on all licensed commercial banks using mobile banking. The study used cross sectional descriptive survey design and applied both quantitative and qualitative approaches. The study population was 43 licensed commercial banks in Kenya which were all sampled using census research method. The study relied on secondary data from the banks' financial reports. Financial performance measurements used by the study were Return on Assets and Return on Equity. The study found out that the annual money moved through mobile banking and number of mobile users influence financial performance in terms of return on equity as well as return on assets. In this regard, a unit increase in the amount moved through mobile banking resulted to 0.671 units increase in financial performance of commercial banks in Kenya with other factors held constant as indicated by a beta coefficient of 0.671. In regard to number of mobile banking users, the study found out that a unit increase in the number of mobile banking users, the financial performance of commercial banks in Kenya increased by 0.738 units. The influence was found to be statistically significant at 5% significance level.

Focusing on commercial banks in Kenya that have already implemented mobile banking technology, Njoroge (2014) out a study to examine the effect of using mobile banking technology on performance of the banks. The study conceptualized bank performance as financial performance. The study targeted all the 44 commercial banks in Kenya that used mobile banking technology and through census research method, the 44 were all sampled. The study obtained its data by reviewing financial reports that are available in the respective banks' website. The study found out that total mobile banking loan, mobile banking transaction charges, mobile banking total deposits and funds through mobile banking explained 12% of the variance in return on assets of the commercial banks. This influence was found to be statistically significant as indicated by  $F(4,407)=7.790$  and  $p<0.05$ .

On Rwandan context, Harelimana (2017) carried out a study to establish the impact that mobile banking has on the financial performance of commercial banks. The study focused on one commercial bank in Rwanda, Unguka Microfinance Bank Ltd. The study used descriptive research design to guide the study. The target population for the study was 67 people. The study used a sample of 50 employees who comprised of 24 senior managers and



26 bank staff. Data was collected by use of questionnaires. Using a Likert Scale of five points where 1=strongly disagree and 5=strongly agree, the study found out that withdrawals were the major uses of mobile banking with a mean of (4.34), then bill payment with a mean of 4.16 and followed by checking financial statements with a mean of 4.00. The study found out that deposits and money transfer were rarely used services in mobile banking due to means of 1.88 and 1.36 respectively.

### **2.3.3 Internet Banking and Competitive Advantages**

Internet banking has been given attention by some researcher in diverse contexts. Mulwa (2017) carried out a study to examine the effect of internet banking on financial performance of Kenyan commercial banks. The study adopted descriptive research design and targeted 40 commercial banks in Kenya. Data was collected using questionnaires as well as review of secondary data sources such as financial statements for the respective banks. Using correlation analysis, the study found that there exists a positive and significant correlation between online customer deposits ( $r=0.792$ ,  $p=0.001$ ), online bank transaction ( $r=0.617$ ,  $p=0.0012$ ), fees and commission ( $r=-0.469$ ,  $p=0.0011$ ), internet banking expenditure ( $r=-0.682$ ,  $p=0.012$ ) and return of assets for the commercial banks in Kenya. The study further established that online customer deposits, online bank transaction, fees and commission, and internet banking expenditure cumulatively accounted for 67.34% of the variability in return on assets for the commercial banks in Kenya. This was due to an R-Square value of 0.6743 in a regression model that was found to be statistically significant at 5% significance level.

Kombe and Wafula (2015) sought to find out how financial performance of commercial banks in Kenya is affected by internet banking. The study focused on one Kenya Commercial Banks (KCB) in Mombasa. The internet banking aspects that were focused on include internet connectivity, 24 hour e-banking and ICT competence of the customers. The study adopted descriptive survey research design to meet its objectives. The study targeted all its 51 employees but selected a sample of 31 respondents to whom research questionnaires were issued. The study found out that majority of the respondents (67.7%) agreed that internet banking lowers the transaction cost of banking. The study further found out that 58.1% of the respondents cheaper internet led to extended client base and created competence to bank employees. It was also found out that 64.5% of the respondents agreed that internet banking leads competitive advantage of banks against its competitors. In regard to ICT competence,

the study found out that 51.6% of the respondents agreed that possession of ICT devices by bank customers is essential in internet banking.

Focusing on listed commercial banks in Kenya, Mateka, Gogo and Omagwa (2016) sought to establish whether or not internet banking affects financial performance of the banks. Descriptive survey research design was used by the study. The study targeted all employees of the listed commercial banks in Kenya. The sample size for the study was 124 employees of the listed commercial banks operating within Nairobi County. Study data was obtained through administering research questionnaires. The study found out that 55% of variation in bank income is attributable to internet banking and whereby a unit increase in internet banking results to 0.896 units increase in banks income with other factors held constant. This was supported by R-Square value of 0.550 and beta coefficient of 0.896. The study further found out that internet banking accounted for 45.2% of variation in bank operational costs and whereby one unit increase in internet banking resulted to an increase of 0.836 units in operational costs with other factors held constant. It was also established that internet banking explained for Loan book 45.6% of variation in loan book and 42.4% of variation in customer deposits. The influence was found to be statistically significant using 95% confidence interval.

A study was carried out in Vietnam by Uyen (2015) to measure the impact internet banking on bank performance. The study measured bank performance in terms of profit ratios, operational costs and bank income. The study used secondary data focusing on the banks performance for the year 2009 to 2014. The study found out that one unit increase in internet banking resulted to 0.1820 and 0.2891 units increase in return of assets and return on equity respectively provided other factors were held constant. It was further established that, with other factors held constant, a unit increase in internet banking resulted to 0.5242 and 0.1535 units increase in operational expenses and banks' income respectively.

#### **2.3.4 Electronic Queue Management System and Competitive Advantage**

The role of electronic queue management system have been examined by diverse scholars across the world. Focusing on Huduma centres in Kenya, (Agwaro, 2017) examined the role of automated queuing on the service delivery in the centres. The study adopted a descriptive research design with a sample size of 70 respondents were purposively chosen across the Huduma centres in the country. Using a five point likert scale, the study found diverse

advantages of using electronic queue management , the study found its diverse uses including customers having to get a ticket from the dispenser for service (mean of 4.96), automated queuing enabling a first come first served policy (mean of 4.80), and customers don't jump the queues (mean of 4.66).

The role of electronic queue management system on the customer experience was examined by Mohamud (2016) in a study on KCB bank. The study adopted a descriptive cross sectional survey research design and a sample size of 150 KCB customers that were purposively chosen. Data was collected using semi structured questionnaires. Using five point likert scale (1=Strongly Disagree and 5=Strongly Agree), the study found that electronic queue management system are associated with diverse service delivery aspects; faster services (mean of 3.36), no queue jumping (mean of 3.69), saving of time in the banking hall (mean of 3.47), electronic queue management system being easy to use (mean of 3.33), electronic queue management system being reliable (mean of 3.26) and convenience in electronic queue management system use (mean of 3.80). Using regression analysis, the study found that a unit increase in automated queuing system was associated with a 0.138 increase in service delivery aspects due to a beta coefficient of 0.138. However, these results were not found to be statistically significant due to a p value of greater than 0.05 which was the level of significance.

In a study based in Ethiopia, Arega (2017) examined the role of queue management on the customer satisfaction levels. Structured questionnaires were used for the purposes of data collection aspects and a sample size of 659 respondents were utilized. The study used correlational analysis to examine the role of queue management system and customer satisfaction levels. The study found a positive correlation of 0.577 in relations to perceived waiting time and customer satisfaction levels; waiting environment and customer satisfaction levels had a correlation of 0.366; and queue discipline was positively correlated with customer satisfaction levels at a correlation of 0.320. Using a five point likert scale, the study found that satisfaction with perceived waiting time had a mean of 2.96; satisfaction with waiting environment had a mean of 2.24; and satisfaction with priority given the elderly and pregnant women had a mean of 3.69.

Still focusing on the role of electronic queue management system and competitive advantage, Austria (2015) examined the queue management practices on the service delivery within

restaurants in Philippines. The study used a sample size of 363 respondents derived from five restaurants and a structured questionnaires were used for the purposes of data collection. Using a five point likert scale, the study indicated the diverse manner in which the electronic queue management influenced service delivery. In this context, the study noted that there was implementation of first come first serve rule (mean of 3.87), efficient service to elderly clients and pregnant mothers (mean of 3.89), and there was no preferential treatment to VIP customers (mean of 3.37). Using regression analysis, a unit increase in automated queuing led to 0.863 increase in service quality due to a beta coefficient of 0.863. These results were found to be statistically significant at 5% level of significance due to p value of 0.000.

### **2.3.5 Deposit Taking ATMs and Competitive Advantage**

There are diverse scholars that have examined the role of ATMs on the competitive advantages in commercial banks. Kumbhar (2011) undertook a study that sought to examine customer satisfaction levels with ATM services in India. The study adopted a sample size of 150 respondents composed of customers from both public and private sector commercial banks. Structured questionnaires were utilized as the data collection instrument for the study. Using a five point likert scale, the study sought to examine the differences in the competitiveness of diverse dynamics of the ATMs in public sector banks and private sector banks. In this context, the study found that in respect to system availability public sector commercial banks had a mean of 4.04 compared to private sector banks of 4.32; security and responsiveness (private sector 3.60 and public sector 3.55); easiness and competitiveness (private sector 3.94 and public sector 3.88). The study therefore concluded the ATMs gave the private sector commercial banks advantages in the context that their ATM services were seen to be more responsive and to have higher system availability capacities.

In Nigeria, Olumide (2014) undertook a study that sought to examine the role of ATM on customer satisfaction levels amongst their customers. The study was a comparative analysis of three commercial banks in Nigeria that is First, Guaranty Trust, and Skye commercial banks. The study distributed 200 structured questionnaires to respondents composed of ATM users that were purposively chosen. The study found a strong and positive relationships between ATM usage and customer satisfaction within the commercial banks in Nigeria. The study also found that ATM usage was associated with reduced customer queues in the banking halls.

Focusing on the Bank of Malawi, Mwatsika (2016) examine the influence of ATM performance on the customer satisfaction levels. The study utilized five commercial banks in Malawi from where it derived its respondents. Using diverse ATM attributes, the study used regression analysis to examine the role of these ATM attributes on the customer satisfaction levels with ATMs. The ATM attributes that were utilized included user fees for the ATM usage, branding of the ATM, waiting times at the ATM, ATM security, and speed of the ATMs. The study found that ATM attributes influenced up to 63.6% of the variation in customer satisfaction levels. This was due to the various aspects of ATMs influencing customer satisfaction levels.

Singh & Komal (2009) while focusing on three commercial banks in India examined the influence of ATM on the competitiveness of those commercial banks. The study adopted a target population made of bank customers and a sample size of 360 respondents with 120 respondents purposively chosen for each commercial bank. The study found that amongst the aspects that there were varying satisfaction levels amongst the commercial banks with SBI, ICICI and HDFC commercial banks having satisfaction levels of 69%, 63% and 56% respectively. Amongst the aspects that were found to influence competitiveness levels of the ATMs included blocking of cards, machine out of cash, old notes, poor visibility of receipts, and lack of receipt print out.

Focusing on commercial banks in Nigeria, Jegede (2014) examined the influence of ATMs on the competitiveness of commercial banks. The study adopted a convenience sample of 125 respondents selected from diverse commercial banks' employees. Structured questionnaires were utilized for the study for the purposes of data collection aspects. In respect to the role of ATMs on the effectiveness of the commercial banks, a majority of 48% indicated that it influenced the effectiveness of the banking sector to a very large extent. A further majority of 37% indicated that the ATM influenced the growth of banking sector to a very high extent while a further majority of 41% indicated that the ATMs influenced the profitability of commercial banks to an average extent.

#### **2.4 Summary of Reviewed Literature**

In regard to mobile banking, Too, Ayuma, and Ambrose (2016) found out that using mobile banking to withdraw and deposit cash, obtain loans, make funds transfer and to pay bills influenced the financial performance of commercial banks. A study by Kithaka (2014) found

out that the annual money mover through mobile banking and number of mobile users influence financial performance in terms of return on equity as well as return on assets. Njoroge (2014) on the other hand found out that total mobile banking loan, mobile banking transaction charges, mobile banking total deposits and funds through mobile banking affected the return on assets of the commercial banks. On Rwandan context, Harelimana (2017) found out that withdrawals and bill payment were the major uses of mobile banking.

Focusing on internet banking, Mulwa (2017) found that there exists a positive and significant correlation between online customer deposits, online bank transaction, fees and commission, internet banking expenditure and return of assets for the commercial banks in Kenya. Kombe and Wafula (2015) found out that majority of the respondents agreed that internet banking lowers the transaction cost of banking, internet banking leads competitive advantage of banks against its competitors and that possession of ICT devices by bank customers is essential in internet banking. Mateka, Gogo and Omagwa (2016) revealed that internet banking influenced banks' income, operational costs, loan book and customer deposits. Uyen (2015) found out that internet banking influenced return of assets and return on equity.

Focusing on the role of electronic queue management system, Agwaro (2017) found out that diverse advantages of using electronic queue management such as customers having to get a ticket from the dispenser for service, automated queuing enabling a first come first served policy and customers don't jump the queues. Mohamud (2016) found that electronic queue management system was associated with increase in service delivery aspects. In a study based in Ethiopia, Arega (2017) found a positive correlation between waiting time and customer satisfaction levels; between waiting environment and customer satisfaction levels; and between queue discipline and customer satisfaction levels. In the same context, Austria (2015) revealed that automated queuing led improvement in service quality.

In respect to the role of ATMs on the competitive advantages in commercial banks, Kumbhar (2011) concluded that ATMs gave the private sector commercial banks advantages in the context that their ATM services were seen to be more responsive and to have higher system availability capacities. Olumide (2014) found a strong and positive relationship between ATM usage and customer satisfaction within the commercial banks in Nigeria. The study also found that ATM usage was associated with reduced customer queues in the banking halls. Mwatsika (2016) found that ATM attributes influenced customer satisfaction levels. Singh &

Komal (2009) found that blocking of cards, machine out of cash, old notes, poor visibility of receipts, and lack of receipt print out influenced competitiveness levels of the ATMs. Lastly, a study by Jegede (2014) found out that ATMs influenced the effectiveness of the banking sector, the growth of banking sector and the profitability of commercial banks.

## **2.5 Knowledge Gap**

From the reviewed literature, various research gaps have been identified and whereby the current study seeks to fill. Studies by Too, Ayuma, and Ambrose (2016) to examine the effect of using mobile banking on the financial performance of commercial banks was done in Kapsabet Town while the current study was done among tier 1 commercial banks in Nakuru town and therefore a conceptual gap. Competitive advantage of commercial banks is also influenced by bank sizes, however, a study by Kithaka (2014) to examine the effect of mobile banking on the financial performance and that by Njoroge (2014) to examine the effect of using mobile banking technology on performance focused in all commercial banks in Kenya in general. The current study fills this contextual gap by striding on tier one commercial banks that will help in generalization of study findings. A study by Harelimana (2017) to establish the impact that mobile banking has on the financial performance of commercial banks presents both contextual and methodological research gaps. Contextually, the study was done in Rwanda while the current study was done in Kenya. The reviewed study utilized descriptive statistics only while the proposed study used inferential statistics to link the study variables an aspect that was not done in the reviewed study.

Mulwa (2017) carried out a study to examine the effect of internet banking on financial performance of Kenyan commercial banks. The findings could have been affected by differences in bank sizes and therefore the current study focuses on tier one commercial banks which have relatively the equal bank sizes. Kombe and Wafula (2015) sought to find out how financial performance of commercial banks in Kenya but only studied one bank and therefore limiting generalizability of study findings. The current study will fill this gap by carrying out a study involving several banks for generalizability purposes. While the current study focuses on tier 1 commercial banks in Kenya, a study by Mateka, Gogo and Omagwa (2016) on the effect of internet banking on financial performance focused on listed commercial banks in Kenya and therefore a contextual research gap to be filled. Uyen (2015) carried out a study to measure the impact internet banking on bank performance but in the context of Vietnam and therefore a contextual research gap.

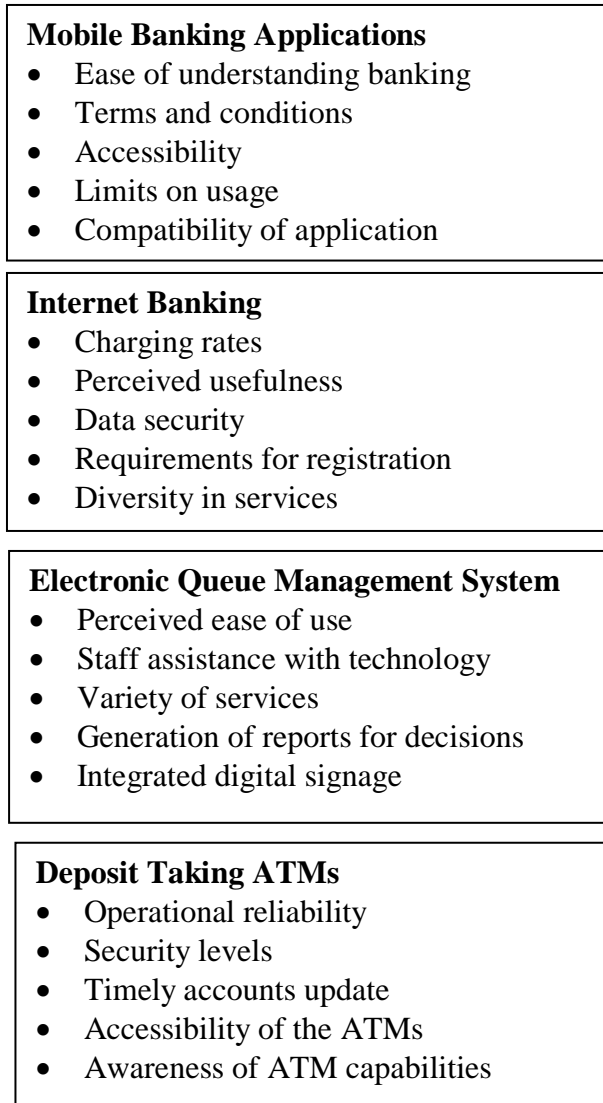
A study by Kumbhar (2011) to examine customer satisfaction levels with ATM services and that of Singh & Komal (2009) on the influence of ATM on the competitiveness of commercial banks presents a contextual research gap for they were done in India while the current study was done on Kenyan context. The studies only used descriptive statistics while the current study used inferential statistics to link the study variables, an aspect that is missing in the reviewed study. Similarly, a study by Olumide (2014) to examine the role of ATM on customer satisfaction levels amongst their customers and Jegede (2014) on the influence of ATMs on the competitiveness of commercial banks were all done in Nigerian context and therefore there is a need for study to be done on Kenyan context. Mwatsika (2016) examine the influence of ATM performance on the customer satisfaction levels but outside Kenya (Malawi). The current study sought do fill this contextual research gap but carrying out a study in Kenyan context.

## **2.6 Conceptual Framework**

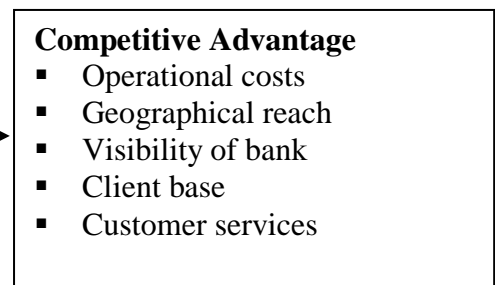
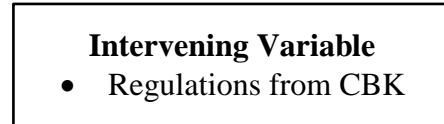
The conceptual framework as shown in Figure 2.1 was used to outline the relationship between the independent variables (mobile banking applications, internet banking, electronic queue management system, deposit taking ATMs) and the dependent variable (competitive advantage). The indicators for competitive advantage was increased turnover and profitability, expanded geographical reach, increased visibility of bank, better recruitment methods, and differentiation advantage.



### Independent Variables



### Dependent Variable



**Figure 2.1: Conceptual Framework**  
**Source: Researcher (2018)**

The conceptual framework in Figure 2.1 shows the hypothesized relationship between the dependent variable, competitive advantage, and the independent variables; mobile banking applications, internet banking, electronic queue management and deposit taking ATMs and. Through managing changes brought about by these new technologies based applications, the Tier 1 banks in the country are expected to improve in their service delivery and increase product offerings, thereby, increasing their competitiveness. The study also anticipated that the presence of the CBK regulations on technology banking may have a modifying effect on the results as intervening variables.

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

Chapter three presents the research methodology that this study used. The chapter covers the following areas; research design, target population, sampling and sampling techniques, data collection instruments, validity and reliability of the research instruments, pilot test, data analysis techniques and concludes with presentations and ethical considerations.

#### **3.2 Research Design**

Jankowicz (2005) defines research design as the strategy that is used to meet the various objectives of the study. This study used descriptive research design. Descriptive research design refers to the method whereby occurrences or phenomena are described in their natural setting as they occur without manipulation or control (Keller, 2014). This research design was useful in describing the role of technological change management on competitive advantage of tier 1 commercial banks in Nakuru town. The advantage of descriptive research design is that is able to obtain a lot of information even a small sample size like the case in this current study (Kombo & Tromp, 2009).

#### **3.3 Population of the Study**

Mugenda (2003) defines target population as a group of individuals that possess specific characteristics that a researcher is interested in and from which a sample is drawn. This study targeted employees of commercial banks operating in Nakuru town. There are 7 tier 1 commercial banks in Kenya and have their branches in Nakuru Town (Cyttonn, 2017). These banks are Kenya Commercial Bank (KCB), Equity Bank, Barclays Bank, Standard Chartered Bank, Cooperative Bank, Stanbic Holdings and Diamond Trust Bank. From the banks, the study targeted their management teams from operations, IT and customer care service department for they are best fitted to understand both technological change management aspects and competitive advantage aspects. A total of 56 banks employees comprising of 7 managers, 21 ICT personnel and 28 customer service personnel.

#### **3.4 Sampling and Sampling Techniques**

According to (Mugenda & Mugenda, 2013), a sample size is a proportion of the target population selected to give information to the study about the entire population. On the other hand, sampling techniques refers to the methods involved in selecting the sampled respondents into the study (Naissuma, 2009). The advantage of sampling is to help to reduce

the number of respondents in a study to a manageable number in terms of budget and time scope and without compromising on study findings (Ondiek, 2008). This study used census sampling to select the number of commercial banks to participate in the study. Census sampling involves complete enumeration of all the target population in the study as sample size. In this case, the sample size is equal to the target population (Orodho, 2003). The advantage of census sampling is that it presents a zero sampling error (Orodho & Kombo, 2002). The study used purposively selected all the targeted employees from the 7 tier 1 commercial banks operating within Nakuru Town. Purposive sampling involves selecting specific objects or individuals based on the information required and therefore their probability of being selected for the study is 1 (Saunders, Lewis, & Thornhill, 2009). The advantage of purposive sampling is that the researcher is able to obtain data from particular people with the required information. Purposive sampling is applicable when the entire study population does not have understanding of the subject matter under investigation (Sekaran, 2003). A total of 56 banks employees comprising of 7 managers, 21 ICT personnel and 28 customer service personnel as shown in Table 3.1.

**Table 3.1: Target Population**

<b>Personnel</b>	<b>Population</b>
Managers	7
ICT Personnel	21
Customer Service Personnel	28
<b>Total</b>	<b>56</b>

### **3.5 Instrumentation**

Sekaran and Bougie (2011) define research instruments as tools that are used for the purposes of obtaining data required in answering the research questions for a given study. The study used structured questionnaire which is a research tool that contains closed-ended questions and confines the researcher from giving information other than the one sought by the study (Shirish, 2012). This research tool provides quicker way of data collection. In addition, structured questionnaires are easy to administer they do not require the researcher to be present in the time of data collection and conceals the identity of the respondent if properly structured with such a considerations as in the case of this study (Upagade & Shende, 2012). The structured questionnaire was divided into six parts whereby the first part contained information regarding the background details of the researcher such as gender, age, and work experience. The second part to the sixth part of the questionnaire sought data in regard to the

study variables and it was based on a five point Likert Scale as follows; 1 =No extent, 2 =small extent, 3=moderate extent, 4=large extent, and 5= very large extent. Likert scale is a measuring system whereby a value is assigned to a statement to transform it from qualitative to quantitative as it is desired in this current study (Jankowicz, 2005).

### **3.5.1 Validity of the Instruments**

According to Keller (2014) validity refers to accuracy of a research tool in measuring the variable that the study intends to measure. This study used content validity index whereby five subject matter experts comprising of four bank managers and the research supervisor was used as subject matter experts. This study used Item level content validity index (I-CVI) for the study. Item level content validity index (I-CVI) is defined as evaluation of validity of a measuring tool based on each item in a latent variable (Kombo & Tromp, 2009). Any item with an item level content validity index (I-CVI) of below 0.8 was removed or improved as recommended by Mugenda (2003).

### **3.5.2 Reliability of the Instruments**

Mugenda and Mugenda (2013) defines reliability as the consistency of a measuring tool in giving true results each time is used to measure the same phenomenon on the same group of respondents. This study used Cronbach's Alpha test of internal consistency to test the reliability of research tools. Cronbach's Alpha coefficient of 0.7 and above was used to confirm that reliability of the study instruments as recommended by Mugenda and Mugenda (2013).

### **3.5.3 Pilot Test**

A pilot study is study carried out prior to actual study and usually at a small scale to help the researcher address issues that may arise before conducting the proposed study (Keller, 2014). In this study, a pilot study was carried out to test the reliability of research tools. Orodho (2003) recommends a pilot study to involve at least 10% of the sample size and should be carried out among respondents who are not selected for the actual study by shares similar characteristics. This study was carried out a three weeks before the main study pilot study among 11 (30% of sample size) senior management personnel from three tier 1 commercial banks within Nairobi CBD, namely KCB, Equity bank and Co-operative Bank.

### **3.6 Data Collection Procedures**

The first step towards data collection was to seek permission to proceed for data collection from Kabarak University through an introduction letter. The second step was to apply for authorization to collect data from the sampled respondents from the National Commission for Science, Technology and Innovations (NACOSTI). The second step was to pay an introductory visit to the selected commercial banks in Nakuru Town. During the introductory visit, the researcher informed the bank managers of the proposed research and schedule for data collection. On the scheduled dates, the researcher returned to distribute the study questionnaires. After distributing the research questionnaires, the researcher gave the respondents two weeks period to fill the questionnaires in order to increase the response rate. After the two weeks period, the study collected the filled questionnaires for analysis.

### **3.7 Data Analysis**

The researcher examined the collected questionnaires for completeness. Only questionnaires that were completely filled were used for the study. Upon this examination, the response rate of the study was computed based on completed questionnaires over the total number of questionnaires issued. After this, the questionnaires were then coded and entered in Statistical Package for Social Sciences (SPSS) version 22 for data analysis. This study used both descriptive and inferential statistics.

Descriptive statistics involves description of basic characteristics of data while inferential statistics gives insights on the descriptive statistics (Orodho, 2003). This study used frequencies, mean and standard deviation for descriptive analysis. Frequency was used to indicate the number of times a particular response is cited, while the mean shows the tendency of respondents on average in answering the research questions. Standard deviation on the other hand was used to show the spread of responses from different respondents (Saunders et al., 2009).

Using a five point Likert scale whereby; 1 = No extent, 2 = little extent, 3 = moderate extent, 4 = great extent, and 5 = very great extent, a mean ( $\mu$ ) of  $4.5 < \mu \leq 5$  will imply a tendency to agree to a very great extent,  $3.5 < \mu < 4.5$  imply a tendency to agree to a great extent,  $2.5 < \mu < 3.5$  a tendency to agree moderately,  $1.5 < \mu < 2.5$  a tendency to agree to a little extent, and  $1 \geq \mu < 1.5$  a tendency to disagree. The standard deviation ( $\sigma$ ) of  $\sigma \leq 0.5$  implied high

consensus,  $0.5 < \sigma X \leq 1$  moderate consensus and  $\sigma X > 1$  denoted low consensus between the study respondents on the corresponding metric on the questionnaire (Sekaran, 2003).

In this study, a multiple linear regression was used for inferential statistics to establish the relationship between technological change management aspects (independent variables) and competitive advantage (dependent variable) of commercial banks in Nakuru Town. The following multiple linear regression model was used.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where;

Y= Competitive Advantage

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$  = Model coefficients

X<sub>1</sub>= Mobile Banking Applications

X<sub>2</sub>= Internet Banking

X<sub>3</sub>= Electronic Queue Management System

X<sub>4</sub>= Deposit Taking ATMs

$\varepsilon$ = Standard estimate of error

The entire analysis was presented in form of tables.

### **3.8 Ethical Considerations**

Some of the ethical considerations that this current study adheres to are; informed consent, anonymity, privacy, confidentiality and voluntary participation. The researcher clearly explained to the study respondents the purpose of the study before letting them participate in the study. For this purpose, the researcher used the introduction letter from Kabarak University as well as permit letter from NACOSTI. The researcher requested the sampled respondents to take part in the study on voluntary basis and specify that they can opt not to take part in the study if they so wish. The respondents were not requested to give any identifying details of themselves and that of the commercial bank they work for. Therefore, the respondents and banks identity will remain anonymous. The respondents were allowed to respond to study questionnaire at their own time and privacy without the supervision of the researcher. All the information obtained in this study was treated as confidential and was used only for academic purposes.

## CHAPTER FOUR

### DATA ANALYSIS, PRESENTATION AND DISCUSSION

#### 4.1 Introduction

This chapter presents the data analysis, presentation and discussion of the study. In the context of the data analysis, the descriptive statistics of frequencies were undertaken while in respect to the inferential statistics the chi square, correlational analysis, and regression analysis were undertaken for the study. The data was presented in tables.

#### 4.2 Response Rate

The target population of the study was 56 banks employees comprising of 7 managers, 21 ICT personnel and 28 customer service personnel. Therefore, fifty-six structured questionnaires were distributed to the respondents for the purposes of data collection purposes. Out of the distributed questionnaires, 46 questionnaires were returned back. There was therefore a response rate of 82.1%. This response rate is deemed sufficient as it is above the 80% that was recommended by Mugenda and Mugenda (2013).

#### 4.3 Background Information

The background information of the study was examined using three components that is gender distribution, age group and length of time worked in a bank.

##### 4.3.1 Gender Distribution

The gender of the respondents was examined and the results presented in table 4.1 below.

**Table 4.1: Gender Distribution**

	<b>Frequency</b>	<b>Percentages</b>
Male	20	43.4%
Female	26	56.6%
<b>Total</b>	<b>46</b>	<b>100.0%</b>

The gender distribution indicated that most of the respondents are female employees at 56.6% while the male employees stood at 43.4% of the target population. The high number of female employees could be attributable to the fact that the banking sector is a service industry and is thus very attractive to the female employees. There could also be less movements amongst the female employees in terms of exit due to the relative well pay of the commercial bank.

### 4.3.2 Age Group

The age group of the respondents were examined and the results presented in table 4.2 below.

**Table 4.2: Age Group Distribution**

	<b>Frequency</b>	<b>Percentages</b>
Below 30 Years	8	17.3%
31-40 Years	20	43.4%
41-50 Years	14	30.4%
Above 50 Years	4	8.9%
<b>Total</b>	<b>46</b>	<b>100%</b>

The results indicated that the respondents who were below 30 years stood at 17.3%, those at 31-40 years stood at 43.4%, those at 41-50 years stood at 30.4%, and those at above 50 years stood at 8.9%. This indicated that a majority of staff stood at 43.4% which could be attributed to the relative seniority of the employees.

### 4.3.3 Length of Time Worked in a Bank

The length of time worked in a bank was examined and the results tabulated in table 4.3.

**Table 4.3: Length of Time Worked in Bank**

	<b>Frequency</b>	<b>Percentages</b>
Below one Year	0	0%
1-5 Years	5	10.8%
6-10 Years	15	32.6%
Above 10 Years	26	56.6%
<b>Total</b>	<b>46</b>	<b>100.0%</b>

The results of the length of time worked in a bank indicated that 10.8% of the respondents had worked in the bank for less than 5 years, 32.6% of the respondents for 6 to 10 years, and 56.6% of the respondents for above 10 years. The high number of respondents who had worked for above 10 years can be attributed to the relative stability and good pay within the commercial banks leading to a huge number of employees staying with the banking sector a relative long period.

## 4.4 Descriptive Statistics

### 4.4.1 Mobile Banking Applications on Competitive Advantage

The study sought to examine the influence of mobile banking applications on competitive advantages of tier one commercial banks in Nakuru. The indicators used for this examination included Ease of understanding of the mobile banking processes, terms and conditions for obtaining loans, accessibility of agencies for cash to mobile app transfer, limit on amount of money that can be transferred, and compatibility of the mobile banking app with the phone.



Respondents scored items using a five point Likert Scale of 1=No extent, 2=small extent, 3=moderate extent, 4=large extent, and 5= very large extent and results displayed in Table 4.4.

**Table 4.4: Mobile Banking Influence on Competitive Advantage**

	NE	SM	ME	LE	VLE	Chi-square	
	%	%	%	%	%	Value	p
Ease of understanding of the mobile banking processes	2.1	10.6	31.9	42.6	12.8	23.484	0.002
Terms and conditions for obtaining loans	0.0	8.5	36.2	51.1	4.3	24.412	0.001
Accessibility of agencies for cash to mobile app transfer	4.3	12.8	29.8	44.7	8.5	22.983	0.002
Limit on amount of money that can be transferred	6.4	14.9	23.4	48.9	6.4	18.662	0.0012
Compatibility of the mobile banking app with the phone	10.6	6.4	34.0	38.3	10.6	17.321	0.019

A majority of respondents agreed to a large extent (42.6%) that ease of understanding of the mobile banking processes influences the competitive advantage of tier one commercial banks in Nakuru. Some other respondents also agreed with the statement to very large (12.8%), moderate (31.9%), and small extents (2.1%). Respondents who felt that ease of understanding of the mobile banking processes had no extent of influence on the competitive advantage of tier one commercial banks in Nakuru were 2.1%. The study found that there was statistically significant relationship between ease of understanding of mobile banking processes and competitive advantage due to a chi square results of  $\chi^2(4) = 23.484, p = 0.002 < 0.05$ .

The terms and conditions for obtaining loans were cited to influence the competitive advantage of tier one commercial banks in Nakuru by 51.1% of respondents to a large extent, 36.2% of respondents to a moderate extent, and 4.3% of respondents to a very large extent. Some respondents agreed that terms and conditions for obtaining loans to a small extent influence the competitive advantage of tier one commercial banks in Nakuru (8.5%) and none of the respondents perceived there to be no extent of influence of terms and conditions for obtaining loans on the competitive advantage of tier one commercial banks in Nakuru (No extent=0.0%). The study found that there was statistically significant relationship between terms and conditions for obtaining loans and competitive advantage due to a chi square results of  $\chi^2(3) = 24.412, p = 0.001 < 0.05$ .

The opinion of a majority of respondents (44.7%) was that accessibility of agencies for cash to mobile app transfer influences the competitive advantage of tier one commercial banks in Nakuru. This opinion was held by 29.8%, 12.8%, and 8.5% to moderate, small, and very large extents, respectively. Respondents who cited contradicting opinions were 4.3% who perceived the accessibility of agencies for cash to mobile app transfer not to have any influence on the competitive advantage of tier one commercial banks in Nakuru. The study found that there was statistically significant relationship between accessibility of agencies for cash to mobile app transfer and competitive advantage due to a chi square results of  $\chi^2 (4) = 22.983$ ,  $p = 0.002 < 0.05$ .

The limit on amount of money that can be transferred was perceived to influence on the competitive advantage of tier one commercial banks in Nakuru by 48.9% of respondents to a large extent, 23.4% of respondents to a moderate extent, 6.4% of respondents to a very large extent, and 14.9% of respondents to a small extent. The study established that 6.4% of respondents cited no influence at all of limit on amount of money that can be transferred on the competitive advantage of tier one commercial banks in Nakuru. The study found that there was statistically significant relationship between limit on amount of money that can be transferred and competitive advantage due to a chi square results of  $\chi^2 (4) = 18.662$ ,  $p = 0.0012 < 0.05$ .

A majority of respondents agreed to a large extent (38.3%) that compatibility of the mobile banking app with the phone influences the competitive advantage of tier one commercial banks in Nakuru. Some other respondents also agreed with the statement to very large (10.6%), moderate (34.0%), and small extents (6.4%). Respondents who felt that compatibility of the mobile banking app with the phone had no influence on the competitive advantage of tier one commercial banks in Nakuru at all were 10.6%. The study found that there was statistically significant relationship between limit on amount of money that can be transferred and competitive advantage due to a chi square results of  $\chi^2 (4) = 17.321$ ,  $p = 0.019 < 0.05$ .

#### **4.4.2 Internet Banking and Competitive Advantage**

The study sought to determine the influence of internet banking on competitive advantages of tier one commercial banks in Nakuru. The indicators used for this measurement were charging rates for internet banking usage, perceived usefulness of the internet banking

platform, security features for data protection, requirements for registration, and diversity in services provided. Respondents scored items using a five point Likert Scale of 1=No extent, 2=small extent, 3=moderate extent, 4=large extent, and 5= very large extent and results displayed in Table 4.5.

**Table 4.5: Influence of Internet Banking on Competitive Advantage**

	NE	SM	ME	LE	VLE	Chi-square	
	%	%	%	%	%	Value	P
Charging rates for internet banking usage	2.1	17.0	25.5	51.1	4.3	19.360	0.007
Perceived usefulness of the internet banking platform	6.4	14.9	31.9	38.3	8.5	21.952	0.004
Security features for data protection	8.5	12.8	27.7	36.2	14.9	22.459	0.002
Requirements for registration	4.3	8.5	36.2	40.4	10.6	23.592	0.002
Diversity in services provided	14.9	6.4	34.0	31.9	12.8	24.451	0.001

The charging rates for internet banking usage were cited to influence the competitive advantage of tier one commercial banks in Nakuru by about half of the respondents (51.1%) to a large extent, 25.5% of respondents to a moderate extent, and 4.3% of respondents to a very large extent. Some respondents agreed that charging rates for internet banking usage to a small extent influence the competitive advantage of tier one commercial banks in Nakuru (17.0%) and 2.1% of the respondents perceived there to be no extent of influence charging rates for internet banking usage on the competitive advantage of tier one commercial banks in Nakuru. The study found that there was statistically significant relationship between charging rates for internet banking usage and competitive advantage due to a chi square results of  $\chi^2(4) = 19.360, p = 0.007 < 0.05$ .

A majority of respondents (38.3%) were of the opinion that perceived usefulness of the internet banking platform influences the competitive advantage of tier one commercial banks in Nakuru to a large extent. This opinion was also held by 31.9 %, 14.9%, and 8.5% of respondents to moderate, small, and very large extents, respectively. Respondents who cited opinions contrary to these were 6.4% who perceived the perceived usefulness of the internet banking platform not to have any influence on the competitive advantage of tier one commercial banks in Nakuru. The study found that there was statistically significant relationship between perceived usefulness of the internet banking platform and competitive advantage due to a chi square results of  $\chi^2(4) = 21.952, p = 0.004 < 0.05$ .

Security features for data protection influence the competitive advantage of tier one commercial banks in Nakuru following the opinions of 36.2% of the respondents to a large extent. Some other respondents shared this opinion although they felt the extent of influence was very large (14.9%), moderate (27.7%), and small (8.5%). The remaining respondents were of the opinion that the competitive advantage of tier one commercial banks in Nakuru is not influenced by security features for data protection at all. The study found that there was statistically significant relationship between Security features for data protection and competitive advantage due to a chi square results of  $\chi^2 (4) = 22.459, p = 0.002 < 0.05$ .

The requirements for registration was perceived to influence on the competitive advantage of tier one commercial banks in Nakuru by 40.4% of respondents to a respondents to a large extent, 36.2% of respondents to a moderate extent, 10.6% of respondents to a very large extent, and 8.5% of respondents to a small extent. The study established that 4.3% of respondents cited the requirements for registration have no influence at all on the competitive advantage of tier one commercial banks in Nakuru. The study found that there was statistically significant relationship between requirements for registration and competitive advantage due to a chi square results of  $\chi^2 (4) = 23.592, p = 0.002 < 0.05$ .

Diversity in services provided influence the competitive advantage of tier one commercial banks in Nakuru following the opinions of 31.9% of the respondents to a large extent. Some other respondents shared this opinion although they felt the extent of influence was very large (12.8%), moderate (34.0%), and small (6.4%). The remaining respondents were of the opinion that the competitive advantage of tier one commercial banks in Nakuru is not influenced by security diversity in services provided at all. The study found that there was statistically significant relationship between diversity in services provided and competitive advantage due to a chi square results of  $\chi^2 (4) = 24.451, p = 0.001 < 0.05$ .

#### **4.4.3 Electronic Queue Management and Competitive Advantage**

The influence of the electronic queue management on competitive advantage was examined a five point likert scale (1=No extent, 2=Small extent, 3=Moderate Extent, 4=Large Extent and 5=Very Large Extent) and set of five indicators. These indicators included perceived ease of use of the electronic queue management system menu, deployment of staff to assist customers select their preferred service, variety of services offered by the electronic queue management system, use of reports from electronic queue management system in decision

making, and use of integrated digital signage for promotions. The results of the frequencies and chi square were presented in table 4.6.

**Table 4.6: Influence of the Electronic Queue Management on Competitive Advantage**

	NE (%)	SM (%)	ME (%)	LE (%)	VLE (%)	Chi-square Value	p
Perceived ease of use of the Electronic Queue Management System menu	12.8	14.9	34.0	29.8	8.5	26.301	0.000
Deployment of staff to assist customers select their preferred service	6.4	8.5	42.6	31.9	10.6	20.133	0.006
Variety of services offered by the Electronic Queue Management System	4.3	12.8	31.9	38.3	12.8	16.392	0.017
Use of reports from Electronic Queue Management System in decision making	2.1	17.0	27.7	34.0	19.1	15.732	0.023
Use of integrated digital signage for promotions	10.6	10.6	25.5	36.2	17.0	18.092	0.009

In respect to the extent in which perceived ease of use of the electronic queue management system menu influenced competitive advantage of commercial banks, a majority of 34.0% of the respondents indicated to a moderate extent. This is in comparison to 12.8%, 14.9%, 29.8%, and 8.5% of the respondents who indicated to no extent, small extent, large extent and very large extent respectively. The study found that there was statistically significant relationship between perceived ease of use of the electronic queue management system menu and competitive advantage due to a chi square results of  $\chi^2(4) = 26.301, p = 0.000 < 0.05$

In respect to the influence of deployment of staff to assist customers select their preferred service on competitive advantage, a cumulative percentage of 42.5% of the respondents indicated to a large extent and very large extent the influence of staff assistance. This is in contrast to 6.4%, 8.5%, and 42.6% of the respondents who indicated to no extent, small extent and moderate extent respectively. The study found that there was statistically significant relationship between influence of deployment of staff to assist customers and competitive advantage due to a chi square results of  $\chi^2(4) = 20.133, p = 0.006 < 0.05$

A majority of 38.3% of the respondents indicated that variety of services offered by the electronic queue management system influenced competitive advantage of commercial banks to a large extent. On the other hand, 4.3%, 12.8%, 31.9%, and 12.8% influenced competitive advantage no extent, small extent, moderate extent, and very large extent respectively. The study found that there was statistically significant relationship between variety of services

offered by the electronic queue management system and competitive advantage due to a chi square results of  $\chi^2 (4) = 16.392, p = 0.017 < 0.05$

In respect to the extent in which use of reports from electronic queue management system in decision making influences competitive advantage the study results indicated that a majority of the respondents at 34.0% indicated the influence is to a large extent. This is compared to 2.1%, 17.0%, 27.7% and 19.1% who ranked the influence at no extent, small extent, moderate extent, and very large extent respectively. The study found that there was statistically significant relationship between use of reports from electronic queue management system in decision making and competitive advantage due to a chi square results of  $\chi^2 (4) = 15.732, p = 0.023 < 0.05$

Finally, the extent in which the use of integrated digital signage for promotions influenced competitive advantage had a majority of 36.2% of the respondents indicating to a large extent. This is compared to 10.6%, 10.6%, 25.5%, and 17.0% of the respondents who indicated that use of integrated digital signage for promotions influenced competitive advantage to a no extent, small extent, moderate extent and very large extent respectively. The study found that there was statistically significant relationship between the use of integrated digital signage for promotions and competitive advantage due to a chi square results of  $\chi^2 (4) = 18.092, p = 0.009 < 0.05$ .

#### **4.4.4 Deposit Taking ATMs and Competitive Advantage**

The influence of the deposit taking ATMs on competitive advantage was examined using a likert scale (1=No extent, 2=Small extent, 3=Moderate Extent, 4=Large Extent and 5=Very Large Extent) and set of five indicators. These indicators include operational reliability of the deposit taking ATMs, level of security provided at the deposit taking ATMs, timeliness in updating the amount deposited, accessibility of the deposit taking ATMs, and awareness of the capability of the deposit taking ATMs. The results of the frequencies and the chi square were presented in Table 4.7.

**Table 4.7: Deposit Taking ATMs and Competitive Advantage**

	NE	SM	ME	LE	VLE	Chi-square	
	(%)	(%)	(%)	(%)	(%)	Value	p
Operational reliability of the deposit taking ATMs	2.1	8.5	23.4	40.4	25.5	19.362	0.007
Level of security provided at the deposit taking ATMs	.0	6.4	36.2	42.6	14.9	21.491	0.005
Timeliness in updating the amount deposited	12.8	10.6	31.9	27.7	17.0	22.722	0.003
Accessibility of the deposit taking ATMs	6.4	12.8	29.8	29.8	21.3	23.492	0.002
Awareness of the capability of the deposit taking ATMs	14.9	17.0	25.5	34.0	8.5	15.892	0.023

The extent in which Operational reliability of the deposit taking ATMs influence competitive advantage of the commercial banks had a majority of the respondents indicating to a large extent. This is comparison to 2.1%, 8.5%, 23.4%, and 25.5% of the respondents who indicated that the influence was to no extent, small extent, moderate extent and very large extent respectively. . The study found that there was statistically significant relationship between operational reliability of the deposit taking ATMs and competitive advantage due to a chi square results of  $\chi^2 (4) = 19.362, p = 0.007 < 0.05$ . In respect to the extent of the influence of the level of security provided at the deposit taking ATMs on competitive advantage, 6.4%, 36.2%, 42.6%, and 14.9% of the respondents indicated that the influence was to a small extent, moderate extent, large extent and very large extent respectively. The study found that there was statistically significant relationship between level of security provided at the deposit taking ATMs and competitive advantage due to a chi square results of  $\chi^2 (4) = 21.491, p = 0.005 < 0.05$ .

The extent in which the timeliness in updating the amount deposited influenced competitive advantage had a majority of 31.9% of the respondents indicating its influence was moderate. This is in contrast to 12.8%, 10.6%, 27.7%, and 17.0% of the respondents who indicated that the influence was to no extent, small extent, large extent, and very large extent respectively. The study found that there was statistically significant relationship between timeliness in updating the amount deposited and competitive advantage due to a chi square results of  $\chi^2 (4) = 22.722, p = 0.005 < 0.05$ .

The extent in which the accessibility of the deposit taking ATMs influence competitive advantages had 6.4%, 12.8%, 29.8%, 29.8%, and 21.3% of the respondents ranked the influence has no extent, small extent, moderate extent, large extent, and very large extent respectively. The study found that there was statistically significant relationship between accessibility of the deposit taking ATMs and competitive advantage due to a chi square results of  $\chi^2(4) = 23.492, p = 0.002 < 0.05$ .

Finally, in respect to the awareness of the capability of deposit taking ATMs influencing competitive advantage of commercial banks, 14.9%, 17.0%, 25.5%, 34.0%, and 8.5% of the respondents ranked its influence as no extent, small extent, moderate extent, large extent and very large extent respectively. The study found that there was statistically significant relationship between awareness of the capability of deposit taking ATMs and competitive advantage due to a chi square results of  $\chi^2(4) = 15.892, p = 0.023 < 0.05$ .

#### 4.4.5 Competitive Advantage

The competitive advantage was examined using a likert scale (1=No extent, 2=Small extent, 3=Moderate Extent, 4=Large Extent and 5=Very Large Extent) and set of five indicators.

These five indicators included operational costs, geographical reach, visibility of the bank, client base and customer service dynamics. The extent in which specific competitive advantage indicators were cumulatively influenced by mobile banking applications, internet banking, electronic queue management system and deposit taking ATMs was examined and the results displayed in Table 4.8.

**Table 4.8: Competitive Advantage**

	NE (%)	SM (%)	ME (%)	LE (%)	VLE (%)
Operational costs	17.0	14.9	19.1	29.8	19.1
Geographical reach	10.6	17.0	27.7	23.4	21.3
Visibility of bank	6.4	19.1	25.5	34.0	14.9
Client base	8.5	12.8	21.3	36.2	21.3
Customer service	12.8	8.5	34.0	27.7	17.0

The results indicated that 17.0%, 14.9%, 19.1%, 29.8% and 19.1% of the respondents indicated that independent variables cumulatively influenced operational costs to no extent, small extent, moderate extent, large extent and very large extent respectively. On the other hand, in respect to the extent in which the independent variables influenced geographical reach, a majority of 27.7% of the respondents indicated that it was to a moderate extent while



23.4% and 21.3% indicated that it was for large extent and very large extent respectively. This was in contrast to the 10.6% and 17.0% of the respondents who indicated that it was to no extent and small extent respectively. In respect to the influence of the independent variables to the visibility of bank, a majority of the respondents at 34.0% indicated that it was to a large extent compared to 6.4%, 19.1%, 25.5% and 14.9% of the respondents who indicated that it was to no extent, small extent, moderate extent, and very large extent respectively. In respect to the extent in which the independent variables influenced client base, a majority of the respondents indicated that it was to a large extent at 36.2% while a further 21.3% of the respondents indicated that the influence was to a very large extent. On the other hand, 8.5%, 12.8%, and 21.3% of the respondents ranked the influence at no extent, small extent and moderate extent respectively. Finally, in respect to the influence of the independent variables on the competitive advantage, 12.8%, 8.5%, 34.0%, 27.7%, and 17.0% of the respondents indicated that they influenced customer service to a no extent, small extent, moderate extent, large extent and very large extent respectively.

#### 4.5 Correlational Analysis

The correlational analysis between variables was undertaken with a view of examining the relationship between the variables. In particular, the Pearson correlation was undertaken due to the fact that both the independent and dependent variables at composite levels were interval data thus making them suitable for Pearson correlation. The results of the correlational analysis were presented in Table 4.9.

**Table 4.9: Pearson Correlational Analysis**

	<b>Mobile Banking</b>	<b>Internet Banking</b>	<b>Electronic Queue Management</b>	<b>Deposit Taking ATMs</b>	<b>Competitive Advantage</b>
Mobile Banking	1				
Internet Banking	.444*	1			
Electronic Queue Management	.563*	.485*	1		
Deposit Taking ATMs	.551*	.345*	.472*	1	
Competitive Advantage	.707**	.784**	.695**	.729**	1
	0.000	0.000	0.000	0.000	

\*. Correlation is significant at the 0.05 level (2-tailed).

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

In respect to the influence of the independent variables on the dependent variable, the correlational analysis indicated that there was positive correlation between each of independent variable against a dependent variable all at 1% level of significance.

The first correlation analysis was carried out to determine whether mobile banking applications significantly influenced competitive advantages of tier one commercial banks in Nakuru town. The correlation results showed that a strong positive significant relationship existed ( $r = 0.707$ ;  $p \leq 0.05$ ). This could be attributed to the fact that the mobile money lending is growing in Kenya especially amongst the youth as well as general population. The friendliness and flexibility of the terms and conditions of obtaining loans would thus drive usage amongst the target group and hence customer satisfaction and thus competitiveness of the bank. This results were consistent with Too, Ayuma, and Ambrose (2016) in a study on influence of mobile banking on financial performance in Kapsabet town found that there was appositve and significant relationship between use of mobile banking to obtain loans. This was demonstrated through a beta coefficient of 0.296 that was achieved in the study.

A correlation analysis was also done to determine whether determine the influence of internet banking significantly influenced competitive advantages of tier one commercial banks in Nakuru. The results showed a significant relationship existed ( $r = 0.784$ ,  $p \leq 0.05$ ) between the two variables. The degree of the association of the two variables was strong and positive suggesting that there was a high degree of usage of internet banking in the Tier 1 banks in order to obtain competitive advantage. The diversity of services offered through the internet banking leads to the usefulness of the internet banking and hence its competitiveness. The results found in this study was similar with those of other studies. Mulwa (2017) carried out a study to examine the effect of internet banking on financial performance of Kenyan commercial banks.

The study also sought to determine whether there was a significant relationship between electronic queue management system and competitive advantages of tier one commercial banks in Nakuru town. The correlation analysis showed that there was a significant relationship existing between the two variables ( $r = 0.695$ ,  $p \leq 0.05$ ). The results also suggest that the relationship between the two variables was strong implying that the electronic queue management system had a strong influence on competitive advantage in the Tier 1 banks. This can be attributed to the fact that the use of these reports can be used to make decisions that drive organizational performance of the commercial bank and hence competitive

advantage of the commercial bank. These results were consistent with empirical results that had been examined, such as, Agwaro (2017) examined the role of automated queuing on the service delivery in banks and found that its diverse uses including customers having to get a ticket from the dispenser for service therefore improving service delivery. .

Finally, the correlation analysis to determine whether there was a significant relationship between deposit taking ATMs and competitive Advantages of tier one commercial banks in Nakuru indicates that the relationship is, in fact, significant and moderate ( $r = 0.725$ ,  $p < 0.05$ ). This finding suggests that the accessibility of the deposit taking mechanism is important in ensuring that clients are able to get the service when the need it and hence improve on their usage of the service. This ensures that the customers don't visit the bank for services that they can easily access over the internet. These results were consistent with Kumbhar (2011) study that found that in respect to system availability in public sector commercial banks had a mean of 4.04 compared to private sector banks.

#### 4.6 Multiple Linear Regression Analysis

This study undertook a multiple linear regression analysis with view of determining the influence of the independent variables on the dependent variable. The results of the multiple linear regression was presented in three tables showing model summary, ANOVA and the regression coefficients. The model summary presented the results for the correlation coefficient and the adjusted coefficient of determination as presented in Table 4.10.

**Table 4.10: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.904 <sup>a</sup>	.817	.800	.15186

a. Predictors: (Constant), Deposit Taking ATMs, Mobile Banking, Electronic Queue Management, Internet Banking

The study used the R square, that is, the coefficient of determination in order determine the variance in the dependent variable that is attributable to the independent variables. In this context, an adjusted coefficient of determination of 0.817 indicates that up to 81.7% of the variance in the competitive advantage in the commercial bank is due to the deposit taking ATMs, mobile banking, electronic queue management, and internet banking cumulatively. This thus indicates that it is only 18.3% of the variance in the competitiveness that is due to other factors not within the model.

To examine as to whether the model is a good fit for data that it has the capability to predict the dependent variable an F test was undertaken and results displayed through Table 4.11.

**Table 4.11: Summary of ANOVA Results**

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.334	4	1.084	46.987	.000 <sup>b</sup>
	Residual	.969	42	.023		
	Total	5.303	46			

a. Dependent Variable: Competitive Advantage

b. Predictors: (Constant), Deposit Taking ATMs, Mobile Banking, Electronic Queue Management, Internet Banking

In this context, the regression model was considered a good fit for data if p value is less than 5% since the test was done at 5% level of significance. The study results indicated that  $F(4, 42) = 46.987$ ,  $P < 0.05$  and therefore the overall model has predictive capability and was used in the study.

To examine the influence of individual independent variable on the dependent variable, then the regression coefficients were examined and the results displayed in Table 4.11.

**Table 4.12; Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
	(Constant)	.101	.266			
1	Mobile Banking	.248	.048	.366	5.193	.000
	Internet Banking	.222	.050	.342	4.457	.000
	Electronic Queue Management	.255	.045	.382	5.622	.000
	Deposit Taking ATMs	.302	.051	.421	5.905	.000

a. Dependent Variable: Competitive Advantage

It can be deduced from the findings in Table 4.11 that the most influential technological change management variable in the model was deposit taking ATMs ( $\beta = 0.421$ ,  $p \leq 0.05$ ). This was followed by Electronic Queue Management ( $\beta = 0.382$ ,  $p < 0.05$ ), Mobile Banking ( $\beta = 0.366$ ,  $p \leq 0.05$ ) and Internet Banking ( $\beta = 0.342$ ,  $p \leq 0.05$ ). This indicates that the dependent variable, that is, the competitive advantage of the commercial banks in the area, would change by a corresponding number of standard deviations when the respective independent variables change by one standard deviation. The study therefore establishes that

Mobile Banking Applications, Internet Banking, Electronic Queue Management System and Deposit Taking ATMs as currently used in the Tier 1 commercial banks in the area were important variables giving them competitive advantage. Therefore, the resulting regression model is given as;

$$Y = 0.101X_1 + 0.248X_2 + 0.222X_3 + 0.255X_4 + 0.302X_5$$

The regression coefficients of mobile banking, internet banking, electronic queue management and deposit taking ATMs were positive leading to implication that they have a positive influence on the dependent variable. This would imply that an increase in the individual independent variables would lead to an increase in the dependent variable with the other variables kept constant. In this context, a unit increase in the mobile banking would lead to a 0.101 increase in the competitive advantage with the internet banking, electronic queue management and deposit taking ATMs kept constant. On the other hand, a unit increase in internet banking would lead to 0.222 increase in the competitive advantage with mobile banking, electronic queue management and deposit taking ATMs kept constant.

A unit increase in electronic queue management will lead to a 0.255 increase in competitive advantage with mobile banking, internet banking and deposit taking ATMs kept constant. Finally, a unit increase in deposit taking ATMs would lead to a 0.302 increase in competitive advantage with mobile banking, internet banking and electronic queue management kept constant. The regression coefficients indicate that deposit taking ATMs had the greatest influence on the competitive advantage due to a regression coefficient of 0.302. This was followed by electronic queue management, mobile banking and internet banking at regression coefficients of 0.255, 0.248 and 0.222 respectively. This was due to the relative strengths of the regression coefficients.

#### **4.7 Test of Hypotheses**

In relation to the influence of the mobile banking applications and competitive advantage, the following null research hypothesis was formulated;

**H<sub>01</sub>:** There is no statistically significant influence of mobile banking applications on competitive advantages of tier one commercial banks in Nakuru

In respect to the first null hypothesis, the achieved value for t statistic was 5.193 and p value was less than 0.05 since the hypothesis is being tested at 5% level of significance. This led to the conclusion to reject the first null hypothesis and accept the alternative hypothesis

indicating presence of a significant relationship between mobile banking applications and competitive advantage. The findings agree with Kithaka (2014) who found that there was statistically significant relationship between limit on amount of money that can be transferred and competitive advantage due to a chi square results. The study, further, found that out that the annual money moved through mobile banking and number of mobile users influence the competitiveness of the commercial bank.

In relation to the influence of the internet banking on the competitive advantages of tier one commercial banks, the following null research hypothesis was formulated;

**H<sub>02</sub>:** There is no statistically significant influence of internet banking on competitive advantages of tier one commercial banks in Nakuru.

In respect to the second null hypothesis, the achieved value for t statistic was 4.457 and p value which was less than 0.05 since the hypothesis is being tested at 5% level of significance. This led to the conclusion to reject the second null hypothesis and accept the alternative hypothesis indicating presence of a significant relationship between internet banking applications and competitive advantage. These results agree with Mulwa (2017) who carried out a study to examine the effect of internet banking on financial performance of Kenyan commercial banks and found that there exists a positive and significant correlation between online customer deposits.

In relation to the influence of electronic queue management system on the competitive advantages of tier one commercial banks, the following null research hypothesis was formulated;

**H<sub>03</sub>:** There is no statistically significant influence of electronic queue management system on competitive advantages of tier one commercial banks in Nakuru

In respect to the third null hypothesis, the achieved value for t statistic was 5.622 and p value which was less than 0.05 since the hypothesis is being tested at 5% level of significance. This led to the conclusion to reject the third null hypothesis and accept the alternative hypothesis indicating presence of a significant relationship between electronic queue management system and competitive advantage. The results agree with Agwaro (2017) who examined the role of automated queuing on the service delivery in institutions and found it significantly increases service delivery in organizations. Its diverse uses including customers having to get a ticket from the dispenser for service. The results also agree with Mohamud (2016) whose

study found that electronic queue management system are associated with diverse service delivery aspects such as electronic queue management system being easy to use.

In relation to the influence of the deposit taking ATMs on competitive advantage, the following forth research hypothesis was formulated;

**H<sub>04</sub>:** There is no statistically significant influence of deposit taking ATMs on competitive advantages of tier one commercial banks in Nakuru.

In respect to the forth null hypothesis, the achieved value for t statistic was 5.905 and p value which was less than 0.05 since the hypothesis is being tested at 5% level of significance. This led to the conclusion to reject the forth null hypothesis and accept the alternative hypothesis indicating presence of a significant relationship between deposit taking ATMs and competitive advantage. These results were consistent with Kumbhar (2011) study that found that there was statistically significant relationship between awareness of the capability of deposit taking ATMs in commercial banks. The timeliness in updating of the customers deposited amount is important in ensuring that the customers feel that they can transaction on real time basis and thus inspire confidence amongst the respondents. In Nigeria, Olumide (2014) also found a strong and positive relationships between ATM usage and customer satisfaction within the commercial banks in Nigeria. The study also found that ATM usage was associated with reduced customer queues in the banking halls.

## **CHAPTER FIVE**

### **SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter gives the summary of the findings and draws conclusions from them, and lastly makes some useful recommendations for stakeholders to enlighten and enable them to craft viable solutions with regard to the research problem based on the research findings.

#### **5.2 Summary**

The general objective of the study was to examine the role of technological change management on competitive advantage of tier 1 commercial banks in Nakuru, Kenya. To support this main objective, the study sought to examine the influence of mobile banking application, internet banking, electronic queue management system and deposit taking ATMs on competitive advantages of tier one commercial banks in Nakuru. To achieve this objectives, the study used structured questionnaires for data collection purposes which were examined using frequencies, chi squares, correlational analysis and regression analysis.

The study distributed fifty-six structured questionnaires were distributed to the respondents for the purposes of data collection purposes. Out of the distributed questionnaires, 46 questionnaires were returned back. There was therefore a response rate of 82.1%. The gender distribution indicated that most of the respondents are female employees at 56.6% while the male employees stood at 43.4% of the target population. The results indicated that the respondents who were below 30 years stood at 17.3%, those at 31-40 years stood at 43.4%, those at 41-50 years stood at 30.4%, and those at above 50 years stood at 8.9%. This indicated that a majority of staff stood at 43.4% which could be attributed to the relative seniority of the employees. The results of the length of time worked in a bank indicated that 10.8% of the respondents had worked in the bank for less than 5 years, 32.6% of the respondents for 6 to 10 years, and 56.6% of the respondents for above 10 years.

##### **5.2.1 Mobile Banking Applications on Competitive Advantage**

The study sought to examine the influence of mobile banking applications on competitive advantages of tier one commercial banks in Nakuru. The indicators used for this examination included Ease of understanding of the mobile banking processes, terms and conditions for obtaining loans, accessibility of agencies for cash to mobile app transfer, limit on amount of money that can be transferred, and compatibility of the mobile banking app with the phone. Using chi square for analysis, the study found that there was significant relationship between



ease of understanding of mobile banking processes and competitive advantage due to a chi square results of  $\chi^2 (4) = 23.484$ ,  $p = 0.002 < 0.05$ ; terms and conditions for obtaining loans and competitive advantage due to a chi square results of  $\chi^2 (3) = 24.412$ ,  $p = 0.001 < 0.05$ ; agencies for cash to mobile app transfer and competitive advantage due to a chi square results of  $\chi^2 (4) = 22.983$ ,  $p = 0.002 < 0.05$ ; limit on amount of money that can be transferred and competitive advantage due to a chi square results of  $\chi^2 (4) = 18.662$ ,  $p = 0.0012 < 0.05$ ; limit on amount of money that can be transferred and competitive advantage due to a chi square results of  $\chi^2 (4) = 17.321$ ,  $p = 0.019 < 0.05$ . With respect to both the correlational analysis and the multiple regression analysis, mobile banking applications statistically significant influenced the competitive advantage of tier one commercial banks in Nakuru town ( $\beta = 0.366$ ,  $p \leq 0.05$ ) leading to the rejection of the null hypothesis **H0<sub>1</sub>**.

### **5.2.2 Internet Banking and Competitive Advantage**

The study sought to determine the influence of internet banking on competitive advantages of tier one commercial banks in Nakuru. The indicators used for this measurement were charging rates for internet banking usage, perceived usefulness of the internet banking platform, security features for data protection, requirements for registration, and diversity in services provided. Using chi square for analysis, the study found that there was significant relationship charging rates for internet banking usage and competitive advantage due to a chi square results of  $\chi^2 (4) = 19.360$ ,  $p = 0.007 < 0.05$ ; perceived usefulness of the internet banking platform and competitive advantage due to a chi square results of  $\chi^2 (4) = 21.952$ ,  $p = 0.004 < 0.05$ ; Security features for data protection and competitive advantage due to a chi square results of  $\chi^2 (4) = 22.459$ ,  $p = 0.002 < 0.05$ ; requirements for registration and competitive advantage due to a chi square results of  $\chi^2 (4) = 23.592$ ,  $p = 0.002 < 0.05$  and diversity in services provided and competitive advantage due to a chi square results of  $\chi^2 (4) = 24.451$ ,  $p = 0.001 < 0.05$ . Further, the correlational analysis and the multiple regression analysis revealed that internet banking applications statistically significant influenced the competitive advantage of tier one commercial banks in Nakuru town ( $\beta = 0.342$ ,  $p \leq 0.05$ ) leading to the rejection of the null hypothesis **H0<sub>2</sub>**.

### **5.2.3 Electronic Queue Management and Competitive Advantage**

The influence of the electronic queue management on competitive advantage was examined using perceived ease of use of the electronic queue management system menu, deployment of staff to assist customers select their preferred service, variety of services offered by the

electronic queue management system, use of reports from electronic queue management system in decision making, and use of integrated digital signage for promotions. Using chi square for analysis, the study found that there was significant relationship perceived ease of use of the electronic queue management system menu and competitive advantage due to a chi square results of  $\chi^2 (4) = 26.301$ ,  $p = 0.000 < 0.05$ ; influence of deployment of staff to assist customers and competitive advantage due to a chi square results of  $\chi^2 (4) = 20.133$ ,  $p = 0.006 < 0.05$ ; variety of services offered by the electronic queue management system and competitive advantage due to a chi square results of  $\chi^2 (4) = 16.392$ ,  $p = 0.017 < 0.05$ ; use of reports from electronic queue management system in decision making and competitive advantage due to a chi square results of  $\chi^2 (4) = 15.732$ ,  $p = 0.023 < 0.05$ ; use of integrated digital signage for promotions and competitive advantage due to a chi square results of  $\chi^2 (4) = 18.092$ ,  $p = 0.009 < 0.05$ . It was further revealed by both the correlational analysis and the multiple regression analysis, electronic queue management applications statistically significant influenced the competitive advantage of tier one commercial banks in Nakuru town ( $\beta = 0.382$ ,  $p < 0.05$ ) leading to the rejection of the null hypothesis **H0<sub>3</sub>**.

#### **5.2.4 Deposit Taking ATMs and Competitive Advantage**

The influence of the deposit taking ATMs on competitive advantage was operational reliability of the deposit taking ATMs, level of security provided at the deposit taking ATMs, timeliness in updating the amount deposited, accessibility of the deposit taking ATMs, and awareness of the capability of the deposit taking ATMs. Using chi square for analysis, the study found that there was significant relationship between operational reliability of the deposit taking ATMs and competitive advantage due to a chi square results of  $\chi^2 (4) = 19.362$ ,  $p = 0.007 < 0.05$ ; level of security provided at the deposit taking ATMs and competitive advantage due to a chi square results of  $\chi^2 (4) = 21.491$ ,  $p = 0.005 < 0.05$ ; timeliness in updating the amount deposited and competitive advantage due to a chi square results of  $\chi^2 (4) = 22.722$ ,  $p = 0.005 < 0.05$ ; accessibility of the deposit taking ATMs and competitive advantage due to a chi square results of  $\chi^2 (4) = 23.492$ ,  $p = 0.002 < 0.05$ ; awareness of the capability of deposit taking ATMs and competitive advantage due to a chi square results of  $\chi^2 (4) = 15.892$ ,  $p = 0.023 < 0.05$ . With respect to both the correlational analysis and the multiple regression analysis, Deposit Taking ATMs statistically significant influenced the competitive advantage of tier one commercial banks in Nakuru town ( $\beta = 0.421$ ,  $p \leq 0.05$ ) leading to the rejection of the null hypothesis **H0<sub>4</sub>**.

### **5.3 Conclusion of the Study**

The study made the following conclusions of the study. The study established that mobile banking applications statistically significant influenced the competitive advantage of tier one commercial banks in Nakuru town. Therefore, it can be concluded that mobile banking application was a factor of competitive advantage of tier one commercial banks in the area.

The findings further revealed that internet banking applications statistically significant influenced the competitive advantage of tier one commercial banks in Nakuru town. Therefore, it can be concluded that internet banking application was a factor of competitive advantage of tier one commercial banks in the area.

Concerning the third independent variable, the study established that electronic queue management applications statistically significant influenced the competitive advantage of tier one commercial banks in Nakuru town. Therefore, it can be concluded that electronic queue management application was a factor of competitive advantage of tier one commercial banks in the area.

Finally, in relation to deposit taking ATMs, the findings established that Deposit Taking ATMs statistically significant influenced the competitive advantage of tier one commercial banks in Nakuru town. Therefore, it can be concluded that application of Deposit Taking ATMs was a factor of competitive advantage of tier one commercial banks in the area.

### **5.4 Recommendations of the Study**

The study recommends that commercial banks should put a focus on the technology innovation in order to lead to competitive advantages amongst commercial banks. In this context, the study recommends that the commercial banks should need to invest in the development of universal mobile phone applications as it was found that there were compatibility issues with their mobile applications.

Concerning the internet banking applications, the study found that the banks need to develop more internet applications that can be easily integrated on popular visitor platforms like watsup, Facebook and PayPal to increase their perceived usefulness online especially when making purchases. The banks also need to provide diverse services online using consumer trends.

The study also recommends in regard to electronic queue management applications that there is need for system developers to further integrate the electronic queue management to the banking services, for example, by using mobile phone alerts as well so as to improve on the perceived ease of use of the System menu. The banks should also improve on their use of integrated digital signage for promotions.

The deposit taking ATMs are versatile machines that can provide an array of services, however, these services remain underutilized. Therefore, the present study recommends that the banks should embark on an awareness campaign on the capability of the deposit taking ATMs so as to improve their utilization prospects.

### **5.5 Recommendations for Further Research**

The study recommends that the influence of the technological innovation on other aspects of the banks performance aspects such as financial performance should be examined. The scope of future studies should also be expanded to include other players in the financial sector.

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## APPENDICES

### APPENDIX I: LETTER OF INTRODUCTION

Dear Respondent,

My name is Linda Matelong, a student pursuing a Master's degree on Business Administration from Kabarak University. In partial fulfillment of the requirement for the award of the said masters program, I am required to undertake a research study. I am therefore conducting a study to *examine the role of technological change management on competitive advantage of tier 1 commercial banks in Nakuru, Kenya*. In this regard, I hereby request you to take part in this study by providing the information requested in the attached questionnaire. The information you will provide will help the study in meeting its objectives. Your participation in this study is voluntary and therefore you may opt not to take part in the study. The information you will provide was treated as confidential and was used only for academic purposes. Please do not include any identifying details in any part of the attached questionnaire for respondents' identity should be anonymous.

Regards,

Linda Matelong,

## APPENDIX II: QUESTIONNAIRE

### THE ROLE OF TECHNOLOGICAL CHANGE MANAGEMENT ON COMPETITIVE ADVANTAGE OF TIER 1 COMMERCIAL BANKS IN NAKURU

**Instructions:** Please complete the following questionnaire appropriately.

**Confidentiality:** The responses you provide was strictly confidential. No reference was made to any individual(s) in the report of the study.

Please tick or answer appropriately for each of the Question provided.

#### Part I: Background Information

Indicate your answer by ticking the response that best describes your answer.

1. Which is your gender?

Male [ ]    Female [ ]

2. Which age group do you belong to?

Below 30 Years [ ]    31-40 Years [ ]    41-50 Years [ ]    Above 50 Years [ ]

3. For how long have you worked for the current bank?

Below one Year [ ]    1-5 Years [ ]    6-10 Years [ ]                          Above 10 Years [ ]

#### Part II: Mobile Banking Applications and Competitive Advantages

This part of the questionnaire seeks to examine the influence of mobile banking applications on competitive advantages of tier one commercial banks in Nakuru. Use the following five point Likert Scale; 1=No extent, 2=small extent, 3=moderate extent, 4=large extent, and 5=very large extent to rate the corresponding items.

No	<i>To what extent do you agree that the following aspects of mobile banking influence the competitive advantage of tier one commercial banks;</i>	1	2	3	4	5
4.	Ease of understanding of the mobile banking processes					
5.	Terms and conditions for obtaining loans					
6.	Accessibility of agencies for cash to mobile app transfer					
7.	Limit on amount of money that can be transferred					
8.	Compatibility of the mobile banking app with the phone					

### Part III: Internet Banking and Competitive Advantages

This part of the questionnaire seeks to establish the influence of internet banking on competitive advantage of tier one commercial banks in Nakuru. Use the following five point Likert Scale; 1=No extent, 2=small extent, 3=moderate extent, 4=large extent, and 5= very large extent to rate the corresponding items.

No	<i>To what extent do you agree that the following aspects of internet banking influence the competitive advantage of tier one commercial banks;</i>	1	2	3	4	5
9.	Charging rates for internet banking usage					
10.	Perceived usefulness of the internet banking platform					
11.	Security features for data protection					
12.	Requirements for registration					
13.	Diversity in services provided					

### Part IV: Electronic Queue Management System and Competitive Advantage

This part of the questionnaire seeks to examine the influence of electronic queue management system on competitive advantages of tier one commercial banks in Nakuru. Use the following five point Likert Scale; 1=No extent, 2=small extent, 3=moderate extent, 4=large extent, and 5= very large extent to rate the corresponding items.

No	<i>To what extent do you agree that the following aspects of Electronic Queue Management System influence the competitive advantage of tier one commercial banks;</i>	1	2	3	4	5
14.	Perceived ease of use of the Electronic Queue Management System menu					
15.	Deployment of staff to assist customers select their preferred service					
16.	Variety of services offered by the Electronic Queue Management System					
17.	Use of reports from Electronic Queue Management System in decision making					
18.	Use of integrated digital signage for promotions					

**Part V: Deposit Taking ATMs and Competitive Advantage**

This part of the questionnaire seeks to establish the role of deposit taking ATMS on competitive advantages on competitive advantages of tier one commercial banks in Nakuru. Use the following five point Likert Scale; 1=No extent, 2=small extent, 3=moderate extent, 4=large extent, and 5= very large extent to rate the corresponding items.

No	<i>To what extent do you agree that following statements influence the competitive advantage of tier one commercial banks;</i>	1	2	3	4	5
19.	Operational reliability of the deposit taking ATMs					
20.	Level of security provided at the deposit taking ATMs					
21.	Timeliness in updating the amount deposited					
22.	Accessibility of the deposit taking ATMs					
23.	Awareness of the capability of the deposit taking ATMs					

**Part VI: Competitive Advantage**

This part of the questionnaire seeks to measure the level of competitive advantage of tier one commercial banks in Nakuru. Use the following five point Likert Scale; 1=No extent, 2=small extent, 3=moderate extent, 4=large extent, and 5= very large extent to rate the corresponding items.

No	<i>To what extent do you agree that new technologies in the bank influence the following aspects;</i>	1	2	3	4	5
24.	Operational costs					
25.	Geographical reach					
26.	Visibility of bank					
27.	Client base					
28.	Customer service					

## APPENDIX III: RECOMMEDATION FROM KABARAK UNIVERSITY



**KABARAK UNIVERSITY**

INSTITUTE OF POST GRADUATE STUDIES

Private Bag - 20157  
KABARAK, KENYA  
E-mail: [directorpostgraduate@kabarak.ac.ke](mailto:directorpostgraduate@kabarak.ac.ke)

Tel: 0773265999  
Fax: 254-51-343012  
[www.kabarak.ac.ke](http://www.kabarak.ac.ke)

5th November, 2018.

Ministry of Higher Education Science and Technology,  
National Council for Science, Technology & Innovation,  
P.O. Box 30623 - 00100,  
Nairobi

Dear Sir/Madam,

**RE: RESEARCH BY LINDA MATELONG-GMB/NE/0450/05/17**

The above named is a student of Kabarak University taking Masters of Business Administration (Strategic Management Option). Her research is entitled "Influence of Technological Change Management on Competitive Advantage of Tier I Commercial Banks in Nakuru" 'she has been **Examined and Accepted** by the Board of Postgraduate Studies.

She is therefore authorised to proceed on with her research. Any assistance accorded to her is highly appreciated.

Thank you.

Yours faithfully,

**Dr. Betty Tikoko**  
**DIRECTOR - (POST GRADUATE STUDIES)**



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**Kabarak University Moral Code**

*As members of Kabarak University family, we purpose at all times and in all places, to set apart in one's heart, Jesus as Lord. (1 Peter 3:15)*



Kabarak University is ISO 9001:2015 Certified



## APPENDIX IV: NACOSTI RESEARCH AUTHORIZATION LETTER



### NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,  
2241349,3310571,2219420  
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/18/20034/26848**

Date: **15<sup>th</sup> November, 2018**

Linda Chepkemei Matelong  
Kabarak University  
Private Bag - 20157  
**KABARAK.**

#### **RE: RESEARCH AUTHORIZATION**

Following your application for authority to carry out research on *“Influence of technological change management on competitive advantage of tier 1 commercial banks in Nakuru”*. I am pleased to inform you that you have been authorized to undertake research in **Nakuru County** for the period ending **15<sup>th</sup> November, 2019**.

You are advised to report to **the County Commissioner and the County Director of Education, Nakuru 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.

  
**BONIFACE WANYAMA**  
**FOR: DIRECTOR-GENERAL/CEO**

Copy to:

The County Commissioner  
Nakuru County

The County Director of Education  
Nakuru County

*National Commission for Science, Technology and Innovation is ISO9001:2008 Certified*

## APPENDIX V: NACOSTI PERMIT

<b>THIS IS TO CERTIFY THAT:</b>	<b>Permit No : NACOSTI/P/18/20034/26848</b>
<b>MS. LINDA CHEPKEMEI MATELONG</b>	<b>Date Of Issue : 15th November,2018</b>
<b>of KABARAK UNIVERSITY, 0-30100</b>	<b>Fee Received :Ksh 1000</b>
<b>Eldoret, has been permitted to conduct</b>	
<b>research in Nakuru County</b>	
<b>on the topic: INFLUENCE OF</b>	
<b>TECHNOLOGICAL CHANGE MANAGEMENT</b>	
<b>ON COMPETITIVE ADVANTAGE OF TIER 1</b>	
<b>COMMERCIAL BANKS IN NAKURU</b>	
<b>for the period ending:</b>	
<b>15th November,2019</b>	
<b>Applicant's</b>	
<b>Signature</b>	
	<b>Director General</b>
	<b>National Commission for Science,</b>
	<b>Technology &amp; Innovation</b>