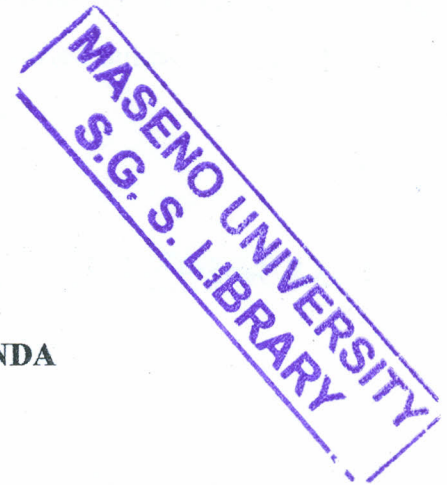


**RELATIONSHIP BETWEEN MOBILE PHONE BANKING TECHNOLOGIES AND
CUSTOMER BASE OF COMMERCIAL BANKS IN KISUMU COUNTY, KENYA**

BY

FRED JONAH OCHANDA



**A PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE
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ABSTRACT

Mobile phone banking technology is revolutionizing the global banking and payment industry. It offers new opportunities for commercial banks to provide added convenience to their existing customers in both developed and developing countries. However commercial banks are being slow in embracing mobile phone banking technology, only 17 out of 46 commercial banks as at 2013 were facilitating mobile money transfer, consequently risking being left behind in terms of enhanced customer services. The relationship between mobile phone banking technology and customer base of commercial banks in Kisumu County is not known. The main purpose of the study was to determine the relationship between the mobile phone banking technology and customer base of commercial banks in Kisumu County, Kenya. The specific objectives were to determine, examine and ascertain respectively the relationship between Interactive voice response, Standalone mobile application clients, short messaging service technology and customer base of commercial banks in Kisumu County, Kenya. The conceptual framework shows customer base as the dependent variable, perceived adoption of mobile phone banking technologies as the independent variable and the mobile phone bank environment as intervening variables. The study was anchored on the theories of technology adoption model, innovation diffusion theory and contemporary banking theory. The study used both descriptive and correlation research designs on a population of 30 commercial bank branches in Kisumu County, Kenya chosen on the basis of convenience to the researcher. Test re-test confirmed reliability at alpha (α) equal to 0.8. Data was obtained by use of semi structured questionnaires administered to bank managers. Data was analyzed using both descriptive statistics such as mean and standard deviations and correlation analyses. Data was presented using bar graphs and pie charts to present the findings. The findings show that there is a positive correlation between IVR technology $r = 0.665$, $n = 30$, $p = 0.000$, standalone mobile application client technology $r = 0.258$, $n = 30$, $p = 0.169$, SMS technology $r = 0.233$, $n = 30$, $p = 0.215$ and customer base meaning that adoption of mobile phone banking technology increases perceived customer base of commercial banks in Kisumu county Kenya. The study concluded that IVR, standalone mobile application client and SMS technology positively correlates to customer base hence mobile phone banking technologies positively correlates to customer base of commercial banks in Kisumu County Kenya. The study recommended that commercial banks should adopt mobile phone banking technologies. Further studies should be carried out on threat of network providers in providing banking services. The study is immensely significant in diverse ways to all stakeholders since the findings increase general knowledge on the subject of mobile phone banking technology.

CHAPTER ONE

INTRODUCTION

1.0. Overview

This chapter highlights following; the background of the study, the statement of the problem, the objectives, the research questions, the scope, justification and the conceptual framework of the study.

1.1. Background of the Study

Ondiege (2010) agree that improving access to financial services can contribute to transforming peoples' lives in developing countries. However, the majority of the ordinary people in these countries still have limited access to these services. Today, an estimated 2.7 billion people in developing countries have no access to financial services. Over a billion people in Africa, Latin America and Asia are currently without bank accounts but do have a mobile phone. This number is set to reach 1.7 billion by 2012 Mobile telephony penetration in Africa has increased exponentially from less than 2 million subscribers in 1998 to over 400 million in 2009. Mobile banking offers an opportunity to serve the "unbanked": only 20 percent of African families have a bank account. Mobile banking is staging a true "revolution" in access to finance. A mobile phone can serve as: a virtual bank card; a point of sale terminal; an ATM; an internet banking terminal. Mobile banking offers more opportunities for partnerships between commercial banks, non-bank financial institutions; mobile telephony enables MFIs and IFIs to increase access to finance, especially in rural areas for households and SMEs.

Pousttchi & Schurig (2007) defines mobile banking as "a type of execution of financial services in the course of which within an electronic procedure the consumer uses mobile communication techniques in conjunction with mobile devices". With their cell phone, consumers can access their accounts and check account balances, pay bills, and perform other banking transactions (Brown *et al.*, 2003). Mobile banking can be categorized as the latest advancement in electronic banking, which has widened customers' access to bank accounts through wireless channels. Mobile banking is a financial service where the bank customers perform balance inquiry, credit transfer, and other businesses according to instruction sent through the mobile phone. From customers' perspective adopting mobile banking services benefit in terms of convenience to

perform banking transactions anytime and anywhere. The innovations in telecommunications have led to the use of mobile devices in banking services (Suoranta & Mattila, 2004). Mobile banking is an important application of mobile commerce since it is an additional source of revenue to both commercial banks and telecom services.

These assertions compares to the argument of Ondiege (2010) in terms of global proliferation and convenience of mobile phone banking technology. While it is known from the two studies that mobile banking has led to increased number of subscribers for service providers, what is not known is the response of customers of commercial banks in Kisumu County as a result of adoption of mobile phone banking technology by the banks. This study sort to determine the relationship between mobile phone banking technology and the customer base

Commercial banks are financial intermediaries who are the main providers of credit to the household and corporate sector and operate the payments mechanism. Commercial banks are typically joint stock companies and may be either publicly listed on the stock exchange or privately owned. Commercial banks play a vital role in the economic resource allocation of countries; they channel funds from depositors to investors continuously. They can do so, if they generate necessary income to cover their operational cost they incur in the due course (Opondo, 2011). The banks play very important role for the economic development of the country. The importance can be examined as; Increase in saving where people deposit their savings into the banks and the bank pays reasonable profit on these savings, Increase in investment where money which is collected by the bank is lent to businessman and industrialist. The increase in the investment increases the level of employment; Increase in employment, the banks advance loan to the investors and as a result; the industrial units are setup in different parts of the country. Hence the level of employment is increased; Transfer of Money where people transfer their money from one place to another place, they get travelers cheque and the bank draft from the bank; Loan to Government where when the government. needs funds to complete the public works programs, the banks provide loans to it; Capital formation, the process of the capital formation is completed with the financing Commercial banks to increase capital formation; Balanced development, when the banks provide loans to the less developed areas, the chances of

progress and development are increased in the areas; Saving in metals e.g. gold, when the payments are made through currency notes and credit instruments, the precious metals are saved.

According to the Communication Commission of Kenya 2012, Kenyan mobile phone usage exceeded 70 percent and there were more mobile subscribers than adults in Kenya, internet usage exceeded 35 percent. There are now more Internet users in Kenya than in South Africa – even though South Africa has 25 percent more people and its GDP is ten times that of Kenya's, according to the World Bank.

KIPPRA (2013) reports that growth in mobile phone financial services was registered in 2012. Subscriptions in mobile money transfer increased from 18.9 million in 2011 to 21.1million in 2012 (Communications Commission of Kenya, 2013). Four more banks signed partnerships with mobile phone providers. This increased the number of banks facilitating money transfer services for their customers from 13 in 2011 to 17 in 2012. A total of Kshs 1,545 billion was transacted in 2012 (Central Bank of Kenya, 2013).

Ministry of Devolution and Planning (2014) avers that the financial sector grew slower in 2012 to post a growth of 6.5 per cent in 2012 compared to a 7.8 per cent growth in 2011. This growth was on account of; High interest incomes for commercial banks including other bank charges and increased branch network and agency banking.

The technologies generally used for mobile banking are Interactive Voice Response (IVR), Standalone Mobile Application Clients, Short Messaging Service (SMS) and Wireless Application Protocol (WAP) (Mwange, 2013).

Interactive Voice Response (IVR) service operates through pre-specified numbers that commercial banks advertise to their customers. Customer's make a call at the IVR number and are usually greeted by a stored electronic message followed by a menu of different options. Customers can choose options by pressing the corresponding number in their keypads, and are then read out the corresponding information, mostly using a text to speech program. Mobile banking based on IVR has some major limitations that they can be used only for Enquiry based services and they are more expensive as compared to other channels as it involves making a voice call which is generally more expensive than sending an SMS or making data transfer

(Banerjee *et al.*, 2011). This study seeks to determine the perception of commercial banks on the cost effectiveness in embracing the IVR technology.

Nuance Communications (2011) in United States, the US Airways in 2011 was able to use an Interactive Voice Response (IVR) system known as Nuance on Demand that included natural language call steering, personalized call handling with proactive automated collection of trip information to shorten hold time for agents. Callers are simply prompted to say what they're calling about in their own words. The system understands their freely spoken request and responds appropriately, making interaction more like a natural conversation. The system uses natural technology that teaches the IVR system to recognize the callers intent regardless of the specific words used. This frees live agents to focus on more complicated caller issues. To US Airways, the more they know about their customers and reason for calling, the more efficiently they can provide the assistance they need and allow them to get on with their day. By integrating these insights with cutting edge speech recognition technology they are providing their customers with the convenient quality care they have come to expect from US Airways. After five months in operation the US Airways self-Service IVR had already increased call containment by as much as 5%. The increased containment yields millions of dollars in annual savings for the airline in addition to reducing costs, delivering the service faster, friendlier and with personalized caller experience that makes it the airline of choice for many travelers. This findings are similar to the findings of (Chakraborty *et. al* 2013) and (Sharma, 2013) in terms of savings, speed of delivery and comparability to live operators. The findings were however based on studies on noncommercial banks. This study sort to determine the relationship between IVR and perceived customer base of commercial banks in Kisumu County Kenya.

Communication service providers across the globe are adopting new age strategies such as customer experience based differentiation and focusing on transforming their customer interaction approaches through collaboration and mash-up of multiple channels. A customer experience through an IVR interaction really depends on who (customer/IVR) does most of the thinking during dialogue. In order to deliver the right experience, the service providers have started to evolve their legacy IVR system into smart IVRs. These intelligent IVRs take the onus away from the customers thus optimizing the interaction and providing a differentiated, unique

and personalized customer experience. With the intelligence to think ahead of the customer, they have the ability to anticipate customer needs and present the most relevant options. The improved speed and accuracy with which these IVR serve customers provides an impetus to the CSP's overall strategy of taking the customer experience to a new level (Sharma, 2013). What is not known is the extent to which commercial banks have adopted the IVR technology in Kisumu and the relationship between adoptions of IVR on the customer base of commercial bank in Kisumu County.

The IVR platform compares favorably with a live operator; this was confirmed by (Chakraborty *et al.*, 2013) in a study evaluating IVR versus a live operator for phone surveys in India. They recognized that IVRs do have some drawbacks such as having an error rate of 4% although this effect depends on the priority of the organization using the IVR. What is not known are the preferences of commercial banks in Kisumu County between IVR platform and live operators?

Yuviler (2012) avers that IVR systems, if properly designed, can increase customer satisfaction and loyalty, cut staffing costs and increase revenue by extending business hours and market reach. Poorly designed IVR systems, on the other hand, will cause the opposite effect and lead to dissatisfied customers, increased call volume and even increased agent turnover, as customers take out their frustrations on the agents. A recent Purdue University study revealed that 92% of US consumers form their image of a company based on their experience using the company's call center. More strikingly, the study found that 63% of consumers stop using a company's products based on a negative call center experience. What is not known is the relationship between the efficiency of the IVR systems on the customer base of commercial banks in Kisumu.

From the foregoing studies it is known that the use of IVR yields savings, improved speed and accuracy of serving customers, compares favourably with live operators but can only be limited to enquiry based services, increase in customer satisfaction and loyalty. However what is not known is the relationship between IVR on the customer base of commercial banks in Kisumu County.



There exists mobile applications that continue to work without the need for an internet. Standalone or “offline” solution that can fully operate a mobile device App when a connection to the internet is intermittent or completely absent. This “standalone client” is a completely self-contained wrapper application for mobile devices and encompasses all the necessary resources including JavaScript, image files and Omnis remote forms and definitions in the wrapper application bundle. The standalone functionality provides local storage and local database support on the mobile device and is compatible with HTML5’s offline capabilities. In “online” mode apps can be switched to connect to the Server to synchronize your mobile App database and application content with an online database. This mode would suit end users who have intermittent connection or when a connection is entirely unavailable, but need to synchronize their database or update their client application files to a central location once an internet connection is re-established. From internet access obstacles to entering data while traveling, the benefits of offline mobile app development within the modern enterprise are prevalent and diverse (Omnis Blog Team, 2013). This findings are similar those of (Benerjee *et al* 2011) as to limited use of this technology however the findings do not demonstrate use of this technology in commercial banks globally or locally. Consequently the relationship between adoption of this technology and customer base is not known.

Standalone mobile applications are the ones that hold out the most promise as they are most suitable to implement complex banking transactions like trading in securities. They can be easily customized according to the user interface complexity supported by the mobile. In addition, mobile applications enable the implementation of a very secure and reliable channel of communication. One requirement of mobile applications clients is that they require to be downloaded on the client device before they can be used, which further requires the mobile device to support one of the many development environments like J2ME. J2ME is fast becoming an industry standard to deploy mobile applications and requires the mobile phone to support Java. The major disadvantage of mobile application clients is that the applications needs to be customized to each mobile phone on which it might finally run. J2ME ties together the API for mobile phones which have the similar functionality in what it calls profiles (Banerjee *et al.*, 2011). What is not known is the extent to which commercial banks in Kisumu County have embraced the stand alone mobile application technology and the relationship between the

technologies on their customer base. This study strives to determine the relationship between this technology on the customer base of commercial banks in Kisumu County.

Short Messaging Service (SMS) banking is a type of mobile banking, a technology-enabled service offering from Commercial banks to its customers, permitting them to operate selected banking services over their mobile phones using SMS messaging. It works by the customer requesting for information by sending an SMS containing a service command to a pre-specified number. The bank responds with a reply SMS containing the specific information. One of the major reasons that transaction based services have not taken off on SMS is because of concerns about security. The main advantage of deploying mobile applications over SMS is that almost all mobile phones are SMS enabled (Banerjee *et al.*, 2011).

SMS banking services are operated using both push and pull messages. Push messages are those that the bank chooses to send out to a customer's mobile phone, without the customer initiating a request for the information. Typically push messages could be either Mobile marketing messages or messages alerting an event which happens in the customer's bank account, such as a large withdrawal of funds from the ATM or a large payment using the customer's credit card, etc. (Riley *et al.*, 2011). Whereas commercial banks have embraced the push messages what is not known is the relationship between these services on their customer base.

Pull messages are those that are initiated by the customer, using a mobile phone, for obtaining information or performing a transaction in the bank account. Examples of pull messages for information include an account balance enquiry, or requests for current information like currency exchange rates and deposit interest rates, as published and updated by the bank (Mousumi & Jamil, 2010).

Financial services institutions report multiple benefits from the SMS-based mobile banking channel. Depending on their respective market position and priorities, individual institutions may value the benefits differently. Most commercial banks find that at least some portion of SMS transactions replaces live agent interactions, thereby yielding tremendous cost savings. Migrating even 1% of contact center calls to mobile banking would produce "wildly successful" results in

terms of return on investment (ROI), given that the average cost to the bank for a contact center transaction is \$3.75 whereas the cost of an SMS mobile transaction is closer to \$0.05 (Shahajalal Islami Bank , 2012). The study seeks to determine the extent to which commercial banks customer basis affected by SMS transactions. The findings of (Riley *et al* 2012), (Mousumi & Jamil, 2010) and (Shahajalal Islami bank 2012) are similar in terms of knowledge and use of SMS banking technology. However (Shahajal Islami bank 2012) further found that the use of the technology by the banks produce widely successful results in terms of return on investment. The study failed to determine whether the benefits in return on investment was a result of change in the customer base of the commercial banks. These study sort to ascertain the relationship between SMS banking technology and customer base of commercial banks in Kisumu County, Kenya.

The TAM suggests two specific beliefs, perceived ease of use and perceived usefulness, determine one's behavioral intention to use a technology (Venkatesh, 2000; Venkatesh and Davis, 2000). Venkatesh (2000) defines perceived ease of use as "the extent to which a person believes that using a technology will be free of effort". It is thus a construct tied to an individual's assessment of the effort involved in the process of using the system. Perceived usefulness is defined as "the degree to which a person believes that using a particular technology will enhance his performance" (Sun and Zhang, 2006). Further, TAM posits that perceived usefulness will be influenced by perceived ease of use because, other things being equal, the easier a technology is to use, the more useful it can be (Venkatesh, 2000). What is known is that mobile phone banking uses technology; however the relationship of ease of use and usefulness of this technology and customer base of commercial banks in Kisumu County, Kenya is not known.

1.2. Statement of the research problem

Mobile banking is staging a true revolution in access to finance. The mobile phone has become the main tool of mobile banking and can serve as a virtual bank card, Point of sale terminal, ATM, and internet banking terminal. Financial institutions have been in the process of significant transformation with innovation of mobile phone banking being the force. In Kenya subscriptions in mobile money transfer increased from 18.9 million in 2011 to 21.1 million in 2012.

Mobile banking operates in the interface between commercial banks and cash remittance services of mobile telephone service firms. The cash remittance services are facilitated by MPBT.

Efforts have been made by governments and the private sector in recent years to encourage the development of models which might provide enhanced access to banking financial services. These financial inclusion plans are based on creating access channels that can reduce high transaction costs for agents by use of high level of coverage available through mobile telephony. However commercial banks are being slow in embracing mobile phone banking technology consequently risking being left behind in terms of enhanced customer services. Previous studies have identified the following mobile phone banking modules; interactive voice response, standalone mobile application client, short messaging service and wireless application protocol. In addition it was known that these technologies yield annual savings, improved speed and accuracy of serving customers, increase customer satisfaction and loyalty. However what is not known is the relationship between mobile phone banking technology on numbers of consumers accessing services in commercial banks in Kisumu County; the extent to which commercial banks have adopted mobile phone technologies in Kisumu County, the challenges they are facing and the relationship between the mobile phone network providers and the commercial banks as they provide the mobile banking services. This study sought to fill the research gaps by determining the relationship between MPBT and customer base of commercial banks in Kisumu County, Kenya.

1.3.Objective of the Study

The main objective of the study was to determine the relationship between Mobile phone banking technology on the customer base of commercial banks in Kisumu County, Kenya. The Specific Objectives are to:-

- i) Determine the relationship between interactive voice response (IVR) technology on customer base of commercial banks in Kisumu County.
- ii) Examine the relationship between of standalone mobile application client's technology on customer base of commercial banks in Kisumu County.
- iii) Ascertain the relationship between of short messaging service (SMS) and customer base of commercial banks in Kisumu County.

1.4. Research Questions

- i) What is the relationship between interactive voice response (IVR) Technologies and customer base of commercial banks in Kisumu County?
- ii) What is the relationship between Standalone Mobile Application Clients Technology and customer base of commercial banks in Kisumu County?
- iii) What is the relationship between Short Messaging Service (SMS) on customer base of commercial banks in Kisumu County?



1.5. Scope of the Study

The study was limited to three (3) types of mobile phone banking technology (MPBT) and focused on three (3) variables namely; mobile phone banking technology, the mobile phone banking environment and the commercial banks customer base at Kisumu county. The study included all commercial banks in Kisumu County as listed in the published financial statements for all commercial banks as at December 2012. The scope of the study was stretched to bank partnership with the mobile phone providers in introduction of new products to realize customer satisfaction and reach out to more customers who are unbanked.

1.6. Justification of the study

The study is immensely significant in diverse ways to business, marketing practitioners, policy makers and other stakeholders. To the mobile money transfer companies such as Safaricom, Orange Kenya and Airtel Kenya, the study findings and results that have been reported in this study provide more reliable scientific measure and perspective for describing and evaluating the success of their products in the market. The study also serves as an invaluable source of information that brings to need for better software. This study also provides empirical support for management of strategic decisions in several critical areas of operations and provides justifiable valid and delivering customer value, achieving customer satisfaction and loyalty, building long term mutually beneficial relationship with profitable customers and the helps in achieving sustainable business growth in Kenya.

To the policy makers like government agencies such as the central bank, ministry of communication and Communication Commission of Kenya (CCK), the study findings and results provides invaluable insights and a more reliable guide to monitoring the impact of the

operations of the mobile money providers and the banking industry. It also acts as a yardstick for measuring partly their respective policies and objectives such as enhancing the reliability and efficiency of the provision of mobile money transfer services.

The stakeholders like investors, shareholders, employees, researchers, pressure groups and consumer associations, the study report provides invaluable information that allows them to provide useful suggestions to the improvement in service delivery of their commercial banks and respective mobile money providers. The study will also help the academia in increasing the general knowledge on the subject of mobile phone banking technology, customer response and perception and also acts as a reference material to future researchers and scholars who may wish to embark on related studies.

1.7. Conceptual Framework

The study identified the independent variable as the adoption of mobile phone banking technologies; interactive voice response (IVR), standalone mobile application clients, short messaging service (SMS). The dependent variable as perceived customer base and the intervening variable was the mobile phone banking environment (regulation: rise of supportive role from public, authorities, emergence of new regulatory concepts, risks: collaborative model to share risks, infrastructure: payment network, point-of-sale terminals). The conceptual framework shows that adoption of mobile phone banking technologies determines perceived customer base, while the mobile phone banking environment intervene in the process.

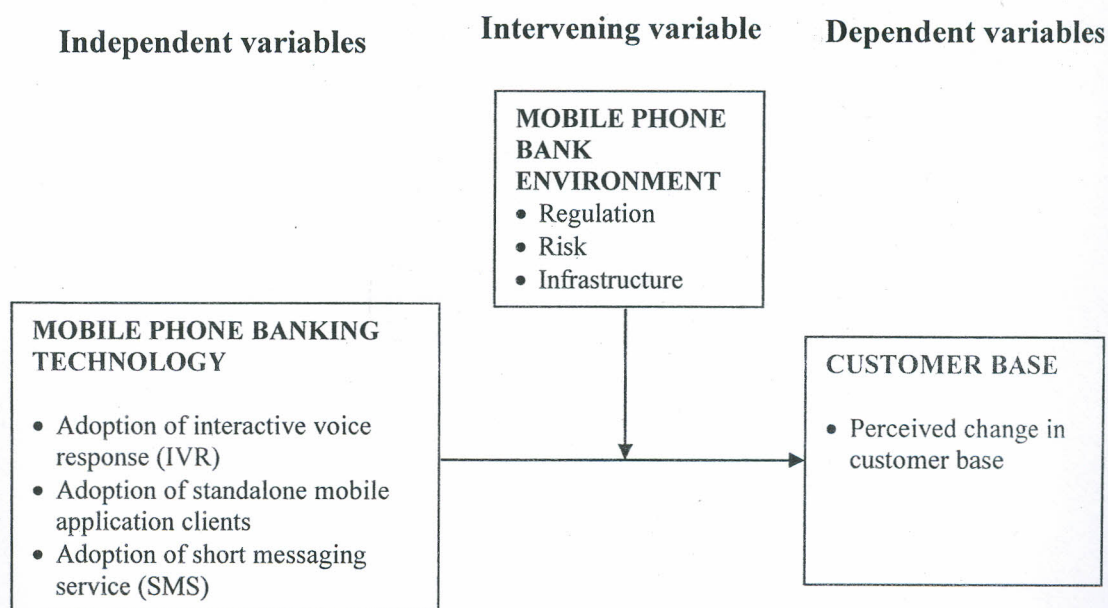


Figure 1.1: A relationship between mobile phone banking technology and Perceived change in customer base

Source: - Modified research model based on TAM (Lee, 2009)

CHAPTER TWO

LITERATURE REVIEW

This study reviewed both theoretical and empirical literature relevant to the research area of study. This chapter highlights the following; the concept of mobile banking technology as used in the partnership of network providers and commercial banks, and the perceived relationship with customer base of commercial banks in Kisumu County, Kenya.

2.1 Theoretical Studies

2.1.1 Technology Adoption Model

Information technology acceptance and its use have been the focal point in many studies for well over a decade. Several theoretical models have been used to study user acceptance and the usage behavioral emerging information technologies, including Rogers' diffusion theory (Bhatti, 2007), the Theory of Reasoned Action (TRA) (Komiak and Benbasat, 2006) and the Theory of Planned Behaviour (TPB) (Lim and Dubinsky, 2005). From this stream of research the technology acceptance model (TAM) has emerged as a powerful and parsimonious model that represents the antecedents of technology usage through beliefs related to the perceived usefulness and perceived ease of use of a technology.

The TAM suggests two specific beliefs, perceived ease of use and perceived usefulness, determine one's behavioral intention to use a technology (Venkatesh, 2000; Venkatesh and Davis, 2000). Venkatesh (2000) defines perceived ease of use as "the extent to which a person believes that using a technology will be free of effort". It is thus a construct tied to an individual's assessment of the effort involved in the process of using the system. Perceived usefulness is defined as "the degree to which a person believes that using a particular technology will enhance his performance" (Sun and Zhang, 2006). Further, TAM posits that perceived usefulness will be influenced by perceived ease of use because, other things being equal, the easier a technology is to use, the more useful it can be (Venkatesh, 2000). From this theory, it is known that customers will use MBPT in executing their transactions if doing so is free of effort and will enhance their performance. However TAM does not explain how perceived ease of use and usefulness of MPBT is related to perceived customer base. This study will be anchored on TAM to conceptualize this relationship.

2.1.2 Innovation diffusion theory (IDT)

Rogers (1995), defines diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. Given that decisions are not authoritative or collective, each member of the social system faces his/her own innovation-decision that follows a 5-step process: knowledge – person becomes aware of an innovation and has some idea of how it functions; persuasion – person forms a favorable or unfavorable attitude toward the innovation; decision – person engages in activities that lead to a choice to adopt or reject the innovation; implementation – person puts an innovation into use; confirmation – person evaluates the results of an innovation-decision already made.

The most striking feature of diffusion theory is that, for most members of a social system, the innovation-decision depends heavily on the innovation-decisions of the other members of the system. There is, after about 10-25% of system members adopt an innovation, relatively rapid adoption by the remaining members and then a period in which the holdouts finally adopt. The innovation-decision is made through a cost-benefit analysis where the major obstacle is uncertainty. People will adopt an innovation if they believe that it will, all things considered, enhance their utility. So they must believe that the innovation may yield some relative advantage to the idea it supersedes. How can they know for sure that there are benefits? Also, in consideration of costs, people determine to what degree the innovation would disrupt other functioning facets of their daily life. Is it compatible with existing habits and values? Is it hard to use? The newness and unfamiliarity of an innovation infuse the cost-benefit analysis with a large dose of uncertainty. It sounds good, but does it work? Will it break? If I adopt it, will people think I'm weird? This theory compares to TAM in terms of users consideration on ease of use and usefulness. IDT however brings on board consideration on cost benefit analysis and response of hold outs after about 10 – 25% of system members adopt an innovation. The response of holdout customers in commercial banks is not known. This study sought to determine the relationship between adoption MPBT and perceived customer base of commercial banks in Kisumu County, Kenya.

2.1.3 Contemporary banking theory

Bhattacharya and Thakor (1993) on contemporary banking theory avers that commercial banks, together with other financial intermediaries are essential in the allocation of capital in the

economy. This theory is centered on information asymmetry, an assumption that “different economic agents possess different pieces of information on relevant economic variables, in that agents will use this information for their own profit” (Freixas and Rochet, 1998). Asymmetric information leads to adverse selection and moral hazard problems. Asymmetric information problem that occurs before the transaction occurs and is related to the lack of information about the lenders characteristics is known as adverse selection. Moral hazard takes place after the transaction occurs and is related with incentives by the lenders to behave opportunistically. This theory will help ascertain the perception of commercial banks on the availability of information on MPBT and its relationship to perceived customer base.

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2.1.4 Transaction cost innovation theory

The transaction cost innovation theory's main pioneers are (Hicks and Niehans, 1983). They thought that the dominant factor of financial innovation is the reduction of transaction cost, and in fact, financial innovation is the response of the advance in technology which caused the transaction cost to reduce. The reduction of transaction cost can stimulate financial innovation and improvement in financial services. This theory studied the financial innovation from the perspective of microscopic economic structure change. It thought that the motive of financial innovation is to reduce the transaction cost. And the theory explained from another perspective that the radical motive of financial innovation is the financial institutes' purpose of earning benefits. This theory discussed the motive and the process of financial innovation from different sides. While the theory identified cost reduction, and earning benefits as the motive of financial innovation, it does not highlight the relationship between financial innovations on customer base of commercial banks. This study recognizes MPBT as an aspect of financial innovation and commercial banks customers as key beneficiaries of reduction in transaction costs and generator of earning benefits to commercial banks. This study will use the theory to ascertain the relationship between perceived reductions in transaction cost on the customer base of commercial banks in Kisumu County.

2.2 Empirical studies

Wessels & Drennan (2009) in a study in Australia that aimed at determining the trends in M-Banking and specifically consumer uptake avers that the trends in M-Banking so far shows that consumer uptake around the world is falling below the expectations of both academics and industry specialists. This is supported by the notion that technological advances and service availability do not automatically lead to widespread adoption and use; calls for the investigation of factors that predict or explain the adoption, acceptance, and use of mobile services (M-Services) while the study called for investigation of factors that predict or explain adoption, acceptance and use of mobile service (M- Services), it does not explain the relationship between fall in consumer uptake of M-Banking on the perceived customer base of commercial banks. This study will sort to determine the relationship between mobile phone banking technology and customer base of commercial banks.

Ismail & Masinge (2010) in a study that aimed to examine the factors influencing the adoption of mobile banking by the base of the pyramid (BOP) in South Africa, with a special focus on trust, cost and risk including the facets of risks: performance risk, security/privacy risk, time risk, social risk and financial risk. The research model includes the original variables of extended technology acceptance model (TAM2). Data for this study was collected through paper questionnaires in townships around Gauteng. This research found that customers in the BOP will consider adopting mobile banking as long as it is perceived to be useful and perceived to be easy to use. But the most critical factor for the customer is cost; the service should be affordable. Furthermore, the mobile banking service providers, both the commercial banks and mobile network providers, should be trusted. Trust was found to be significantly negatively correlated to perceived risk. Trust therefore plays a role in risk mitigation and in enhancing customer loyalty. The study bridges the gaps identified by Wessels & Drennan (2009) in terms of factors that explain adoption of mobile services. It is known from this study that trust and cost are critical factors determining adoption of mobile banking. What is not known is the relationship between adoption and perceived customer base of commercial banks.

Adewoye (2013) in a study aimed at examining the impact of mobile banking on service delivery in the Nigeria commercial banks. The study was carried out in Lagos state, and data collected

was analyzed using frequency table, percentage and mean score analysis while the non-parametric statistical test Chi-square was used to test the formulated hypothesis using STATA 10 data analysis package/software to examine the impact of mobile banking on service delivery and also look at the relationship between mobile banking and service delivery in the sampled commercial banks. The results of the findings shows that mobile banking improve commercial banks service delivery in a form of transactional convenience, savings of time, quick transaction alert and save of service cost which has recuperate customer's relationship and satisfaction. The study recommended that commercial banks management should create awareness to inform the public about the benefits derived on the e-banking service products. Collaboration among commercial banks should perfectly be maintained. Skilled manpower and computer wizard should be employed by every commercial bank, in order to prevent fraudulent persons and hackers from manipulating the commercial banks data and stealing money from the commercial banks accounts. The study differs from that of (Wessels & Drennan 2009) and (Ismail & Masinge 2010) because it determined the benefit of mobile phone banking technology to customers of commercial banks. However the study failed to address the ultimate motive of commercial banks- the relationship between improved service deliveries on their customer base. This study sort to determine whether the perceived improvement in service delivery by commercial banks via MPBT affects the commercial banks customer base in Kisumu County.

Ondiege (2010) avers that improving access to financial services can contribute to transforming peoples' lives in developing countries. However, the majority of the ordinary people in these countries still have limited access to these services. Today, an estimated 2.7 billion people in developing countries have no access to financial services. Over a billion people in Africa, Latin America and Asia are currently without bank accounts but do have a mobile phone. This number is set to reach 1.7 billion by 2012 Mobile telephony penetration in Africa has increased exponentially from less than 2 million subscribers in 1998 to over 400 million in 2009. Mobile banking offers an opportunity to serve the "unbanked": only 20 percent of African families have a bank account. Mobile banking is staging a true "revolution" in access to finance. A mobile phone can serve as: a virtual bank card; a point of sale terminal; an ATM; an internet banking terminal. Mobile banking offers more opportunities for partnerships between commercial banks, non-bank financial institutions; mobile telephony enables MFIs and IFIs to increase access to

finance, especially in rural areas for households and SMEs. From this study it is known that there is a steady increase in the number of unbanked customer who are accessing financial services via mobile telephony. This contradicts the findings of (Wessels & Drennan 2009) Who asserted that uptake around the world is falling below expectations. What is not known is the corresponding response of customers of commercial banks.

Okiro & Ndungu (2013) in a study with an aim to determine the impact of mobile and internet-banking on performance of financial institutions in Kenya where the survey was conducted on financial institutions in Nairobi. The study also sought to identify the extent of use of mobile and internet banking in financial institutions. The study investigated 30 financial institutions. The study found that the most prevalent internet banking service is balance inquiry while the least is online bill payment. Cash withdrawal was the most commonly used mobile banking service whereas purchasing commodities was the least commonly used. The study findings compares to those of (Ondiege, 2010) in terms of services facilitated by mobile phone banking technology. However the findings did not address the main objective of the study which was to determine the impact of mobile and internet banking on performance of FIs in Kenya. The researcher sort to bridge this gap by determining the relationship between MPBT and the customer base of commercial banks which is an aspect of performance on commercial banks.

McLeod (2014) in a survey conducted by the Kenya Bankers Association reveals 60% of the respondents use mobile phones for financial or banking transactions. The report shows financial institutions have been in the process of significant transformation with innovation of mobile and internet banking being the force. Currently the mobile money market size is about 17 million users transferring Kshs 2 billion daily. The respondents in rural areas using mobile phones for financial transactions are 71% compared to 57% in urban areas the survey does not highlight the corresponding statistics for respondents using commercial banks for financial transactions. The findings are similar to those of (Ondiege 2010) in terms of numbers accessing financial services through MPBT. The study however failed to address corresponding response of customers of commercial banks.

Nuance communications (2011) avers that the U.S. domestic airline industry's first natural language understanding IVR system delivers a superior caller experience while reducing operational to costs customer U.S Airways nuance solutions speech-enabled IVR self-service solution hosted on nuance on demand, featuring natural language call steering and personalized call handling with proactive information delivery. Results; Improved customer experience increased call containment 5%, Millions of dollars in annual savings.

Chakraborty *et al.*, (2013) wrote a paper that seeks to address the question of employing a live operator, or utilize interactive voice response (IVR) by giving two identical interviews, one using IVR, and one using a live operator to 31 low-income job seekers in India. The IVR interview included a brief introduction by a live operator, to provide context for the call. Out of the 20 people who completed both surveys, we found that IVR incurs a 4.0% error rate (95% C.I. 2.5% {6.1%}) and requires 2.5 times longer for users. The study concluded that IVR platform compares favorably with a live operator.

Harris (2014) explains the IVR technology in very practical ways. He indicates that If you've ever called your credit card issuer and meandered through a maze of prompts -- "For English, press 1; for account information, press 2" -- then you're familiar with interactive voice response. In mobile banking, it works like this: commercial banks advertise a set of numbers to their customers; customers dial an IVR number on their mobile phones. They are greeted by a stored electronic message followed by a menu of options; customers select an option by pressing the corresponding number on their keypads; a text-to-speech program reads out the desired information. He concludes by indicating that IVR is the least sophisticated and the least "mobile" of all the solutions. In fact, it doesn't require a mobile phone at all. It also only allows for inquiry-based transactions, so customers can't use it for more advanced services. What is not known is if commercial banks in Kisumu County, Kenya have services where customers call and are guided via a recorded voice to make transaction. This study will determine the banks that have embraced this technology. From the studies of (Nuance communications, 2011), (Chakraborty *et al.*, 2013) and (Harris, 2014) it is known that the use of IVR technology improve customer experience, results in savings, compares favourably to live operators and the is the least sophisticated. What is not known is the consequence of these benefit on the response of

customers of commercial banks. The study sort to determine relationship between adoption of MPBT and the customer base of commercial banks in Kisumu County, Kenya.

Tarawneh *et al.*, (2012) in a study in Jordan developed and presented a mobile business solution based on stand-alone mobile application clients (called MB-MAC) for commercial banks in Jordan. MB-MAC extends the convenience of existing online services- such as account balance information, funds transfer, and mini-statements- by making them accessible from any mobile device. As such with mobile services, a bank will need to hire even less employees as customer will no longer need to visit bank branches apart from certain occasions. The MB-MAC -designed to accommodate commercial banks and customers' interfaces- was developed, implemented and tested successfully.

Harris (2014) avers that some commercial banks are now providing a downloadable client that mobile subscribers can use to access bank services. These mobile applications offer a reliable channel and enable users to conduct even complex transactions. They also allow commercial banks to customize the interface and brand it accordingly. Although this solution likely represents the future of mobile banking, there are some issues. First, users are forced to download, install and learn a proprietary application. Not only that, the application must be customized to each mobile phone on which it will reside, greatly increasing development costs. And just like the mobile browsers used in WAP banking, these standalone applications are vulnerable to attacks, have limited availability and can only accommodate customer-initiated communication. As a financial institution prepares for the mobile banking revolution, it must weigh the advantages and disadvantages of these various solutions to decide which one best meets the needs of its customers and its own technology infrastructure.

Dave (2006) in a study in India, looks at the need of financial institutions to understand the kind of mobile usage, in terms of technology, being practiced by their target customers so that they can decide on the best manner to 'mobilize' their services. He states that standalone mobile applications are the ones that hold out the most promise, as they are most suitable to implement complex banking transactions like trading in securities. They can be easily customized according to the user interface complexity supported by the mobile. In addition, mobile applications enable

the implementation of a very secure and reliable channel of communication. One requirement of mobile applications clients is that they require to be downloaded on the client device before they can be used, which further requires the mobile device to support one of the many development environments like J2ME or BREW. J2ME is fast becoming an industry standard to deploy mobile applications and requires the mobile phone to support java. The major disadvantage of mobile application clients is that the applications needs to be customized to each mobile phone on which it might finally run. J2ME ties together the API for mobile phones which have the similar functionality in what it calls 'profiles'. However, the rapid proliferation of mobile phones which support different functionality has resulted in a huge number of profiles, which are further significantly driving up development costs. This scale of this problem can be gauged by the fact that companies implementing mobile application clients might need to spend as much as 50% of their development time and resources on just customizing their applications to meet the needs of different mobile profiles. From the findings of Tarawneh *et al.*, (2012), Harris (2014) and Dave (2006), there is similarity in terms of need for stand alone application client to be downloaded and customized. They also noted that the technology is susceptible to internet interruption and requires high development cost. What is not known is the consequence of the limitation of the technology on the perceived customer base of commercial banks in Kenya. This study sort to fill this research gap.

Petrova (2010) carried out a study in New Zealand with an aim to identify the factors that influence the customer's decision to uses SMS banking. The study explored developing a model with respect to individuals' behavior when considering using SMS banking. His findings show that service quality, as well as the degree of customers' awareness about the service, influence participants' perceptions about the usefulness of SMS banking and their intentions to use and adopt the service in the future.

Mousumi & Jamil (2010)in a paper presented in Bangladesh presents a Push Pull services offering SMS (Short Messaging Service) based M-Banking system which is able to provide several essential banking services only by sending SMS to bank server from any remote location. This proposed system is divided into five major phases: Interfacing Module, SMS Technology Adoption Module, SMS Banking Registration Module, Push Pull m-Banking Services

Generation Module, and Modified Data Failover Module. This push-pull services specified system facilitates bank customers by carrying out real time m-Banking utilities by categorizing services into five major on the basis of their homogeneity. They are Broadcast, Scheduling, Event, and Enquiry and m-Commerce services. Fifteen push pull services underlying these categories are implemented in this proposed system which are most desired to customers. The proposed system not only brings banking transaction in hand's grip but also makes it easier, robust and flexible with highest security. Moreover, modified data failover algorithm handles unexpected SMS server failure with any congestion or service request loss. At last, after evaluating each module of our proposed system a satisfactory accuracy rate 94.95% has been obtained. The views of (Petrova, 2010) and (Mousumi & Jamil 2010) are similar in terms of considerations and benefits of the SMS technology to uses. However the extents to which these benefits influence customers of commercial banks is not known.

Banerjee *et al.* (2011) in a paper presentation made in India with the objective of building a secured m-payment systems presented an effective mobile payment system (MPS) in existing wireless insecure environments using mobile devices. The proposed framework provides a secure and convenient payment mechanism. They included SMS technology that uses the popular text-messaging standard to enable mobile application based banking. The way this works is that the customer requests for information by sending an SMS containing service command to a pre-specified number. The bank responds with a reply SMS containing the specific information. One of the major reasons that transaction based services have not taken off on SMS is because of concerns about security. The main advantage of deploying mobile applications over SMS is that almost all mobile phones are SMS enabled.

Riley *et al.*, 2011 in New York provides an overview of the SMS delivery infrastructure, presents best practice uses of SMS messaging in the consumer banking market, and explores future capabilities of SMS in financial services more broadly the best practices discussed include: Driving adoption of the mobile delivery channel; Opening the mobile channel to all customers; Utilizing SMS for cross-selling; Leveraging SMS for fraud prevention. Message flows: The Pull and Push of SMS, benefits and risks of SMS, what commercial banks can expect from adopting SMS, The future of SMS. Conclusion SMS banking will remain an important component of

financial services institutions' mobile banking strategies because of its ability to provide rapid and accurate communication. Its ability to push content to subscribers or deliver information is data efficient and ubiquitous. Mobile banking clients in Kenya have already demonstrated an affinity for SMS-based mobile banking services instead of or in addition to the other mobile banking modalities. From the study of Banerjee *et al.* (2011) and (Riley *et al.* 2011) it is known that SMS banking is an important component of financial services for institution's mobile banking strategy ranking more highly than other MPBTs. What is not known is the relationship between SMS technology and customer base of commercial banks. The researcher sort to Ascertain the relationship between adoption of MPBT and percieved customer base of commercial banks in Kenya.

Pousttchi & Schurig (2007)in an assessment of today's mobile banking applications from the view of the customer requirements in the university of Augsburg avers that the short message service (SMS) is a GSM service to exchange text messages up to 140 byte (or 160 characters of 7 bit). The transmission of mobile-originated short messages is carried out by the short message service center (SMSC) of the particular network operator. The SMSC is receiving the message from the mobile device and routing it to the destination device. For generating mobile-terminated short messages, it is possible that a company or a special service provider runs an own SMSC. Thus, a bank could generate SMS from bank data like account balance or account movements and send it to the mobile device of the customer. This technique is used at SMS-banking: The customer sends an SMS with a request to the bank, and gets the desired data as an answer. The customer has to include a PIN for authorization in every SMS he sends to his bank. Alike the WAP banking, one should pay special attention on the security of the location of the SMSC. The operation of SMSC is offered as a service by many service providers. The usage of such a service is out of question for commercial banks, because of the high sensitive character of the transmitted data. For this reason it is mandatory for commercial banks to run their own SMS-Gateway and secure it from unauthorized access. The main problem with this kind of transmission is the phone. An encryption of pure text-SMS is not possible (unless an application on the mobile device would be able to decrypt the information). So the data is transmitted unencrypted. Because of this missing encryption, commercial banks are only offering pure information services like a request for the account balance via SMS. Thus, it is not possible to

make transactions via SMS banking. The study seeks to determine among other things the mobile banking services that use SMS in Kisumu County.

2.3 Summary of Reviewed Literature

From the reviewed literature, the study has identified theories that will be used to ascertain; the ease of use and usefulness of MPBT (Technology Adoption model), adoption of MPBT by commercial banks (Innovation diffusion theory), availability of information on MPBT (Contemporary Banking theory), the study identified gaps in the theories in relation to the relationship between MPBT and perceived customer base of commercial banks in Kisumu County, Kenya. The study reviewed empirical studies which identified gaps in relation to knowledge on commonly used MPBT, consequences of improved service delivery by MPBT, therefore what is not known is the relationship between adoptions of mobile phone banking technology and perceived customer base of commercial banks in Kisumu County Kenya.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

The study used both descriptive and correlational research designs. Frankel and Wallen (2000) described descriptive survey as that method that involves seeking the opinion of a large group of people about a particular issue. Information will be obtained from the entire population of commercial banks in Kisumu County. Surveys was concerned with perception of managers of commercial banks, opinions that they hold, processes that were going on, effects that were evident or trends that are developing as commercial banks embrace mobile phone technology. The design was chosen because of its appropriateness in collecting information about people's attitudes, opinions, habits or any of the varieties of social issues (Orodho and Kombo, 2012)

3.2 Study Area

This study was carried out on 30 commercial bank branches in Kisumu County with headquarter situated at the equator with coordinates $0^{\circ}44'22.81''S$ and $67^{\circ}52'22.92''E$ and an elevation of 3656ft above sea level. Appendix 5 shows the location of the study. Most of the commercial banks are branches but they enjoy a certain level of autonomy hence suitable for this study.

3.3 Target Population

The study target population consisted of 35 commercial banks as at 30th April 2014 which constitute the entire population of commercial banks in the study area. Zikmond (2003) defines a population as any complete group of people, companies, hospitals, stores, college students or the like that share some set of characteristic.

3.4 Sample Frame

The sample population consisted of 30 commercial banks since the other 5 banks were used to pretest the tools. Questionnaires were administered by the researcher to all the bank managers or their assignees in Kisumu County, Kenya and all the questionnaires were responded to 100%. From the received questionnaire feedbacks, meaningful results were found and documented.

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3.5 Data Collection

3.5.1 Type of Data

Primary data was utilized for this study. A questionnaire was used to collect data from the bank employees. Research assistants administered the questionnaires to the respondents. Where necessary the questionnaire was left with the respondents and collected later by the research assistants after one week. Secondary data which includes data originally used for different purpose will provided insight into the perception of commercial banks on MPBT. The data was gathered through document analysis and desktop research.

3.5.2 Sources of Data

The study utilized commercial bank branches in Kisumu County upon which questionnaires were administered to. Other sources of data include text books, refereed journals, Google scholar, Eurostat, Emerald and websites.

3.5.3 Data Collection Procedure

Two research assistants were engaged to collect data on behalf of the researcher. They were recruited from a pool of college students at Kenya College of Accountancy. The research assistants were trained on data collection and interpersonal relations. They were then taken through a paper based questionnaire which they were to administer to the respondents in the intended commercial banks in Kisumu County Kenya. The research assistants gave the respondents the questionnaires to fill at their own time and commit to collect after one week. The research assistants collected, compiled the questionnaires and presented them to the researcher for analysis.

According to (Zikmund, 2003), using a likert scale allows the respondents to indicate their attitude by checking how they strongly agree or strongly disagree with the construct statements. Five alternatives were offered: Strongly agree, Agree, uncertain, disagree, or strongly disagree. This study will adopt the five alternatives.

3.5.4 Instrument for Data Collection

A questionnaire was used to collect data. It was divided in to four parts consisting of a mixture of closed and open questions covering the mobile bank environment, mobile banking technology

and Customer Base. The questionnaire items were constructed using nominal and ordinal scale. The questionnaire is included in the appendix 2.

3.5.5 Reliability Test

Before conducting the main survey, a pretesting was administered in five (5) Commercial bank branches which include Family bank, Kenya Commercial bank, Cooperative bank, Equity Bank and CFC along Oginga Odinga Street, branch (Phelan and Wren, 2005). In the pretest the respondents were asked to comment on; general understanding of words employed, wording of scales, format and length of the instrument. The feed backs were used to adjust the questionnaire accordingly. The adjusted questionnaire were then administered one week later to judge the level at which the respondents interact with it. The scores from time one and time two after one week was then be correlated in order to evaluate the test for stability over time. The data collected was entered into SPSS where Cronbach's alpha (α) was used to perform the reliability test. In the pretest, an alpha of 0.8 was obtained (Tavakol and Dennick, 2011). Once the pretest was completed, the questionnaires was administered to all the 30 commercial banks in Kisumu County, Kenya.

Table 3.1 below shows the results of reliability test done after data collection. A Cronbach's Alpha of 0.957 was obtained confirming reliability of the data collection tool. Since this is greater than the recommended benchmark of 0.60 (Wu & Wang, 2005).

Table 3.1 Reliability test after data collection

Reliability Statistics	
Cronbach's Alpha	N of Items
0.957	63

Table 3.1 show that (α) alpha was at 0.957 after data had been and it confirmed reliability of the data collection tool.

3.5.6 Validity Tests

Validity refers to how well a test measures what it is purported to measure. The type of validity test employed was construct validity which is used to ensure that the tool actually measure what it is intended to measure (i.e. the construct), and not other variables. The researcher used a panel

of “experts” (individuals with experience in ICT and commercial banking) to assess validity. The experts examined the items and decide on specific items to be measured (Colin and Julie, 2006).

CHAPTER FOUR

3.6 Data Analysis and Presentation

3.6.1 Data Analysis

Data was analyzed using Descriptive statistics such as mean mode median and standard deviation and inferential statistics such as multiple regression and correlation was used to summarize the data. Bickman and Rog (1998) suggest that descriptive studies can answer questions such as “what is” or “what was.” Data was presented by way of bar graphs and pie charts for categorical variables were used to depict the relationship between two quantitative variables.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter gives out the results of statistical analysis. It starts with; presentation of demographic, descriptive and correlation analysis amongst the variables in the study where it used SPSS in the deductions of responses to the research questions. Finally a discussion follows that covers the consequences of data analysis for the research objectives developed in this study.

4.2 Demographic Analysis

The section outlines findings on demographic characteristics of the respondents which include: respondents' Position, Race, level of education experience, Sex and Age.

4.2.1 Respondents Position

The study collected data from 30 respondents out of which Four (4) were senior managers representing 13.3% and twenty six (26) were managers representing 86.7% as shown in Figure 4.1 below.

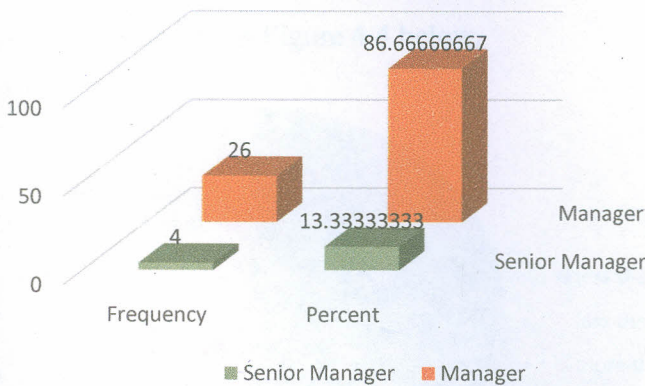


Figure 4.1: Respondent's position in the Bank

Source: Author 2014

4.2.2 Race of Bank Manager

The data collected showed that the race of bank managers were either Africans 66.7% or Asian 33.3% as shown in Figure 4.2 below

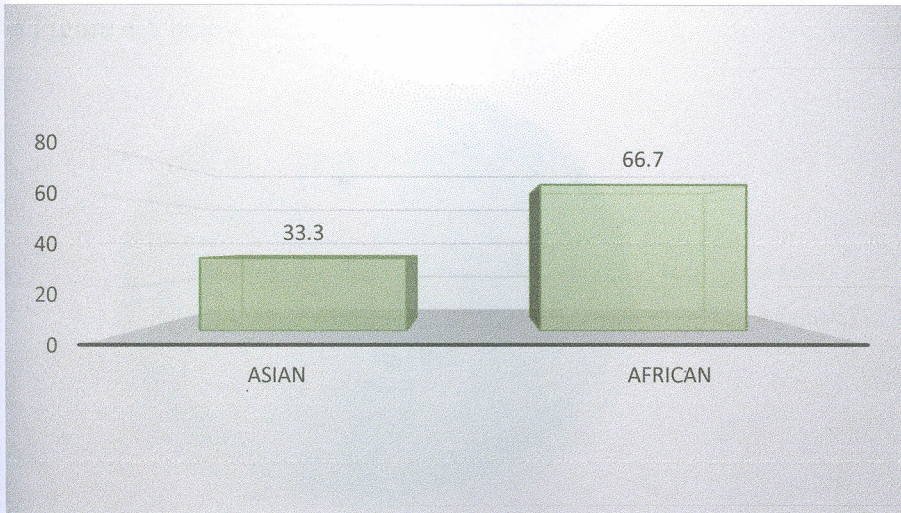


Figure 4.2 Race of Bank Manager

Source: Author 2014

4.2.3 Experience of the Bank Manager

From the data collected, 50% of the bank managers had worked in their current banks for less than one year, 27% had worked for less than seven years and 23% had worked for more than seven years as shown in Figure 4.4 below.

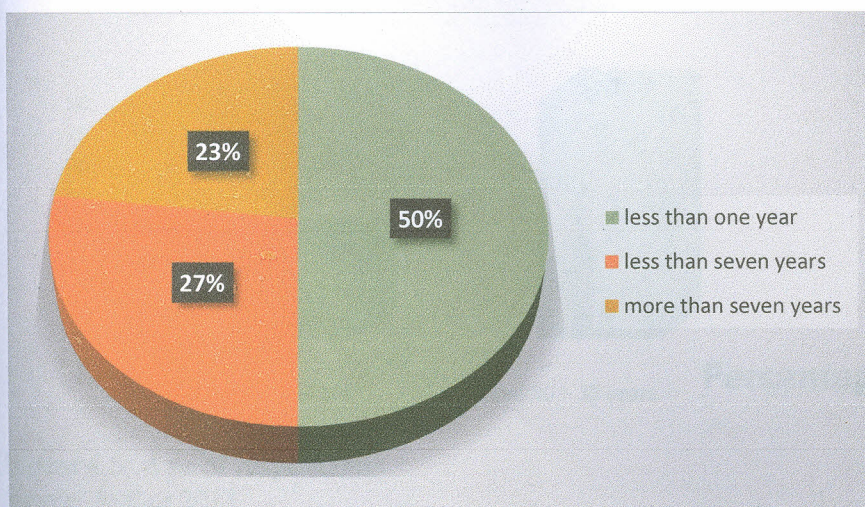


Figure 4.3: Experience of respondent

Source: Author 2014

4.2.4 Sex of Bank Managers

From the data collected, 87% of the bank managers were male while 13% were female as shown in Figure 4.5 below

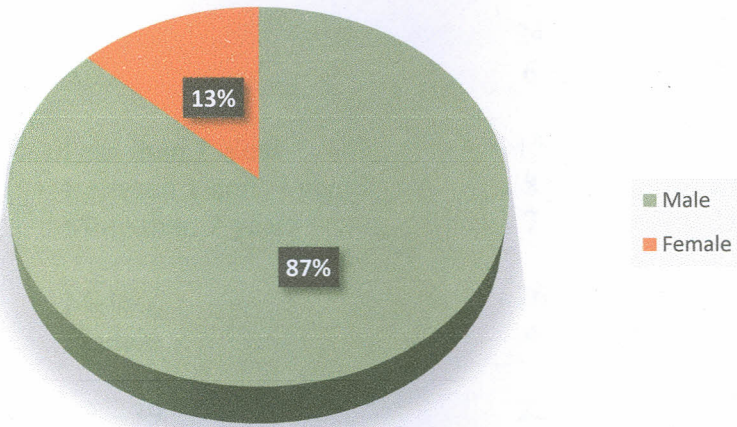


Figure 4.4: Sex of respondents
Source: Author 2014

4.2.5 Age of Bank Managers

The findings show that 26.7% of the respondents are aged between 40 – 49 years while 73.3% were aged between 30 – 39 years.

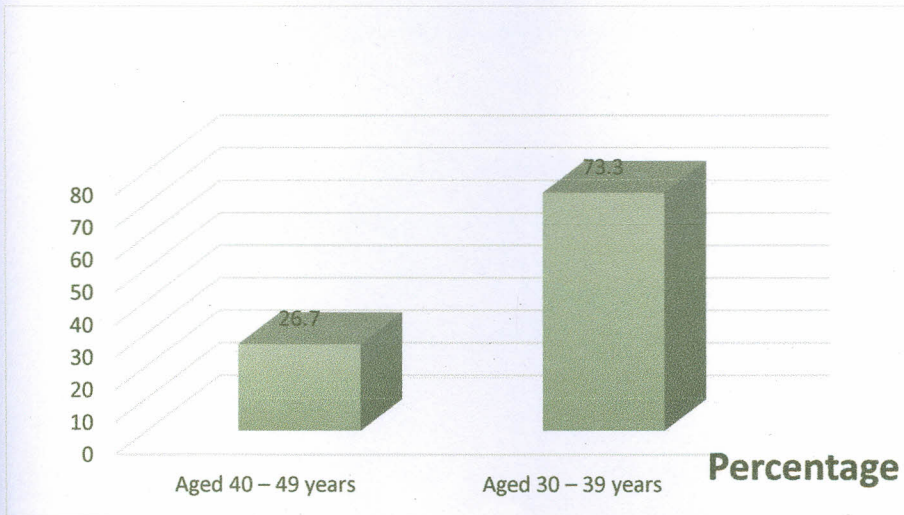


Figure 4.5: Age of respondents
Source: Author 2014

4.2.6 Summary of background Information

Table 4.1: Summary of background Information

Demographic factors of Managers	Frequency	Percentage (%)
Position in Bank		
Senior Manger	6	20
Manager	24	80
Race		
African	24	80
Asian	6	20
Experience		
Less than 1 Year	15	50
Between 1 and 7 years	8	27
More than 7 years	7	23
Gender		
Male	26	87
Female	4	13
Age		
30 – 39	22	27
40 – 49	8	73

Source: Author 2014

4.3 Relationship between Mobile phone banking technology and Customer Base

The study sought to investigate the use of three types of mobile phone technologies and their relationship to Customer Base. For each Technology the investigation involved: comparison with live operators and with each other, availability and use by various banks, benefits to banks and their customers, relation to customer base and finally correlation to Customer Base.

4.3.1 Objective 1: Interactive Voice Response (IVR) Technology and Customer Base

The data obtained from the questionnaires was entered in to SPSS to generate percentages, means and standard deviations. The relationship between IVR and customer base was categorized and analyzed under; Comparison with live operators (Table 4.1), Use and availability (Table 4.2), benefits to banks and their customers (Table 4.3), levels of increase in Customer base (Table 4.4) and their Correlation (Table 4.5)

Table 4.2: Interactive Voice Response (IVR) Technology - comparison

	N	VMC	NU	NC	Mean	SD
i) How IVR technology compare with a live operator on errors	30	30 (100)	0 (0)	0 (0)	4	0
ii) Comparison of IVR on efficiency	30	13 (43.3)	7 (23.4)	10 (33.3)	3.67	0.485
iii) Comparison of IVR on expenses to the client	30	7 (23.3)	4 (13.4)	19 (63.3)	2.75	1.13
iv) Comparison of IVR technology on expenses to the bank (installation/operation)?	30	7 (23.3)	0 (0.1)	23 (76.6)	3	1.251
Average	30	14 (47)	3 (9)	13 (43)	3	1

N: Total Number, VMC: Very Much Comparable, NU: Neutral, NC: Not Comparable, SD: Standard Deviation

Source: Author 2014

All the respondents agree that IVR is Very Much Comparable to live operators on errors, 43.3% indicated that IVR technology is Very Much Comparable to live operators on Efficiency. This explains why not all banks are using IVR technology. This is in conformity to the findings of (Nuance communications, 2010) and (Chakraberty et al 2013).

Table 4.3: Interactive Voice Response (IVR) Technology – use and availability

	N	Response		Mean	SD	Source
		No	Yes			
i) Availability of IVR platform	30	8 (26.7)	22 (73.3)	1.2	0.407	Author 2014
ii) The most commonly used banking services that uses IVR technology						Table
Payments Bill	30	13 (43.3)	17 (56.7)	1.60	.498	4.3 shows that 73%
Cash Transfer	30	30 (100)	0 (0)	0.2	.000	
Cash Withdrawals	30	30 (100)	0 (0)	0.2	.000	
Cash Payments	30	30 (100)	0 (0)	1.8	.407	
ATM Withdrawals	30	6 (20)	24 (80)	1.8	.407	
Account Balances	30	30 (100)	0 (0)	2.0	.000	
Average	30	21 (70)	9 (30)	1.26	.245	

of the respondents indicated that the IVR Technology is available in their banks. The use of IVR was limited to payment of bills and ATM withdrawals. This is in contrast to the findings of (Hains 2014) who indicated that IVR only allows inquiry based transactions.

Table 4.4: Interactive Voice Response (IVR) Technology – benefits to banks and their customers

	N	SA	NU	SDI	Mean	SD
i) IVR technology increased customer satisfaction and loyalty	30	7 (23.3)	10 (33.4)	13 (43.3)	3	1.445
ii) IVR technology contributed to cutting costs and increased revenue for the bank	30	17 (56.7)	0 (0)	13 (43.3)	3.75	1.675
Average	30	12 (40)	5 17	13 (43)	3	2

N: Total Number, NU: Neutral, SA: Strongly Agree, SDI: Strongly Disagree SD: Standard Deviation

Source: Author 2014

The study determined that 23.3% of the respondents believe IVR Technology has increased customer satisfaction and loyalty while 56.7% indicated that IVR technology has contributed to cutting costs and increased revenue for the banks. This is in conformity to the finding of (Ismail & Masinge 2010).

Table 4.5: IVR Technology on Customer Base

IVR Technology	N	(0-25) %	(26-50)%	(51-75)%	Mean	SD
% Increase in Customer Base	30	13 (43.3)	7 (23.3)	10 (33.3)	2.00	0.722

Source: Author 2014

From Table 4.5 above, in 20 commercial banks the increase in customer base was below 50% while 10 of the commercial banks perceived an increase in customer base above 50%. This distribution is skewed below 50% because of the 8 banks in which IVR technology had not been

adopted. In summary, adoption of IVR technology leads in an increase in the customer base of commercial banks in Kisumu County.

Table 4.6 Correlations of customer base and IVR Technology

Correlations		
Customer Base	Pearson Correlation	1
	Sig. (2-tailed)	
	N	30
IVR Technology	Pearson Correlation	.665**
	Sig. (2-tailed)	.000
	N	30

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

Source: Author 2014

In Table 4.6, the researcher sought to determine the correlation between the customer base and IVR Technology. The correlation reported in the table is a strong positive of (0.665) between IVR Technology and Customer Base. This means that as commercial banks adopt IVR technology they experience perceived increase in their customer base as it is with service providers. This increased number of customers are as a result of benefits of IVR as identified by (Nuance communications 2011), (Chakraborty *et al.*, 2013) and (Harris 2014).

4.3.2 Objective 2: Standalone Mobile Application Client Technology and Customer Base

The data obtained from the questionnaires was entered in to SPSS to generate percentages, means and standard deviations. The relationship between Standalone Mobile Application Client Technology and customer base was categorized and analyzed under; Comparison with live operators (Table 4.7), Use and availability (Table 4.8), benefits to banks and their customers (Table 4.9), levels of increase in Customer base (Table 4.10) and their Correlation (Table 4.11)

Table 4.7 Standalone Mobile Application Client Technology - comparison

	N	VMC	NU	NC	Mean	SD
i) How Standalone Mobile Application Client Technology compare with a live operator on errors	30	25 (83.3)	0 (0)	5 (16.7)	3	1.287
ii) Comparison of Standalone Mobile Application Client Technology on efficiency	30	17 (56.7)	0 (0)	13 (43.7)	2.6	1.38
iii) Comparison of Standalone Mobile Application Client Technology on expenses to the client	30	7 (23.3)	10 (33.4)	13 (43.3)	2.5	1.13
iv) Comparison of Standalone Mobile Application Client Technology on expenses to the bank (installation/operation)	30	17 (56.7)	0 (0)	13 (43.3)	2.25	1.327
Average	30	17 (55)	3 (8)	11 (37)	3	1

N: Total Number, VMC: Very Much Comparable, NU: Neutral, NC: Not Comparable

Source: Author 2014

Table 4.7 shows that 83% of the banks that have it agree that Standalone Mobile Application Client Technology is Very Much Comparable to live operators on errors, 56.7% indicated that Standalone Mobile Application Client Technology is Very Much Comparable to live operators on Efficiency. This explains why not all banks are using Standalone Mobile Application Client Technology. However its level of comparability is lower that for SMS (75%) which is higher than IVR (47%). This confirms the finding of (Tarawneh *et. al* 2012).

Standalone Mobile Application Client Technology has contributed to cutting costs and increased revenue for the banks. The findings are similar to (Omins Blog Team 2013).

Table 4.10 Standalone Mobile Application Client Technology % increase in Customer Base

Standalone Mobile Application Client Technology % Increase in Customer Base	N	(0-25) %	(26-50)%	(51-75)%	Mean	SD
	30	0 (0)	15 (50)	15 (50)	2.33	0.485

Source: Author 2014

The researcher sought to determine the perception of bank managers on the percentage increase in customer base attributed to Standalone Mobile Application Client Technology. Table 4.10 above shows 50% indicated that Standalone Mobile Application Client Technology has increased customer base by between 26 -50% and 50% indicated that Standalone Mobile Application Client Technology has increased customer base by between 51 -75%.

Table 4.11: Correlations of customer base and Standalone Mobile Application Technology

Customer Base	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	30	
Standalone Mobile Application Technology	Pearson Correlation	.258	1
	Sig. (2-tailed)	.169	
	N	30	30

Source: Author 2014

In Table 4.11, the researcher sought to examine the relationship between Standalone Mobile Application client Technology and the customer base of commercial banks. The correlation reported shows that Standalone Mobile Application client Technology is positively correlated to customer base in the magnitude of 0.258 this implies that as commercial banks adopt standalone application client there is a corresponding increase in their customer base. The increase is however not significant because majority of commercial banks in Kisumu County (25) have not adopted the technology. The slow uptake of this technology could be as a result of high cost of customization and downloading as found out by Dave 2006 and Harris 2014.

4.3.3 Objective 3: SMS Technology and Customer Base

The data obtained from the questionnaires was entered in to SPSS to generate percentages, means and standard deviations. The relationship between Short Message Services (SMS) Technology and customer base was categorized and analyzed under; Comparison with live

operators (Table 4.12), availability and use (Table 4.13), benefits to banks and their customers (Table 4.14), levels of increase in Customer base (Table 4.15) and their Correlation (Table 4.16)

Table 4.12 SMS Technology - comparison

	N	VMC	NU	NC	Mean	SD	Source:
i) How SMS Technology compare with a live operator on errors	30	17 (56.7)	8 (26.6)	5 (16.7)	3.2	1.19	Author
ii) Comparison of SMS Technology on efficiency	30	25 (83.3)	0 (0)	5 (16.7)	3.4	1.22	or
iii) Comparison of SMS Technology on expenses to the client	30	25 (83.3)	0 (0)	5 (16.7)	3.6	1.38	2014
iv) Comparison of SMS Technology on expenses to the bank (installation/operation)	30	23 (77.0)	0 (0)	7 (23.0)	3	1.44	Table
Average	30	23 (75.1)	6.65	5 (18.3)	3.3	1.31	e

N: Total Number, VMC: Very Much Comparable, NU: Neutral, NC: Not Comparable

shows that 56.7% the respondents agree that SMS Technology is Very Much Comparable to live operators on errors, 83.3% indicated that SMS Technology is Very Much Comparable to live operators on Efficiency. This explains why all banks are using SMS Technology. This confirms the findings of (Shahajalal Islam Bank 2012), (Mousum & Jamil 2010) and (Riley et al. 2011).

Table 4.13 SMS Technology – availability and use

	N	Response		Mean	SD	Source
		No	Yes			
i) Availability of SMS Technology platform	30	0 (0)	30(100)	1	0	: Author
ii) The most commonly used banking services that uses SMS Technology						2014
Payments Bill	30	13 (43.3)	17 (56.7)	1.6	0.498	Table
Cash Transfer	30	23 (76.7)	7 (23.3)	1.8	0.407	
Cash Withdrawals	30	1 (3.3)	29 (96.7)	2	0.0	
ATM Withdrawals	30	0 (0)	30 (100)	1.8	0.407	
Account Balances	30	0 (0)	30 (100)	1.6	0.498	
Transaction Alert	30	0 (0)	30 (100)	1.2	0.407	
General enquiries	30	13 (43.3)	17 (56.7)	1.5	0.501	
Average	30	6 (20.83)	24 (79)	1.56	0.34	4.13

shows that 100% of the respondents indicated that the SMS Technology is available in their banks, but its use is limited to Payments of bill, cash transfers, Cash withdrawals, ATM withdrawals account balances transaction alerts and general enquiries. This is in conformity to the findings of (Banerjee et al 2011).

Table 4.14 SMS Technology - benefits to banks and their customers

	N	SA	NU	SDI	Mean	SD
i) SMS Technology increased customer satisfaction and loyalty	30	12 (40)	0 (0)	18 (60)	4.33	0.97
ii) SMS Technology contributed to cutting costs and increased revenue for the bank	30	7 (21.7)	14 (45)	10 (33.3)	4	0.722
Average	30	30.9	22.5	46.7	4.2	0.8

N: Total Number, NU: Neutral, SA: Strongly Agree, SDI: Strongly Disagree SD: Standard Deviation

Source: Author 2014

The study determined that 40% of the respondents indicated that SMS Technology has increased customer satisfaction and loyalty while 21.7% indicated that SMS Technology has contributed to cutting costs and increased revenue for the banks.

Table 4.15 SMS Technology

SMS Technology % Increase in Customer Base	N	(0-25) %	(26-50)%	(51-75)%	Mean	SD
	30	8 (26.7)	7 (23.3)	15 (50)	2.4	0.814

Source: Author 2014

The researcher sought to determine the perception of bank managers on the percentage increase in customer base attributed to SMS Technology. Table 4.15 above shows that 26.7% indicated that SMS Technology has increased customer base by between 0 – 25%, 23.3% indicated that SMS Technology has increased customer base by between 26 -50% and 50% indicated that SMS Technology has increased customer base by between 51 -75%.

Table 4.16: Correlations of customer base and SMS Technology

		Correlation	
Customer Base	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	30	
SMS Technology	Pearson Correlation	.233	1
	Sig. (2-tailed)	.215	
	N	30	30

Source: Author 2014

In Table 4.16, the researcher sought to ascertain the correlation between the SMS Technology customer base of commercial banks. The results show that adoption of SMS technology is positively correlated to the perceived customer base in commercial banks in the magnitude of 0.233. This implies that an increase in adoption of SMS technology by commercial banks results

in an increase in the perceived customer base of commercial banks in Kisumu County. Though the technology is available in all the commercial banks in Kisumu County it has the lowest correlation coefficient as compared to IVR and standalone application client. This could be as a result of concerns about security hence rendering this technology not suitable for transaction based services as ascerted by (Benerjee *et al.* 2011) and (Pouttchi and Schurig 2007) .

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter summarizes, concludes and makes policy recommendations as per the study objectives. Finally, limitations and suggestion for future research are made.

5.2 Summary of findings

On technology adaptation, majority of the respondents indicated that the IVR Technology is available in their banks and all the respondents agree that IVR is Very Much Comparable to live operators. The study determined that IVR technology is positively correlated to customer base of commercial banks in Kisumu County, Kenya.

Standalone Mobile Application Client Technology is the least available in the banks. Its use is limited and most of the services in the bank do not use it. However where it is used it is Very Much Comparable to live operators and has contributed to increase in customer satisfaction and Customer Base. The study established a positive correlation between Standalone Mobile Application Client Technology and customer base of commercial banks in Kisumu County, Kenya.

On analysis of SMS Technology, all of the respondents indicated that the SMS Technology is available in their banks, majority of the respondents agree that SMS Technology is Very Much Comparable to live operators. The study ascertained a positive correlation between IVR Technology and customer base of commercial banks in Kisumu County, Kenya.

5.3 Conclusion

Technology adaptation is very crucial in the banking industry. There is over whelming evidence that the respondent in this study appreciates Technology. From the study the researcher determined that there is a positively correlated between IVR and customer base, Standalone Mobile Application Client Technology is positively correlated to customer base and SMS Technology is positively correlated to customer base. Hence Mobile phone banking technology is positively correlated to customer base of commercial banks in Kisumu County, Kenya.

5.4 Recommendations

From the Qualitative data collected and Key Informant discussions held during data collect, the study recommends that:-

1. Commercial banks should enhance adoption of IVR technology in order to maintain or increase their customer base
2. Commercial banks while adopting standalone Mobile application client technology should address the high customization and downloading costs of this technology.
3. Commercial banks should find ways of applying the SMS banking technology in executing transaction based services.
4. Commercial banks should therefore adopt mobile phone banking technology since doing so results in increase in their customer base.
5. Further studies should be carried out on threat of network providers in providing banking services.

5.5 Limitations of the study

First a major limitation of this study was to obtain the targeted the sample size. This made the researcher widen the scope of study to include banks and their branches within Kisumu County.

5.6 Areas for Future Studies

Relationship between Other technologies such as WAP on Customer Base, the relationship between demographic factors of bank managers on customer base during technological adaptations. The relationship between Mobile phone banking technology should be studied to determine or confirm its coefficient in a different population.

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