EFFECTS OF TECHNOLOGICAL INVENTIONS ON PERFORMANCE OF COMMERCIAL BANKS: A CASE OF EQUITY BANK LIMITED

BY

NZUKI L. MUTISYA

UNITED STATES INTERNATIONAL UNIVERSITY-AFRICA

SPRING 2019
EFFECTS OF TECHNOLOGICAL INVENTIONS ON PERFORMANCE OF COMMERCIAL BANKS: A CASE OF EQUITY BANK LIMITED

BY

NZUKI L. MUTISYA

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

UNITED STATES INTERNATIONAL UNIVERSITY-AFRICA

SPRING 2019
STUDENT’S DECLARATION

I, the undersigned, pronounce this is my unique work and has not been submitted to some other institution or university other than to the United States International University-Africa (USIU-Africa) in Nairobi, Kenya for academic credit.

Signed: __________________________  Date: __________________________

Nzuki L. Mutisya (ID: 613122)

This project proposal has been presented for examination with my approval as the appointed supervisor.

Signed: __________________________  Date: __________________________

Dr. Timothy Okech (PhD)

Signed: __________________________  Date: __________________________

Dean, Chandaria School of Business
ABSTRACT

The general objective of this study was to determine the effects of technological inventions on performance of commercial banks with a case of Equity Bank Limited. The specific objectives that guided the study were to: examine the effect of mobile banking on performance, analyse the effect of online banking on performance; and assess the effect of automated banking on performance.

The study applied descriptive survey method, targeting Equity Bank Limited employees who were identified using stratified sampling. A structured questionnaire was used to collect primary data from the target respondents. Data collected was analysed to obtain both inferential and descriptive statistics where descriptive analysed percentages and frequencies and inferential statistics analysed regression and correlational analysis.

The findings on the extent to which mobile banking enhances performance of commercial banks. The findings have revealed the existence of statistically significant relationship between mobile banking and performance of commercial banks, r (0.807); p value < 0.01.

The findings of this study have also revealed a strong relationship between online banking and performance of commercial banks. The relationship that exists between the two variables was statistically significant, r (0.651); p value < 0.01

The findings of the study indicate the existence of a relationship between automated banking and performance of commercial banks, r (0.807); p value < 0.01. All components of automated banking including customer service, operational cost reduction, profitability, revenue streams, coordination of banking activities and the volumes of banking transactions contributed to a statistically significant relationship between automated banking and performance of commercial banks.

The study concludes that the relationship that exist between mobile banking and performance of commercial banks was statistically significant. This study also concludes that the relationship between online banking and performance of commercial banks was statically significant and the variables associated with online banking contributed to this relationship.

This study recommends that Equity Bank Limited should put in place mobile banking mechanisms. This should include loan mobile application systems to cater for the unbanked population. The bank should also put in place online banking systems and more importantly
training and creating awareness of the online services to its customers for enhanced adoption. The bank should increase automation in their operations apart from relying on automated teller machine innovation, they should also automate cheque deposit and loan application services.
ACKNOWLEDGEMENT

I would like to acknowledge Dr. Timothy Okech (Phd) for his supervision from the initial stages of aligning my proposal to its final stages of completion. He has been reliable and offered feedback on time.
DEDICATION

I dedicate this project to my family, comprising my wife Dorothy and our two sons Nzuki and Kimatu plus my mum Mary, for their support and encouragement.
# TABLE OF CONTENTS

STUDENT'S DECLARATION ........................................................................................................... ii
COPYRIGHT ................................................................................................................................. iii
ABSTRACT ................................................................................................................................... iv
ACKNOWLEDGEMENT ................................................................................................................ vi
DEDICATION ............................................................................................................................... vii
CHAPTER ONE .......................................................................................................................... 1
  1.0 INTRODUCTION .................................................................................................................. 1
    1.1 Background of the Problem ................................................................................................. 1
    1.2 Statement of the Problem .................................................................................................. 6
    1.3 General Objective ............................................................................................................ 7
    1.4 Specific Objectives .......................................................................................................... 7
    1.5 Significance of the Study .................................................................................................. 7
    1.6 Scope of the Study ........................................................................................................... 8
    1.7 Definition of Terms ......................................................................................................... 8
    1.8 Chapter Summary ........................................................................................................... 9
CHAPTER TWO ............................................................................................................................. 10
  2.0 LITERATURE REVIEW .......................................................................................................... 10
    2.1 Introduction ..................................................................................................................... 10
    2.2 Effect of Mobile Banking on Performance of Commercial Banks ................................. 10
    2.3 The Effect of Online Banking on Performance of Commercial Banks ......................... 14
    2.4 The Effect of Automated Banking on Performance of Commercial Banks ................. 18
    2.5 Chapter Summary ........................................................................................................... 22
CHAPTER THREE ......................................................................................................................... 23
  3.0 RESEARCH METHODOLOGY ............................................................................................. 23
    3.1 Introduction ..................................................................................................................... 23
    3.2 Research Design ............................................................................................................. 23
    3.3 Population and Sampling Design .................................................................................... 23
    3.4 Data Collection Methods ................................................................................................ 25
    3.5 Research Procedures ....................................................................................................... 26
    3.6 Data Analysis Methods .................................................................................................... 27
CHAPTER FOUR ......................................................................................................................... 28
  4.0 RESULTS AND FINDINGS ................................................................................................... 28
LIST OF TABLES

Table 4. 1: Response Rate .............................................................................................................28
Table 4. 2: Mobile Banking and Convenience .............................................................................33
Table 4. 3: Mobile Banking and Accessibility of Banking Services .............................................34
Table 4. 4: Mobile Banking and Easy Use of Banking Services ..................................................35
Table 4. 5: Correlation between Mobile Banking and Performance ...........................................36
Table 4. 6: Model Summary for Mobile Banking .......................................................................37
Table 4. 7: ANOVA for Mobile Banking ......................................................................................37
Table 4. 8: Coefficients for Mobile Banking ..............................................................................38
Table 4. 9: Online Banking and Fraud Detection .......................................................................38
Table 4. 10: Online Banking and Convenience .......................................................................39
Table 4. 11: Online Banking and Customer Retention ...............................................................40
Table 4. 12: Online Banking and Productivity ..........................................................................41
Table 4. 13: Online Banking and Customer Satisfaction ...........................................................41
Table 4. 14: Correlation between Online Banking and Performance .......................................42
Table 4. 15: Model Summary for Online Banking ...................................................................43
Table 4. 16: ANOVA for Online Banking ...................................................................................43
Table 4. 17: Coefficients for Online Banking ...........................................................................44
Table 4. 18: Automated Banking and Cost Savings .................................................................44
Table 4. 19: Automated Banking and Service Delivery ..............................................................45
Table 4. 20: Automated Banking and Profitability ...................................................................46
Table 4. 21: Automated Banking and Efficiency ......................................................................47
Table 4. 22: Automated Banking and Revenue Streams ............................................................48
Table 4. 23: Correlation between Online Banking and Performance .......................................48
Table 4. 24: Model Summary for Automated Banking ..............................................................49
Table 4. 25: ANOVA for Automated Banking ...........................................................................49
Table 4. 26: Coefficients for Automated Banking ....................................................................50
Table 4. 27: Correlation Analysis ..............................................................................................51
Table 4. 28: Regression Model Summary ...................................................................................51
Table 4. 29: Analysis of Variance (ANOVA) ............................................................................52
Table 4. 30: Coefficient Analysis ...............................................................................................53
LIST OF FIGURES

Figure 4.1: Gender of the Respondents.................................................................29
Figure 4.2: Age of the Respondents.................................................................29
Figure 4.3: Work Experience...............................................................................30
Figure 4.4: Respondents’ Level of Education..................................................31
Figure 4.5: Respondents Work Department......................................................31
Figure 4.6: Mobile Banking and Revenue Generation.....................................32
Figure 4.7: Mobile Banking and Customer Attraction......................................33
Figure 4.8: Mobile Banking and Security of Banking Transactions...............34
Figure 4.9: Mobile Banking and Financial Inclusion........................................35
Figure 4.10: Mobile Banking and Sources of Revenues....................................36
Figure 4.11: Online Banking and Customer Security.........................................39
Figure 4.12: Online Banking and Sales..............................................................40
Figure 4.13: Online Banking and Customer Loyalty..........................................42
Figure 4.14: The Significance of Automated Banking.......................................44
Figure 4.15: Automated Banking and Banking Transactions...........................46
Figure 4.16: Automated Banking and Coordination of Banking Activities.......47
ABBREVIATIONS AND ACRONYMS

ATM: Automated Teller Machine

SPSS: Statistical Package for Social Sciences

ANOVA: Analysis of Variance

CBK: Central Bank of Kenya
CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Problem

Technological innovation is the ideology of developing new products or the activity of new production process with an aim of better performance in the organization operations. In the financing industries, the term innovation is basically, the philosophy of developing new processing instruments, technologies, departments and markets with the purpose of facilitating the easy access of information, trading activities and forms of payments (Wheelock & Wilson, 2017). Technological innovations entails the inter-organizational processes of a market based sell-buy relationships and the collaboration being the consumer oriented activities and the intra-organizational processes that support them (Pogodaeva & Baburina, 2018). Technological innovations has enabled organizations to embrace electronic commerce as a means of market expansion, improved customer service, cost reduction and enhanced productive. Arguably in the banking industry, the most revolutionary technological innovation has always been the Automated Teller Machine (ATM) (Cao & Wang, 2012).

The banking sector has, for the past decade, witnessed various improvements and new technologies with the main purpose of improving the service delivery of the banking sector. The fundamental assumption suggest that much of the recent research in the improvement of operations learning is that technological innovation has a direct impact on bearing performance improvements (Moser, 2015). Currently, nearly all the commercial banks in developing nations have adopted the use of ATM enhancing their utility to their target market making the innovation of ATM to be the most successful delivery channel for consumer banking at their convenience (Adewoye, 2013).

Another technological innovation in the banking industry is electronic cards that the banks have developed over the years (Wolf, 2008). Banks have also given a recognition to the internet an opportunity of them generating revenues as well as gaining competitive advantage. Similarly, mobile banking has taken a big leap due to its convenience and time (Asongu, 2015). According to Amin (2016), the services that are available with this kind of system do ascertain credible and reliable information pertaining to the bank’s products, complaints of the customers, bank statements and any other possible complaints or inquiry the client might want it addressed by the bank.
The creation of new innovations in the global point of view has created a solid foundation through the spread and readily available access on the economic and financial development information and on the global market (Wonglimpiyarat, 2017). Technological innovation has eased the mobilization of capital improving the accounting systems that foster screening by distant investors. Nevertheless; major developed countries don’t face any difficulties in embracing the technological innovation since they are highly advanced in terms of technology (Greenwood, 2014). These countries have numerous capital and technical skills that would help them do research on new technological techniques on to enhance efficiency in the banking sector (Kaushik & Rahman, 2014).

On the other hand, some of the scholars assert that innovation is not only limited to the financial industries and sectors instead it is a wide concept that is applied in the diverse marketing fields (Idun & Aboagye, 2014). For example U.S has deployed the innovation technology in the banking industries by implementing Volcker Rule, regulations around governance expectations of bank boards, and the size threshold for systemically important institutions. However, higher capital and liquidity requirements, stress testing, and recovery and resolution planning will likely remain intact. According to Babu and Kumar (2018) they indicate that, the ideology of technological innovation is a concept that involves processing of products through which technological advancement are produced.

The financial industry has developed marking rules that is regulated by European Union on the banking strategies as far as the technological innovation is concerned. For instance, the regime that has been proposed by the EU is responsible of establish intermediate holding companies similar to those required under US regulation should continue to be significant priorities for global banks (Petti & Zhang, 2013). Additionally, the second Payments Service Directive (PSD2) regime could have spill over effects across geographies. Data protection rules, especially the General Data Protection Regulation, should further add to the compliance burdens (Rozario, 2016).

In the current global and the dynamic competitive environment, product innovation is gaining more popularity and becoming more relevant through the three main aspects of intense competition, demanding market, and the rapidly changing technologies (Mullan, Bradley, & Loane, 2017). Again, in today’s global; most of the organization are deploying technological innovation with the aim of increasing the capacity of producing new goods (Ahmed, Manwani, & Ahmed, 2018). In that regard, it is clear to argue that the ideology of technological innovation
is closely connected with the idea of generation, application, and dissemination of technologies. Currently, the push of technologies is not more stable because the ideology of technology is advancing at a higher rate that it creates alternatives on the daily basis that most of the organization can gain diverse technological strategies. To put it differently, some of the veteran scholars suggest that innovations come to be seen as a result of collaboration for integration of skills and capabilities when competing for the future market (Torres, 2018). Importantly, the purpose of technological innovation in the financing sectors is paramount throughout the world to the successful and profitable services delivery in those organizations. Additionally, technological innovations play a significant role in improving the efficiency of the banking sector as well as reducing the costs of banking transactions for customers.

Technological innovation has greatly been recognized and considered as the major key to economic growth and development of firms in terms of profitably and employment in Africa. In that regard, some of the relevant countries in Africa that have deployed the innovation channels include South Africa, Morocco, and Nigeria (Asongu, 2015). These countries have implemented enormous rule to regulate online transaction thus making it favourable for the clients to think of this ideology in the different direction as compared to the past few decades (Idun & Aboagye, 2014). This service delivery is effective and flexible to customers because it enables them to have control over their transactions anytime to check the account details, bank statements, and other account details. Mobile banking has also saved time and distance for both the customers and enabling staffs serving them continually regardless of the distance. It is suggested that, currently any banking industry in the African continent that fails to shift to the internet banking in the market, chances of losing its customers is likely to be high, whereas, from the assumption of cost consideration, the cost of keeping a branch banking is higher than the cost of offering internet banking (Moser, 2015). This notion is confirmed that in some commercial banks that take advantage of the internet technology to establish bank websites but few would offer the internet banking services. Adoption by many banks to offer the internet banking services would improve performance and put Africa into a competitive environment globally (Charles, Seth, & Darmoe, 2017).

Despite the fact that Africa is ranked amongst the top most competitive continents globally with in terms of innovation, there are some of the challenges that are facing the banking industries in Africa. Luckily, in South Africa, Nigeria, and Angola, the reduction of branches and ATMs available in the countries has influenced a higher proportion of customer’s
preference for service delivery (Torres, 2018). Customers are inclined to make use of digital channels for their transactions in place of channels available in bank branches. These economies are supported by standard financial markets indicating the potential for growth of the banking industries in the African market (Idun & Aboagye, 2014). Through studies and research, better and efficient retail payment systems were discovered that enhance efficiency in the financial market. Every economic system has adopted the electronic payment instruments like the use of the electronic fund transfer and the payments through cheques that has helped the banks in determination and accounting of their profit and cost ratios. Stronger relationships have been built in these countries where there is a high retail payment transaction system like the POS terminals and the ATMs (Ahmed, Manwani, & Ahmed, 2018).

In South Africa, the technological innovation has already been implemented while other innovations are still being worked on. South Africa has installed FinTech innovation technology, with innovative companies applying technology to create ways to do banking in a virtual environment (Makanyeza, 2017). In addition, the financial institutions are also waking up the opportunity that this brings as it is a way for them to retain customers and profitability, while at the same time cutting costs. Telecommunications companies could plausibly use FinTech to get into the banking sector (Ahmed, Manwani, & Ahmed, 2018). The biggest challenges they face are in obtaining banking licenses, existing competition and monopolies, and being able to comply with the regulations associated with having a banking license (Moser, 2015). That said these companies will make forays into the banking environment on a partnership or shared risk type model. They will partner with the smaller, already licensed financial institutions, and will then introduce FinTech using technology (Wheelock & Wilson, 2017). Both the banks and telecommunications companies are under pressure from a growth and performance perspective and they both have access to customer data that they can utilize to offer new and innovative products and services (Shankar, Jreisat, & Hassan, 2018).

Kenya comprises of 43 commercial banks, 6 deposit-taking micro-financing organizations, 1 mortgage, 124 foreign bureaus, 3 representative office, and 3 credit reference bureaus (Charles, Seth, & Darmoe, 2017). The Kenyan financial institutions have undergone tremendous changes in the last two decades. For example, a manuscript that financial products have increased, activities and organizational forms have also improved and the overall efficiency of the financial system has increased (Idun & Aboagye, 2014). Commercial banks branch network has grown from 530 in 1999 to 1,102 branches by end of June 2011, ATMs increased from 262
to 2,021, a number of deposit accounts from approximately 1 million with 16,673 staff to 12.8 million with 28,846 staff over the same period (CBK, 2011). Consequently, the banking sector productivity score continued to improve where the staffs to customers’ ratio were 1:444 in June 2011 compared to 1:60 in 1999. Total assets increased from Ksh. 387,371 million in December 1999 to Ksh. 1.9 trillion in June 2011 while customer deposits from Ksh. 235 billion to Ksh. 1.4 trillion in June 201 (Ahmed, Manwani, & Ahmed, 2018).

Equity Bank Limited is a financial service provider that has its headquarters in Nairobi, Kenya. Equity Bank is one of the innovative banks in the Kenyan economy since it has developed various banking products under its Fintech holdings to support its operations. Equity Bank has adopted the basic technological innovations that are electronic, mobile, and internet banking and it has taken an extra mile to develop a sim card to enable banking of its customers most effective (Mwiti, 2018). The organization is licensed and authorized to perform financial transaction by the commercial bank, Central Bank of Kenya, and the national banking regulators (Okoth, 2018). Under its operation, the agency banking model was introduced in 2010 after been proved successful and it’s still regulated by the Central Bank of Kenya (Wheelock & Wilson, 2017).

Equity Bank Kenya Limited was incorporated in 2014 as a result of the restructure of Equity Group Holding Limited. It was after the restructure that Equity Bank announced to incorporate new wholly owned subsidiary, Equity Bank Kenya Limited under which it will transfer some of their assets, liabilities, and banking business.

Equity Bank Kenya Limited has gained more popularity in the past few decades due to the implementation of the technological innovations in their business operations. Ideally, this organization has the highest coverage area in Kenya and has the highest number of branches among other banks in Kenya (Katwalo & Huhanji, 2014). Technological innovation at Equity has enabled it to become the biggest bank in the African continent in terms of customer base (Riungu, 2010).

According to Dasgupta (2011), profitability is the main goal of commercial banks that is the desires performance of commercial banks. All the strategies including innovations are therefore meant to realize this grand objective of attaining good performance which is measured in terms of profitability and market share. Technological innovations in the banking sector attract customer base which in return the bank gains from various services that are offered to its clients as well as creating new avenues of revenue generations through innovation (Altendorf & Schreiber, 2015).
1.2 Statement of the Problem

Globally, despite the perceived benefits of the Information Communication Technology and the electronic commerce, there is still a debate on whether and how the adoption of this technology improves the performance of commercial banks (Matevu & Kerongo, 2015). The investment in ICT and electronic commerce by commercial banks needs organization and innovation costs which comes along with various risks that the banks should be willing to take in order for them to accurately assess the impact of the adoption on performance (Idun & Aboagye, 2014).

The Kenyan banking sector on the other hand has witnessed tremendous changes in the banking industry from internet banking to the mobile banking being one of the disruptor of the banking sector in a way that has forced banks to partner up with them rather than competing on the same clientele (Asongu, 2015). Today, consumers of the banking services have the efficient way of banking, convenient and fast banking service delivery as a result of the technological inventions such as the automated banking, mobile and online banking systems. Regardless the benefits of the technological inventions, the investment in the adoption of these technologies remains risky and costly and prone to failure as well as increased fraud globally, hence, the technological inventions in the commercial bank have a resounding positive impact or negative impact on the performance of the banking operations (Adewoye, 2013).

Locally studies have been carried out, for instance Kiragu (2017) did a study on the effects of e-banking on the financial performance of Kenyan banks and found out that the profitability of banks increased after the introduction of electronic banking, Manyocho (2015) conducted a study on the relationship between banking technologies and financial performance of commercial banks in Kenya and the study revealed that adoption of automated banking had a positive influence on the performance of commercial banks and Wasilwa and Omwenga (2016) effects of ICT strategies on performance of commercial banks and their study revealed that mobile phones had a higher effect than internet services in banking performance. However, they failed to establish the effects of technological inventions as a whole aspect on the performance of commercial banks in Kenya, making this study essential as it sought to establish the effects of technological inventions on performance of commercial banks with a case of Equity Bank Limited.
1.3 **General Objective**

The general objective of this study was to determine the effects of technological innovations on performance of commercial banks in Equity Bank Limited.

1.4 **Specific Objectives**

The following objectives guided this study.

1.4.1 To determine the effect of mobile banking on performance in Equity Bank Limited.

1.4.2 To determine the effect of online banking on performance in Equity Bank Limited.

1.4.3 To determine the effect of automated banking on performance in Equity Bank Limited.

1.5 **Significance of the Study**

This study is significant to the following stakeholders.

1.5.1 **Equity Bank Limited**

Equity Bank Limited benefited from the findings of this study by knowing the effects of technological inventions on performance of commercial banks, hence, enabling the bank in creating strategies that are appropriate and in line with the dynamic technological inventions to support their business operations.

1.5.2 **Banking Industry**

This study was significant to various banking institutions as well as the banking industry as a whole in assessing the role of technological inventions on banking performance and help the institutions to adopt the right technology that is essential to their banking performance. The findings also informed strategic planning of the financial institutions since technology is considered as one of the biggest disruption in the banking industry.

1.5.3 **Policy Makers**

The regulatory framework and the governing body of commercial banks also benefited from the findings of this study on the effects of technological inventions on commercial banks, based on the findings the policy makers can then formulate the right policies and laws that take into consideration the welfare of the banking industry in terms of technology inventions taking place in the business environment.
1.5.4 Scholars and Researchers

The study was also significant to the researchers and academicians that seek additional knowledge in the field of technological inventions taking place in the banking industry. Scholars and researchers can also use the findings of the study in their literature review as far as their study touches the effects of technological inventions on performance of the banking industry.

1.6 Scope of the Study

The study focuses on determining the effects of technological inventions on performance of commercial banks with a specific case of Equity Bank Limited. The duty stations surveyed for this study were limited to Nairobi, targeting the top level managers and the middle level managers. The study covers three essential areas determining the effect of mobile banking on performance, determining the effect of online banking on performance and determining the effect of automated banking on performance in Equity Bank Limited.

1.7 Definition of Terms

1.7.1 Mobile Banking

Mobile banking refers to the service provided by banks or any other financial institution which allows its customer base to conduct financial transactions remotely through the use of mobile devices like a smartphone or tablet (Tiwari & Stephan, 2007).

1.7.2 Automated Banking

Automated banking refers to a banking service that is fully automated in that it has eliminated the need for having an actual human attendant to render the service of the bank (Gustin, 2009).

1.7.3 Electronic Banking

Online banking is the process in which the core banking services can be accessed directly from the internet (Mwangi, 2010).

1.7.4 Technological Innovation

Technological innovation refers to the process of where a company or a group of people working outside a structured organization embark in journey where the importance of
technology as a source of innovation has been identified as a critical success factor for enhanced market competitiveness (Amin, 2016).

1.8 Chapter Summary

The chapter presented the background information in respect to problem being investigated, statement of the problem has also been highlighted in this chapter, the general objective of the study has been indicated with a focus to establish the effect of technological innovations on performance, and the research objectives that guided the study have were introduce in this chapter. The significance of the study highlighting key stakeholders who are likely to benefit from the study has also been presented, followed by the scope of the study and definitions of terms used in the study. The next chapter will present the literature review of the study followed by chapter four that will present the results and findings obtained from the target respondents and the last chapter will present the discussion, conclusions and recommendations of the study.
CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter will present the literature review on the effects of technological inventions on performance of commercial banks by reviewing publication of various authors on the subject matter. The first section of the chapter presents the effect of mobile banking on performance of commercial bank, followed by the effect of online banking on performance of commercial banks and the last section will present the literature on the effect of automated banking on performance of commercial banks. The chapter also presents a chapter summary at the end highlighting all the major elements covered in the chapter.

2.2 Effect of Mobile Banking on Performance of Commercial Banks

Mobile banking refers to the service provided by banks or any other financial institution which allows its customer base to conduct financial transactions remotely through the use of mobile devices like a smartphone or tablet (Tiwari & Stephan, 2007). Unlike the related internet banking which uses software called an app offered by the financial institution for transactional purpose despite other financial institutions having restrictions on which accounts can be accessed through mobile banking (Vaidya, 2011).

According to Idun and Aboagye (2014) mobile banking involves the use of mobile phone or another mobile device in carrying out financial transactions that are directly linked to the customer account. AL-Ajam and Nor (2015) suggest that mobile banking involves the provision and the availing of banking and financial service with the help of mobile telecommunication device. The services cut across the carrying out of balance checks, account transactions, payments, credit applications and other banking transactions through a mobile device like a smartphone which is the most used device in developed nations or the personal digital assistant.

An innovation stemming from the telecommunication revolution in the late twentieth century, mobile banking brings the convenience of making monetary transaction from a bank account to other bank accounts to even presentation and printing of bank statements by a client point of convenience (Mallat, 2004). It is whereby the banking service provider provides a platform in which their customers conveniently transact securely from remote locations usually locations of their convenience such as their homes or workplaces. Customers need not to visit a bank,
premise to do their transactions as the core banking services such as payment of bills, production of statements, transfer of cash from one account to another account and payment of goods and services at a shopping store. The banking institution usually provide any form of support to a client on a twenty four hours basis through mostly a hotline number provided or on an instant chat service (Lee, 2009).

Before the evolution of smart phones, mobile banking relied heavily on the use of an SMS based services on the feature phones to deliver on transactions (Vaidya, 2011). This required users to send a short code message to the main banking system, which prompted them to pass an authentication test therefore given the gateway to the banking services (Owen, 2014). With the advent of smart phones, mobile banking was made easier since the banking service is provided on a platform of an application. Users were required to download the banking application on popular application stores such as the google play store or the apple play store (Charles, Seth, & Darmoe, 2017).

This increased the functionality of the mobile banking since the more features were introduced on the applications and it ensured better security for transaction thereby reducing potential fraud considerably (Makanyeza, 2017). To ensure the security for transactions, mobile banking on the smartphone application has gone to put more than one layer of authentication. Case in point is the banking application fusing with artificial intelligence, whereby mobile banking requires to use finger print detection aside from the traditional username and password to grant access to the mobile banking platform (Mbiti, 2011). These features of authentication are almost common to all banking application as security is of more importance when transacting on a mobile device.

There is a rapid uptake of the mobile banking application among the population with statistics indicating that two out of five customers in the developed world prefer the use of mobile banking to when conducting transactions for the obvious reasons as the ease of convenience in the banking process (Zhou, 2011). Mobile banking has had notable effects on the performance of commercial banks in Kenya with seeming interest for every commercial bank to adopt the technology. It is a technology that is a necessity and a top priority for every player in the Kenyan financial sector (Barnes & Corbitt, 2013). Each year there can be observed that the commercial banks set out huge expenditure budgets for the expansion, adoption and maintenance of their mobile banking platforms and system. For the banking institution to survive competition in the market, there is need to put up the innovation that guarantees
convenience to the customers. The convenience to link to a bank account through a mobile
gadget is seen as power and empowerment to the customer owing to the fact that he or she has
total financial control over their funds at any time of day or night (Adewoye, 2013).

According to Asongu (2015) the growth of Information Technology has impacted almost each
aspects of life, among them being the banking sector. Mobile banking invention has changed
and has redefined the way commercial banks are running since the technology is now regarded
as a major input for the organization’s achievement as a main proficiencies, for both local and
international banks as they channels their finances more on offering customers with fresh
technologies by means of mobile banking. Amin (2016) suggests that technological
developments have not only influenced lifestyle but has had an impact on the way customers
conduct their banking activities. In the ancient days, commercial banks used mobile vehicles
to transfer their services to clients particularly the ones in rural areas. This was followed by a
move of using email and internet services in offering services to clients. Charle et al (2017) in
the last decade, has seen an unbelievable expansion in the mobile growth in developing nations.
Nonetheless, of great importance is that while the mobile phones offers a number of features
like the likelihood of mobile banking, approximately half of the global populations have not
accepted mobile banking and monetary services or they have denied the same (Barnes &
Corbitt, 2013).

According to Dasgupta (2011) in the recent years, commercial banks have developed
innovative products and services and offered a wide range of services in the effort to increase
efficiency which is the most critical goal of any commercial bank. Mobile banking involves
the accessibility of banking services and facilities using electronic mobile devices like mobile
phones. Abdullai and Nyaoga (2017) argues that although various and at times the competing
labels and definitions have been used while discussing the provision of financial services
through mobile phone networks mobile money focuses on the convergence of mobile telephone
and financial services.

2.2.1 Financial Inclusion

Mobile banking, which is a critical integration of the banking system and has a firm footing in
the banking industry has allowed for consumers to transact with convenience thereby not
needing to visit any banking hall (Dasgupta, 2011). Banks rely on customer deposits in order
to make available funds to conduct the business of lending and financing. For this to happen,
banks require high levels of liquidity as the more cash at their disposal the many projects they
are able to finance and lend out. Financial inclusion of all category of earners is critical in boosting the liquidity level of the bank. It is critical not to ignore the bracket of earners that are considered as low income earners in the financial sector or the banking sector.

Aside the core business of taking deposits from clients and customers, commercial banks provide for the much needed credit to the economy of the country (Al-Hawar, 2014). Under regulation from the central banks, commercial banks make available credit to business enterprises and individuals seeking extra funding for development of projects (Adewoye, 2013). Commercial banks also offer credit to government institutions and they do fund and guarantee different development projects for the government.

Mobile banking has revolutionised this phenomenal as most of the platforms allow deposits to be made directly into the banks. To achieve this, commercial banks have integrated their mobile banking system with the mobile money systems offered by telecommunication companies in the all the countries that support and license mobile telecoms money (Wolf, 2008). Customers can deposit money at any time of their convenience and the overall effect is the rise of liquidity of the commercial banks. This has resulted to commercial banks having a competitive edge over their competitors in the highly competitive market (Asongu, 2015).

2.2.2 Customer Attraction

Not any time in history has the banking sector experienced competition as these modern times, with the expanding market is the quest for commercial banks to increase their presence (Lee, 2009). It is a game of the jungle whereby the big players in the banking sector easily overrun the small players in the financial sector. There seem to be a hunt for new market opportunities at every wake and turn of day. To stay on top of competition is the ability of the commercial bank to adopt any innovation in the market. It is to be understood that it is not only adopting the new forms of technology that will guarantee the ability to stay afloat but also the ability to adopt the technology at a rate that is faster than the competitor (ChauShen, 2013). Speed is crucial in market survival and expansion. A measure of market performance is based on how the organisation is expanding not only in the physical space but the virtual space (Wolf, 2008). Virtual spaces enables any organisation to spread its wings to newer markets and territories thus expanding and maximizing on its potential. To expand in the virtual space needs that the organisation expand in terms of adopting new technologies as the most notable advantage of organisation ability to conduct its operation in a rather seamless and convenient manner (Thakur, 2014).
Online banking is the process in which the core banking services can be accessed directly from the internet. The internet allows the core banking system to be linked to customers and in turn, the customer can enjoy the banking service at any convenience via a device that can access the internet (Singh & Srivastava, 2018). Internet banking enjoyed popularity towards the end of the 20th century when the internet started becoming available to the general public. The internet was mostly a preserve for large organisation and mostly military organisation. It was also an expensive form of communication thereby not making it feasible to connect the general public in that the return on investment was mostly marginal and took really a long time for organisations that set out on the venture to commercially sell the internet connection a lengthy period to recoup their investments (Rawashdeh, 2015). There is a considerable effort towards creating “virtual banking halls” where the banking customers can manage their transaction without necessarily having the hassles of visiting the real banking hall (Adewoye, 2013).

According to Barnes and Corbitt (2013) indicates that online banking is the use of electronic and telecommunication networks in delivering a wide range of value added products and services to the bank customers. The use of information technology in the banking sector is known as online banking. According to Ahmed et al. (2018) online banking is the product of e-commerce in the area of banking and financial services. Commercial banks also offer payment services on behalf of their consumers who conduct financial transactions in various electronic shops. Commercial banks provide payment services on the behalf of their consumers making an umbrella term for the process by which individuals may carry out banking transactions electronically without the use of a brick and mortar institution.

The products and services offered through online banking may mirror services and products obtained through the traditional banks service delivery channels when a client visits the bank premises (Bashir & Madhavaiah, 2015). The online banking services range from information push services where clients receive information about their banks pertaining to products, services to the information download platforms enabling customers to download the account information and full-transaction services where clients are able to perform most banking transactions like transfers between accounts, bill payments, card and loan applications done electronically (Giordani, Floros, & Judge, 2013). Online banking allows funds to be moved from a checking account to a savings account and vice versa, clients can fill out their loan
applications from personal loans to mortgages online and can even use online banking for their investments. Online banking accounts can be accesses any time, day or night provided that the client has an internet connection of any kind. Customers use encrypted passwords to secure their banking transactions so that they are safe and secure all the time (Kiragu, 2017). Internet has become the prop of business in the world. It is virtually impossible to conduct business without directly engaging the internet as it is a means in which data and information is exchanged (Mahadevan, 2012). Information systems are linked via the internet and the banking industry has stood to benefit immensely in that their information systems can be interlinked forming a web. It has contributed to the ease of doing business in the world, as it only requires an internet connection to get everything going.

In the past few years online banking has been accepted and rapidly growing, about 55 percent of private banking customers in Finland have online banking contracts with their banks (Barnes & Corbitt, 2013). Generally, Europe has been and still the leaders of online banking technology and usage, in comparison, in the year 2000 only 20 percent of the United States banks provided online banking services and only 20 percent of US banks private banking customers were equipped with an internet connection used in online banking services (Al-Ajam & Nor, 2015). According to Hojjati and Rabi (2013), the first world countries mostly the United States of America and the European Union in general are seen as the leaders in internet banking. They are the markets with the highest adoption rates in internet banking in the world. This is attributable to the fact that internet infrastructure is readily available and well developed. The fact of the two economic regions of the world having a well-established banking system and being the primary test markets for this revolutionary technology in the 1980s also makes them the leaders in internet banking. The rest of the world is rapidly following suit in the adoption of this technology as it is the frontier into the future of the banking business (Rawashdeh, 2015).

There is a commendable effort by commercial institutions especially in Kenya to push for adoption of the internet banking as a primary way of replacing the traditional banking system with the results showing that there is a reward in the efforts that are being employed (Gikandi, 2010). The rush to adoption of the online banking option and platforms has brought about a shakeup in the banking industry, as the technology is revolution in that it changes the way banking traditionally used to be conducted (Kiragu, 2017). The easy to use mobile platforms require that customers of the bank conduct the activities that were once being done by the employer of the bank. To allow for effective transactions in the online platforms is the adoption
of a raft of security measures that ensure security protocols are not breached and thereby making the whole process convenient and free from fraud (Charles, Seth, & Darmoe, 2017). Multi-level security protocols are employed and the users are encouraged to log into the online banking platforms from secure connections and always keep the banking details to themselves.

Online banking platforms provide customer care service at an instance through the various online portal and users can conveniently get helps on any queries they may have (Kimwomi & Muturi, 2018). Businesses are shifting global and in line with the banks quest to retain customers and attract newer customers is the massive investments in the online banking sector (Mwangi, 2010). Online banking is the most convenient tool of transaction for businesses and businesspersons in that it provides for access of bank accounts even if they are in a far or foreign area provided that they have internet connection.

There is increased awareness on the mobile banking platforms as it is a cost cutting measure for the banking industry. As trends can be observed, banks are not moving towards the expansion in terms of brick and mortar but in the virtual space (Asongu, 2015). This as alluded earlier is a cost cutting measure in that the banking institution save a considerable amount of money when they in not expanding thus overall growing on their profit margins. Statistics put out to the public domain indicate that online banking is on the rise with majority of customers really wanting to adopt the technological revolution (Mahadevan, 2012). Majority of customers prefer to use the internet to conduct transaction currently. The advent of this technology in the country did not attract much curiosity from the customers and the general public owing to the little education and awareness accorded to it and it is only in the recent time that the adoption gained traction (Mbiti, 2011).

2.3.1 Efficiency

Efficiency is crucial for any organisation transacting business. The organisation, in this aspect commercial banks rely on efficiency to attract more customers and seek a better market position. Customer retention and growth is a direct indication of good and efficient performance by any organisation and it relies on heavily on good management of the organisation (Lee, 2009). In the case of commercial banks, faster growth is a guarantee that the investment are finally paying off and that the financial institutions are gaining a firm footing in the location markets (ChauShen, 2013). With the online banking platforms, banking industries have been seen gaining the tremendous rate of efficiency, an obvious sign of the return on their investments as a whole. New and curios customers have been drawn into the
wave of online banking adding up to the number already using the online banking platforms. The online banking platforms are such that they provide for opening of banking accounts at only few clicks after they person wishing to open a bank account provides the required credentials. This has thus boosted to the additional of customers into the bracket of online banking and consequently increasing the population of banked individuals (Amin, 2016).

Challenges that initially faced banks like bouncing of a cheque is now a thing of the past for online banking customers since monitoring of accounts can be done online at any time enabling customers to track their transactions by knowing which cheques have been cleared helping in tracking when deposits and payments have been done (Charles, Seth, & Darmoe, 2017). This is all possible by customers simply going online to the websites of their banks and conducting all necessary transactions without any interaction. The convenience of data captured online makes it much easier in budgeting and tracking where the customers’ money goes because online banking enables customers to view copies of the cheques and transactions they perform without having any physical assistance from the bank, hence, bringing a desirable efficiency in the banking operations as well as cutting down on costs they would incur in offering service to the clients manually (Matevu & Kerongo, 2015).

2.3.2 Security and Fraud Detection

According to Patel (2018) while customers have the ability of viewing their bank accounts at any time, it is easier to detect fraudulent activity early before a much damage is made in the banking systems. He further indicates that as soon as the customer’s bank account is log into, they quickly get a notification whether they is anything amiss after checking on their deposits and debts. When funds are withdrawn from a bank account fraudulently, a client can get notified right away through an email or mobile devices such as smartphones enabling the customer to correct the issue immediately before causing a bigger damage rather than waiting for a longer time as opposed to traditional way of banking (Bashir & Madhavaiah, 2015).

Fraud is the biggest impediment to the growth of the online banking sector. Global statistics of cyber related fraud are in the overwhelming figures of billions of dollars. As far as the technology to make better and improve the online experience, fraud keeps on uncovering thereby exposing the risk of losing transactions by customers (Bashir & Madhavaiah, 2015). Commercial banks however, do not report the exact amounts lost to fraud in fear of losing customers or customers loosing trust with the online banking platforms. Fraud has eroded the gains made in the field of internet banking, despite the instances of fraud, the banking sector
has to keep investing in the online banking platforms as it is a necessary tool for operation of businesses. To avert the instances of fraud, much investment have been done in mobile banking technology offering the desirable security for banks (Barnes & Corbitt, 2013).

2.4 The Effect of Automated Banking on Performance of Commercial Banks

Automated banking refers to a banking service that is fully automated in that it has eliminated the need for having an actual human attendant to render the service of the bank (Gustin, 2009). Usually automated banking works by making available the teller machine at every convenient spot such as around the shopping areas. The automated teller machine requires that the customer of the bank to use a card usually a credit card to access his or her own funds (Al-Hawar, 2014). Automated banking has that the teller machine be filed with customers financial data such as bank balances. The automated teller machine is linked to the central banking system. The link is via a dedicated high speed internet connection. This allows for the updating of the customers financial records especially when he or she is involved in a transaction. Automated banking is advanced in such ways that customers can be able to access their bank balance information directly from the teller machine (Al-Ajam & Nor, 2015).

According to Makanyeza (2017) automation is the usage of systems as well as processes such as computers in controlling industrial machinery to substitute human aspect. The classification involving historical progression of the manual, mechanization and automated is significant in comparing the impact that each has on the competitive priorities of quality, cost, flexibility and speed. The automation process is one of the areas companies should consider in achieving performance objectives. It is actually one of the ways of enhancing performance through reduced costs (Adewoye, 2013).

The banking industry is increasingly buying into the ideology of convenience. Convenience is a key aspect in the commercial banking business as there is need for their customers to actually be right at convenience when they are in need of a banking service (Mahadevan, 2008). To keep ahead of competition, the banking industry has resulted to investing more in the field that enables them to be convenient, that is the automated banking systems. The result for this is that there is more benefits that comes with the convenience as compared to if the commercial banks did not commit to invest in the aspects that provided for convenience (Mullan, Bradley, & Loane, 2017). Automated banking has proved convenient and data and statistics coming from the banking industry insiders indicate that the banking industry indicate a massive uptake of automated banking from their clients (Gustin, 2009).
Automated banking gained in its popularity during the period that witnessed a rapid expansion of internet revolution and technology. The period of the late 20th century guaranteed the rapid expansion of automated banking out of better internet connectivity and faster and better computing infrastructure (Rawashdeh, 2015). Automated banking has had inroads in the banking sector with commercial banks being keen to offer the automated experience in their clients. Commercial banks are teaming up with major card providers around the world to offer this experience. Major card providers and support technology providers such as the giant VISA and MasterCard are keen to partner with the banking industries especially in the emerging economies to the world class experience of automated banking (Abdullai & Nyaoga, 2017).

In the current temporary business environment context, a need of Automated Teller Machines by commercial banks cannot be overemphasized (Abdullai & Nyaoga, 2017). The banking industry adopted the Automated Teller Machine concept for cost reductions and offering a better service for the consumers. The first Automated Teller Machine was installed by Barclays bank in London, United Kingdom in the early 1967. Banks started installing of ATM machines in the banking buildings where cash dispensing machines were not linked to the account directly with the spread of internet connectivity and the ATM machines have now become a part of the urban landscape with its presence in shopping malls, parks, airports with many other services on offer than just cash dispensing (Al-Hawar, 2014).

There various ways of measuring operational performance, the most predominant one being the level of profits. While commercial banks have adopted Self-service technology services to conveniently be available to customers (Abdullai & Nyaoga, 2017). Amin (2016) argue that there is a big number of customers still transacting with tellers within the banking halls, and consumers are found in many ques every time in the banking halls and ATMs. Similarly, the systems remained unnoticed by consumers and certainly underused. According to Patel (2018) the ques in the banking halls develop due to systems downtime and when there is inefficiency in the operations since all the banking operations cannot run as required. Many studies done on the Automated Banking have focused on customers’ experience. Narteh (2015) conducted a study on the perceived service quality and satisfaction of self-service technology. Kimwoni (2018) argued that there is a high degree of customer complaints with ATMS downtime, high charges and poor service recovery efforts when customers have issues. Past studies have focused on the areas of ATMs and not specifically ATMs and the operational performance, therefore, not providing the effect of automated teller machines on operational performance.
Commercial banks therefore, adopt the use of Automated Teller Machine without certainly on the desired outcome in terms of operational performance.

2.4.1 Coordination of Banking Activities

Automated banking can be regarded as a form of a shared resource banking. With the teller machines working in liaison with the main banking system, the network is expected to be at all-time high in order to reduce the occurrences of inconveniencing (Greenwood, 2014). Performance and coordination has a direct relationship with the general customer satisfaction. Researching on customer satisfaction in regards to the automated banking, it was found out that the rate of satisfaction of customers was dependent on the efficient of functioning of the automated system (Gustin, 2009). It was found that the level of satisfaction was high when they discovered that the machine was up and functional at any time of their convenience. In addition, the level of satisfaction was high when they went around and found out that they could withdraw their funds in without any hitches. Automation, sharing resource with all the banking customers and the users has to be a controlled resource with often a cap on the maximum and the minimum funds that can be withdrawn from it. The higher the capping rate and the allowed frequency of withdrawal of funds lead to a higher preference rate of a particular commercial banking company as compared to the other commercial banking companies. Thereby to avoid on any inconveniences and lead to a high level of customer satisfaction, commercial banks have resulted to frequency recharge of their automated machines and also the (Clerk, 2010).

In addition, another factor queried about the preference of an automated banking is the ease of use of the automated software. As it is to be noted, not all customers of a commercial bank are well informed with complex computer workings (Matevu & Kerongo, 2015). This as a factor intimidates the customers of a commercial bank and thus turn in it can lead to a low rate of adoption of the technology around internet banking. For instance, the rate of adoption in regards to statistics in the developing world is rather considered low compared to the counterparts in the advanced economies (Gustin, 2009). This is despite the fact that the emerging and the growing economies are seen as the next frontier hubs for the commercial banking sector growth and in view of the ever growing population and the campaigns to bring every citizen into the banking bracket. The attribution to this fact is that there is low literacy levels in the emerging and the growing markets compared to the advanced world (Barnes & Corbitt, 2013).
Other commercial banking entities are not the players in the automated banking industry owing to the expensive nature of rolling the infrastructure that support the automation in the banking industry and also the low level in terms of liquidity for the financial institution (Al-Ajam & Nor, 2015). Also the idea of automation in the banking industry is relatively new compared to the more developed worlds and it is a matter of time before the whole process and campaign gathered momentum out of constant lobbying by the commercial banking sector. It can be observed that the commercial banking entities that are based in the major developed towns and cities in the developing world and that the majority of the population has to travel in these cities to get the service of automated banking (Rawashdeh, 2015).

2.4.2 Liquidity

A key driver for growth in the commercial banking industry is the ability of the banks to increase their margins of deposits in the quest to boost on their liquidity (Wolf, 2008). In this respect, automated banking is an addition to the quest for the bank to increase their liquidity level. Automated banking has made it easy for commercial banks to actually realise this quest as the automated teller entities have the ability to take in deposits from customers. This is for the purpose of winning trust among the customers as trust is key to the growth and the prosperity of the automated banking system. As the basic foundation of commercial banking is trust this can be attributed to the fact that the customers felt lesser secure about their deposits being left at an automated teller outlet of the bank (Abdullai & Nyaoga, 2017). It did not guarantee them the trust that their money would actually be banked without them needing to sign authority form, as is with the case with traditional banking. Another study carried out in the developing world markets in regards to automation in banking suggested that the rate of the idea of leaving deposit at an automated teller banking outlet is a bad idea to them out of the experiences that they encountered when they first attempted the idea of leaving deposits at the automated outlets (Barnes & Corbitt, 2013).

Numerous cases of fraud were observed in the automated outlets of the commercial banks. For instance, it was recorded that the rate of crime around the automated spots surged by great margins (James, 2007). This can be attributed to the fact that around the teller outlets, criminals realised that the automated banking outlets were cash spots and that it made a lot more sense to attack the deposit making customer at the automated banking point as they were easier cash cows. This scared the customers and the effort that was made to encourage automation was greatly eroded (Gustin, 2009). However, after careful consultations with the stake holders of
the automated banking sector and with collaboration from the relevant security authorities, fraud instances have recorded a significant drop since the raft of measures that were agreed upon and implemented seem to produce result (Idun & Aboagye, 2014).

2.5 Chapter Summary

This chapter reviewed literature on the effects of technological inventions on performance of commercial banks. The chapter reviewed literature on the effect of mobile banking on performance of commercial banks followed by the literature on the effect of online banking on the performance of commercial banks and lastly the literature on the effect of automated banking on performance of commercial bank. The next chapter presents the research methodology that the study will adopt in addressing the research problem.
CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter presented the research methodology adopted by the study with the aim of addressing the research problem. The research methodology of this study included, the research design of the study highlighting the approach that the study will take, study population, the sample size, followed by sampling technique, data analysis methods and the procedures that will be used to analyse the data collected. The chapter provided a chapter summary at the end with an attempt of highlighting all the components covered in the chapter.

3.2 Research Design

Research design is an overall strategy that the researcher selects with a purpose of integrating various elements of the study in a coherent manner and logic while at the same time ensuring that the research problem has been addressed effectively (Makrygiannakis & Jack, 2018). The research design encompasses the blueprint used for data collection, measurements and data analysis. This study adopted descriptive survey research design. Descriptive survey involves the attempt of seeking to get information which best describes the existing phenomena through asking for responses from the target respondents their attitudes, behaviours, views and values towards the existing phenomena (Altendorf & Schreiber, 2015). This method was selected since it is regarded as the most appropriate method for obtaining factual and attitudinal information that can effectively address the research problem, since it enabled the researcher to obtain opinions, characteristics, and beliefs of the respondent (Rouzies, 2013).

3.3 Population and Sampling Design

3.3.1 Population

Population is defined as a well-defined group of individuals or objects that are known to have similar attributes or characteristics (Salimath, 2011). For this study, the target population was top level and middle level managers that work for Equity Bank Limited as indicated in table 3.1.
Table 3.1: Population Distribution Table

<table>
<thead>
<tr>
<th>Population Area</th>
<th>Population</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Management</td>
<td>4</td>
<td>3%</td>
</tr>
<tr>
<td>General managers</td>
<td>31</td>
<td>25%</td>
</tr>
<tr>
<td>Senior Operations</td>
<td>39</td>
<td>31%</td>
</tr>
<tr>
<td>Supervisors</td>
<td>52</td>
<td>41%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>126</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

*Source: Equity Bank Human Resources Office (2018)*

3.3.2 Sampling Design

3.3.2.1 Sampling Frame

According to Sapsford and Jupp (2011), sampling frame refers to a device of a list that represents the population of the study from which the researcher is able to draw a sample. Sampling frame being the source material or a device from which the sample of this study is drawn, the sampling frame was obtained from the Human Resource Office at Equity Bank Limited.

3.3.2.2 Sampling Technique

Sampling technique is the tactic that is used by the researcher to ensure that different kind of groups that are either heterogeneous or homogeneous are well represented in the final selection of the sample to be studied (Cooper & Schindler, 2014). This study deployed stratified sampling method in ensuring that all the levels of management are well represented in the selection of the respondents for the study. Stratified sampling is the ideal method in ensuring that there is no bias in selection of the respondents (Lewis-Beck, Bryman, & Liao, 2004), therefore, it was used in picking managers to take part in the study.

3.3.2.3 Sample Size

Sample size refers to a smaller unit that forms a larger population of the study (Cooper & Schindler, 2014). In determining the sample size, the researcher is guided by the level of confidence that they need to have in the data, the kind of analysis to be conducted, the accuracy and the total population of the study. This study used Yamane’s formula to determine the sample size as follows assuming the confidence level of 95%:
\[ n = \frac{N}{(1 + Ne^2)} \]

Where \( n \) = sample size

\( N \) = study population

\( e \) = alpha level, 0.05

Substituting these values in the above equation, the estimated sample size was:

\[ n = \frac{126}{1 + 126(0.05^2)} \]

\[ = 96 \]

From the Yemen’s Formula above, the sample size of the study was determined. Based on the study population of 126 respondents, the sample size based on the formula was 96.

Table 3.2: Sample Size Distribution Table

<table>
<thead>
<tr>
<th>Population Area</th>
<th>Population</th>
<th>Sample</th>
<th>Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior Management</td>
<td>4</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>General managers</td>
<td>31</td>
<td>29</td>
<td>30%</td>
</tr>
<tr>
<td>Senior Operations</td>
<td>39</td>
<td>25</td>
<td>26%</td>
</tr>
<tr>
<td>Supervisors</td>
<td>52</td>
<td>39</td>
<td>41%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>126</strong></td>
<td><strong>96</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Author (2019)

3.4 Data Collection Methods

Cooper and Schidler (2014) have defined data collection as the process of collecting required data from the respondents of the study in manner that is well established and systematic with the aim of responding to the research questions or objectives. A questionnaire was used for this study as the primary instrument for data collection. Questionnaire can be defined as the research instrument that contains a series of questions for the purpose of obtaining information from the respondents of the study (Robinson, 2018). The questionnaire used a Likert Scale of the 5 measurements that is (Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree). The first section of the questionnaire had demographic information of the respondents, then the
second section consisted of the questions to address the first objective of the research, followed by the third section which had questions for the second objective of the study and the last section of the questionnaire had the questions addressing the last objective of this study. Howard-Paynee (2015) suggest that questionnaires are crucial tools for collection of primary data in research. Therefore, the use of questionnaire in this study is justifiable to the extent that the study only captured primary data from the respondents.

3.5 Research Procedures

Cooper and Schindler (2014) define research procedures as the detailed description that consists of the steps by step guidance on how the research should be carried out and meet the objectives intended. For this particular study, after approval of the research proposal, a letter was drafted to the Director of Human Resource for Equity Bank Limited asking the permission to allow the study to be conducted from their premises, after the approval, a pilot testing was carried out using 10 respondents to determine the level validity and reliability of the questionnaire being used in data collection. Once the pilot test was complete, any weaknesses and inconsistence that were determined from the study questionnaire, they were corrected before the actual data collection takes place. This was followed by the researcher appointing research assistant that went to the office of Equity Bank Limited, located the possible respondents and explained to them what the study intended to fulfil and how their bank would benefit from it. The research assistants gave the respondents a minimum of five days to fill the questionnaires being dropped at their office, then made a follow up to make sure that all the questionnaires have been filled. After counter checking all the sections with an attempt to make sure that all the sections are dully filled by the respondents, any questionnaire that had missing section, were returned back to the respondents and sought for the missing information. Then all the questionnaires were handled back to the researcher to perform data analysis.

Reliability Analysis

Reliability analysis was conducted to determine the validity of the study instrument. The study instrument had a reliability analysis Alpha value above 0.7 as indicated in table 3.3 below.
Table 3.3: Reliability Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of Items</th>
<th>Alpha Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Banking</td>
<td>8</td>
<td>0.823</td>
</tr>
<tr>
<td>Automated Banking</td>
<td>8</td>
<td>0.926</td>
</tr>
<tr>
<td>Online Banking</td>
<td>8</td>
<td>0.907</td>
</tr>
<tr>
<td>Business Performance</td>
<td>6</td>
<td>0.798</td>
</tr>
</tbody>
</table>

3.6 Data Analysis Methods

Data analysis is the process by which the researcher reduces raw data that is collected from the respondents into a meaningful information to provide answers to the research questions (Cooper & Schindler, 2014). This study used both descriptive and inferential statistics, whereby descriptive statistics examined percentages, frequencies, standard deviation and means while inferential statistics examined the correlation between the study variables. Data analysis software was used to analyse the data collected, this study used Statistical Package for Social Studies (SPSS) in data analysis, and the findings were presented in tables and figures.

3.7 Chapter Summary

This chapter highlighted the research methodology, first, the research design was presented, which was descriptive survey, the population of the respondents was also presented which is a total of 126 top executives and middle level managers working at Equity Bank Limited, sampling technique was highlighted, the sample size was also presented consisting of the senior and middle level managers. The chapter presented the data collection methods that a closed-ended questionnaire that was used, followed by the research procedures and data analysis methods. Chapter four provides results and findings based on the research methodology.
CHAPTER FOUR

4.0 RESULTS AND FINDINGS

4.1 Introduction

This chapter presents results and findings of the study. The chapter starts with general information of the respondents, followed by the results and findings on the effect of mobile banking on performance, the effect of online banking on performance and the effect of automated banking on performance of commercial banks. Chapter summary to sum up the major elements of the chapter is presented at the end.

4.2 Response Rate and Demographics

The study established the response rate and the demographic factors of the target respondents.

4.2.1 Response Rate

This study had a response rate of 76%. Out of 96 questionnaires handed out, only 73 questionnaires were duly filled, the rate is above 50%, hence, the survey results are a good representative of the target population.

Table 4.1: Response Rate

<table>
<thead>
<tr>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responded</td>
<td>72</td>
<td>76</td>
</tr>
<tr>
<td>Did Not Respond</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>100</td>
</tr>
</tbody>
</table>

4.2.2 Demographic Analysis

To determine the demographic data for this study, respondents were asked to indicate their gender, age bracket, working experience, work department and level of education. The findings are presented in the following sections;

4.2.2.1 Gender of the Respondents

The respondents were asked to indicate their gender, 44% of the respondents were female and 56% were male as shown in figure 4.1. This implies that there is gender equality in Equity Bank Limited since gender is well distributed across the organization.

28
4.2.2 Age of the Respondents

The study sought to establish the age of the respondents, 33% were aged between 41 and 47 years, 27% aged between 34 and 40 years, 21% were above 48 years, 14% aged between 26-33 years while the remaining 5% aged between 18 to 25 years. This implies that the majority of the respondents aged between 41 and 47 years as indicated in figure 4.2.

Figure 4.2: Age of the Respondents
4.2.2.3 Work Experience

On the question to indicate the number of years the respondents had been with the company, the findings revealed that 18% had been with company for less than one year, 12% had worked with the company for less than 4 years, 345 of the respondents had worked for more than five years, 17% had worked for less than 10 years while 19% had been with the company for more than 10 years as highlighted in Figure 4.3 below.

![Number of Years at Work](image)

**Figure 4. 3: Work Experience**

4.2.2.4 Respondents’ Level of Education

The study sought to establish the level of education of the respondents; 3% of the respondents have a diploma, 3% have a doctorate degree, 52% of the respondents have a bachelor’s degree and 42% have master’s degree as indicated in figure 4.4. This indicates that all respondents had the ability to interpret the information sought by this study.
Figure 4.4: Respondents’ Level of Education

4.2.2.5 Respondents Work Department

The findings show that 10% of the respondents worked in human resource department, 22% worked in the marketing department, 11% in research and development, 26% in sales and 31% in finance. Finance had the highest representation since the majority work in the finance department since most of the banking activities involve finance. The findings are presented in figure 4.5.
4.3 Effect of Mobile Banking on Performance of Commercial Banks

The study sought to determine the effect of mobile banking on performance of commercial banks. The variables include; revenues generation, customer attraction, convenience, accessibility of banking services, customer security, easy use of banking services, financial inclusion and creation of revenues sources in the bank.

4.3.1 Mobile Banking and Revenue Generation

The study sought to find out whether mobile banking had enhanced revenue generation at Equity Bank Limited; Majority of the respondents agreed at 56% and 44% of the respondents strongly agreed while 0% of the respondents were neutral, disagreed nor strongly disagreed as shown in Figure 4.6. This implies that mobile banking has enhanced revenue generation at the bank.

![Mobile Banking and Revenue Generation](image)

**Figure 4. 6: Mobile Banking and Revenue Generation**

4.3.2 Mobile Banking and Customer Attraction

On the question whether mobile banking enhanced customer attraction to use banking services, 44% of the respondents agreed while 56% strongly agreed while 0% were neutral, disagreed and strongly disagreed. The findings are presented in figure 4.7 below.
4.3.3 Mobile Banking and Convenience

The study sought to find out whether mobile banking brought convenience among its customers when carrying out banking transactions; 50% agreed and 46% strongly agreed. 4% of the respondents were neutral while 0% neither disagreed nor strongly disagreed as indicated in table 4.2 below. It implies that mobile banking has brought convenience in conducting banking transactions among customers and workers in the bank.

Table 4. 2: Mobile Banking and Convenience

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>36</td>
<td>50.0</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>34</td>
<td>46.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>3</td>
<td>4.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.3.4 Mobile Banking and Accessibility of Banking Services

On the question whether mobile banking had increased accessibility of banking services; 48% of the respondents agreed and 52% strongly agreed. 0% of the respondents were neutral, disagreed and strongly disagreed as indicated in table 4.3 below. This implies that mobile banking has increased the accessibility of banking services.
Table 4.3: Mobile Banking and Accessibility of Banking Services

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>35</td>
<td>47.9</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>38</td>
<td>52.1</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

4.3.5 Mobile Banking and Security of Banking Transactions

When the respondents were asked whether mobile banking had enhanced security of the banking transactions among customers; 45% strongly agreed, 4% were neutral and 51% agreed. Other respondents who neither disagreed nor strongly disagreed represented 0% as indicated in figure 4.8. It implies that mobile banking has enhanced security of banking transactions.

![Mobile Banking and Security](image)

**Figure 4.8: Mobile Banking and Security of Banking Transactions**

4.3.6 Mobile Banking and Easy Use of Banking Services

The respondents were asked whether mobile banking supports the easy use of banking services, 60% of the respondents agreed and 40% strongly agreed as shown in table 4.4. This implies that mobile banking supports easy use of banking services.
Table 4.4: Mobile Banking and Easy Use of Banking Services

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>44</td>
<td>60.3</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>29</td>
<td>39.7</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Disagreed</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagreed</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.3.7 Mobile Banking and Financial Inclusion
On the question whether mobile banking enhances financial inclusion, 4% of the respondents were neutral, 41% strongly agreed and 55% while those who neither disagreed nor strongly disagreed were 0% as shown in figure 4.9 below. It implies that mobile banking enhances financial inclusion.

![Figure 4.9: Mobile Banking and Financial Inclusion](image)

4.3.8 Mobile Banking and Sources of Revenues
On the question whether mobile banking created more sources of revenues for the bank; 3% of the respondents disagreed, 54% agreed and 43% strongly agreed and those who neither disagreed nor strongly disagreed represented 0% as indicated in figure 4.10 below. It implies that mobile banking has created more sources of revenues for the bank.
4.3.9 Correlation between Mobile Banking and Performance

The Pearson correlation analysis was applied to establish the nature, strength, and direction of relationships between performance and its components and business performance at Equity Bank Ltd. Correlation coefficient for mobile banking where the p-value was 0.681 demonstrates a very strong, positive and statistically significant relationship with Performance. The association is reflected as statistically significant as the P-value or Sig. (2-tailed) value of 0.000 is less than 0.01 or 1% level of significance.

**Table 4.5: Correlation between Mobile Banking and Performance**

<table>
<thead>
<tr>
<th></th>
<th>Performance</th>
<th>Mobile banking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>73</td>
</tr>
<tr>
<td>Mobile banking</td>
<td>Pearson Correlation</td>
<td>.681**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>73</td>
</tr>
</tbody>
</table>

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

The regression analysis demonstrates the usefulness of the model in predicting business performance at Equity Bank Ltd. R square, which is the coefficient of determination, stood at 0.464. This revealed that 46.4% of the variation in performance at Equity Bank which is the dependent variable is explained by variation in the mobile banking which is the independent variables. To that effect, only 53.6% of the variation in performance is explained by other factors not included in the model.

Table 4.6: Model Summary for Mobile Banking

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.681^a</td>
<td>.464</td>
<td>.456</td>
<td>2.83443</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Mobile banking

4.3.11 ANOVA for Mobile Banking

The statistical output of F-test performed using Statistical Packages for Social Sciences. The study of ANOVA revealed the presence of a significant relationship between the study variables, $F = 61.407$; $p$-value $= 0.000$; which is less than 0.05 the threshold required for a relationship to be significant. This showed that mobile banking had significant effect on Performance at Equity Bank Ltd. This is demonstrated by high F-values (61.407) and low p-values (0.000) which are less than 5% level of significance.

Table 4.7: ANOVA for Mobile Banking

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>493.340</td>
<td>1</td>
<td>493.340</td>
<td>61.407</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>570.413</td>
<td>71</td>
<td>8.034</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1063.753</td>
<td>72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance
b. Predictors: (Constant), Mobile banking

The regression model coefficients table represents the pinnacle of the regression analysis. This is because it highlights objectively, the effect of each independent variable on the dependent
variable that is key to answering the research questions. The beta coefficient for mobile banking was 0.681 which meant that a unit increase in implementation of mobile banking provision would lead to a 0.681 unit increase in performance. The regression model for mobile banking was therefore developed as follows; \( Y = 14.919 + 0.889 \) Mobile Banking

**Table 4.8: Coefficients for Mobile Banking**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>14.919</td>
<td>3.766</td>
</tr>
<tr>
<td>Mobile banking</td>
<td>.889</td>
<td>.113</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance

**4.4 The Effect of Online Banking on Performance of Commercial Banks**

The study sought to determine the effect of online banking on performance of commercial banks. The variables include; security and fraud detection, customer security, convenience, customer retention, sales, productivity, customer satisfaction, and customer loyalty.

**4.4.1 Online Banking and Fraud Detection**

The respondents were asked to indicate whether online banking had improved fraud detection associated with banking transactions; 64% agreed while 36% strongly agreed, 0% of the respondents were neutral, disagreed and sternly disagreed as indicated in table 4.5. This implies that online banking has improved fraud detection associated with banking transactions.

**Table 4.9: Online Banking and Fraud Detection**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>47</td>
<td>64.4</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>26</td>
<td>35.6</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
4.4.2 Online Banking and Customer Security

On the question whether online banking had enhanced customer security; the majority of the respondents 51% strongly agreed, 4% were neutral, those who were in agreement were 45% and 0% of them neither strongly disagreed nor disagreed. This implies that online banking has enhanced customer security. The findings are presented in figure 4.11.

**Figure 4. 11: Online Banking and Customer Security**

4.4.3 Online Banking and Convenience

The study sought to determine whether online banking enhanced convenience of the banking operations. The findings indicated that 37% of the respondents agreed and 63% strongly agreed. 0% of the respondents were neutral, disagreed and strongly disagreed as indicated in table 4.10. This implies that online banking has enhanced convenience of the banking operations.

**Table 4. 10: Online Banking and Convenience**

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>27</td>
<td>37.0</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>46</td>
<td>63.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>
4.4.4 Online Banking and Customer Retention

On the question whether online banking influenced good customer retention; 43% of the respondents agreed and 57% strongly agreed. 0% of the respondents were neutral, disagreed and strongly disagreed as indicated in table 4.11 below. It implies that online banking influences good customer retention.

Table 4.11: Online Banking and Customer Retention

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>31</td>
<td>43.0</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>42</td>
<td>57.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.4.5 Online Banking and Sales

When respondents were asked whether online banking is crucial for their sales targets; 68% of the respondents agreed and 32% strongly agreed. 0% of the respondents were neutral, strongly disagreed and disagreed as indicated in figure 4.12. It implies that online banking is crucial for the bank to meet its sales targets.

Figure 4.12: Online Banking and Sales
4.4.6 Online Banking and Productivity

On the question whether online banking had improved productivity in the bank; 34% of the respondents agreed and 66% strongly agreed while 0% of the respondents were neutral, neither disagreed nor strongly disagreed as indicated in table 4.12. It implies that online banking improved productivity in the bank.

Table 4. 12: Online Banking and Productivity

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>25</td>
<td>34.2</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>48</td>
<td>65.8</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

4.4.7 Online Banking and Customer Satisfaction

The study also sought to find out whether online banking enhanced customer satisfaction; 5% were neutral, 44% agreed and 51% strongly agreed. 0% of the respondents neither disagreed nor strongly disagreed as indicated in table 4.13 below. It implies that online banking enhances customer satisfaction.

Table 4. 13: Online Banking and Customer Satisfaction

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutral</td>
<td>4</td>
<td>5.5</td>
</tr>
<tr>
<td>Agree</td>
<td>32</td>
<td>43.8</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>37</td>
<td>50.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

4.4.8 Online Banking and Customer Loyalty

The respondents were asked whether online banking was crucial for their customer loyalty; 56% of the respondents agreed and 44% agreed. 0% were neutral, disagreed and strongly disagreed as indicated in figure 4.13. It implies that online banking is crucial for attaining customer loyalty in the bank.
4.4.9 Correlation between Online Banking and Performance

The correlation analysis was applied on the relationships between online banking and business performance at Equity Bank Ltd. Correlation coefficient for online banking where the p-value was 0.792 demonstrates a very strong, positive and statistically significant relationship with performance. The association is reflected as statistically significant as the P-value or Sig. (2-tailed) value of 0.000 is less than 0.01 or 1% level of significance.

**Table 4. 14: Correlation between Online Banking and Performance**

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Performance</th>
<th>Online banking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>73</td>
</tr>
<tr>
<td>Online banking</td>
<td>Pearson Correlation</td>
<td>.792**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>73</td>
</tr>
</tbody>
</table>

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

The coefficient of determination was 0.627. This revealed that 62.7% of the variation in performance at Equity Bank as the dependent variable is explained by variation in the online
banking which is the independent variable. Only 37.30% of the variation performance is explained by other factors not included in the model.

**Table 4.15: Model Summary for Online Banking**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.792a</td>
<td>.627</td>
<td>.622</td>
<td>2.36453</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Online banking

**4.4.10 ANOVA for Online Banking**

The results of ANOVA revealed the presence of a significant relationship between the study variables, $F = 119.262$; $p$-value = 0.000, which is less than 0.05. This showed that online banking had significant effect on Performance at Equity Bank Ltd. This is demonstrated by high $F$-value of 119.262 and low $p$-values 0.000 which are less than 5% level of significance.

**Table 4.16: ANOVA for Online Banking**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>666.792</td>
<td>1</td>
<td>666.792</td>
<td>119.262</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>396.961</td>
<td>71</td>
<td>5.591</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1063.753</td>
<td>72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance  

b. Predictors: (Constant), Online banking

The regression model coefficients table represents the effect of independent variable on the dependent variable that is key to answering the objective of the study. The beta coefficient for online banking was 0.792 which meant that a unit increase in implementation of online banking provision would lead to a 0.792 unit increase in performance. The regression model for online banking was therefore developed as follows; $Y = 10.593 + 1.096 \text{Online Banking.}$
Table 4. 17: Coefficients for Online Banking

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.593</td>
<td>3.100</td>
</tr>
<tr>
<td></td>
<td>Online banking</td>
<td>1.096</td>
</tr>
<tr>
<td></td>
<td>.100</td>
<td>.792</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.417</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.921</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.000</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance

4.5 The Effect of Automated Banking on Performance of Commercial Banks

The study sought to establish the effect of automated banking on performance of commercial banks. The variables include; importance of automated banking, cost savings, service delivery, profitability, banking transactions, efficiency, revenue streams, and coordination of banking activities.

4.5.1 The Significance of Automated Banking

On the question whether automated banking is significant to the performance of the bank; 53% of the respondents agreed and 47% strongly agreed. 0% of the respondents were neutral, disagreed and strongly disagreed as indicated in figure 4.14 below. This implies that automated banking is significant to the performance of the bank.

Figure 4. 14: The Significance of Automated Banking

4.5.2 Automated Banking and Cost Savings

The respondents were asked whether automated banking helped the bank to cut down its operational costs; 59% of the respondents agreed and 41% strongly agreed. 0% were neutral,
disagreed and strongly disagreed as presented in table 4.18 below. This implies that automated banking helps the bank to cut down its operational costs.

Table 4. 18: Automated Banking and Cost Savings

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>43</td>
<td>58.9</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>30</td>
<td>41.1</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>73</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.5.3 Automated Banking and Service Delivery
The respondents were asked whether automated banking had improved their customer service delivery; 37% of the respondents agreed while 63% strongly agreed. 0% were neutral, disagreed and strongly disagreed. This implies that automated banking had improved customer service delivery. The findings are presented in table 4.19.

Table 4. 19: Automated Banking and Service Delivery

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>27</td>
<td>37.0</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>46</td>
<td>63.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>73</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.5.4 Automated Banking and Profitability
When the respondents were asked whether automated banking enhanced their profitability; 5% of the respondents disagreed, 52% agreed and 43% strongly agreed while 0% neither disagreed nor strongly disagreed as shown in table 4.20 below. It implies that automated banking enhances profitability to a great extent.
Table 4. 20: Automated Banking and Profitability

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td>4</td>
<td>5.5</td>
</tr>
<tr>
<td>Agree</td>
<td>38</td>
<td>52.1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>31</td>
<td>42.5</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.5.5 Automated Banking and Banking Transactions

On the question whether automated banking increased the number of banking transactions; 36% of the respondents strongly agreed and 64% of the respondents agreed. 0% of the respondents were neutral, disagreed and strongly disagreed as shown in figure 4.15.

![Automated Banking and Banking Transactions](image)

Figure 4. 15: Automated Banking and Banking Transactions

4.5.6 Automated Banking and Efficiency

The study also sought to find out whether automated banking influenced efficiency associated with banking operations; 58% of the respondents agreed, 40% strongly agreed while 2% were neutral. 0% of the respondents neither disagreed nor strongly disagreed as indicated in table 4.21. It implies that automated banking influences efficiency in the bank.
4.5.7 Automated Banking and Coordination of Banking Activities

The respondents were asked to indicate whether automated banking enhanced coordination of banking activities; 4% of the respondents disagreed, 69% agreed and 27% strongly agreed. 0% of the respondents were neither neutral nor strongly disagreed as indicated in figure 4.16. It implies that automated banking enhanced coordination of banking activities.

Figure 4. 16: Automated Banking and Coordination of Banking Activities

4.5.8 Automated Banking and Revenue Streams

On the question whether automated banking had increased revenue streams for the bank; 30% of the respondents agreed and 70% strongly disagreed. 0% of the respondents were neutral, disagreed and strongly disagreed as indicated in table 4.22. It implies that automated banking increased revenues streams for the bank.
Table 4. 22: Automated Banking and Revenue Streams

<table>
<thead>
<tr>
<th>Scale</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agree</td>
<td>22</td>
<td>30.1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>51</td>
<td>69.9</td>
</tr>
<tr>
<td>Neutral</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>73</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

4.5.9 Correlation between Online Banking and Performance

The correlation analysis was applied on the relationships between automated banking and business performance at Equity Bank Ltd. Correlation coefficient for automated banking where the p-value was 0.596 demonstrates a very strong, positive and statistically significant relationship with performance. The association is reflected as statistically significant as the P-value or Sig. (2-tailed) value of 0.000 is less than 0.01 or 1% level of significance.

Table 4. 23: Correlation between Online Banking and Performance

<table>
<thead>
<tr>
<th>Correlations</th>
<th>Performance</th>
<th>Automated banking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>73</td>
</tr>
<tr>
<td>Automated banking</td>
<td>Pearson Correlation</td>
<td>.596**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>73</td>
</tr>
</tbody>
</table>

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

4.4.10 Regression Analysis

The coefficient of determination was 0.355. This revealed that 35.5% of the variation in performance at Equity Bank is explained by variation in the automated banking which is the independent variables. Only 64.5% of the variation in technological innovation is explained by other factors not included in the model.
Table 4.24: Model Summary for Automated Banking

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.596\textsuperscript{a}</td>
<td>.355</td>
<td>.346</td>
<td>3.10909</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Automated banking

4.5.11 ANOVA for Automated Banking

The results of ANOVA revealed the presence of a significant relationship between the study variables, F = 39.045; p-value = 0.000, which is less than 0.05. This showed that automated banking had significant effect on Performance at Equity Bank Ltd. This is demonstrated by high F-value of 39.046 and low p-values 0.000 which are less than 5% level of significance.

Table 4.25: ANOVA for Automated Banking

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>377.435</td>
<td>1</td>
<td>377.435</td>
<td>39.046</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>686.318</td>
<td>71</td>
<td>9.666</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1063.753</td>
<td>72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance
b. Predictors: (Constant), Automated banking

The regression model coefficients table represents the effect of independent variable on the dependent variable that is key to answering the objective of the study. The beta coefficient for automated banking was 0.596 which meant that a unit increase in implementation of automated banking provision would lead to a 0.596 unit increase in performance. The regression model for automated banking was therefore developed as follows; \( Y = 17.243 + 0.889 \) automated banking.
Table 4.26: Coefficients for Automated Banking

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>(Constant) 17.243 4.348</td>
<td></td>
<td>3.966</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Automated banking .887 .142</td>
<td></td>
<td>.596</td>
<td>6.249</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance

4.6 Joint Correlational Analysis

The Pearson correlation analysis was applied to establish the nature, strength, and direction of relationships between technological innovations and its components and business performance at Equity Bank Ltd. As demonstrated, all the independent variables (mobile banking, online banking, and automated banking) and business performance exhibited significant positive relationships. The Pearson correlation coefficient for mobile banking (0.807) demonstrates a very strong, positive and statistically significant relationship with business performance. The association is reflected as statistically significant as the P-value or Sig. (2-tailed) value of 0.00 is less than 0.01 or 1% level of significance. The Coefficient for online banking (0.651) signposts a strong, positive, and statistically significant relationship with business performance and Sig. (2-tailed) value of 0.00 is less than 0.01 or 1% level of significance. Finally, the correlation coefficient for automated banking (0.523) indicates a very strong, positive relationship with business performance with Sig. (2-tailed) value of 0.00 is less than 0.01 or 1% level of significance.
Table 4.27: Correlation Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Performance</th>
<th>Mobile banking</th>
<th>Online banking</th>
<th>Automated banking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Pearson Correlation</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>73</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>Mobile banking</td>
<td>Pearson Correlation</td>
<td>.807**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>73</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>Online banking</td>
<td>Pearson Correlation</td>
<td>.651**</td>
<td>.388**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>73</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>Automated banking</td>
<td>Pearson Correlation</td>
<td>.523**</td>
<td>.475**</td>
<td>.317**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.006</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>73</td>
<td>73</td>
<td>73</td>
</tr>
</tbody>
</table>

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

4.7 Multiple Regression Analysis

The regression analysis demonstrates the usefulness of the model in predicting business performance at Equity Bank Ltd. R square, which is the coefficient of determination, stood at 0.796. The implication is that 79.60% of the variation in business performance at Equity Bank which is the dependent variable is explained by variation in the technological innovation’s variables; mobile banking, online banking, and automated banking which is the independent variables. To that effect, only 20.40% of the variation in technological innovation is explained by other factors not included in the model.

Table 4.28: Regression Model Summary

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>R</td>
</tr>
<tr>
<td>1</td>
<td>.892a</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Automated banking, Online banking, Mobile banking
The Table below gives statistical output of F-test performed using Statistical Packages for Social Sciences. The study of ANOVA revealed the presence of a significant relationship between the combined study variables, F = 89.873; p-value = 0.000; which is less than 0.05 the Threshold required for a relationship to be significant. This showed that the collective independent variables had significant effect on business performance at Equity Bank Ltd. This is demonstrated by high F-values (89.873) and low p-values (0.000) which are less than 5% level of significance.

Table 4.29: Analysis of Variance (ANOVA)

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>958.923</td>
<td>3</td>
<td>319.641</td>
<td>89.873</td>
<td>.000a</td>
</tr>
<tr>
<td>Residual</td>
<td>245.405</td>
<td>69</td>
<td>3.557</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1204.329</td>
<td>72</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance
b. Predictors: (Constant), Automated banking, Online banking, Mobile banking

4.8 Coefficient Analysis

The regression model coefficients table represents the pinnacle of the regression analysis. This is because it highlights objectively, the effect of each independent variable on the dependent variable that is key to answering the research questions. The Table below provides the regression model coefficients statistics. The multiple linear regression analysis output show that all the independent variables analysed; mobile banking, online banking, and automated banking have a positive and statistically significant effect on business performance. The statistical significance threshold is considered met as all the associate Sig-values for all independent variables for technological innovations are less than 0.01 or 1%.

The beta coefficient for mobile banking (0.826) means that a unit increase in implementation of mobile banking provision would lead to a 0.826 unit increase in business performance. The coefficient for online banking (0.579) demonstrates a positive effect of the variable on business performance. The implication is that a unit increase in online banking in the bank would lead to a 0.579 unit increase in business performance and lastly coefficient for automated banking (0.142) demonstrates a positive effect of the variable on business performance. The implication is that a unit increase in automated banking in the bank would lead to a 0.142 unit increase in
business performance. The regression model for total reward system and employee retention was therefore developed as follows: 

\[ Y = 3.270 + X_10.826 + X_20.579 + X_30.142 \]

**Table 4.30: Coefficient Analysis**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>3.270</td>
</tr>
<tr>
<td></td>
<td>Mobile banking</td>
<td>.826</td>
</tr>
<tr>
<td></td>
<td>Online banking</td>
<td>.579</td>
</tr>
<tr>
<td></td>
<td>Automated banking</td>
<td>.142</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance

**4.9 Chapter Summary**

This chapter provided the results and findings of the study. The major findings of the study show that mobile banking has statically significant relationship with performance of the bank which implies that mobile banking had a positive impact on performance. Online banking on the hand indicated a positive relationship with performance of the commercial bank followed by automated banking demonstrating a statistically significant relationship with the performance of commercial bank. The next chapter will present the discussion, conclusion and recommendations based on the findings.
CHAPTER FIVE

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter presents the study summary, conclusion and recommendations based on the findings presented in the previous chapter.

5.2 Summary

The general objective of this study was to determine the effects of technological inventions on performance of commercial bank with a case of Equity Bank Limited. The study was guided by the following research objectives; to determine the effect of mobile banking on performance in Equity Bank Limited, followed by to determine the effect of online banking on performance in Equity Bank Limited and to determine the effect of automated banking on performance in Equity Bank Limited.

The study adopted descriptive survey design on a target population of 126 managers working at Equity Bank Limited to determine the effects of technological inventions on performance of the bank. A sample of 96 respondents was determined and used for data collection with the help of a structured questionnaire to obtain primary data.

The first research objective sought to determine the effect of mobile banking on performance of commercial bank. The findings indicate that there exist a statistically significant relationship between mobile banking and the performance of commercial bank, r (0.807); p value < 0.01. The regression analysis demonstrates the usefulness of the model in predicting business performance at Equity Bank Ltd. R square, which is the coefficient of determination, stood at 0.464. This revealed that 46.4% of the variation in performance at Equity Bank which is the dependent variable is explained by variation in the mobile banking which is the independent variables. To that effect, only 53.6% of the variation in performance is explained by other factors not included in the model.

The study also sought to determine the effect of online banking on performance of commercial bank. The findings revealed that there exist a statistically significant relationship between online banking and performance of bank, r (0.651); p value < 0.01. The coefficient of determination was 0.627. This revealed that 62.7% of the variation in performance at Equity Bank as the dependent variable is explained by variation in the online banking which is the
independent variable. Only 37.30% of the variation performance is explained by other factors not included in the model.

Furthermore, the study sought to determine the effect of automated banking on performance of commercial banks. The findings shows that there exist a statistically significant relationship between automated banking and performance of Equity Bank Limited, \( r (0.523); \ p \text{ value} <0.01 \). The coefficient of determination was 0.355. This revealed that 35.5% of the variation in performance at Equity Bank is explained by variation in the automated banking which is the independent variables. Only 64.5% of the variation in technological innovation is explained by other factors not included in the model.

5.3 Discussion

5.3.1 Effect of Mobile Banking on Performance of Commercial Banks

One of the objective of this study was to determine the effect of mobile banking on performance of commercial bank. The findings of the study indicate that there exists a statistically significant relationship between mobile banking and performance of commercial banks. These findings are in line with the findings of Mallat (2004) who indicated that mobile banking innovation that stems from the telecommunication revolution in the late twentieth century, he indicates that mobile banking enhances the performance of commercial banks since it brings convenience of making monetary transaction from a bank account to other bank accounts to even presentation and printing of bank statements by a client point of convenience. He further indicates that mobile banking provides a platform in which their customers conveniently transact securely from remote locations and customers need not to visit a bank premise to do their transactions as the core banking services such as payment of bills, production of statements, transfer of cash from one account to another account and payment of goods and services at a shopping store.

The study has revealed that mobile banking has enhanced security among customers transacting with commercial banks. These findings confirms the findings of the study conducted by Makanyeza (2017) that revealed that the increased functionality that has come along with mobile banking due to more features that were introduced on the application. The features have ensured better security for transaction thereby reducing potential fraud considerably. The findings are also in line with the work of Mbiti (2011) who argues that in order to ensure security for transactions, mobile banking on electronic devices such as smartphones have put more than one layer of authentication. Furthermore, banking applications
fuse with artificial intelligence, whereby mobile banking sometimes requires one to use fingerprint detection apart from the traditional username and password to grant access to the mobile banking platform. These features of authentication are almost common to all banking application as security is of more importance when transacting on a mobile device.

The findings also show that mobile banking enhances financial inclusion. The finding the Mobile banking, which is a critical integration of the banking system and has a firm footing in the banking industry has allowed for consumers to transact with convenience thereby not needing to visit any banking hall (Dasgupta, 2011). Banks rely on customer deposits in order to make available funds to conduct the business of lending and financing. For this to happen, banks require high levels of liquidity as the more cash at their disposal the many projects they are able to finance and lend out. Financial inclusion of all category of earners is critical in boosting the liquidity level of the bank. It is critical not to ignore the bracket of earners that are considered as low income earners in the financial sector or the banking sector.

Aside the core business of taking deposits from clients and customers, commercial banks provide for the much needed credit to the economy of the country (Al-Hawar, 2014). Under regulation from the central banks, commercial banks make available credit to business enterprises and individuals seeking extra funding for development of projects (Adewoye, 2013). Commercial banks also offer credit to government institutions and they do fund and guarantee different development projects for the government.

5.3.2 The Effect of Online Banking on Performance of Commercial Banks

The findings of this study have also revealed the existence of a strong relationship between online banking and the performance of Equity Bank Limited as a commercial bank. These findings are in line with the findings of a study done by Kiragu (2017) who indicates that online banking transaction have increased banking performance since banking can be done any time without customers having to visit the banking hall for them to carry out business transactions. Commercial banks are now able to achieve efficiency since online banking accounts can be accessed any time day or night provided that the client has an internet connection of any kind. Customers use encrypted passwords to secure their banking transactions so that they are safe and secure all the time. Information systems are linked via the internet and the banking industry has stood to benefit immensely in that their information systems can be interlinked forming a web. It has contributed to the ease of doing business in the world, as it only requires an internet connection to get everything going.
The findings of this study have indicated that online banking enhances security and fraud detection that is associated with banking transactions. This is in line with argument advanced by Patel (2018) indicating that while consumers do have the ability of viewing their bank accounts at any point in time, it is easier to detect fraudulent activities early before a bigger damage is made in the banking system. Furthermore he indicates that as soon as the consumer’s bank account is log into, they quickly get a notification whether they is anything amiss after checking on their deposits and debts. The findings are also in line with the argument advanced by Bashir and Madhavaiah (2015) arguing that when funds are withdrawn from the bank account, the customer can get notified right away through an email or mobile devices like a smartphone. This will enable the customer to correct the issue immediately before causing a bigger damage rather than waiting for a longer time as opposed to traditional way of banking.

Furthermore, Bashir and Madhavaiah (2015) argue that fraud is the biggest impediment to the growth of the online banking sector. Statistics of cyber related fraud globally are in overwhelming figures of billions of dollars every year. As far as the technology to make better and improve the online experience exists, fraud keeps on uncovering thereby exposing the risk of losing transactions by customers. Commercial banks, however, do not report the exact amounts lost due to fraud in fear of losing customer trust with online banking platforms. Fraud has eroded the gains made in the field of internet banking, despite the instances of fraud, the banking sector has to keep investing in the online banking platforms as it is a necessary tool for operation of businesses. To avert the instances of fraud, much investment have been done in mobile banking technology offering the desirable security for banks.

The findings of the study also revealed that online banking has enabled commercial banks to attain efficiency which is crucial for their productivity. Lee (2009) argued that efficiency is crucial for any organization transacting business. Commercial banks rely on efficiency for them to attract more customers and seek a better market position in return. Customer retention and growth of commercial banks is a direct indication of good and efficient performance which heavily relies on good management of the company. ChauShen (2013) on the other hand, argues that with online banking platforms, banks have been seen gaining the tremendous rate of efficiency, an obvious sign of the return on their investments as a whole. New and curios customers have been drawn into the wave of online banking adding up to the number already using the online banking platforms. The online banking platforms are such that they provide for opening of banking accounts at only few clicks after they person wishing to open a bank account provides the required credentials. This has thus boosted to the additional of customers.
into the bracket of online banking and consequently increasing the population of banked individuals.

5.3.3 The Effect of Automated Banking on Performance of Commercial Banks

The findings have revealed the existence of a significant relationship between automated banking and performance of commercial banks. These findings are in line with the findings of the study conducted by Mullan et al (2017) who argue that in order to be ahead of competition, the banking sector has resulted to investing in more in the field that enables them to become more convenient, that is automated banking. The possible outcome of this is that there is more benefits that comes with the convenience as compared to if the commercial banks did not commit to invest in the aspects that offered convenience. Automated banking has proved convenient and statistics that come from banking sector insiders that the banking sector indicate a massive uptake for automated banking from their customers.

This study has revealed that automated banking has enhanced customer service delivery through automation. This is in line with the study done by Rawashdesh (2015) indicating that automated banking has a role in the banking sector with commercial banks being very keen to offer the automated experience to their customers. Abdullai and Nyaoga (2017) argue that commercial banks have teamed up with major card providers around the world in order to provide this experience. Major card providers and support technology like VISA and MasterCard are increasingly keen in partnering up with banking institutions especially in the emerging economies to offer world class experience of automated banking. In the current temporary business environment context, a need of Automated Teller Machines by commercial banks cannot be overemphasized.

The findings of this study shows that automated banking has enhanced cost reduction associated with banking operations. These findings confirms to the study conducted by Al-Hawar (2014) who argue that the banking sector has adopted the automated banking teller machine concept for cost reductions and offering a better service for the customers. It is essential for commercial banks to undertake cost management practices for survival, and this can be best done through automated banking services that allows banking operations to take place all the time without relying on employees to drive banking operations.

The findings have also revealed that automated banking is essential in coordinating banking operations. Greenwood (2014) argues that automated banking can be regarded as a form of a shared resource banking. With teller machines working in liaison with the main banking
system, the network is expected to be at all-time high with the attempt of reducing occurrences of inconvenience that may hinder banking operations. He further argues that performance and coordination has a direct relationship with the general customer satisfaction, researching on customer satisfaction in regards to automated banking. It was found out that the rate of satisfaction is high when they discovered that the machine was up and functional at any time of their convenience. In addition, the level of satisfaction was high when they went around and found out that they could withdraw their funds in without any hitches. Automation, sharing resource with all the banking customers and the users has to be a controlled resource with often a cap on the maximum and the minimum funds that can be withdrawn from it. The higher the capping rate and the allowed frequency of withdrawal of funds lead to a higher preference rate of a particular commercial banking company as compared to the other commercial banking companies. Thereby to avoid on any inconveniences and lead to a high level of customer satisfaction, commercial banks have resulted to frequency recharge of their automated machines.

5.4 Conclusion

5.4.1 Effect of Mobile Banking on Performance of Commercial Banks

The findings of this study have established the existence of relationship between mobile banking and performance of commercial banks. Mobile banking enhances profitability, customer attraction, convenience, and accessibility of banking services, security among customers, financial inclusion and easy use of banking services. However, the study also concludes that in as much as automated banking services have been adopted by commercial banks, customers are still not embracing the use of these services effectively.

5.4.2 The Effect of Online Banking on Performance of Commercial Banks

The findings of this study have established the existence of relationship between online banking and the performance of commercial banks. The study concludes that online banking enhances security and fraud detection, convenience, improved customer retention, productivity, customer loyalty and satisfaction. The study also concludes that online banking is crucial for revenues generation for commercial banks.

5.4.3 The Effect of Automated Banking on Performance of Commercial Banks

The findings of this study have also established the existence of relationship between automated banking and performance of commercial banks. The study concludes that automated
banking is essential for cost reductions in commercial banks, enhances customer service delivery, increase the number of banking transactions, efficiency in banking operations. The study also concludes that automated banking enhances coordination of banking activities as well as operations.

5.5  Recommendations
5.5.1  Recommendations for Improvement

5.5.1.1 Effect of Mobile Banking on Performance of Commercial Banks

Since the relationship between mobile banking and performance of commercial banks was statistically significant, this study recommends that Equity Bank Limited should put in place mobile banking mechanisms that will yield the desired performance while at the same time addressing the needs of their customers. This should include loan mobile application systems since firms are increasingly coming up with such systems to cater for the unbanked customers.

5.5.1.2 The Effect of Online Banking on Performance of Commercial Banks

The relationship between online banking and performance of the commercial bank was statistically significant. Therefore, this study recommends that Equity Bank Limited should put in place online banking services that will enable its clientele to conduct banking transactions at their convenience. The study also recommends that the bank should take time to train and create awareness of their online banking services to the clients so that the adoption is enhanced.

5.5.1.3 The Effect of Automated Banking on Performance of Commercial Banks

Since the relationship between automated banking and performance of commercial bank was statistically significant, therefore this study recommends that Equity Bank Limited should put in place automated banking mechanisms in order to have a robust coordination of banking operations. Apart from the automated teller machine innovations, the bank should also automate other banking operations like cheque deposits, and loan application systems.

5.5.2  Recommendations for Future Research

This study focused on the effects of technological inventions on performance of commercial banks. The study variables included; mobile banking, automated banking and online banking. However, these variables are not exhaustive in covering technological inventions that are
crucial for the performance of commercial banks. Future studies should focus on areas variables that are not covered by this study.
REFERENCES


APPENDIX I: RESEARCH QUESTIONNAIRE

SECTION I: General Information

This section contains general questions. Kindly answer to the best of your knowledge

1. Kindly indicate your gender
   Male  Female

2. Kindly indicate your age bracket below.
   18-25 Years
   26-33 Years
   34-40 Years
   41-47 Years
   48 and Above

3. Kindly indicate the number of years you have worked at Equity Bank Limited.
   0-1 Years
   2-4 Years
   5-7 Years
   8-10 Years
   Above 10 years

4. Kindly indicate your work department.
   Finance
   Marketing
   Innovation
   Sales
   Human Resources

5. Kindly indicate your level of education.
   Diploma
   Bachelor’s degree
   Master’s degree
SECTION II: Effect of Mobile Banking on Performance of Commercial Banks

Kindly answer the following questions to the best of your knowledge using the following Likert scale. Strongly disagree = 1, disagree = 2, neutral = 3, Agree = 4, strongly agree = 5

<table>
<thead>
<tr>
<th>No</th>
<th>Questions</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Do you think Mobile Banking enhances customer attraction?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Mobile banking gives your customers convenience in terms of carrying out transactions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Mobile banking increases accessibility of banking services.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Mobile banking enhances security among customers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Mobile banking supports easy use of banking services.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Mobile banking supports financial inclusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Mobile banking has created more sources of revenues in your bank.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION III: Effect of Automated Banking on Performance

Kindly answer the following questions using the Likert scale provided in section II

<table>
<thead>
<tr>
<th>No</th>
<th>Questions</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>Automated banking is significant to your banking performance.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Automated banking helps your organization to cut down operational costs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Automated banking has improved your customer service delivery.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
18. Automated banking has increased a number of your banking transactions.

19. Automated banking has brought efficiency in your banking operations.

20. Revenue streams have increased due to automated service.

21. Automated banking has enhanced coordination of banking activities.

**SECTION IV: Impact of Online Banking on Performance**

Kindly answer the following questions to the best of your knowledge using the Likert scale in Section II.

<table>
<thead>
<tr>
<th>No</th>
<th>Questions</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>Online banking has improved security and fraud detection.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Online banking enhances customer security.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Online banking enhances convenience in your organization.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Online banking influences good customer retention.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Do you think online banking is crucial for your revenues generation?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Online banking has improved your productivity.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Online banking improves customer satisfaction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Online banking is crucial for customer loyalty.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Thanks very much for your participation**