ASSESING THE UPTAKE OF MOBILE BANKING AS PERCEIVED BY EMPLOYEES OF COMMERCIAL BANKS IN KENYA

BY

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

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DEDICATION

I dedicate this research to Kenya's Banking Industry and Telecommunication Firms to continue breaking the glass ceiling together through innovation and technology.

APPRECIATION

I would like to thank the following people for their assistance in undertaking this research dissertation.

Dr. Monica Kerrets- Makau, my supervisor, for your guidance, insights and leadership; for continuously going over and beyond to support me through the research journey keeping me focused to achieve this milestone.

The research participants for taking time out of their busy schedules and sharing their views and insights on the subject matter of this thesis.

To My Late Parents who instilled in me the need to pursue my dreams as ambitious as they may be while being a positive influence to those around me. Sad, you are not here to celebrate this achievements but your children/ My Siblings, have stood in your place and made personal sacrifices to help me achieve my desires- I Thank You.

My Friends, for always cheering me on.

Above all, My Lord and Saviour, Am humbled by your abundant blessings and provision in my life- For it is not by my own will, but through God who strengthens me, I have not walked this road alone.

ABSTRACT

Studies have indicated need for Commercial Banks to move from traditional banking norm of brink and motor and embrace technology to improve quality of customer's service, improve customer satisfaction, reduce operational cost and offer customers alternative channels to access banking services through alternative banking channels like Online Banking, Mobile Banking, Agency Banking and ATMs.

The objective of the study is to analyse the value of Mobile Banking adoption or lack while examining the challenges faced in Mobile Banking adoption- as well as examine ways to increase mobile banking uptake among commercial banks in Kenya as perceived by Banking Employees. The study adopted descriptive research design. The target population were all the 43 commercial banks in Kenya and the sample size was 60 respondents. Quantitative primary and secondary data was analysed using descriptive statistics. The growth in number of customer deposit accounts and value of customer deposit was attributed to increased deposit mobilization by banks as they expanded their outreach and leveraging on mobile banking platforms to mobilise lower cost deposits.

Mobile Banking has enabled commercial banks in Kenya to experience growth, competitive positioning and assured their survival. Kenya has earned its place of pride in the global technological innovation sphere through the revolutionary mobile banking platforms that has exponential capability to transform the mode of banking depending on the extent of its uptake by respective banks. The increased financial inclusion through mobile banking has not only reduced banks operational costs hence cost cutting but also increased their reach, competitiveness and financial performance against the background of dwindling revenues as a result of regulation, competition, inflation among other market forces. The cost of a technology, mobile banking security, human capability, technological, infrastructural related challenges impede mobile banking uptake among the banks.

Based on the findings, the study recommends that the management of the Commercial Bank should rethink their Mobile Banking model and align it with customer's evolving banking needs particularly making it attractive to the financially excluded Kenyan population. They should also allocate adequate financial resources towards Mobile Banking uptake and have a highly robust and Secured Mobile Platforms to encourage uptake There was also the need to undertake a market research to understand the customer needs and to inform their customers on their Mobile Banking product design with key focus to ease of use, competitive cost and improved quality of service.

Key words: *Mobile banking uptake, commercial banks in Kenya*

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LIST OF ABBREVIATIONS

ATM	Automated Teller Machine
CBK	Central Bank of Kenya
DTM	Deposit Taking Micro-Finance
ICT	Information and Communication Technology
IPSL	Integrated Payments Service Limited
KBA	Kenya Bankers Association
KCB	Kenya Commercial Bank
KITS	Kenya Interbank Transaction Switch
ROA	Return on Asset
SACCO	Savings and Credit Cooperative Organization

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

With globalization, increasing competition, financial liberalization and technology revolution (Mutevu, 2015) many banks are putting effort into sustaining and retaining a reliable customer base by delivering high quality service and customer satisfaction (World Bank, 2015). Mobile banking has allowed the developments of new and more efficient delivery and processing channels as well as more innovative products and services in banking industry (Kato et al., 2014). Consequently, banks are changing the way they conduct business and are adopting new digital technologies to better meet ever evolving customer needs and wants to retain their market share, remain profitable and sustainable (Chiteli, 2013).

In the banking industry, innovative technology-based digital channels have been adopted such as mobile banking, internet banking and automated teller machine (ATM) banking. They are not only seen as innovative technologies for providing financial services to existing bank customers, but also essential technologies in expanding financial inclusion (World Bank, 2015). According to Leach, Beghin, Pickens and Moran (2007) customers are not entirely satisfied with the quality of service provided by commercial banks. For instance, queuing time is considered reasonable at ATMs but too long in banking halls. The study however, focusses on mobile banking as it is the most widely used digital banking channel in Kenya over the last five-year period based on CBK statistics.

Mobile banking has enhanced customer services, improved efficiency in operations, ensured faster access to information, improved internal processes and increased customer satisfaction and service quality (Wahid, 2013). Based on the low perceived risk of failure, non-complexity, better security and personalized service, mobile banking has been the most preferred banking technology in developing nations (Bordens & Abbott, 2011). Tiwari & Buse, (2007) noted that the various types of services offered through mobile

banking include; account balance enquiries, transaction inquiry, cheque status inquiry, password change, intra bank transfers, request bank account mini statement, SMS alerts among others. The mobile banking platform offers bank enormous potential as a service channel because of its ubiquity, and it could help banks to retain existing technology-savvy customers by providing value-added, innovative services whilst at the same time attracting new customers.

Notwithstanding the enormous contribution of mobile baking on performance of banks, faced by the pressure to remain competitive in the highly competitive financial sector, the bank management may consciously overlook challenges that come with mobile banking adoption threatening the investment in mobile banking. This oversight is invariably risky and could result in failure of mobile banking technology adoption among banks (CBK, 2016).

The main benefits with mobile banking platforms among commercial banks in Kenya include; enhancing customer convenience, satisfaction and loyalty besides enabling the introduction of microloans, improved quality of banking service, reduced banking hall queuing time, creation of innovative products, improved efficiency in operations, increased competitive advantage and improved overall performance. However, the major challenges facing the adoption of mobile banking in Kenya include; lack of models to benchmark with given that it is less than 10 years, the adoption being capital intensive, lack of requisite skills, risks due to fraud, destruction of infrastructure by terrorist and slow adoption of some of mobile banking options (Kenya Bankers Association, 2016).

1.1.1 Digitization within the Banking Industry

During the year 2016, there was no major acquisition or upgrade of existing core banking systems in Kenya's banking sector (CBK 2017). Commercial banks in Kenya continue to leverage on robust Information and Communication Technology (ICT) platforms to provide robust banking services. The banking institutions continue to devise ways of

minimizing operating costs especially on the backdrop of the recent Banking (Amendment) Act, 2016 that capped interest rate. The robust ICT platforms continue being a perfect enabler for institutions to offer banking services efficiently (KBA, 2017). The commercial banks business strategies are mainly driven by the capabilities of these core banking systems and other integrated systems. The capability of these systems enables banks to roll out different products and services to their customers. Important to note however, is the fact that the increased use of ICT has brought increased cases of ICT related frauds in the banking sector with banks and customers losing approximately over Kshs. 0.5 billion between 2014 and 2017 (CBK, 2017).

In Kenya, the commercial banks have been implementing different digitization initiatives to increase their efficiency, profitability and competitiveness. Some of these digitization initiatives include; mobile banking, ATM banking, online banking, agency banking, and PesaLink an interbank mobile money digital platform (CBK, 2017). Among the highlighted digitization pillars in the banking sector, mobile banking is the most utilised platform. This study therefore specifically focusses on mobile banking in Kenya as banks leverage on it not only to remain profitable but to increase their competitiveness and sustainability.

1.1.2 Mobile Banking Uptake in the Kenya

The Kenyan banking sector has been undergoing rigorous technological innovations in the last decade. Several technological innovations being applied simultaneously with the traditional banking - brick and motor model include; agency banking, ATM banking, mobile banking and online/internet banking. Among the four banking technologies, mobile banking is the most preferred technological innovation by Kenyans based on number and value of banking transactions over the last five years (2013-2017) (CBK, 2017).

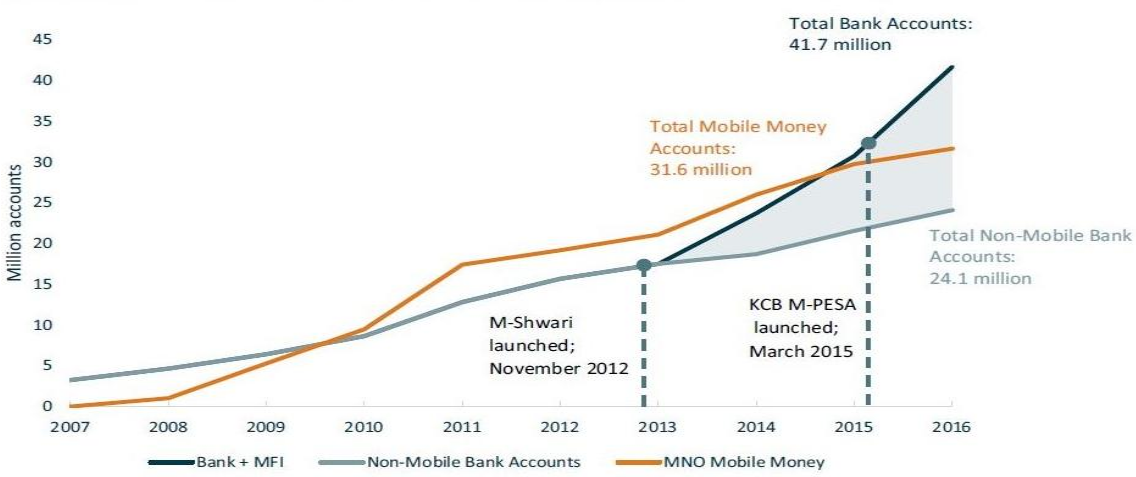
The paradigm shift from brick and mortar banking model to mobile banking has been attributed to; ever changing customer need, innovative financial products, technological advancements, deregulation, changing economic conditions, globalization, and onset of multiple delivery channels (Chiteli, 2013 and Ndungu, 2013). Another reason behind the increasing deployment of mobile banking by banks is the stiff competition between banks and competition from other licensed financial service providers including SACCOS, DTMS and Micro-Finance Banks, and telecoms that are offering mobile banking platforms (Atieno, 2011; Kimenyi & Ndung'u, 2009). The presence of robust telecommunication industry, high penetration of mobile phones and its supportive infrastructure are some of the strategic drivers of mobile banking in Kenya (Communication Authority of Kenya, 2016).

Interestingly though, only person to person mobile banking has registered significant growth. Other mobile banking options like internet banking through mobile phones and commercial mobile banking have nor registered significant growth over the same period. This presents mixed fortunes for the banks given that only person to person mobile money transfer model of banking has been successful while mobile applications supported banking, internet and mobile banking transfers have not been as successful.

Unfortunately, the person to person mobile banking is not a preserve of commercial banks but is currently dominated by telecommunication companies through brand names such as M-PESA, Airtel Money, Orange Money, Mobikash and Tangaza. It was assumed by banks that just as person to person mobile banking was successful, other mobile banking options that banks own like internet and mobile application supported banking and mobile banking transfers would also be successful. However, this has not been the case. It is this divide between the success and failure in uptake of mobile banking that warrants the current study. By understanding the challenges facing commercial banks in their mobile banking uptake agenda would help in coming up with requisite recommendations to enable them optimize their sales.

M-PESA, a product of Safaricom was the first person to person mobile banking platform in Kenya which was launched in 2007. The platform underwent exponential growth with over 43% of Kenya's GDP flowing through M-PESA in 2016. Upon this realization, and to reclaim their market share, banks have partnered with dominant telecoms to offer banking services through mobile platforms such as; M-Shwari by Commercial Bank of Africa, M-Benki by KCB and Equitel by Equity Bank (Atieno, 2016). The shift in mode of banking has significantly changed over the period between 2009 and 2015 with mobile banking taking the lead underpinning its importance to the banks. It's the slow growth in its uptake that deprives the commercial banks the great benefits, hence the need to understand the challenges facing commercial banks in mobile banking uptake efforts.

Figure 2.1 Distribution of accounts by mobile and non-mobile banking channels (2009-2015)

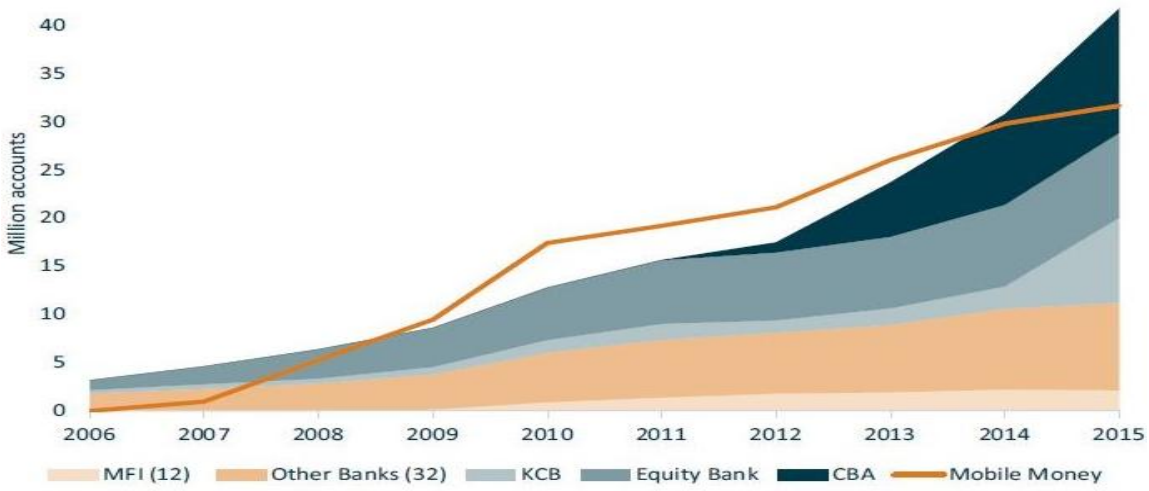


It is worth noting that M-PESA offers banking services either as a person to person mobile banking platform or as a commercial mobile banking platform (Safaricom, 2017). As a person to person mobile banking platform, M-PESA is heavily used by Kenyans for services ranging from; money deposits and withdrawals, sending and receiving from person to person, buying airtime and bill payment through Lipa Na M-PESA. Its success reshaped Kenya's banking and telecommunication sectors and paved way for the

inception of the rest of the mobile banking platforms by banks and telecoms over the last 10 years (Safaricom, 2016; CBK, 2016; World Bank, 2015).

As a commercial mobile banking platform, M-PESA, has enabled Safaricom to partner with commercial banks and create different banking platforms such as; M-Shwari by Commercial Bank of Africa, M-Benki by KCB and M-Kesho by Equity Bank. The commercial banking services offered through these platforms include; Fixed savings account, deposit and withdrawal from the bank account to MPESA, microcredits and loans, and checking of the bank account balance among other services.

Figure 2.2 Comparing person to person mobile banking and commercial mobile banking



There is a great divide between highly performing person to person mobile banking MPESA platform and poorly performing commercial mobile banking MPESA platforms is controversial. On one hand, the person to person mobile banking MPESA platform has registered significant growth in value and impact and is well researched on. On the contrary, commercial mobile banking MPESA platform, has registered dismal performance in value and impact over the years and is not well researched. Yet both of them have similar potential in enhancing the sales volume of the banks. This study

therefore sets forth to unravel this controversy by exploring the challenges of mobile banking uptake among commercial banks in Kenya.

According to Mwania and Muganda (2011) some of the reasons explaining the controversy between the highly performing person to person mobile banking compared to low performing commercial mobile banking include; high financial exclusion in Kenya, customer behaviors, technology challenges resulting from integration of M-PESA and bank systems, failure by banks to extensively market their commercial mobile banking among other reasons (Deloitte, 2017). It would thus be important to undertake a more in-depth research to further explore the reasons behind the poor performance of commercial mobile banking.

This study chooses to focus on uptake of mobile banking in Kenya given that the 50% increase in commercial banks capital expenditure was geared towards uptake of mobile banking (CBK, 2017). Mobile banking entails, Mobile money transfer (Person to Person), Mobile banking transfers (customer to bank or bank to customer) and Mobile Banking Supported. Mobile money transfer, a mobile banking option has had an exponential growth of over 250% over the last five years (2013-2017) both in terms of number and value of money transacted and currently stands at Kshs 3.35 trillion with M-PESA by Safaricom leading at Kshs 892.8 billion which was 77.5% of total transaction made (CBK, 2017).

With the recent enactment of the capping of interest rates in 2016, majority of the commercial banks in Kenya resulted to upgrading of their mobile banking platforms to ensure their profitability and competitiveness (CBK, 2016). This is because their revenue sources from the interest charged on loans significantly reduced necessitating their restructuring. Local and international studies on uptake of mobile banking in developing countries like Kenya are non-conclusive and contradicting and largely unattested. This is partly because mobile banking in Kenya is still at formative stages, hence lacking benchmarks locally and abroad. It would therefore be insightful to establish antecedents

of mobile banking uptake among commercial banks in Kenya. This study therefore specifically focusses on the challenges of mobile banking uptake among commercial banks in Kenya, given that it is the most preferred technological innovation by Kenyans compared to other technological banking service delivery options like agency banking, ATM banking based on number and value of banking transactions over the period between 2013 and 2017.

1.2 Problem Definition

Mobile banking has enabled customers to access all banking services at their convenience, increased banks efficiency as well as provided commercial banks with the opportunity to expand operations and attract new customers (Bangens & Soderberg, 2018; Kimenyi & Ndung'u, 2016). The use of mobile banking has been necessitated by the rapid change in technology, fast-changing competitive environment, globalization, economic changes, regulation, privatization. The banking industry has adopted new strategies of sustaining their growth due to stiff competition (Tchouassi, 2012). According to Mabrouk and Mamoghli (2010) there has been a fundamental assumption that digital banking innovations such mobile banking results to operations improvement among commercial banks and therefore has direct impact on their financial performance. This is reinforced by Mbiti & Weil, 2011). Ndung'u, (2013) who established that banks overall performance was directly dependent on efficiency of mobile banking; therefore, tight controls and standards must be institutionalized to prevent losses associated with efficiency and risks of mobile banking.

In the Kenyan context mobile banking as the most popular digital banking channel has been attributed to increased mobile phone penetration, partnership between commercial banks and telecommunication firms, change in regulations and the need for banks to change from brick and mortar to technology driven service delivery to cut operational costs and remain profitable following the introduction of interest capping that significantly reduced their bank revenue from interests charged on loans. The commercial

banks are heavily relying on technology such as mobile banking to leverage against stiff competition from other financial service providers like the SACCOs and deposit taking micro-finance institutions (Mbiti, 2011). However, the growth rate of commercial mobile banking in Kenya over the last five years has been stagnating at 5 to 10% despite the mobile penetration rapidly increasing from 55% in 2015 to 75% in 2016 (CBK, 2016). It would therefore be important to investigate the drivers of uptake of commercial mobile banking services among commercial banks in Kenya which remains largely unattested. Hence, this study sought to explore challenges of mobile banking uptake among commercial banks in Kenya.

1.3.1 General Objective

To explore challenges of mobile banking uptake among commercial banks in Kenya.

1.3.2 Specific Objectives

i. To analyse the benefits of mobile banking uptake, or lack of it thereof, to commercial banks in Kenya,

ii. To explore uptake of mobile banking in commercial banks of Kenya,

iii. To propose ways to increase mobile banking uptake among commercial banks in Kenya.

1.3.3 Research Questions

i. Are there any benefits to mobile banking uptake to commercial banks in Kenya?

ii. What is the uptake of mobile banking in commercial banks of Kenya?

iii. What are the ways to increase mobile banking uptake among commercial banks in Kenya?

1.4 Scope of the Study

The study sought to explore challenges of mobile banking uptake among commercial banks in Kenya. To achieve this, the study sought to analyse the benefits of mobile banking adoption, or lack of it thereof, to commercial banks in Kenya. It also examined mobile banking uptake challenges facing commercial banks in Kenya. In addition, sought ways to increase mobile banking uptake. The study was conducted among the 10 commercial banks from the tier 1 to 3 as reported by Central Bank of Kenya for the period between 2013 and 2017. The data was sourced from the top management staff from the selected banks.

1.5 Significance of the Study

By understanding the challenges of mobile banking uptake, the bank management may be better placed to make the right investment decision about digitization of the banking services with the higher chances of optimizing their financial performance.

The study may be useful to the policy makers in the banking and telecommunication sector. By confirming the challenges facing mobile banking among commercial banks, the government agencies regulating the use of mobile banking including Central Bank of Kenya and Communication Authority may understand areas in the current policy that require review and adjustment. The government and its strategic stakeholders may also benefit from the study findings in formulating appropriate strategies to alleviate the challenges facing mobile banking and harness opportunities for the growth of the banking sector while ensuring fair competition.

The study findings may add to the body of knowledge on Digital innovation in banking industry and their impact within Commercial banks in Kenya. The study therefore would act a useful reference point for the scholars and academicians with interest in this area.

To other stakeholders particularly the telecommunication partners, the study findings will highlight the reasons behind commercial banks failing to synergise with them in optimizing mobile banking. Hence, inform them on the areas they need to improve on in order to successfully partner with commercial bank in driving mobile banking uptake forward for mutual benefit.

To the mobile banking customers, the study will highlight their personal related issues that explain their failure to leverage on mobile banking to improve the quality of their lives. The customers can then use the study findings to seek solutions that address their failure to use mobile banking. Hence start enjoying mobile banking services in the market.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The chapter presents the theoretical review that underpin the study. It them presents the empirical literature relevant to the study objectives which included; benefits of mobile banking uptake; mobile banking uptake challenges and ways to increase mobile banking uptake. In addition, the study conceptual framework explaining the study variables are presented.

2.2 Theoretical Review

The study was underpinned on Task Technology Fit (TTF) Theory which was proposed by Goodhue and Thompson (1995).

2.2.1 Task Technology Fit (TTF) Theory

The study was anchored on the Task Technology Fit (TTF) Theory. Which was proposed by Goodhue and Thompson (1995). According to Goodhue and Thompson (1995) TFT theory states that it is more likely to have a positive impact on individual performance and be used if the capabilities of Information Communication and Technology (ICT) match the tasks that the user must perform. Originally, Goodhue and Thompson focused on conceptualization of the technological aspects, thereby bypassing the 'matching' aspects of the theory. As a result, quantification of parallel units remains an uncharted aspect of TTF theory. This results to a high level of subjectivity in application of the theory. He mentioned the factors that measure task-technology fit as; quality, locatability, authorization, and compatibility, eases of use/training, production timeliness, systems reliability and relationship with users. The model is useful in the analysis of various context of a diverse range of information systems including Ecommerce systems and combined with or used as an extension of other models related to information systems outcomes (Junglas & Watson, 2006).

The theory of task-technology fit maintains that a match between business tasks and information technology is important to explain and predict the success of technology adoption and use. Therefore, the key aspects of the innovation include; Task Characteristics Technology Characteristics, Task- Technology Fit, Performance Impacts and Utilization (Goodhue & Thompson, 1995). For various scenarios of task and technology, statistical significance has been established of a positive association between task-technology fit and information system success measures, such as use (Dishaw & Strong, 1999), and impact on individual performance (Goodhue and Thompson, 1995) and on group performance (Zigurs *et al.,* 1999). The concept of task-technology fit promises to help identify aspects that are critical to support a given business task, and can contribute to the success of technology innovations (Junglas & Watson, 2006). One such innovation is represented by mobile technology to support an increasingly mobile workforce (Barnes, 2003).

Upon applying the theory of task-technology fit to mobile information systems, however, it becomes apparent that previous studies have focused mainly on the functionality that is provided by the technology and have paid less attention to the context in which the technology is being used (Perry, O'Hara, Sellen, Brown & Harper, 2001). At the same time, usability studies suggest that the use-context may have a non-trivial impact on the conditions of task-technology fit (Perry *et al*., 2001). First, it can be observed that non-functional features, such as weight and size, play a more prominent role in mobile than in non-mobile use contexts (Gebauer & Ginsburg, 2006).

Second, functional requirements may shift as business tasks are often performed differently in mobile versus non-mobile use contexts (Gebauer & Shaw, 2004; Perry *et al.*, 2001). As a result of the observable changes of business tasks and related technology requirements, it becomes necessary to assess the applicability of the theory of task-technology fit to mobile technologies and mobile use contexts, and to carefully determine the needs for theory adjustments and extensions (Junglas & Watson, 2006; and Lyytinen *et al*. 2014).

The relevance of the theory to the study is explained by the theory's proposition that the match between business tasks and mobile banking technologies explain the uptake of mobile banking. Therefore, mobile banking technologies must have the following aspects to be successful; task characteristics-task technology fit, performance impacts-utilization. Depending on how each of the commercial banks in Kenya institutionalizes this aspects to their mobile banking technologies determine if they are an impediment or value adding to its uptake process. This is to mean that challenges like lack of requisite skills among banking staff; disconnect between gain to the customer vis a vis cost of use explain the mismatch between task characteristics-task technology fit and performance impacts-utilization of mobile banking.

2.2.2 Technology Acceptance Model (TAM)

According to Davis (19985) the theoretical basis of TAM is built on the premise that when users are presented with a new technology, three major factors influence their decision on how and when they will use it. The first determinant is its perceived usefulness (PU), the second is the perceived ease of use (PEOU), while the third determinant is user attitude towards usage (ATU).

According to Davis (1985) perceived usefulness (PU) is the degree to which a user believes that using a particular system would enhance his or her job performance. On the other hand, perceived ease-of-use (PEOU) is the degree to which a user believes that using a particular technology would be free from effort. In other words, it is the degree to which consumers perceive a technology as better than its substitutes. Chen et al. (2012) extends the argument that perceived usefulness (PU) and perceived ease of use (PEOU) positively affects the attitudes toward usage (ATU) of a technology.

The uptake of mobile banking in Kenya can be explained by TAM as it is a function value/benefits/usefulness of mobile compared to brick and mortar bank, hence the theory is relevant to the study. Similarly, the ease of use of mobile technology both by bank staff

and the customers is a determining challenge or driver of mobile banking uptake in Kenya. The staff and customer perceived usefulness of mobile banking also differentiates mobile banking technologies used by different banks, hence explaining its uptake depending on whether it is well taken care of (beneficial) or poorly done hence an impediment to mobile banking uptake.

2.4 Empirical Literature Review

The empirical literature presented in the subsequent sub-sections responds to the study five thematic areas.

2.3.1 Benefits of mobile banking uptake to commercial banks

Otoo (2013) notes that financial innovations have come with disadvantages that may affect financial performance of the commercial banks in Kenya. The nature of the global market and competitions in the banking sector exposes the commercial banks in Kenya to operational challenges like cybercrime and other internet related frauds including identity thefts. The impact of such crimes is detailed as opportunity costs and losses by the commercial banks and individuals. Expenditures to curb these risks increase operational costs which affects financial performance. On the other hand, Mwania and Muganda (2011) reiterates that the benefits of financial innovations far outweigh the disadvantages and hence financial innovation has significant contribution to financial performance. Studies by Pooja and Singh (2009) and Franscesa and Claeys (2010) concluded that financial innovations had least impact on financial performance. Studies by Adhiambo (2014) and Mwania and Muganda (2011) concluded that financial innovation had significant contribution to financial performance.

Durkin and Howcroft (2003), evaluated the banker-customer relationship using Technology Acceptance Model and found that, the relationship was improved through mobile, phone and internet banking. The authors found that the mobile banking has made the banks very competitive and profitable and internet has played a key role in it.

Perception of bankers and customers regarding the use of internet was examined. They pointed out that as consumer usage of remote bank delivery channels increases, relationship management will become more important. Further, the combination of traditional and new delivery channels, if followed, can help to improve their productivity and profitability.

Lee *et al.* (2003) performed eight interviews to collect transcripts from participants and concluded that relative advantages and compatibility were positive factors affecting the adoption of mobile banking, perceived risk was negative factor affecting the adoption of mobile banking, and consumer previous experience and self-efficacy generalized their beliefs (a negative or positive attitude) toward the adoption of mobile banking.

By looking at trust and resources, Luarn and Lin (2005) employed the extended technology acceptance model to explore human behavioral intention to use mobile banking. They collected 180 respondents in Taiwan and found that perceived self-efficacy, financial cost, credibility, easy-of- use and usefulness had positive effects on the behavioral intention to use mobile banking. Likewise, due to the parsimony and predictive power of Technology acceptance model, Amin *et al*. (2008) used an extended research containing five constructs - perceived usefulness, perceived ease-of-use, perceived credibility, the amount of information, and normative pressure to explore the adoption of mobile banking. They gathered 158 valid questionnaires in Malaysia and supported that perceived ease-of-use markedly influenced perceived usefulness and credibility, and human intentions to adopt mobile banking was significantly affected by perceived usefulness, perceived ease-of-use, perceived credibility, the amount of information, and normative pressure.

Kimingi (2010) investigated the effects of technological innovations on the financial performance of the commercial banks in Kenya. The study used a descriptive survey. The study concluded that the banks had employed various technological innovations like ATM services, mobile phone transactions and internet-based banking services. The study

also concluded that technological innovations had led to improved financial performance of commercial banks in Kenya through increased bank sales, profits increment and return on equity.

World bank (2015); UNTCAD (2016) and CBK (2016) concur that the main driver for the rapid economic development is the new Mobile Banking services. The mobile banking services are less expensive and have a geographical footprint defined by the reach of mobile networks in contrast to services offered by traditional retail bank branches, which are out of reach for many people in rural areas from both an economic and geographical perspective. The potential of mobile banking to provide access to financial services is compounded by the exponential growth that mobile penetration rates have displayed in recent years across Africa. While uncertainties remain over some of the implications of using mobile banking services – ranging from regulatory approaches, security concerns, the lack of human interfaces, to the difficulty of complying with Know Your Customer (KYC) rules – the retail network, speed of service, and affordability of mobile banking transactions holds a tremendous potential to expanding access to the formally financially excluded (Mwania & Muganda, 2011; Kato *et al*., 2014 and Mutevu, 2015 and Kiprop *et al*., 2016).

2.3.2 Mobile banking uptake challenges facing commercial banks

A study by De Young, Lang and Nolle (2007) adopt an approach to the innovation performance relationship which does not take into account the antecedents to innovation inside and outside the banks, all of which could influence this relationship. According to Word bank (2014) the key pillars of mobile banking is product innovation, competition, regulations and security. The adoption of mobile banking is capital intensive and its failure rate is very high in the financial sector (Mwangi, 2013). It would therefore be very important to establish the extent of adoption of mobile banking and its subsequent influence on financial performance of commercial banks in Kenya. Commercial banks in Kenya have continued to deploy huge investments in mobile banking and in training of

manpower to handle the new technologies. It would therefore be important to establish the effect of mobile banking on performance of commercial banks in Kenya as a way of justifying the huge capital investments in mobile banking.

Previous local and international empirical studies on the impact of banking technological innovations on bank performance produced mixed results. Pooja and Singh (2009) and Franscesa and Claeys (2010 concluded that banking technological innovations had least impact on bank performance, while Batiz-Lazo and Woldesenbet (2006) and Mwania and Muganda (2011) concluded that banking technological innovations had significant contribution on bank financial performance. It is at the center of such mixed conclusions that necessitates the need to carry out a study from a Kenyan context to determine the challenges of mobile banking adoption among commercial banks in Kenya.

A study was done by Laukkanen *et al* (2007) summarizing 18 factors into five barriers, namely Usage, Value, Risk, Tradition, and Image barriers. The theory of innovation resistance, adapted from the psychology and the IDT of Rogers (Rogers, 2003) aims to explain why customers resist innovations even though these innovations were considered necessary and desirable. Through investigating 1525 usable respondents from a large Scandinavian bank, the study uncovered that the value and usage barriers were the most intense barriers to mobile banking adoption, while tradition barriers (such as preferring to chat with the teller and patronizing the banking office) were not an obstacle to mobile banking adoption.

Yang (2009) established that factors inhibiting mobile banking adoption were safety and initial set-up fees. Similarly, Cruz *et al* (2010) surveyed 3585 online respondents in Brazil and supported that the cost of Internet access and service and perceived risk were top two barriers for adopting mobile banking services.

Building agent network is also a challenge which focuses on establishing effective agent with well-trained manpower; trusted by customers; strategically and conveniently

located; and properly incentivized to follow procedures, keep sufficient float on hand, and serve customers. When agents provide a range of services (e.g., account opening, deposits, withdrawals, bill payments, etc.) they can generate transaction volume and balance liquidity. An agent must maintain adequate cash and e-money float balances to meet customer cash-in/cash-out requests. If too much cash is taken in, the agent may run out of e-float and not be able to accept more deposits. If there are too many withdrawals, the agent will accumulate e-float but run out of cash. In either case, customers will get discouraged if the agent cannot provide the services they need when they need them. In addition, a secure mechanism needs to be in place to transport cash needs to and from an agent (Flaming *et. el* 2011).

Interruption in services of telecommunications due to technical or nontechnical issue and non-availability of any parallel system or alternative may cause disruption in service availability. Similarly, congestion in network may become a bottle neck in providing Quality of Service to Agent Banking user (Mutevu, 2015).

The inconsistent availability of power supply in the country particularly in the rural area is one of the challenges for the implementation and continuous availability of Mobile and Agent Banking service. Therefore, Utility disruptions or software or hardware failures can cause a lack of service availability and information loss. Financial Institution without business continuity and disaster recovery planning may be on risk of non-availability of services in case of catastrophic events, power breakdowns, fire etc. and natural disasters (flooding, earthquake etc.) (Barasa *et al*, 2013; Flaming *et al.*, 2011).

Managing the Risk has remained a challenge in association with technologically innovative products like Mobile and Agent Banking. Technological related risks are risks about technology and could be characterized by unparalleled speed of transformation related to technological and customer service innovation, the nature of electronic network is open everywhere in the globe, the mobile banking application systems are integrated with the financial institutions legacy core application systems and with the hardware.

And the necessary information technology service increases the financial institution dependency on the third parties (Chiteli, 2013).

Given that mobile application supported banking is conducted through internet, several challenges facing internet banking also affects this platform. A common and widely recognized obstacle to internet banking has been the lack of security and privacy over the internet (Bee, 2008). The level of internet banking perceived riskiness could possibly fall between these two transactions. In Huang *et al.* (2006) research, the perceived risk significantly influences adopters 'attitudes toward internet banking. The online exchange raises information privacy risk as it often involves the collection, use, or disclosure of consumers 'personal data (Seounmi, 2009). With more private information exposed to service providers, internet banking customers require more assurance of privacy protection and more control over the information that can be released (Liu & Arnett, 2010).

Lee (2008) has suggested perceived information privacy risk is still negatively influencing internet banking adoption because potential internet banking customers worry about their inability to predict whether a financial institution will comply with fair information privacy practice. Employees working for internet banking provider pose the threat of insider fraud racket. Like any electronic banking system, the danger lies in the interception and modification of payment instructions by the staff whereby they may alter a payment instruction (Szmigin, 1999). On the other hand, cyber criminals are increasingly attacking internet banking and payment services (Lee & Park, 2006). Viruses have been identified whereby a malicious code, that is software inform of a virus, worm or other malware, can be loaded onto the computer or the banks server to perform unauthorized process that will have adverse impact on the confidentiality, integrity or availability of financial information and transactions (Luarn & Lin, 2005).

2.3.3 Ways to increase mobile banking uptake among commercial banks

Gorton and Metrick (2010) and Batiz-Lazo and Woldesenbet (2006) summarize the reasons for the growth of modern financial innovation as; reduction in bankruptcy costs, tax advantages, reduction in moral hazard, reduced regulatory costs, transparency and customization. A highly turbulent environment leads to successful innovation creating a unique competitive position and competitive advantage and lead to a superior. performance (Roberts and Amit, 2003). This can only be maintained by ceaseless innovation and improvement of the product and the process (Porter, 2004).

King (2012) and Mbiti and Weil (2011) revealed that individual intention to adopt mobile banking was significantly influenced by social circles, perceived financial cost, performance expectancy, and perceived credibility, in their order influence strength. The behavior was considerably affected by individual intention and facilitating conditions. The study discovered that gender significantly moderated the effects of performance expectancy and perceived financial costs on behavior intention. The age considerably moderated the effects of facilitating conditions and perceived self-efficacy on actual adoption behavior.

The study by Ndung'u (2013) concluded that mobile banking usage is significantly influenced by relative advantage, trial ability, number of banking services, and risk. Secondly, Information sources (i.e., interpersonal word-of-mouth), age, and household income significantly influence mobile banking adoption. To add on this, awareness, confidential and security, past experience with computer and new technology are salient factors influencing mobile banking adoption. Moreover, perceived self-efficacy, financial costs, credibility, easy-of-use, and usefulness had remarked influence on intention to adopt mobile banking, perceived benefits (i.e., location free and efficiency) are main factors encouraging people to adopt mobile banking.

Al-Jabri (2012) studied mobile banking adoption in Saudi Arabia by looking at the application of diffusion of innovation theory. This study sought to investigate a set of technical attributes and how they influence mobile banking adoption in a developing nation, like Saudi Arabia. The study used diffusion of innovation as a base-line theory to investigate factors that may influence mobile banking adoption and use. The findings suggested that banks, in Saudi Arabia, should offer mobile banking services that are compatible with various current users' requirements, past experiences, lifestyles, and beliefs to fulfill customer expectations.

2.4 Research Gap

Given the divide the performance difference in value and impact between Person to Person Mobile Banking and Commercial Mobile Banking, a gap exists in the factors explaining this divide. On one hand, Person to Person Mobile Banking has had tremendous growth in value and impact while Commercial Mobile Banking continues to register dismal performance during the same period. The previous research noted the reasons explaining the divide between Person to Person Mobile Banking and Commercial Mobile Banking to include; high financial exclusion in Kenya, customer behaviors, technology challenges resulting from integration of Mobile Money Platforms and bank systems, and failure by banks to invest in marketing mobile banking. Hence, this study seeks to undertake a more in-depth research to further explore the behind the uptake of Mobile Banking within of Commercial Banks in Kenya.

The empirical literature reviewed in this chapter mainly focused on; value of mobile banking adoption to commercial banks, challenges facing mobile banking and studies on solutions to mobile banking adoption challenges. Some of the studies reviewed on value of mobile banking adoption to commercial banks concluded that mobile banking was beneficial to banks. On the contrary, other studies concluded that financial innovations had least impact on financial performance. Hence, the two present a non-conclusive outcome on the value of mobile banking adoption to commercial banks. Hence a study is

needed to conclude on the value of mobile banking adoption, or lack of it thereof, to commercial banks.

The reviewed studies on challenges facing mobile banking mainly explained mobile banking in developed economies while Kenya is a developing economy hence a knowledge gap exists. In addition, the earlier studies reviewed used case study research design while the current study is a survey of commercial banks in Kenya.

On solutions to mobile banking uptake the studies reviewed require validation given that mobile banking technology is evolving at a very fast pace. At the same time the solutions highlighted in the reviewed studies require a similar study for the same to be generalized on the Kenyan banking context, given the differing contextual realities like regulation and competition.

2.5 Conceptual Framework

A conceptual framework is a concise description accompanied by a graphical or visual depiction of the major concepts of the study and the hypothesized relationships and linkages among them (Mugenda & Mugenda, 2008). The conceptual framework presented here under shows the interaction between uptake of mobile banking as the independent variable. The constructs explaining mobile banking uptake or lack of include; cost, human capability, nature of ICT infrastructure and mobile banking security.

To drive the uptake of mobile banking the initial acquisition of mobile banking technologies is capital intensive as well as the costs related to its maintenance, upgrading and marketing hence it's a capital expenditure to banks. Depending on the available funds that respective banks have determine the uptake of these technologies. Similarly, as a new technology, mobile banking requires technologically savvy staff to run it as well as troubleshoot in case of down time. The banks have been struggling to hire competent staff as well as equip their staff with requisite skills to effectively deploy and scale up its use. The uptake of mobile banking is pegged on the security measures applied by the

respective, otherwise it remains a loss-making channel from the high frequency of fraud facing the sector. The uptake of mobile banking is a function of reliability of mobile network and internet connectivity in Kenya underpinning the role of infrastructure in driving the uptake of such banking innovations with concentration mostly in urban as opposed to national wide utilization of mobile banking among banks. On the other hand, the study dependent variable, financial performance of commercial banks was measured using return on asset values for the period between 2013 and 2017.

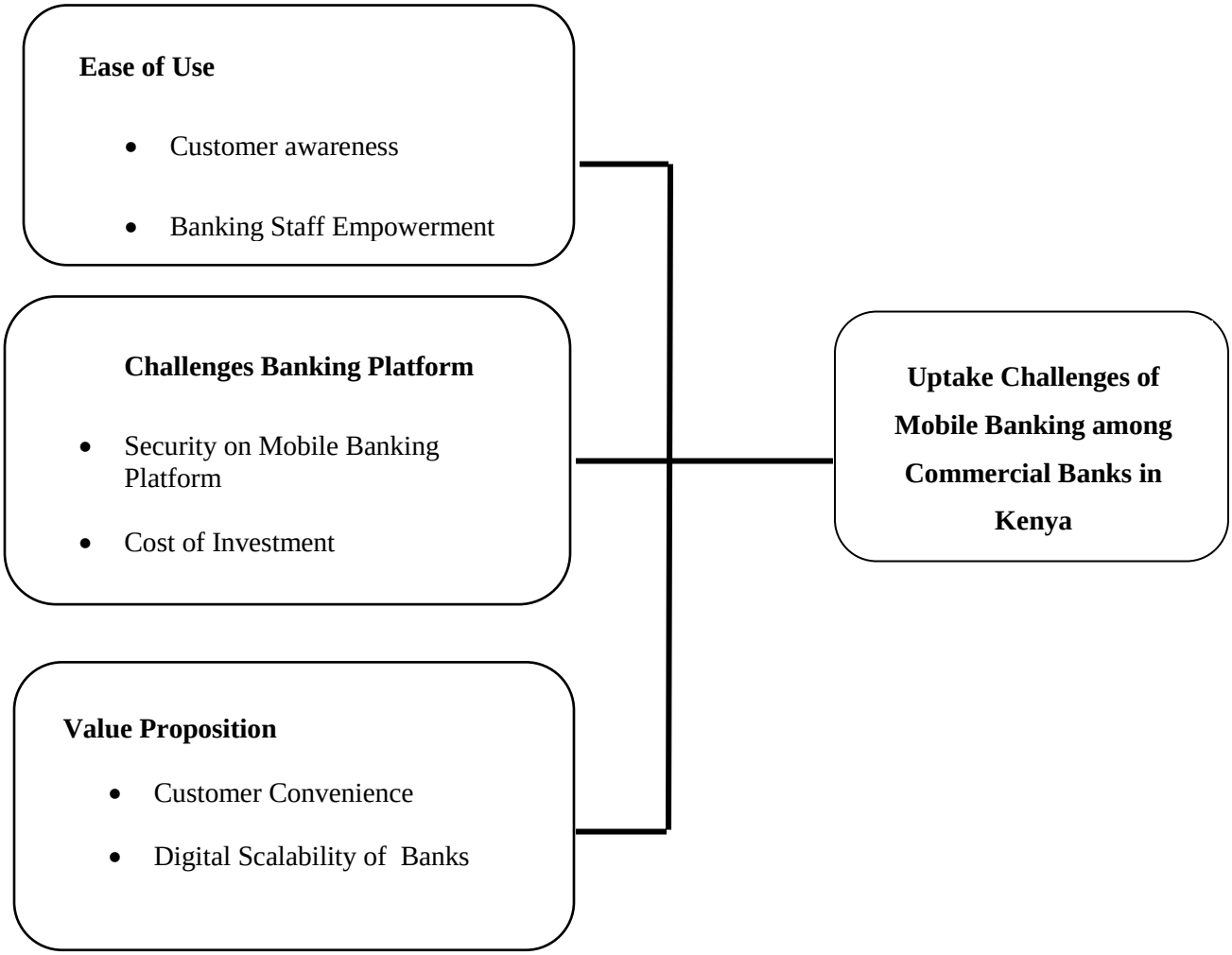


Figure 2.3 Conceptual Framework

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

The chapter presents the research methodology that was adopted in executing the study. More specifically, the chapter provides the information detailing the research design, population and sampling, data collection methods, data analysis plan and research quality and ethical issues observed in this research.

3.2 The Research Design

The study adopted descriptive research design. According to Bryman and Bell (2015) descriptive research design is concerned with determining the frequency with which something occurs or the relationship between variables. According to Polit and Beck (2013) in a descriptive study, researchers observe, count, delineate, and classify. They further describe descriptive research studies as studies that have, as their main objective, the accurate portrayal of the characteristics of persons, situations, or groups, and/or the frequency with which certain phenomena occur. The design is preferred because it enables assessing relationships between variables and it provides opportunity to identify moderators between variables (Tashakkori & Teddlie, 2013). The descriptive research design was further suitable in this study given that it allowed for use of quantitative methodologies which were readily analyzable form.

3.2 Population and Sampling

According to Pole and Bryman (2014) a target population is classified as all the members of a given group to which the investigation is related. The target population were all the 43 commercial banks in Kenya as at 31st, December 2017 (CBK, 2017). From the target population of 43 banks, the study further targeted banks based on three categories of; tier 1/large banks; tier 2/medium banks and tier 3/small banks. The distribution of banks was as follows.

Table 3.1 Sampling Frame

Category of bank	Number of banks	Market share (%)	Respondents per bank
Large banks	8	65.32	40
Medium banks	11	25.9	16
Small banks	20	8.77	4
Delisted	3	0.0	0
Total	**43**	**100**	**60**

The study used purposive sampling technique to select the top management employees to participate in the study. The management staff to participate in the study were sourced from the following departments; operations/customer service, information technology, retail banking and finance. The targeted departments coordinate technology and banking innovations in their respective banks and were therefore information rich as far as mobile banking uptake by commercial banks was concerned. The purposive sampling procedure estimates of overall population parameters with great precision (Nsubuga, 2006).

The stratified sampling technique was then applied to select the respective tier of bank where three tiers (1-large banks, 2-medium banks and 3-small banks) was used. The selection of respondents was based on the market share of each tier as well as number of banks per category of banks. From a sample size of 60 respondents, the distribution of respondents per respective bank tier was as presented in table 3.2 below.

The study selected the three tiers of banks in a ratio of 2:2:1 giving the study a total of ten banks disaggregated as follows; four large/tier-one banks, four medium/tier-two banks and two small /tier-3 banks. The study selected more respondents from large/tier one banks than the rest given that even through they had the financial capability to fully finance uptake of mobile banking unlike the other tier banks, they did not make significant progress in uptake of mobile banking. It would therefore help the study better

understand the reasons behind their low uptake of mobile banking uptake. The medium/tier-two had the second largest proportion of respondents selected to participate in the study as they this tier of banks invested moderately in mobile banking technologies but way below tier one banks. The small/tier-3 banks had the least proportion of respondents as they rarely invested in mobile banking technologies.

Table 3.2 Distribution of respondents per bank tier

Category of bank	**Number of banks**	**Total respondents to be selected**	**Banks to be contacted per tier**	**Respondents per each bank**	**Sample size**
Large banks/tier 1	8	40	4	10	40
Medium banks/ tier 2	11	16	4	4	16
Small banks tier 3	20	4	2	2	4
Delisted	3	0	0	0	0
Total	**43**	**60**	**10**		**60**

3.3 Data Collection Methods

This study used both primary and secondary data. Primary data was obtained using self-administered questionnaires. The questionnaire was made up of both open ended and closed ended questions. The open-ended questions encouraged the respondents to give an in-depth response without being held back while closed or structured questions was used as they were in readily usable form. Secondary data to be used in this study was from the published annual statement for the period 2013 and 2017. The secondary sources provided factual data on financial performance of the selected banks. Using the primary and secondary data allowed the researcher to triangulate and validate the data collected hence collecting high quality data. The data collection tool was administered through drop and pick later method where the respondents were allowed time to respond to the

study questions. The questionnaires covered all the study specific objectives using a mixture of open ended, closed ended and five-point Likert questions. In total, 60 questionnaires was administered to the respondents.

3.4 Data Analysis Plan

Once the questionnaires were collected, they were checked for completeness and consistency before the data entry process took place. Then coding and data entry of close ended questions was undertaken using Statistical Package for Social Studies (SPSS Version-23). Data cleaning which entailed checking for errors in data entry followed data entry. The quantitative data from closed ended questions in the questionnaires and secondary data was analysed using descriptive statistics. The descriptive statistics applied on the study variables included frequencies, percentages, mean score and standard deviation. The descriptive statistics was useful in establishing the frequency, trend and pattern in the data collected for useful interpretation. The analysed data was presented inform of tables and graphs as appropriate with explanation provided in prose. Through the descriptive statistics the researcher meaningfully described the distribution of scores, and trend.

3.5 Research Quality

The pilot testing was conducted using the questionnaire to 13 banking staff from three banks. The pilot group was sampled through random sampling and they did not participate in the main study. Test retest method of piloting was used where the questionnaires were administered to the same respondents twice in a lapse of one week. The questionnaire pre-tests was done through personal interviews to observe the respondents' reactions and attitudes. All aspects of the questionnaire were pre-tested including question content, wording, sequence, form and layout and instructions (Sekaran & Bougie, 2014). The feedback obtained was used to revise the questionnaire before the main study.

According to Golafshani (2013) validity is the accuracy and meaningfulness of inferences, based on the research results. The study used both construct and content validity to ascertain the validity of the questionnaires. Content validity draws an inference from test scores to a large domain of items like those on the test. Content validity is concerned with sample-population representativeness. The expert in technological innovations related field were consulted to ascertain the validity of the questionnaires.

Instrument reliability on the other hand is the extent to which a research instrument produces similar results on different occasions under similar conditions. It's the degree of consistency with which it measures whatever it is meant to measure (Bell, 2014). A Cronbach alpha coefficient of 0.7 or above, for all the study constructs, was adequate for this study (Rousson, Gasser & Seifer, 2013). Reliability coefficient of the research instrument was assessed using Cronbach's alpha (α) coefficient from the pilot study data.

3.6 Ethical Issues in Research

The research was conducted on the principles of confidentiality and anonymity. All the participants had to give their consent after the researcher had explained the purpose of the study, their role and the fact that their participation was voluntary. The participants were also informed about their right to withdraw consent of participation at any time without a penalty. In addition, participants were assured that all information they would provide would be kept private and confidential. This study guarded against the potential possibility of invading the privacy of the respondents. Anonymity and confidentiality were achieved by not divulging respondents' identities and using special codes throughout the entire study processes.

CHAPTER 4: PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

The chapter presents the findings on the study on challenges of mobile banking uptake among commercial banks in Kenya. The specific objectives included; to analyse the benefits of mobile banking uptake, or lack of it thereof, to commercial banks in Kenya; to examine mobile banking uptake challenges facing commercial banks in Kenya; and to propose ways to increase mobile banking uptake among commercial banks in Kenya.

The study had a sample size of 60 respondents to whom questionnaire were administered to as indicated on Table 4.3 below.

Table 4.3 Response rate

Response Rate	
Questionnaire administered	60
Questionnaire returned	50
Response rate (%)	**83.3%**

As indicated in Table 4.3 above, only 50 of the respondents returned the questionnaires duly filled in contributing to a response rate of 83.3%. This response rate was sufficient and representative and conforms to Mugenda and Mugenda (2008) stipulation that; a response rate of 50% is adequate; 60% is good while 70% and over is excellent for analysis and statistical reporting.

4.2 Background Information

The analysis on the background information of the respondents to ascertain the suitability of the respondents was undertaken and the findings presented in Table 4.4 below.

Table 4.4 Background Information

For how long you have worked in the banking sector?	**Frequency**	**Percent**
1-5 years	16	32
6-10 years	30	60
Over 10 years	4	8
Total	**50**	**100**
What is your highest level of education?	Frequency	Percent
Graduate	16	32
Masters	34	68
Total	**50**	**100**
Roles of Interviewees	Frequency	Percent
Heads of operations	10	20
Heads of customer service	10	20
Directors of information technology/ Innovations	10	20
Heads of retail banking	10	20
Heads of finance	10	20
Total	**50**	**100**

The study established that 60% of the respondents had worked in the banking sector 5-10 years, 32% for 1-5 years while 8% had worked for over 10 years. From the findings, it was deduced that majority of the respondents had extensive work experience and therefore had substantial understanding on banking technologies such as mobile banking and could therefore provide high quality data on the study subject.

On the respondents' highest level of education, 68% of the respondents had masters while 32% were degree holders. Therefore, the banking managerial staff were highly qualified in their profession given their advanced education background. The study therefore gained from their deep theoretical and practical understanding on mobile banking uptake in Kenya and related information.

With regard to the roles of the study participants in their respective commercial banks, the study established the distribution of the respondents as follows; heads of operations (20%); heads of customer service (20%); directors of information technology/ innovations (20%); heads of retail banking (20%) and heads of finance (20%). Therefore, the study benefited from good quality data based on the broad range of expertise in the banking sector with managerial experience on the uptake of mobile banking by commercial banks. The findings further depict that the respondents were well aware of the challenges of mobile banking uptake among commercial banks in Kenya owing to the managerial positions they held at their respective commercial banks.

4.3 Benefits of mobile banking

The respondents were to indicate their level of agreement with statements on the benefits of mobile banking to commercial banks. Their responses were rated on a five-point Likert scale where: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree.

Table 4.5 Value of mobile banking

Value of mobile banking	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
improved efficiency in bank operations	0	2	12	70	16	4	4.1200	.62727
enabled creation of innovative banking products	0	2	14	62	22	4	4.0600	.76692
enhanced customer loyalty	0	2	18	52	28	4	4.0400	.80711
enhanced customer convenience	0	2	22	58	18	4	4.0000	.60609
increased bank efficiency in service delivery	0	0	24	56	20	4	3.9800	.65434
improved quality of banking service	0	18	46	26	10	3	3.9600	1.02936

Value of mobile banking	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
enabled the introduction of microloans	0	0	28	60	12	3	3.9600	.66884
reduced banking hall queuing time	2	2	10	70	16	4	3.9400	.65184
increased banks' productivity	2	4	16	54	24	4	3.9200	.66517
increased financial inclusion	0	4	20	60	16	4	3.9200	.44447
created new revenue sources	2	2	16	66	14	4	3.9000	.67763
enhanced customer satisfaction	0	2	14	72	12	3	3.8800	.91785
helped to attract new customers	0	10	20	48	22	4	3.8600	.70015

Value of mobile banking	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
increased banks' profitability	0	2	18	70	10	3	3.8200	.89648
increased banks' overall performance	0	2	22	60	16	4	3.7800	.84007
increased banks' competitive advantage	0	2	16	72	10	3	3.7800	.78999
enabled banks to reduce operational costs	0	2	20	66	12	3	3.6800	.76772

As Table 4.5 indicated the majority of the respondents were in agreement that the benefits of mobile banking to commercial banks included; improved efficiency in bank operations (M=4.1200); enabled creation of innovative banking products (M=4.0600); enhanced customer loyalty (M=4.0400); enhanced customer convenience (M=4.0000); increased bank efficiency in service delivery (M=3.9800); improved quality of banking service (M=3.9600); enabled the introduction of microloans (M=3.9600); reduced banking hall queuing time (M=3.9400); increased banks' productivity (M=3.9200);

increased financial inclusion (M=3.9200); created new revenue sources (M=3.9000); enhanced customer satisfaction (M=3.8800); helped to attract new customers (M=3.8600); increased banks' profitability (M=3.8200); increased banks' overall performance (M=3.7800); increased banks' competitive advantage (M=3.7800); and enabled banks to reduce operational costs (M=3.6800) respectively.

Therefore, indeed mobile banking has enabled commercial banks in Kenya to experience growth, competitive positioning and assured their survival. Kenya has earned its place of pride in the global technological innovation sphere through the revolutionary mobile banking platforms that has exponential capability to transform the mode of banking depending on the extent of its uptake by respective banks. The mobile banking has brought with it the opportunity for more Kenyans to access financial services and propagate financial inclusivity in critical economic activities. The increased financial inclusion through mobile banking has not only reduced banks operational costs hence cost cutting but also increased their reach, competitiveness and financial performance against the background of dwindling revenues as a result of regulation, competition, inflation among other market forces. Hence offering banks the much-needed breather to their survival in very difficult banking environment that has been complicated by the effects of 2009 global financial crisis, deregulation, globalization and political instability that lead to reduced patronage of banking services due to reduced economic growth in the country over the last five years. Mobile banking is largely sought after by banks for operating costs minimization and operating revenues maximization and also improved banks asset quality by reducing the proportion of overdue and underperforming assets as well as improved customer experience and satisfaction.

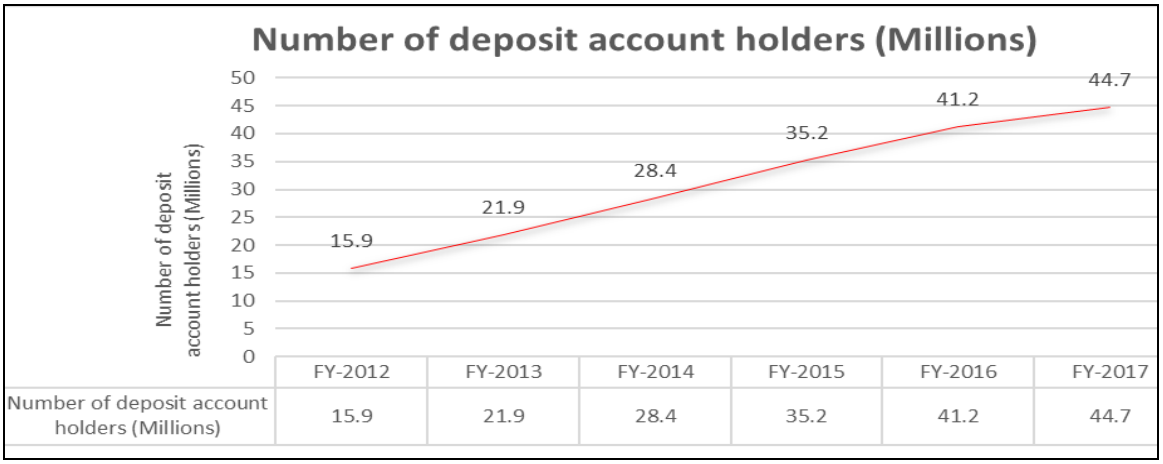
Mobile banking has enabled commercial banks to effectively deal with challenges associated with accessing financial services, especially in the rural areas of the country. This is given the robust telecommunication industry, high penetration of mobile phones and its supportive infrastructure. Through mobile banking, commercial banks will therefore raise money through deposits in larger amounts and at a cheaper cost than they

could through brick and mortal banking model hence increasing banks revenues and profits. Through mobile banking, banks have also developed new opportunities to innovate their products that in the end provide more them with more income for their survival, competitiveness, improve bank earnings and profitability.

Secondary data finding on benefits of mobile banking

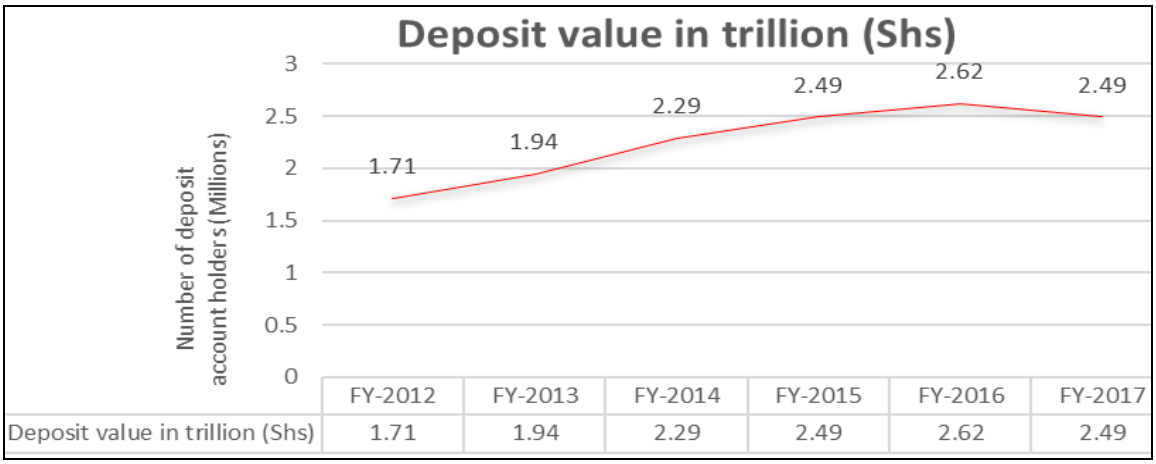
In addition, research was carried out to ascertain the benefits of mobile banking to the commercial banks, the study initially sought to find out the use of mobile banking in enhancing number of customer deposit accounts and value of customer deposit in the banking sector for deposit mobilization. Data was sourced from Central Bank of Kenya data for the period between 2013- 2017. The findings are as shown in Figure 4.6 and Figure 4.7 below.

Figure 4.6 Distribution of Number of deposit account holders (Millions)



	FY-2012	FY-2013	FY-2014	FY-2015	FY-2016	FY-2017
Number of deposit account holders (Millions)	15.9	21.9	28.4	35.2	41.2	44.7

Figure 4.7 Deposit value in trillion (Kshs)



As indicated in Table 4.6 above, there was significant growth (by 181.1%) in number of deposit account holders over the five-year period from 15.9 million accounts in financial year 2012 to 44.7 million accounts in financial year 2017. Similarly, the deposit value grew significantly (by 45.6%) from Kshs 1.71 trillion in 2012 to Kshs 2.49 trillion in 2017. In both cases, there was slight in the rate of growth recorded in financial year 2016 occasioned interest capping. The growth in number of customer deposit accounts and value of customer deposit was attributed to increased deposit mobilization by banks as they expanded their outreach and leveraging on mobile banking platforms to mobilise lower cost deposits underpinning the crucial role of mobile banking uptake to the survival and sustained positive financial outlook of the commercial banks in Kenya at the backdrop of intense competition and change from brick and mortar banking model to mobile banking model occasioned by change in regulations and customer preference for digital banking.

4.4 Mobile banking uptake challenges

The second objective of the study was to examine mobile banking uptake challenges facing commercial banks in Kenya**.**

4.4.1 Mobile banking uptake challenges

The respondents were to indicate their level of agreement with statements on mobile banking uptake challenges facing commercial banks. Their responses were rated on a five-point Likert scale where: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree.

Table 4.8 Mobile banking uptake challenges

Mobile banking uptake challenges	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
mobile banking is capital intensive	0	2	10	30	8	4	4.1800	.82536
lack of models to benchmark mobile banking implementation with	2	6	14	60	18	4	4.0800	.72393
the training of manpower to handle the new mobile banking technologies is expensive	0	2	28	54	16	4	3.9600	.66884

Mobile banking uptake challenges	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
there is lack of requisite skills among the staff to effectively deploy mobile banking services	0	4	26	60	10	4	3.8400	.71027
the use of mobile banking is threatened by increasing ICT and internet related fraud	0	4	28	58	10	4	3.8200	.94091
there poor internet connectivity discourages uptake of mobile banking	2	12	20	44	22	3	3.8200	.71969
the unreliable ICT infrastructure in the country disrupts mobile banking services	0	4	30	54	12	3	3.7200	1.01096

Mobile banking uptake challenges	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
mobile banking technologies are expensive to maintain	0	0	24	56	20	4	3.5800	.75835

The mobile banking uptake challenges facing commercial banks as indicated by majority of respondents included; mobile banking being capital intensive (M=4.1800); lack of models to benchmark mobile banking implementation with (M=4.0800); the training of manpower to handle the new mobile banking technologies is expensive (M=3.9600); there is lack of requisite skills among the staff to effectively deploy mobile banking services (M=3.8400); the use of mobile banking is threatened by increasing ICT and internet related fraud (M=3.8200); there poor internet connectivity discourages uptake of mobile banking (M=3.8200); the unreliable ICT infrastructure in the country disrupts mobile banking services (M=3.7200); and that mobile banking technologies are expensive to maintain (M=3.5800) respectively.

Mobile banking opens the door to enormous potential for monetary as well as reputation risk, with Consumers' perception of insecurity being one of the deterrents against the uptake of mobile banking. Another notable challenge impeding uptake of mobile banking is the Price of a technology is an important factor that influences the utilization of the technology. In times of increased competition, a distribution channel must organize business processes efficiently so as to reduce distribution costs. Commercial banks can increase the volume of utilization to enjoy economies of scale by paying particular attention to their pricing strategy of their mobile products and services.

Beliefs, misunderstandings, habits, and concerns also comes out as some of the customer related challenges that impede mobile banking uptake. In the social aspect of economic transactions factor there is a long list of social or contextual influences on mobile banking use. Both macro-level cultural factors and micro-level, locally-negotiated norms in families and among peers−particularly about money−are at play. Attitude towards change and personal characteristics is another factor which affects mobile banking uptake. The poor and unreliable network connectivity slows the rate of mobile banking uptake. The noted the major infrastructural related mobile banking uptake challenges in the Kenya consist of poor and inadequate information systems, inadequate IT infrastructure, limited skills in ICT, lack of appreciation of ICT, technology weaknesses exhibited by heavy reliance on inappropriate and obsolete technology, lack of skills on modern technology, lack of awareness of the changing technology, poor dissemination mechanisms between and among the various levels of enterprises, and poor technology linkages between banks and telecoms. Banks are facing competition from many different areas, including non-traditional players. These players don't necessarily follow the rules that banks have been following over the years. One of the key problems facing many banks is that all of their processes were designed in the past, at a time when they had a strong and thriving branch network. This has created a major hurdle. When banks want to switch to a digital approach, they have to re-think their processes to avoid the need for any intervention from an employee. Some of the new entrants in the market are much more experienced in this area because they don't have the same legacy as the banks – and this is one of the main reasons why it's so difficult for a more traditional bank to simplify all of its operations. Another important issue that arises when changing to digital is that involves the use of a lot of data and various algorithms. Financial institutions talk a lot about digitisation, new technologies and new processes but they aren't really looking closely at their own people in order to equip them to deal with these new technologies and processes. Financial institutions somehow expect that people who have been working in the bank for many years could automatically become experts in the new mobile banking

technologies and in developing the processes. In reality, banks need to ensure that they are equipping their personnel with the right set of skills.

4.5 Ways to increase the uptake of mobile banking

The third objective of the study sought to establish ways through which commercial banks could increase the uptake of commercial mobile banking in Kenya.

4.4.1 Improving the mobile banking uptake

The respondents were to indicate their level of agreement with statements on ways through which commercial banks could significantly increase the uptake of commercial mobile banking. Their responses were rated on a five-point Likert scale where: 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree.

Table 4.9 improving the mobile banking uptake

Solutions to resolve mobile banking uptake challenges	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
intense marketing of mobile banking services	6	2	20	56	16	4	4.2000	.69985
build the capacity of their staff to efficiently use mobile banking technologies	2	4	34	54	6	4	3.9600	.57000
emphasize on the easy-of- use of their mobile banking technologies by customers	2	8	24	58	8	4	3.8000	.75593
regularly upgrade their mobile banking technologies	4	10	32	40	14	4	3.7400	.62429

Solutions to resolve mobile banking uptake challenges	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
regularly upgrade their mobile banking technologies	4	10	32	40	14	4	3.7400	.62429
offer innovative mobile banking products	4	14	26	54	2	3	3.7200	.64015
invest heavily in mobile banking technologies infrastructure	0	6	4	66	24	3	3.6200	.83029
continuously improve the quality of mobile banking services	4	16	28	42	10	4	3.5800	.97080
reducing the cost of mobile banking services	2	18	40	40	0	3	3.5200	.90891

Solutions to resolve mobile banking uptake challenges	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mode	Mean	Std. Deviation
increase their investment in robust risk management of their mobile banking technologies to mitigate losses from ICT related fraud	0	0	6	28	66	4	3.7600	1.06061
reducing the cost of mobile banking services	2	18	40	40	0	3	3.5200	.90891

The majority of the respondents provided the to significantly increase the uptake of mobile banking as follows; intense marketing of mobile banking services (M=4.2000); building the capacity of their staff to efficiently use mobile banking technologies (M=3.9600); emphasizing on the easy-of- use of their mobile banking technologies by customers (M=3.8000); increasing their investment in robust risk management of their mobile banking technologies to mitigate losses from ICT related fraud (M=3.7600); regularly upgrading the mobile banking technologies (M=3.7400); offering innovative mobile banking products (M=3.7200); investing heavily in mobile banking technologies infrastructure (M=3.6200); continuously improving the quality of mobile banking services (M=3.5800); and reducing the cost of mobile banking services (M=3.5200) respectively.

The commercial banks could unlock the benefits from uptake of mobile banking by solving the technological, managerial and business and customer-related challenges behind its full optimization. As the use of mobile banking increases, the security and privacy threats of mobile banking through malwares, hacking, unauthorized access and mobile fraud increases. In this context, the traditional login and password authentication is considered insufficient in securing critical applications such as online and mobile banking, while two-factor authentication schemes promise a higher protection level by extending the single authentication factor.

Fintech companies are currently very active at trying to disrupt the financial services market as they primarily sit across three segments of the financial services industry including: payments, lending and personal finance. As a result, some banks believe that fintech's are competitors that will ultimately take a large slice of the financial services 'cake' These banks feel that customers might prefer the solutions provided by fintechs because they are able to move more rapidly than banks can at the moment. Some banks are also doubtful about investing too much in a digital partnership because in the future, the fintechs (with less investment) will be able to do a great job and will be faster and more customer-centric.

Direct contact with customers is a big advantage for banks. However, there is currently a large discrepancy between the capabilities existing in the branches and those existing in digital channels. Therefore, more attention needs to be paid to the digitization of the branch and how it participates in the overall digital experience. Just as banks have in the past delayed in partnering with telecoms, it is advisable that they partner with telecoms and fintechs to access resources that they might not have that would make them reinvent the wheel in mobile banking uptake. It's further important that all of a bank's employees are kept in touch with the new developments in the digital space. It can be particularly difficult to change the habits and views of long-established employees. They aren't always acquainted with the new technologies and often lack the professional skills required – and enabling them to develop these skills can become a major issue.

Banks also need to create software applications that support multiple mobile operating systems (including iOS4, Android, BlackBerry OS, Windows Mobile, and Symbian), multiple form factors (smartphones, iPads, and tablet computers), multiple telecommunication standards, which can be easily upgraded to support new features and advancements. This is particularly important for mobile banking supported through mobile applications which is gaining momentum with increased access to internet in Kenya. Similarly, banks will need to integrate their existing bank platforms including core banking, customer relationship management, and payment hubs with mobile banking solutions. Banks will also need to manage a multitude of partners, such as telecommunication providers, social media outlets, data analytics providers, retailers, payment networks, mobile device manufacturers, and many other stakeholders.

Other notable strategies to enhance mobile banking uptake in Kenya should include; increased investment in marketing and risk management; inhouse training of staff on latest mobile banking technologies; innovative and customer-centric product offering. Continued partnering with telecommunication players and government in improving the mobile banking infrastructure (mobile network and internet connectivity) would also help in mobile banking uptake.

CHAPTER 5: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the discussions and conclusions made on the challenges of mobile banking uptake among commercial banks in Kenya. It thereafter presents the recommendations based on the research questions. The chapter finally provides areas for further research by scholars in future.

The key findings with regards to benefits of mobile banking uptake to commercial banks in Kenya was that the growth in number of customer deposit accounts and value of customer deposit was attributed to increased deposit mobilization by banks as they expanded their outreach and leveraging on mobile banking platforms to mobilise lower cost deposits underpinning the crucial role of mobile banking uptake to the survival and sustained positive financial outlook of the commercial banks in Kenya at the backdrop of intense competition and change from brick and mortar banking model to mobile banking model occasioned by change in regulations and customer preference for digital banking.

Similarly, it was established that mobile banking has enabled commercial banks in Kenya to experience growth, competitive positioning and assured their survival. Kenya has earned its place of pride in the global technological innovation sphere through the revolutionary mobile banking platforms that has exponential capability to transform the mode of banking depending on the extent of its uptake by respective banks. The mobile banking has brought with it the opportunity for more Kenyans to access financial services and propagate financial inclusivity in critical economic activities. The increased financial inclusion through mobile banking has not only reduced banks operational costs hence cost cutting but also increased their reach, competitiveness and financial performance against the background of dwindling revenues as a result of regulation, competition, inflation among other market forces. Hence offering banks the much-needed breather to

their survival in very difficult banking environment that has been complicated by the effects of 2009 global financial crisis, deregulation, globalization and political instability that lead to reduced patronage of banking services due to reduced economic growth in the country over the last five years. Mobile banking is largely sought after by banks for operating costs minimization and operating revenues maximization and also improved banks asset quality by reducing the proportion of overdue and underperforming assets as well as improved customer experience and satisfaction.

Mobile banking has enabled commercial banks to effectively deal with challenges associated with accessing financial services, especially in the rural areas of the country. This is given the robust telecommunication industry, high penetration of mobile phones and its supportive infrastructure. Through mobile banking, commercial banks will therefore raise money through deposits in larger amounts and at a cheaper cost than they could through brick and mortal banking model hence increasing banks revenues and profits. Through mobile banking, banks have also developed new opportunities to innovate their products that in the end provide more them with more income for their survival, competitiveness, improve bank earnings and profitability.

The major findings on the mobile banking uptake challenges facing commercial banks in Kenya, was that mobile banking opens the door to enormous potential for monetary as well as reputation risk, with consumers' perception of insecurity being one of the deterrents against the uptake of mobile banking. Another notable challenge impeding uptake of mobile banking is the Price of a technology is an important factor that influences the utilization of the technology. In times of increased competition, a distribution channel must organize business processes efficiently so as to reduce distribution costs. Commercial banks can increase the volume of utilization to enjoy economies of scale by paying particular attention to their pricing strategy of their mobile products and services.

Beliefs, misunderstandings, habits, and concerns also comes out as some of the customer related challenges that impede mobile banking uptake. In the social aspect of economic transactions factor there is a long list of social or contextual influences on mobile banking use. Both macro-level cultural factors and micro-level, locally-negotiated norms in families and among peers−particularly about money−are at play. Attitude towards change and personal characteristics is another factor which affects mobile banking uptake. The poor and unreliable network connectivity slows the rate of mobile banking uptake. The noted the major infrastructural related mobile banking uptake challenges in the Kenya consist of poor and inadequate information systems, inadequate IT infrastructure, limited skills in ICT, lack of appreciation of ICT, technology weaknesses exhibited by heavy reliance on inappropriate and obsolete technology, lack of skills on modern technology, lack of awareness of the changing technology, poor dissemination mechanisms between and among the various levels of enterprises, and poor technology linkages between banks and telecoms. Banks are facing competition from many different areas, including non-traditional players. These players don't necessarily follow the rules that banks have been following over the years. One of the key problems facing many banks is that all of their processes were designed in the past, at a time when they had a strong and thriving branch network. This has created a major hurdle. When banks want to switch to a digital approach, they have to re-think their processes to avoid the need for any intervention from an employee. Some of the new entrants in the market are much more experienced in this area because they don't have the same legacy as the banks – and this is one of the main reasons why it's so difficult for a more traditional bank to simplify all of its operations. Another important issue that arises when changing to digital is that involves the use of a lot of data and various algorithms. Financial institutions talk a lot about digitisation, new technologies and new processes but they aren't really looking closely at their own people in order to equip them to deal with these new technologies and processes. Financial institutions somehow expect that people who have been working in the bank for many years could automatically become experts in the new mobile banking

technologies and in developing the processes. In reality, banks need to ensure that they are equipping their personnel with the right set of skills.

On ways through which commercial banks could increase the uptake of mobile banking in Kenya, the study revealed that banks need to solve the technological, managerial and business and customer-related challenges behind its full optimization. As the use of mobile banking increases, the security and privacy threats of mobile banking through malwares, hacking, unauthorized access and mobile fraud increases. In this context, the traditional login and password authentication is considered insufficient in securing critical applications such as online and mobile banking, while two-factor authentication schemes promise a higher protection level by extending the single authentication factor.

Fintech companies are currently very active at trying to disrupt the financial services market as they primarily sit across three segments of the financial services industry including: payments, lending and personal finance. As a result, some banks believe that fintech's are competitors that will ultimately take a large slice of the financial services 'cake' These banks feel that customers might prefer the solutions provided by fintechs because they are able to move more rapidly than banks can at the moment. Some banks are also doubtful about investing too much in a digital partnership because in the future, the fintechs (with less investment) will be able to do a great job and will be faster and more customer-centric.

Direct contact with customers is a big advantage for banks. However, there is currently a large discrepancy between the capabilities existing in the branches and those existing in digital channels. Therefore, more attention needs to be paid to the digitization of the branch and how it participates in the overall digital experience. Just as banks have in the past delayed in partnering with telecoms, it is advisable that they partner with telecoms and fintechs to access resources that they might not have that would make them reinvent the wheel in mobile banking uptake. It's further important that all of a bank's employees are kept in touch with the new developments in the digital space. It can be particularly

difficult to change the habits and views of long-established employees. They aren't always acquainted with the new technologies and often lack the professional skills required – and enabling them to develop these skills can become a major issue.

Banks also need to create software applications that support multiple mobile operating systems (including iOS4, Android, BlackBerry OS, Windows Mobile, and Symbian), multiple form factors (smartphones, iPads, and tablet computers), multiple telecommunication standards, which can be easily upgraded to support new features and advancements. This is particularly important for mobile banking supported through mobile applications which is gaining momentum with increased access to internet in Kenya. Similarly, banks will need to integrate their existing bank platforms including core banking, customer relationship management, and payment hubs with mobile banking solutions. Banks will also need to manage a multitude of partners, such as telecommunication providers, social media outlets, data analytics providers, retailers, payment networks, mobile device manufacturers, and many other stakeholders.

Other notable strategies to enhance mobile banking uptake in Kenya would include; increased investment in marketing and risk management; inhouse training of staff on latest mobile banking technologies; innovative and customer-centric product offering. Continued partnering with telecommunication players and government in improving the mobile banking infrastructure (mobile network and internet connectivity) would also help in mobile banking uptake.

5.2 Discussions

5.2.1 Benefits of mobile banking uptake to commercial banks

The study established that commercial mobile banking had great benefits to commercial banks in Kenya. Through commercial mobile banking commercial banks would significantly; improve their efficiency in bank operations, quality of service and service delivery; introduce innovative banking products to the market; achieve customer loyalty

by improving customer experience, convenience and satisfaction. The mobile banking would further enable banks to; reduce banking hall queuing time; increase banks' productivity, financial inclusion and create new revenue sources to the banks. Mobile banking further enabled banks to; reduce operational costs attract new customers; increase banks' competitive advantage, profitability and overall performance.

The findings agree with Wahid (2013) who indicated that Mobile banking has enhanced customer services, improved efficiency in operations, ensured faster access to information, improved internal processes and increased customer satisfaction and service quality.

The mobile banking had numerous benefits to the commercial banks in Kenya. Dependent on their leveraging on mobile banking as one of the channels in service delivery, the respective commercial banks would accrue the diverse benefits from mobile banking. As noted from the findings, the value of mobile banking to the commercial banks ranged from; improved efficiency in service delivery and quality of service; innovative product offering; improvement in customer experience, convenience, satisfaction and loyalty; creation of new revenue sources to the bank hence profitability; and significant reduction in operational costs. Mobile baking further increased commercial bank competitiveness and market share against other financial institutions like DTMs and SACCOs as customers operated their accounts from their phones as opposed to going to the physical bank.

The findings are similar to Kenya Bankers Association (2016) who established that the main benefits with mobile banking platforms among commercial banks in Kenya include; enhancing customer convenience, satisfaction and loyalty besides enabling the introduction of microloans, improved quality of banking service, reduced banking hall queuing time, creation of innovative products, improved efficiency in operations, increased competitive advantage and improved overall performance.

5.2.2 Mobile banking uptake challenges

The mobile banking uptake challenges facing commercial banks in Kenya included; mobile banking being capital intensive in terms of initial acquisition cost, training costs, upgrading cost, maintenance costs and marketing cost. There was also lack of models to benchmark mobile banking implementation with as well as lack of requisite skills among the staff to effectively deploy mobile banking services. another challenge was the fact that the use of mobile banking is threatened by increasing ICT and internet related fraud and the poor internet connectivity and unreliable mobile network which discourages uptake of mobile banking.

The findings are in agreement with Mwangi (2013) whose study noted the major challenges facing the adoption of mobile banking to include; lack of models to benchmark with given that it is less than 10 years, the adoption being capital intensive, lack of requisite skills, risks due to fraud, destruction of infrastructure by terrorist and slow adoption of some of mobile banking options

It was evident that the benefits that commercial banks would gain from using mobile banking were threatened by various challenges that derailed its uptake by existing and prospective customers. It was paramount for the commercial banks to address these key challenges to turn around mobile banking to be one of their most trusted banking service delivery channels. The low uptake of commercial mobile banking was attributed to; high cost of implementing mobile banking technologies; lack of requisite skills among the staff and customers on using mobile banking technologies; ever present security risks from its usage; and poor ICT infrastructure in the country that was necessary for its country wide rolling out particularly poor mobile network and internet connectivity in rural parts of Kenya.

The findings support earlier findings by Pooja and Singh (2009) whose study concluded that the low uptake of commercial mobile banking in India was related to; high cost of

implementing mobile banking technologies; lack of requisite employee skills and security risks from fraud coupled with poor infrastructure requisite to scale mobile banking nationally.

5.2.3 Ways to increase mobile banking uptake among commercial banks

To significantly increase the uptake of mobile banking among commercial banks in Kenya, they would be required to; intensely market their mobile banking services; build the capacity of staff to efficiently use mobile banking technologies and ensure easy-of-use of their mobile banking technologies by customers. Similarly, they would need to increasingly invest in robust risk management of mobile banking technologies to mitigate losses from ICT related fraud as well as regularly upgrade the mobile banking technologies. It would also be important for the banks to; offer innovative mobile banking products; invest heavily in mobile banking technologies infrastructure and continuously improve the quality of mobile banking services. They would also need to reduce the cost of their mobile banking services.

This is in agreement with King (2012) and Mbiti and Weil (2011) who noted that uptake of mobile banking among commercial banks was a function of marketing, possession of requisite skills among staff, risk management and upgrading of the infrastructure.

The commercial banks could unlock the benefits from mobile banking through executing strategies that would significantly enhance uptake of mobile banking by Kenyans. The key strategies that would help to increase mobile banking uptake in Kenya included; increased investment in marketing mobile banking; continuous inhouse training of staff on effective implementation of mobile banking technologies; innovative upgrading of the mobile banking technologies with special focus on ease of use, improved quality of service and risk management. It was also important for the commercial banks to continue partnering with telecommunication players and the government in improving the ICT infrastructure in the country to increase financial inclusion. The banks would also do well

on the mobile banking front by regularly introducing innovative products at competitive costs to the market.

The findings are similar to Al-Jabri (2012) who indicated that banks in Saudi Arabia, should offer mobile banking services that are compatible with various current users' requirements, past experiences, lifestyles, and beliefs to fulfill customer expectations. Similarly, they should continue to; invest in marketing mobile banking; build the capacity of the staff to effectively deploy mobile banking technologies coupled with innovative upgrading of mobile banking technologies.

5.3 Conclusions

5.3.1 Benefits of mobile banking uptake to commercial banks

The key findings with regards to benefits of mobile banking uptake to commercial banks in Kenya was that the growth in number of customer deposit accounts and value of customer deposit was attributed to increased deposit mobilization by banks as they expanded their outreach and leveraging on mobile banking platforms to mobilise lower cost deposits underpinning the crucial role of mobile banking uptake to the survival and sustained positive financial outlook of the commercial banks in Kenya at the backdrop of intense competition and change from brick and mortar banking model to mobile banking model occasioned by change in regulations and customer preference for digital banking.

Similarly, it is notable that mobile banking has enabled commercial banks in Kenya to experience growth, competitive positioning and assured their survival. Kenya has earned its place of pride in the global technological innovation sphere through the revolutionary mobile banking platforms that has exponential capability to transform the mode of banking depending on the extent of its uptake by respective banks. The mobile banking has brought with it the opportunity for more Kenyans to access financial services and propagate financial inclusivity in critical economic activities. The increased financial inclusion through mobile banking has not only reduced banks operational costs hence

cost cutting but also increased their reach, competitiveness and financial performance against the background of dwindling revenues as a result of regulation, competition, inflation among other market forces. Hence offering banks the much-needed breather to their survival in very difficult banking environment that has been complicated by the effects of 2009 global financial crisis, deregulation, globalization and political instability that lead to reduced patronage of banking services due to reduced economic growth in the country over the last five years. Mobile banking is largely sought after by banks for operating costs minimization and operating revenues maximization and also improved banks asset quality by reducing the proportion of overdue and underperforming assets as well as improved customer experience and satisfaction.

Mobile banking has enabled commercial banks to effectively deal with challenges associated with accessing financial services, especially in the rural areas of the country. This is given the robust telecommunication industry, high penetration of mobile phones and its supportive infrastructure. Through mobile banking, commercial banks will therefore raise money through deposits in larger amounts and at a cheaper cost than they could through brick and mortal banking model hence increasing banks revenues and profits. Through mobile banking, banks have also developed new opportunities to innovate their products that in the end provide more them with more income for their survival, competitiveness, improve bank earnings and profitability.

5.3.2 Mobile banking uptake challenges

The mobile banking uptake challenges facing commercial banks in Kenya, remains the fact that it opens the door to enormous potential for monetary as well as reputation risk, with consumers' perception of insecurity being one of the deterrents against the uptake of mobile banking. Another notable challenge impeding uptake of mobile banking is the Price of a technology is an important factor that influences the utilization of the technology. In times of increased competition, a distribution channel must organize business processes efficiently so as to reduce distribution costs. Commercial banks can

increase the volume of utilization to enjoy economies of scale by paying particular attention to their pricing strategy of their mobile products and services.

Beliefs, misunderstandings, habits, and concerns also comes out as some of the customer related challenges that impede mobile banking uptake. In the social aspect of economic transactions factor there is a long list of social or contextual influences on mobile banking use. Both macro-level cultural factors and micro-level, locally-negotiated norms in families and among peers−particularly about money−are at play. Attitude towards change and personal characteristics is another factor which affects mobile banking uptake. The poor and unreliable network connectivity slows the rate of mobile banking uptake. The noted the major infrastructural related mobile banking uptake challenges in the Kenya consist of poor and inadequate information systems, inadequate IT infrastructure, limited skills in ICT, lack of appreciation of ICT, technology weaknesses exhibited by heavy reliance on inappropriate and obsolete technology, lack of skills on modern technology, lack of awareness of the changing technology, poor dissemination mechanisms between and among the various levels of enterprises, and poor technology linkages between banks and telecoms. Banks are facing competition from many different areas, including non-traditional players. These players don't necessarily follow the rules that banks have been following over the years. One of the key problems facing many banks is that all of their processes were designed in the past, at a time when they had a strong and thriving branch network. This has created a major hurdle. When banks want to switch to a digital approach, they have to re-think their processes to avoid the need for any intervention from an employee. Some of the new entrants in the market are much more experienced in this area because they don't have the same legacy as the banks – and this is one of the main reasons why it's so difficult for a more traditional bank to simplify all of its operations. Another important issue that arises when changing to digital is that involves the use of a lot of data and various algorithms. Financial institutions talk a lot about digitisation, new technologies and new processes but they aren't really looking closely at their own people in order to equip them to deal with these new technologies and

processes. Financial institutions somehow expect that people who have been working in the bank for many years could automatically become experts in the new mobile banking technologies and in developing the processes. In reality, banks need to ensure that they are equipping their personnel with the right set of skills.

5.3.3 Ways to increase mobile banking uptake among commercial banks

On ways through which commercial banks could increase the uptake of mobile banking in Kenya, the study concludes that banks need to solve the technological, managerial and business and customer-related challenges behind its full optimization. The use of mobile banking increases, the security and privacy threats of mobile banking through malwares, hacking, unauthorized access and mobile fraud increases. In this context, the traditional login and password authentication is considered insufficient in securing critical applications such as online and mobile banking, while two-factor authentication schemes promise a higher protection level by extending the single authentication factor.

Fintech companies are currently very active at trying to disrupt the financial services market as they primarily sit across three segments of the financial services industry including: payments, lending and personal finance. As a result, some banks believe that fintech's are competitors that will ultimately take a large slice of the financial services 'cake' These banks feel that customers might prefer the solutions provided by fintechs because they are able to move more rapidly than banks can at the moment. Some banks are also doubtful about investing too much in a digital partnership because in the future, the fintechs (with less investment) will be able to do a great job and will be faster and more customer-centric.

Direct contact with customers is a big advantage for banks. However, there is currently a large discrepancy between the capabilities existing in the branches and those existing in digital channels. Therefore, more attention needs to be paid to the digitization of the branch and how it participates in the overall digital experience. Just as banks have in the

past delayed in partnering with telecoms, it is advisable that they partner with telecoms and fintechs to access resources that they might not have that would make them reinvent the wheel in mobile banking uptake. It's further important that all of a bank's employees are kept in touch with the new developments in the digital space. It can be particularly difficult to change the habits and views of long-established employees. They aren't always acquainted with the new technologies and often lack the professional skills required – and enabling them to develop these skills can become a major issue.

Banks also need to create software applications that support multiple mobile operating systems (including iOS4, Android, BlackBerry OS, Windows Mobile, and Symbian), multiple form factors (smartphones, iPads, and tablet computers), multiple telecommunication standards, which can be easily upgraded to support new features and advancements. This is particularly important for mobile banking supported through mobile applications which is gaining momentum with increased access to internet in Kenya. Similarly, banks will need to integrate their existing bank platforms including core banking, customer relationship management, and payment hubs with mobile banking solutions. Banks will also need to manage a multitude of partners, such as telecommunication providers, social media outlets, data analytics providers, retailers, payment networks, mobile device manufacturers, and many other stakeholders.

Other notable strategies to enhance mobile banking uptake in Kenya should include; increased investment in marketing and risk management; inhouse training of staff on latest mobile banking technologies; innovative and customer-centric product offering. Continued partnering with telecommunication players and government in improving the mobile banking infrastructure (mobile network and internet connectivity) would also help in mobile banking uptake.

5.4 Recommendations from the Study

5.4.1 Benefits of mobile banking uptake, or lack of it thereof, to commercial banks in Kenya

On benefits of mobile banking uptake, or lack of it thereof, the study revealed that mobile banking was highly beneficial to commercial banks as an add on to the brick and mortar model of banking. To realize these benefits through increased mobile banking uptake, the management of the commercial bank should rethink their commercial mobile banking model and align it with customer's evolving banking needs particularly making it attractive to the financially excluded Kenyan population. This should be coupled with continued partnering with government and telecommunication players in optimizing the use of the existing infrastructure while also building a country-wide infrastructure to enhance uptake of mobile banking in long-term.

5.4.2 Mobile banking uptake challenges facing commercial banks

A number of mobile banking uptake challenges faced commercial banks denying them the much-needed revenue from its uptake. The mobile banking deployment among commercial banks was capital-intensive, suffered from limited competent staff and was characterised by huge losses from mobile banking security breaches. The commercial banks management should allocate adequate financial resources towards mobile banking uptake as well as finance robust mobile banking security to safeguard clients from prevalent fraud. This should be coupled with continuous empowerment of the customers on ways to protect themselves from fraud. The financing will further go into hiring highly qualified staff to spearhead mobile banking strategy as well as build the capacity of the existing staff.

5.4.3 Ways to increase mobile banking uptake among commercial banks in Kenya

On ways to increase mobile banking uptake among commercial banks, the study established that they included; investment in marketing, continuous inhouse training of staff and executing innovative upgrading of the mobile banking technologies. Therefore, the study recommends that the management of commercial banks should undertake a

market research to understand the customer needs to inform their mobile banking product design with key focus on ease of use, competitive cost and improved quality of service.

5.5 Limitations

Due to fear of disclosure of the collected data from the commercial banks, some of the respondents shied away from sharing information which could have benefited the study. They feared that the data would be shared with their competitors and that their way of operations would be copied by competitors.

The fact that participation in the study was voluntary, the response rate to the study might have been smaller. The busy work schedule of bankers meant that they had limited time to respond to the questionnaire share with them.

The representation of all tiers of banks was not balanced as the tier one had more respondents who were targeted than the rest of the tiers hence the study results are skewed to tier one banks. This was because the rest of the tiers had not made significant investment in mobile banking uptake hence the need to focus on tier one bank more.

5.6 Areas for Further Research

The study recommends that further studies should focus on the effect of cost of mobile banking on financial inclusion in Kenya.

Similar study should also be done on other financial institutions like SACCOs and DTMs for comparison purposes and generalization of findings.

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APPENDICES

APPENDIX I: QUESTIONNAIRE

Instructions:

The questionnaire should be filled in by employees in the banking sector. The questionnaire is meant to answer questions on "**assessing challenges of mobile banking uptake among commercial banks in Kenya"**. Your response to each of the questions based on your work experience will be very useful.

Section A: Background Information.

This section provides background information about the respondent. Kindly respond to each of the questions.

1. For how long have you worked in the banking sector?

Less than 1 years	[ ]	1-5 years	[ ]
6-10 years	[ ]	Over 10 years	[ ]

2. What is your highest level of education?

Certificate	[ ]	Diploma	[ ]
Graduate	[ ]	Masters	[ ]
PhD	[ ]		

Section B: Value of mobile banking adoption

3. What would you say is the importance/value of commercial mobile banking adoption to your bank? ……..
   ……...
   ……
4. This section aims to analyse the value of mobile banking adoption, or lack of it thereof, to commercial banks in Kenya. Please indicate your agreement with the following statements related to the value of mobile banking adoption, or lack of it thereof, to commercial banks in Kenya. Use a scale where: 5 = Strongly Agree, 4 = Agree, 3 = moderately agree, 2 = Disagree, 1 = Strongly Disagree.

No:	Value of mobile banking adoption	1	2	3	4	5
1.	enhancing customer convenience					
2.	enhancing customer satisfaction					
3.	enhancing customer loyalty					
4.	enabling the introduction of new banking products					
5.	enabling the introduction of microloans					
6.	improved quality of banking service					
7.	reduced banking hall queuing time					
8.	Enabled creation of innovative baking products					
9.	improved efficiency in bank operations					
10.	Has enabled the banks to efficiently offer banking services					
11.	Has increased banks' competitive advantage					
12.	Has increased banks' productivity,					
13.	Has increased banks' profitability					
14.	Has increased banks' overall financial and non-financial performance					
15.	Has created new revenue sources for the bank					
16.	Has increased financial inclusion					
17.	Helped to attract new customers					
18.	Enabled banks to significantly cut the operational costs					

Section B: Mobile banking adoption challenges

1. What would you say are the main reasons behind low uptake of commercial mobile banking by Kenyans? ……
   ……..……
   ……..**.....**
   ……
2. This section aims to examine mobile banking adoption challenges facing commercial banks in Kenya. Please indicate your agreement with the following

statements on mobile banking adoption challenges facing commercial banks in Kenya. Use a scale where: 5 = Strongly Agree, 4 = Agree, 3 = moderately agree, 2 = Disagree, 1 = Strongly Disagree.

No:	Mobile banking adoption challenges	1	2	3	4	5
1.	There is lack of models to benchmark with during mobile banking adoption					
2.	The mobile banking adoption is capital intensive					
3.	There is lack of requisite skills among staff to effectively deploy mobile banking services					
4.	mobile banking brings with it many risks due to fraud					
5.	The destruction of ICT infrastructure by terrorist disrupts mobile banking offering in some areas					
6.	There is slow adoption of some of mobile banking options					
7.	There is high failure rate in adoption of internet based mobile banking options					
8.	The training of manpower to handle the new mobile banking technologies is expensive					
9.	The increased use of ICT has led to increased ICT frauds, cybercrime and internet related frauds					
10.	Mobile banking technologies are expensive to maintain					

Section B: Solutions to resolve mobile banking adoption challenges

1. What are some of the strategies that commercial banks should use to enhance the uptake of commercial mobile banking by Kenyans?

   ……

   ……

   ……

   ……

2. This section aims propose solutions to resolve low commercial mobile banking and related challenges facing commercial banks in Kenya. Please indicate your

agreement on the following statements related to solutions to resolve mobile banking adoption challenges facing commercial banks in Kenya. Use a Likert scale where: 5 = Strongly Agree, 4 = Agree, 3 = moderately agree, 2 = Disagree, 1 = Strongly Disagree.

No:	Solutions to resolve mobile banking adoption challenges	1	2	3	4	5
1.	Increased investment in mobile banking technologies					
2.	Capacity building of their staff to efficiently use mobile banking technologies					
3.	Innovative product offering through mobile banking technologies					
4.	Bank's increased investment in robust risk management in the mobile banking technologies to mitigate losses from ICT related fraud					
5.	Continuous monitoring of quality of mobile banking services to improve it					
6.	Improving the easy-of- use of the mobile banking					
7.	Reduce the cost of using the mobile banking services					
8.	Banks to continue marketing their mobile banking services and products through diverse marketing channels					

The end, thank you for your time

APPENDIX II: LIST OF COMMERCIAL BANKS IN KENYA

1. African Banking Corporation Limited
2. Bank of Africa Kenya Limited
3. Bank of Baroda (K) Limited
4. Bank of India
5. Barclays Bank of Kenya Limited
6. CfC Stanbic Bank Limited
7. Charterhouse Bank Limited
8. Chase Bank (K) Limited
9. Citibank N.A Kenya
10. Commercial Bank of Africa Limited
11. Consolidated Bank of Kenya Limited
12. Co-operative Bank of Kenya Limited
13. Credit Bank Limited
14. Development Bank of Kenya Limited
15. Diamond Trust Bank Kenya Limited
16. Ecobank Kenya Limited
17. Equatorial Commercial Bank Limited
18. Equity Bank Limited
19. Family Bank Limited
20. Fidelity Commercial Bank Limited
21. Guaranty Trust Bank (K) Ltd
22. First Community Bank Limited
23. Giro Commercial Bank Limited
24. Guardian Bank Limited
25. Gulf African Bank Limited
26. Habib Bank A.G Zurich
27. Habib Bank Limited

28. I & M Bank Limited
29. Jamii Bora Bank Limited
30. Kenya Commercial Bank Limited
31. Sidian Bank Limited (Formerly K-Rep Bank)
32. Middle East Bank (K) Limited
33. National Bank of Kenya Limited
34. NIC Bank Limited
35. Oriental Commercial Bank Limited.
36. Paramount Universal Bank Limited
37. Prime Bank Limited
38. Standard Chartered Bank Kenya Limited
39. Transnational Bank Limited
40. UBA Kenya Bank Limited.
41. Victoria Commercial Bank Limited
42. HFC Limited
43. Habib Bank Limited

APPENDIX II: DISTRIBUTION OF RESPONDENTS PER BANK TIER

Category of bank	**Banks to be contacted per tier**	**Selected banks**	**Total number Deposit accounts (Million)**
Large banks/tier 1	4		4.594
Medium banks/ tier 2	4		
Small banks tier 3	2		
Delisted	0		