UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

ADOPTION OF MOBILE BANKING SERVICES BY NAIROBI COUNTY SACCOS

BY

TIMOTHY GIKANDI MBURU

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Supervisor

DR. ROBERT OBOKO

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DECLARATION

This research project is my original work and has not been presented to any other university for the award of a degree.

Student Name: Timothy Gikandi Mburu

Signed _____ Date _____

This research project has been submitted for examination with my approval as the university supervisor.

Supervisor Name: Dr. Robert Oboko

Signed _____ Date _____

DEDICATION

I would like to dedicate this work to my family, friends, and fellow classmates for giving their

unlimited support, help, encouragement and motivation throughout the completion of this research.

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I take this opportunity to thank God for good health and for bringing me this far. I also want to extend special gratitude to my supervisor, for the great partnership we made. The guidance, encouragement and patience in reading, correcting, re-reading and refining this work is commendable. I am thankful to my colleagues and classmates for their encouragement and support as well as the University of Nairobi for all their support.

ABSTRACT

Mobile money providers have partnered with commercial banks in Kenya to offer mobile based financial products that aim to reach the unbanked. However, as compared to commercial banks in Kenya, the penetration of M-banking in SACCOs (Savings and Credit Cooperative Organizations) has been very slow. The purpose of this study was to assess the adoption of mobile banking services by Nairobi County SACCOs. The study was also seeking to find out mobile banking services that can be offered through mobile banking; to determine the factors that influence adoption of Mobile Banking in Sacco's in Kenya; and to develop a model that can be used to evaluate mobile banking adoption.

This study used a descriptive research design. In this study, the target population was all the 44 SACCOs operating FOSA (Front Office Savings Activity) services in Nairobi County. The study made use of primary data and targeted 3 respondents in each SACCO. 10 SACCOs responded to the study. Semi structured questionnaires were used to collect primary data. Data analysis was quantitative as well as qualitative. Descriptive statistics such as frequency distribution, percentages, measures of central tendencies (mean) and measures of dispersion (standard deviation) were utilized to analyze quantitative data. The findings were then presented in tables and graphs. On the other hand, qualitative data was coded thematically and was analyzed by use of thematic content analysis. The results were then presented in a prose form. This study used factor analysis to identify underlying factors and to screen the variables. Inferential statistics such as ANOVA and multivariate regression analysis were used to test the association between the independent and the dependent variables.

The study found that SACCOs in Nairobi County had adopted mobile banking and were offering services such as requesting mini statements, checking account balance, cash withdrawals, buying airtime, loan repayments, paying Bills (Paybill), cash deposits, money transfer, loan applications services and buying SACCO shares, selling SACCO Shares, opening accounts and ATM Card Pin Change services on mobile banking platforms. The study also found that perceived benefits, external environmental factors, organization readiness and security perceptions influence the adoption of mobile banking positively and significantly. The study recommends that SACCOs should create awareness to the members on the perceived benefits of using mobile banking, which include convenience, accessibility and affordability. The top management of SACCOs should show support and campaign for the adoption of mobile banking so as to reduce resistance to change.

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ATM: Automated Teller Machine

FOSA: Front Office Savings Activity

GDP: Gross Domestic Product

ICA: International Co-operative Alliance

PEOU: Perceived Usefulness and Perceived Ease of Use

PI: Personal Innovativeness

PR: Perceived Risk

SACCO: Savings and Credit Cooperative Organization

SASRA: Sacco Societies Regulatory Authority

TALC: Technology Adoption Life Cycle

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Over the years, banking has transcended from a traditional brick and mortar model of customers queuing for services in the banks to modern day banking where banks can be reached at any point for their services (Awadhi, 2013). Today, banks have welcomed wireless and mobile technology into their boardroom to offer their customers the freedom to pay bills, planning payments and many other services while stuck in traffic or while moving about. Today, more people than ever are banking on the move rather than visiting bank offices. E-payment done by mobile banking (m-banking) is rapidly becoming one of the latest trends of e-banking (Okiro and Ndungu, 2013). During the 21st century, mobile banking advanced from providing mere text messaging services to that of pseudo internet banking where customers do not only view their balances and set up multiple types of alerts but also transact activities such as fund transfers, redeem loyalty coupons, deposit cheques via the mobile phone and instruct payroll based transactions (Tobbin, 2012).

According to Keli (2012), technology has greatly advanced playing a major role in improving the standards of service delivery in the financial institution sector. Days are long gone when customers would queue in the banking halls waiting to pay their utility bills, school fees or any other financial transactions. They can now do this at their convenience by using their phones or over the internet from the comfort of their homes. Additionally, due to the tremendous growth of the mobile phone industry, most financial institutions have ventured into the untapped opportunity and have partnered with mobile phone network providers to offer banking services to their clients (Imetur, 2012).

1.1.1 Mobile Banking

McGee (2009) argues that mobile banking is causing a flurry of activity in the world's financial services industry. In fact, it is leapfrogging traditional banking and now many top banks are up and running with their own mobile banking solutions, trying to take advantage of technology that comes with mobile phones and introduce the service as a means of providing fast and efficient services, and financial institutions of all sizes are busy assessing their place in the mobile banking world. Consequently, it has created a playing field for competitors comprising of not only banks but also telecommunication companies (Kaina, 2010).

In addition, mobile banking has led to financial deepening. Financial deepening is the increased provision of financial services, and access to basic financial services such as credit, savings and insurance. It is the increase in the size of the financial system and in its role of financing with a wider choice of service geared to the development of all levels of society (Weigel et al., 2014). Financial inclusion offers incremental and complementary solutions to tackle poverty, to promote inclusive development. It aims at drawing the unbanked population in to the formal financial system so that they have the opportunity to access financial services ranging from savings, payments and transfers to credit and insurance. Financial deepening plays an important role in reducing risk and vulnerability for disadvantaged groups, and increasing the ability of individuals and households to access basic services like health and education, thus having a more direct impact on poverty reduction (Pozzebon, Mackrell and Nielsen, 2014).

Porteous (2006) argues that the penetration of retail banking systems in most African countries is very low and that although there are no reliable figures yet that exist for the proportion of people who are banked at the continental level, various national household surveys conducted in selected countries including Kenya show that within a decade or less of rollout of mobile phones as many

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or more people have these gadgets as have bank accounts even though the latter have been available for much longer. As unbanked people start to use mobile phones they become reachable at a lower cost and therefore more bankable in the sense that a basic transactional service becomes more viable to offer via the phone.

Wunderlich et al. (2014) indicate that there are different factors which play a vital role in the adoption of these relatively new services. These factors could be social, economic or technological. Some of the social factors identified include conceptualizing electronic money, the social context of transactions, awareness, attitude towards change (embracing new technology), trust in one's bank or service provider, convenience of the service and the comfort that people have in using these services. Economic factors include mobile phone access, cost of the service, marketing strategies and availability of alternatives. Technological factors include service availability and reliability, security and privacy concerns, ease of use, network coverage, handset operability and availability of the service on different mobile networks (Gouws and Oudtshoorn, 2011).

This fast-paced phenomenon is however, not devoid of challenges which are experienced by both the customers and the banks themselves. Some of the challenges experienced by customers include handset operability challenges, security concerns and availability on different mobile networks. The banks may experience challenges such as network coverage, integration with other systems, adoption and diffusion levels, threat of substitutes in the financial industry (competition), scalability and reliability of the service and regulatory challenges (Porteous, 2006). According to a study conducted by Asongu (2012), the demands of a vibrant mobile banking market revolve around improved network coverage, quality connections and reduced costs. Hence he concluded that these form part of the challenges which mobile banking service providers may need to address.

In Kenya, adoption of M-banking services is still very low compared to mobile operator led transfer services using mobile phones. Unlike mobile money transfer services operated by mobile network operators, M-banking promises a lot more to the users, including interest on funds saved, credit history and access to loans. This leads to questioning the banking sector as to whether the un-banked user has been well understood (Demombynes and Thegeya, 2012).

Mobile networks in Kenya offer m-money services in the name of M-pesa by Safaricom, Orange money by Orange, Yu-cash by Essar, and Airtel money by Airtel. Currently the mobile money market size is about 15 million users transferring Kshs. 2 billion daily, of these over 14 million are Mpesa customers. There has since been a rapid growth in the adoption of mobile banking by the commercial banks in Kenya in recent years, evidenced by the numerous advertisements in the media on the various mobile banking services being offered by these banks (Maina, 2012). For instance, the major advertisements by banks seen in the media include Barclays Bank of Kenya's Hello Money, Kenya Commercial Bank's M-Benki, Co-operative Bank of Kenya's MCo-op Cash, Equity Bank's M-Kesho and Eazzy 247, Family Bank's Pesa Pap, National Bank's SIM-ple banking, Commercial Bank of Africa's M-Shwari just but to mention a few. Some of the services being offered include transfer of funds from bank account to mobile phone account like M-Pesa, airtime top-up, change of mobile banking PIN, banking services like account inquiry which includes balance inquiry and mini statement inquiry, funds transfer between accounts both own and other people's accounts, cheque book request, bill payment and viewing linked accounts, just but to mention a few (Owen, 2009).

1.1.2 SACCOs

A Savings and Credit Co-operative (SACCO) is a democratic, unique member driven, self-help co-operative. It is owned, governed and managed by its members who have the same common bond: working for the same employer, belonging to the same church, labour union, social fraternity or living/working in the same community. A Savings and Credit Co-operative's membership is open to all who belong to the group, regardless of race, religion, colour, creed, and gender or job status. These members agree to save their money together in the SACCO and to make loans to each other at reasonable rates of interest. Interest is charged on loans, to cover the interest cost on savings and the cost of administration (Mburu, 2013). Most Saccos are known to be efficient in service delivery. For instance, the processing of loans in Saccos takes a short time compared to commercial banks. Saccos also offer services like development loans, emergency loans, FOSA services, school fees loans among others.

Co-operatives have played an important role in the development of the economies of Kenya, Uganda and Tanzania and have led to the uplifting of the standards of living of the people. It is estimated that there are more than 6 million Co-operative members in the Region (Mwiti, 2009). According to for the last four or so decades, the financial co-operatives have played a pivotal role in the development process in Kenya, accounting for about 25% of all the financial services in the country and contributing 45% of Gross Domestic Product (GDP) with 31% of national savings and deposits (Mwiti, 2009). In Kenya there are more than 2.5 million members in SACCOs countrywide out of the 7 million Co-operators while there are 3,000 SACCOs countrywide, out of the 11,000 registered Co-operatives (Mwiti, 2009). In the year 2012, the savings mobilized by SACCOs in Kenya were Kshs. 110 billion (US$1.5 billion) and the loans outstanding were Kshs. 95 billion (US$1.3 billion) (Mwiti, 2009). However, the concentration of co-operative activities is

within the financial sector (44%) and the agricultural sector (38%) while the rest of the sectors constitute 18% of the total number of registered cooperative societies (Mwiti, 2009). In the agricultural sector, co-operatives are largely involved in the primary production, processing and marketing of agricultural commodities, procurement of farm inputs, disbursement of credit and introduction of new technologies (Mburu, 2013).

SACCOs have been involved in the provision of credit for the purchase of land, farm inputs, housing, education, medication and development of various business ventures. The SACCOs sub-sector experienced major changes in the economic environment, brought about by the liberalization of economic activities and the emergence of a competitive market economy. This led to mushrooming of cooperative societies, increasing competition among the players in the movement. Most cooperative societies in Nairobi County are savings and credit cooperatives commonly referred to as Urban SACCOs. They offer the following products to their members; normal loans, emergency loans, school fees loans, special loans and front office services (Kaina, 2010).

The traditional savings and credit services that has been practiced by SACCOs over the years has led to many cooperatives experiencing low liquidity problems especially because members are not allowed to withdraw their savings at will although they can borrow as much as three times of the amount they have saved in the society. This has caused SACCOs to seek other ways to improve their liquidity position (Mburu, 2013). A number of SACCOs have diversified and introduced Front Office Saving Activity (FOSA) where they offer such products and services as payment of salaries, salary advance, Banker's cheques, safe-keeping of documents and ATM services. The result is that Front Office Saving Activity (FOSA) have begun to be very popular with the SACCOs as members now have access to their savings right away. SACCOs that have introduced FOSA

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services have experienced a rapid asset growth (Maina, 2012). However, most of the SACCOs have not adopted mobile banking.

1.2 Statement of the Problem

Financial transactions that are based on wireless handsets may soon prove to be as pervasive as Internet-based financial applications (Porteous, 2006). The foregoing discussion shows that the earlier studies established that many developed countries have embraced mobile banking hence enabling people to seek services such as viewing account balances, making transfers between accounts, or paying bills via a mobile device such as a mobile phone (Demombynes and Thegeya, 2012).

The statistics at the ministry of information and communication shows that there has been exponential growth of the mobile subscribers which increased to 28.08 million up from 26.49 million in the year 2012 which is a 5.99% increase. Currently the mobile money market size is about 15 million users transferring Kshs. 2 billion daily, of these over 14 million are Mpesa customers. M-money providers have partnered with commercial banks such as Equity Bank, IandM Bank, and Kenya Commercial Bank, Barclays, Commercial Bank of Africa, National Bank of Kenya and Co-operative bank to offer mobile based financial products that aim to reach the unbanked. However, as compared to commercial banks in Kenya, the penetration of M-banking in SACCOs has been very slow (Tobbin, 2012). Banks and Saccos are regulated by different institutions and operate under different structures. For instance, Saccos are supervised and regulated by SASRA while banks are supervised and regulated by the Central Bank of Kenya.

According to Mbogo (2010) the cost of running deposit taking SACCOs (FOSAs) is set to go up significantly with the new set regulations in effect threatening the low interest rates regimes that

for decades have given SACCOs an edge over commercial banks in the lending market. This implies that with the increased cost of doing business, profitability is adversely affected and this creates a need for innovations like mobile banking. This study therefore sought to assess the adoption of mobile banking services by Kenyan Saccos.

1.3 Purpose of Study

The purpose of this study was to assess the adoption of mobile banking services by Nairobi County SACCOs.

1.4 Objectives of the Study

The objectives of this study were;

   i.   To find out mobile banking services that can be offered through mobile banking

  ii.   To determine the factors that influence adoption of Mobile Banking in Sacco's in Kenya

 iii.   To develop a model that can be used to evaluate mobile banking adoption

1.5 Significance of the Study

To the management of Saccos, this study provides information on the mobile banking offerings available in Kenya for Saccos, factors that influence adoption of Mobile Banking and the impact of mobile banking adoption by Kenyan Sacco's, that can be used to make decisions on whether or not to adopt Mobile Banking.

The findings from the study may particularly be useful in providing additional knowledge to existing and future organizations on the adoption of mobile banking services by Saccos. This study is also be beneficial to the banking industry since it enhances the realization of financial deepening in Kenya through the mobile phone platform.

Scholars and other researchers may also find the study helpful to identify further areas of research built on the findings of this study. The study may be a source of reference material for future researchers on other related topics; it may also help other academicians who undertake the same topic in their studies.

The findings of this study may help the policy makers both in public and private sector to identify crucial areas in their organizations and make appropriate decisions to enhance the adoption of mobile banking services in Saccos. In addition, the study provides information that can be used to formulate policies to protect stakeholders in the sector.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature on the adoption of mobile banking services. The chapter begins with the concept of M-Banking, Mobile Banking adoption, empirical literature, theoretical review, followed by conceptual framework and research gaps.

2.2 The Concept of M-Banking

The terms m-banking, m-payments, m-transfers, m-payments, and m-finance refer collectively to a set of applications that enable people to use their mobile telephones to manipulate their bank accounts, store value in an account linked to their handsets, transfer funds, m-banking or even access credit or insurance products (Imetur, 2012). This study uses the compound term m-banking/m-payments systems to refer to the most common features. The first targets for these applications were consumers in the developed world. By complementing services offered by the banking system, such as checkbooks, ATMs, voicemail/landline interfaces, smart cards, point-of-sale networks, and internet resources, the mobile platform offers a convenient additional method for managing money without handling cash (McGee, 2009).

For users in the developing world, on the other hand, the appeal of these m-banking/ mpayments systems may be less about convenience and more about accessibility and affordability. An exploration is underway between banks, mobile operators, hardware and software providers, regulatory agencies, donors, and users to determine the shape of m-banking/m-payments services in the developing world (Weigel et al., 2014).

According to Pozzebon, Mackrell and Nielsen (2014), mobile phone operators have identified m-banking/m-payments systems as a potential service to offer customers, increasing loyalty while

generating fees and messaging charges. Financial institutions, which have had difficulty providing profitable services through traditional channels to poor clients, see m-banking/m-payments as a form of "branchless banking", which lowers the costs of serving low-income customers.

There is no universal form of m-banking; rather, purposes and structures vary from country to country. The systems offer a variety of financial functions, including micropayments to merchants, bill-payments to utilities and long-distance remittances. Currently, different institutional and business models deliver these systems (Asongu, 2012). Some are offered entirely by banks, others entirely by telecommunications providers, and still others involve a partnership between a bank and a telecommunications provider. Regulatory factors, which can vary dramatically from country to country, play a strong role in determining which services can be delivered via which institutional arrangements (Demombynes and Thegeya, 2012).

Most m-banking/m-payments systems in the developing world enable users to do three things: Store value (currency) in an account accessible via the handset. If the user already has M-banking a bank account, this is generally a question of linking to a bank account (Jonathan and Camilo, 2008). If the user does not have an account, then the process creates a bank account for her or creates a pseudo bank account, held by a third party or the user's mobile operator. Convert cash in and out of the stored value account. If the account is linked to a bank account, then users can visit banks to cash-in and cash-out. In many cases, users can also visit the GSM providers' retail stores. In the most flexible services, a user can visit a corner kiosk or grocery store, perhaps the same one where he or she purchases airtime, and transact with an independent retailer working as an agent for the, transaction system. Transfer stored value between accounts (Karjaluoto, 2002).

According to Uppal (2010), users can generally transfer funds between accounts linked to two mobile phones, by using a set of SMS messages (or menu commands) and PIN numbers. The new services offer a way to move money from place to place and present an alternative to the payment systems offered by banks, remittance firms, pawn shops, etc. The uptake of m-banking/m-payments systems has been particularly strong in the Philippines, where three million customers use systems offered by mobile operators Smart and Globe; in South Africa, where 450,000 people use Wizzit ("the bank in your pocket") or one of two other national systems; and in Kenya, where nearly two million users registered with Safaricom M-Pesa system within a year of its nationwide rollout (Maina, 2012).

2.3 Mobile Banking Adoption

Mobile banking adoption can be examined using the Technology Adoption Life Cycle (TALC) which describes how new ideas and technologies spread in different cultures. According to TALC, the stages by which a person adopts an innovation includes awareness of the need for an innovation, decision to adopt or reject the innovation, initial use of the innovation to test it and continued use of the innovation (Demombynes and Thegeya, 2012). Through these stages diffusion is accomplished. There are five different categories of adopters namely innovators, early adopters, early majority, late majority and laggards. Innovators are those people who want to be the first to try the innovation, are interested in new ideas and are willing to take risks. Early adopters are people who represent opinion leaders; they enjoy leadership roles, embrace change opportunities and do not need convincing for them to change. Early majority adopt new ideas before the average person but they typically need to see the innovation work before they are willing

to adopt it. Late majority are people who are skeptical of change and will only adopt an innovation after it has been tried by the majority. Laggards are bound by tradition and are very conservative, hence they fear innovation (Rogers, 2013).

The adoption of mobile banking has been gradually increasing with the rapid increase in the use of mobile or wireless handsets in the recent past (Asongu. 2012). Studies conducted in the early 2000 showed that European countries including Scandinavian countries, France, UK, Ireland and Germany, alongside Canada and Japan were among the leaders in mobile banking. In some Asian countries (Singapore and Malaysia) mobile banking penetration was on the increase whereas Australia and New Zealand were among the slow adopters. There was no reference to Africa considering it is a developing continent and mobile banking was still very new in the technology world. However, other studies conducted in mid 2000s showed that mobile banking had grown faster in Sub-Saharan Africa than in most other parts of the world within a relatively short time, and was expected to continue increasing (Wunderlich et al., 2014).

According to Karjaluoto (2002), the first targets for mobile banking applications were consumers in the developed countries. By complementing services offered by the banking system such as cheque books, ATMs among others, the mobile platform offers a convenient additional method for managing money without handling cash. For users in the developing world on the other hand, the appeal for mobile banking may be less about the convenience and more about accessibility and affordability. Generally, mobile banking systems in the developing world enable users to do three things: store value in an account accessible via the handset, convert cash in and out of the stored value account and transfer stored value between accounts.

In Kenya, financial institutions, which have had difficulty providing profitable services through traditional channels to poor clients, which lowers the costs of serving low-income customers. A good example in Kenya is Equity Bank whose target market is the low income earners. Government regulators see a similar appeal, but are working out the legal implications of the technologies, particularly concerning security of mobile transactions (Mburu, 2013).

According to McGee (2009), consumer's propensity to use mobile devices to conduct banking functions depends on the sophistication of the device and not the consumer's age. Indeed, mobile users with smart phones are more likely to use the device for mobile financial services than users with ordinary cell phones or even devices with full keyboards regardless of age. This argument thus implies that in Kenya, given the economic conditions of people majority of who live below the poverty line, most people are not likely to adopt mobile banking in the real sense. This is because majority of those who can even afford cell phones have the ordinary cell phones.

Imetur (2012) argue that the personal characteristics of mobile banking users are important determinants of their adoption decisions. This provides the financial services industry with a better understanding of customer perceptions of mobile banking services and helps them plan their marketing strategies and promotion approaches for mobile banking services in the future.

2.4 Empirical Literature

There is a lot of literature on the adoption of mobile banking both globally and locally. For instance, Uppal (2010) studies the extent of mobile banking in Indian banking industry during the years 2000-2007. The study concludes that among all e-channels, ATM is the most effective while mobile banking does not hold a strong position in public and old private sector but in new private

sector banks and foreign banks m-banking is good enough with nearly 50 pc average branches providing m-banking services. M banking customers are also the highest in e-banks which have positive impact on net profits and business per employee of these banks. Among all, foreign banks are on the top position followed by new private sector banks in providing m-banking services and their efficiency is also much higher as compared to other groups.

Awadhi (2013) did a study on the adoption and acceptance of M-Banking system in Kingdom of Bahrain. A self-administered questionnaire was used to gather the data. The study explains the important factors that influence acceptance of mobile banking among bank clients. The population of the survey was limited to 2 banks clients only, in particular "Ithmar Bank and National Bank of Bahrain"; this population was chosen because these are among the few banks that applied m-banking in Kingdom of Bahrain. Out of 400 clients contacted, response rate was high at approximately 90%. The study investigated the impact of a number of factors on clients' attitudes towards acceptance of m-banking in Kingdom of Bahrain, the client's perspective of future of m-banking, and the overall attitudes towards m-banking. The results show that some of the independent m-banking metrics affect clients' attitudes towards m-banking, like mobile usage in financial sector and wireless technology. While some other metrics found to have significant effect on client's attitudes, like: bank commitments, behavioral intentions and extrinsic influence. Also, the study exposes that clients generally have positive attitudes towards m-banking to bank from anywhere and 24 hours seven days a week.

Maina (2012) from her study on the contribution of mobile banking to financial performance of commercial banks in Kenya investigated the relativity between mobile banking and financial performance. The study also sought to find the financial strategies that had been adopted by the institutions to enhance growth and efficiency of mobile banking. From the findings of the study

70% of financial institutions in Kenya had adopted process innovation (mobile banking) which enabled them to serve more clients within a shorter time hence boosting the financial performance over time. She concludes that adoption of mobile banking by financial institutions is very important in improvement of financial adequacy of commercial banks as well as improving operations and reduce costs in the long run hence increase in earnings.

Tobbin (2012) did a study on a model of adoption in mobile banking by the unbanked: a qualitative study. This paper presented a qualitative study on mobile banking technology acceptance by the rural unbanked. The number of mobile phone users has long exceeded the number of people with bank accounts across the world. The purpose of this paper was to determine the factors that affect the acceptance of mobile banking by the rural unbanked. The findings of the study indicate that perceived usefulness and perceived ease of use from the technology acceptance model, economic factors and trust influence the rural unbanked intention to adopt and use mobile banking services.

Keli (2012) conducted a study on the factors affecting adoption of mobile Phone banking by customers of commercial Banks in Kenya. The study also found out that the respondents used mobile banking because they found it cheap, safe and reliable to a greater extent. The study also found out that the respondent's colleagues, friends and family influenced the respondents to adopt and use mobile banking while the influence of the media on the adoption of mobile banking is not clear. The study found out that perceived usefulness and perceived ease of use (PEOU) has positive relationship in examining the intention to adopt mobile banking in Kenya. Similarly, relative advantage was found to be significant in determining the intention to use mobile banking. In addition, personal innovativeness (PI) has positive significant relationship towards the intention to adopt mobile banking services. However, social norms were found to have insignificant

relationship with the intention to adopt the service. Finally the study found out that there is a negative significant relationship between perceived risk (PR) and mobile banking adoption.

Imetur (2012) conducted a study on the factors affecting the implementation of mobile banking at Kenya Commercial Bank, Kenya. The study found out that the following factors had a positive effect on mobile banking: System Quality, agents' availability, linkage to MPESA, new technology, service availability, information quality, and ease of use, user satisfaction, convenience, charges, individual impact and organizational goodwill. The factors that had a negative impact were poverty, taxation and lack of mobile handsets. Mobile banking has room for growth in the future into the unbanked populace, mobile banking can be used as a propellant in the uptake of banking products and there are a number of factors that are either impeding or propelling the roll out of mobile banking.

2.5 Theoretical Review

The theoretical review presents theories and models relevant to mobile banking adoption. There are many theories used in IS research (Wade 2009). We were only interested in theories about technology adoption. A number of these models have been used in the study of related technologies such as internet banking and mobile banking. The most used models and theories are

- The technology acceptance model (TAM) (Davis 1986, Davis 1989, Davis et al. 1989)
- Theory of planned behavior (TPB) (Ajzen 1985, Ajzen 1991)
- Unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al. 2003)
- The Diffusion on Innovation (DOI) framework (Rogers 1995)

- The technology, organization, and environment (TOE) framework (Tornatzky and Fleischer 1990).

- Institutional Theory

- Iacovou et al. (1995) model

In this study, we reviewed theories for adoption models at the firm level used in information systems (IS) literature and discuss two prominent models, i.e. diffusion on innovation (DOI) (Rogers 1995); and the technology, organization, and environment (TOE) framework (Tornatzky and Fleischer 1990), since most studies on IT adoption at the firm level are derived from theories such as these two (Chong et al. 2009).

2.5.1 Diffusion of Innovation Theory (DOI)

DOI has been used since the 1950s to describe the innovation-decision process (Rogers, 1962). According to the innovation-decision process, an individual or decision making unit, passes from first the knowledge of an innovation, then to forming an attitude toward the innovation to a decision to adopt or reject to implementation of the new idea and to confirmation of this decision. Das and Pal (2011) shows that the DOI is one of the most well-known theories related to adoption of new technologies. Rogers transformed the model into five specific stages as follows (Rogers, 1995): knowledge occurs when an individual is exposed to an innovation's existence and gains some understanding of how it functions; persuasion occurs when an individual forms a favorable or unfavorable attitude toward the innovation; decision occurs when an individual becomes involved in activities that lead to a decision to adopt or reject the innovation; implementation occurs when an individual puts an innovation into use; and confirmation occurs when an individual seeks reinforcement for an innovation-decision already made, or reverses a previous decision to adopt or reject the innovation if exposed to conflicting messages about the innovation. In the

persuasion stage, five attributes that persuade an individual to adopt the innovation are: relative advantage, compatibility, complexity, trialability and observability.
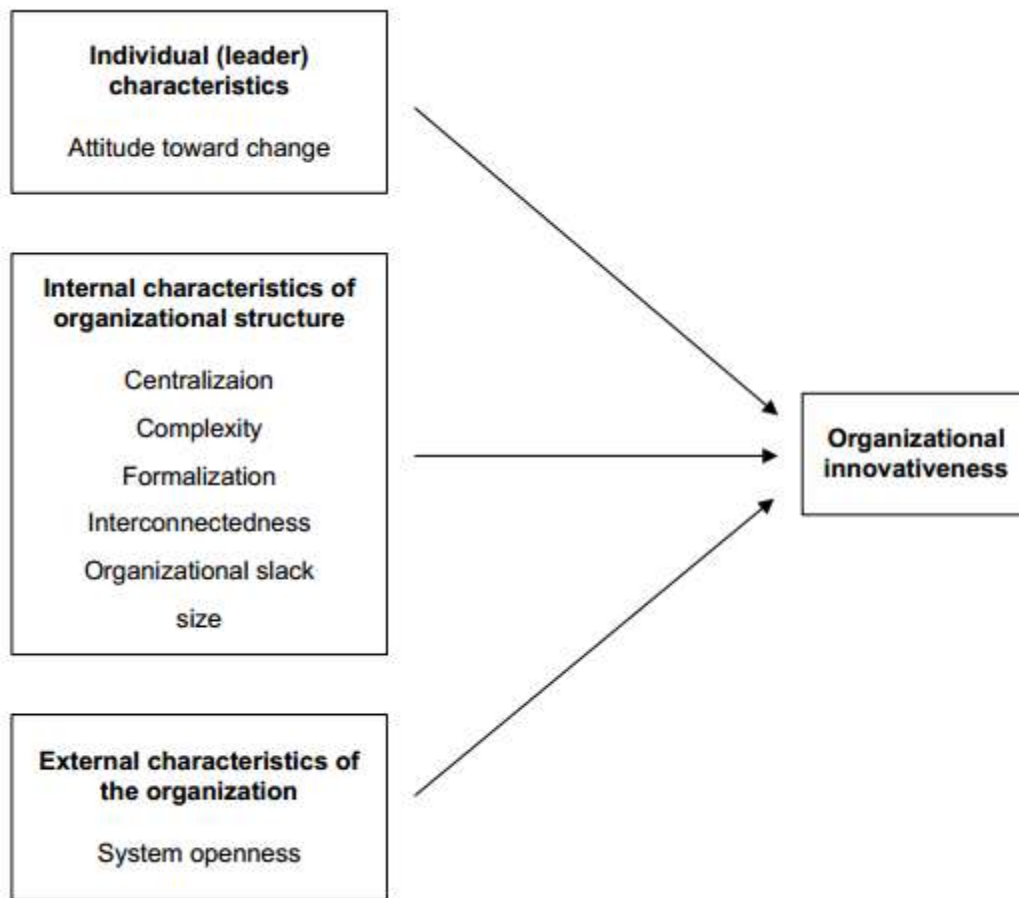
Figure 1: Diffusion of Innovation Model (Rogers, 1995)

Based on DOI theory at firm level (Rogers 1995), innovativeness is related to such independent variables as individual (leader) characteristics, internal organizational structural characteristics, and external characteristics of the organization as shown in Figure 1 above.

- Individual characteristics: describes the leader attitude toward change.

- Internal characteristics of organizational structure: includes observations according to Rogers (1995) whereby:

- o Centralization is the degree to which power and control in a system are concentrated in the hands of a relatively few individuals.

- o Complexity is the degree to which an organization's members possess a relatively high level of knowledge and expertise.

- o Formalization is the degree to which an organization emphasizes its members' following

  rules and procedures.

- o Interconnectedness is the degree to which the units in a social system are linked by interpersonal networks.

- o Organizational slack is the degree to which uncommitted resources are available to an organization.

- o Size is the number of employees of the organization.

- External characteristics of organizational refers to system openness.

2.5.2 Technology – Organization – Environment Framework (TOE)

The process by which a firm adopts and implements technological innovations is influenced by the technological context, the organizational context, and the environmental context (Tornatzky and Fleisher 1990).

- *Technological context*: describes both the internal and external technologies relevant to the firm. This includes current practices and equipment internal to the firm (Starbuck 1976), as well as the set of available technologies external to the firm (Thompson 1967, Khandwalla 1970, Hage 1980).

- *Organizational context*: refers to descriptive measures about the organization such as scope, size and managerial structure.

- *Environmental context:* is the arena in which a firm conducts its business—its industry, competitors, and dealings with the government (Tornatzky and Fleischer 1990).

This framework is consistent with the DOI theory, in which Rogers (1995) emphasized individual characteristics, and both the internal and external characteristics of the organization, as drivers for organizational innovativeness.

These are identical to the technology and organization context of the TOE framework, but the TOE framework also includes a new and important component, environment context. The environment context presents both constraints and opportunities for technological innovation as shown in Figure 2**Error! Reference source not found.** below.

The TOE framework makes Rogers' innovation diffusion theory better able to explain intra-firm innovation diffusion (Hsu *et al.* 2006).
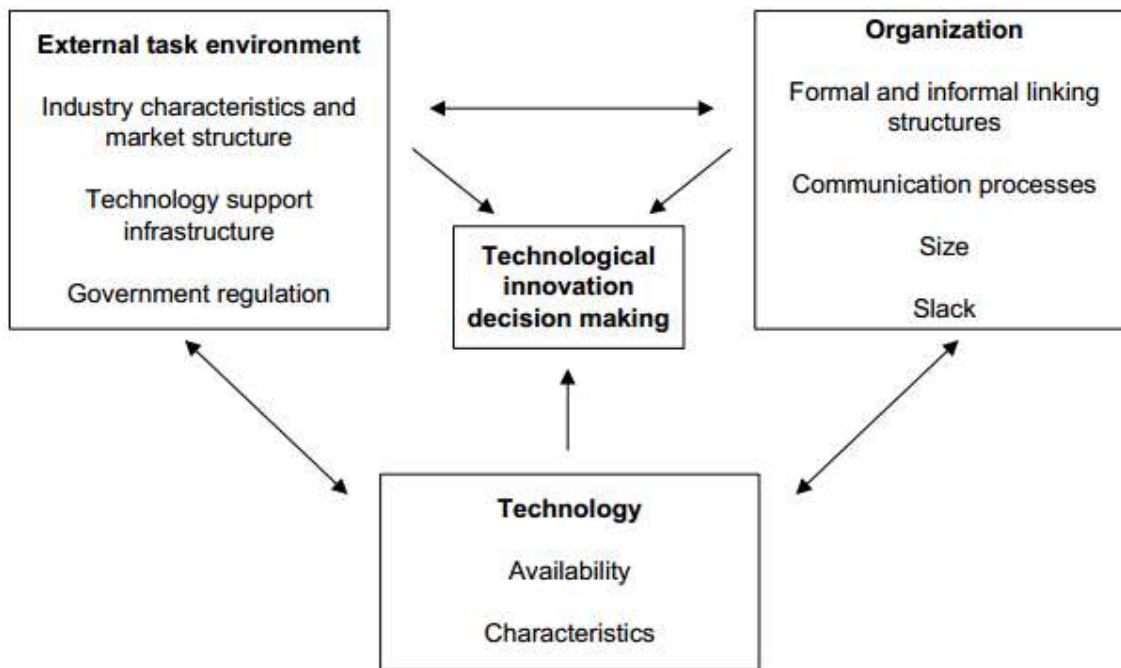
Figure 2: Technology – Organization – Environment Framework (Tornatzky and Fleischer 1990)

Several authors used only the TOE framework to understand different IT adoptions, such as:

- electronic data interchange (EDI) (Kuan and Chau 2001)

- open systems (Chau and Tam 1997)

- Web site (Oliveira and Martins 2008)

- e-commerce (Liu 2008, Martins and Oliveira 2009, Oliveira and Martins 2009)

- enterprise resource planning (ERP) (Pan and Jang 2008)

- business to business (B2B) e-commerce (Teo et al. 2006)

- e-business (Zhu et al. 2003, Zhu and Kraemer 2005, Zhu et al. 2006b, Lin and Lin 2008, Oliveira and Martins 2010a)

- Knowledge management systems (KMS) (Lee et al.2009).

The variables analyzed, methods used, data, and context of empirical studies are presented in Table 2.

2.5.3 Institutional Theory

Institutional theory emphasizes that institutional environments are crucial in shaping organizational structure and actions (Scott and Christensen 1995, Scott 2001). According to the institutional theory, organizational decisions are not driven purely by rational goals of efficiency, but also by social and cultural factors and concerns for legitimacy.

The theory claims that firms become more similar due to isomorphic pressures and pressures for legitimacy (Dimaggio and Powell 1983). This means that firms in the same field tend to become homologous over time, as competitive and customer pressures motivate them to copy industry leaders. For example, rather than making a purely internally driven decision to adopt e-commerce, firms are likely to be induced to adopt and use e-commerce by external isomorphic pressures from competitors, trading partners, customers, and government.

Several recent studies have taken an institutional approach to e-commerce or EDI diffusion and assimilation (Purvis et al. 2001, Chatterjee et al. 2002, Teo et al. 2003). It is well known that mimetic, coercive, and normative institutional pressures existing in an institutionalized environment may influence organizations' predisposition toward an IT-based inter-organizational system (ISO System) (Teo et al.2003).

Mimetic pressures are observed when firms adopt a practice or innovation imitating competitors (Soares-Aguiar and Palma-Dos-Reis 2008).

Coercive pressures are a set of formal or informal forces exerted on organizations by other organizations upon which the former organizations depend (Dimaggio and Powell 1983).

Normative pressures come from dyadic relationships where companies share some information, rules, and norms. Sharing these norms through relational

channels amongst members of a network facilitates consensus, which, in turn, increases the strength of these norms and their potential influence on organizational behavior (Powell and DiMaggio 1991).

Some studies combine the TOE framework with the institutional theory (Gibbs and Kraemer 2004, Li 2008, Soares-Aguiar and Palma-Dos-Reis 2008).

The institutional theory adds to the environmental context of the TOE framework external pressures, which include pressure from competitors and pressure exerted by trading partners.

2.5.4 Iacovou Model

Iacovou et al. (1995) analyzed inter-organizational systems (IOSs) characteristics that influence firms to adopt IT innovations in the context of EDI adoption.

Their framework is well suited to explain the adoption of an IOS. It is based on three factors: perceived benefits, organizational readiness, and external pressure.

Perceived benefits is a different factor from the TOE framework, whereas organizational readiness is a combination of the technology and organization context of the TOE framework. Hence, IT resources is similar to technology context and financial resources is similar to organizational context.

The external pressure in the Iacovou et al. (1995) model adds the trading partners to the external task environmental context of the TOE framework as a critical role of IOSs adoptions as shown in Figure 3 below.
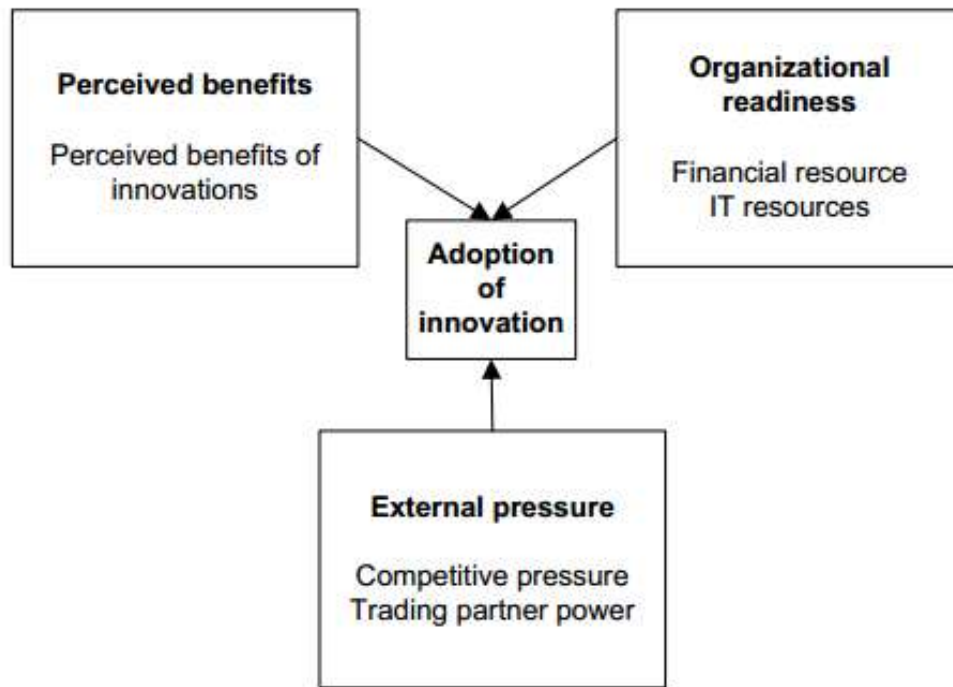
Figure 3: Iacovou et al. (1995) model

Hsu et al. (2006) used the DOI theory, the TOE framework, and the Iacovou et al. (1995) model to explain e-business use. Their model proposed four constructs (perceived benefits, organizational readiness, external pressure, and environment).

Organization readiness, is consistently used in all three frameworks in the literature. Environment is from the TOE framework. Perceived benefits and external pressure are from the Iacovou et al. (1995) model.

Oliveira and Martins (2010b) used the TOE framework, and the Iacovou et al. (1995) model to explain adoption of e-business by firms belonging to European Union (EU) countries. Their proposed model comprises three dimensions (perceived benefits, technology and organizational readiness, and environmental and external pressure).

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The perceived benefits dimension comes from the Iacovou et al. (1995) model. The technology and organizational readiness is a combination of TOE from the Tornatsky and Fleischer (1990) framework and organizational readiness from the Iacovou et al. (1995) model. The environmental and external pressure is also a combination from both earlier studies.

We have made a review of literature of IT adoption models at the firm level. Most empirical studies are derived from the DOI theory and the TOE framework. As the TOE framework includes the environment context (not included in the DOI theory), it becomes better able to explain intra-firm innovation adoption; therefore, we consider this model to be more complete.

The TOE framework also has a solid theoretical basis, consistent empirical support, and the potential of application to IS adoption. For this reason an extensive analysis of the TOE framework was undertaken, analyzing empirical studies that use only the TOE model, and empirical studies that combine this model with the DOI theory, the institutional theory, and the Iacovou et al. (1995) model, and concluding that the same context in a specific theoretical model can have different factors.

We proposed to combine aspects of the 2 theories i.e. the DOI theory and Institutional theory, and aspects of the T-O-E framework. The Iacovou model, which is an implementation of the T-O-E framework has also been considered in coming up with the proposed conceptual framework.

The following hypotheses are therefore developed:

H1: Perceived Benefit influences the adoption of Mobile Banking in Sacco's in Kenya

H2: External Environment influences the adoption of Mobile Banking in Sacco's in Kenya

H3: Organizational Readiness influences the adoption of Mobile Banking in Sacco's in Kenya

H4: Security Concerns influence the adoption of Mobile Banking in Sacco's in Kenya

2.6 Conceptual Framework

This study seeks to assess the adoption of mobile banking services by Nairobi County Sacco's. Specifically the study seeks to assess mobile banking offerings available in Kenya, factors that influence adoption of Mobile Banking in Sacco's and develop a model that can be used to evaluate mobile banking adoption. From the literature review, the factors influencing the adoption of mobile banking include perceived benefits, external environmental factors, organization readiness and security perceptions. In addition, the adoption of mobile banking leads to increased revenue, increased number of transactions, improved loan repayment, reduced cost of offering services and a wider customer reach as shown in **Error! Reference source not found.** below.

Perceived Benefit
- Perceived benefits of innovation
- Relative advantage
- Compatibility
- Increased efficiency
- Increased convenience

External Environment
- Industry characteristics/trends
- Market structure
- Competitive pressure
- Government regulations
- Perceived success of competitor adopters

Organizational Readiness
- Top management support
- Financial resources
- I.T resources
- Technological competence and support
- Communication process
- Organizational size
- Organizational slack

Security Concerns
- Exposure to fraud
- Transaction failure
- Protection of client details
- Security anxiety

Adoption of Mobile Banking by SACCOs
- Range of services offered
- Increased number of transactions
- A wider customer reach (No. of customers that use mobile banking)

Independent Variables   **Dependent Variable**

Figure 4: Conceptual Framework

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2.7 Research Gaps

Various studies have been conducted on mobile banking in Kenya and globally. Uppal (2010) did a study on the extent of mobile banking in Indian banking industry during the years 2000-2007 and Awadhi (2013) did a study on the adoption and acceptance of M-Banking system in Kingdom of Bahrain. In Kenya, Keli (2012) conducted a study on the factors affecting adoption of mobile Phone banking by customers of commercial Banks in Kenya and Imetur (2012) conducted a study on the factors affecting the implementation of mobile banking at Kenya Commercial Bank, Kenya. However, the findings of these studies cannot be generalized to SACCOs in Kenya as banks and SACCOs have different characteristics and regulations. Commercial banks in Kenya are supervised and regulated by the Central bank of Kenya under the Central Bank of Kenya while deposit taking SACCOs are regulated by SASRA under the SACCOs Act (2008). In addition, Sacco's have a different structure from banks where members are the shareholders. In banks, members are not necessarily the shareholders. This study will therefore seek to fill this gap by assessing the adoption of mobile banking services by Kenyan Saccos.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the procedures and methodology that was used in collecting and analyzing the data in the study. The chapter contains the type of research design used, the population of the study, sampling techniques and the sample size, data collection instruments, pilot testing, data analysis and presentation.

3.2 The Research Design

This will be a mixed study but will mostly use a descriptive research design. This offers the best of both worlds, the in-depth contextualized and natural but more time consuming insights of qualitative research coupled with the more efficient quantitative research. (Bryman, 2003). This study was a descriptive study where the researcher gathered data to assess the adoption of Mobile Banking services by SACCOs with FOSAs.

The study also employed both quantitative and qualitative research methods. Quantitative data was obtained from closed ended questions in the questionnaire. On the other hand, qualitative data was obtained from open ended questions and was used to shed some light on the quantitative data to enable for a more in-depth analysis of the research problem.

A pre-study will be carried out before the main research is done. This will employ a purely qualitative research design.

3.3 Target Population

According to Cooper and Schindler (2006), a target population is a population having the desired information. In this study, the target population will be the staff of SACCOs operating FOSA services in Nairobi County. Nairobi County was chosen in this study as most of the SACCOs have their headquarters in Nairobi. According to SASRA (2012), there are 44 SACCOs operating FOSA services in Nairobi County.

3.4 Sampling Techniques and Sample Size

The study is based on the firm level hence the population selected for this study is small i.e. only 44 SACCOs have FOSAs based in Nairobi County, the sample size of this study was therefore 44. Purposive sampling was used as the sample method even though the initial target had been the General Manager's or their designates as respondents due to their vast organizational knowledge.

Table 1: Population Size

Sectors	Number of Saccos
Agriculture	4
Transport	3
Financial services	3
Commercial and services	9
Energy and petroleum	3
Investment	4
Faith based	3
public sector	10
Education	5
Total	**44**

3.5 Data Collection Instruments

This study made use of primary data. In this study, semi structured questionnaires as well as a key informant interview guide will be used to collect primary data. Questionnaires were used to obtain data from the staff of the selected Saccos. The questionnaires comprised of both open ended or closed ended questions in order to enable the respondent to express their opinion in relation to the objectives of the study. Questionnaires were used in this study as they are very efficient in terms of time, finances and energy. The key informants in this study will be ICT managers and general managers in the SACCOs.

Before data collection, the researcher obtained a letter of data collection from the University. During data collection, the researcher used drop off and pick up later method. After dropping off the questionnaires, the respondents were given three days to fill the questionnaires after which they were collected.

3.6 Pre-Test

Pre-testing was carried out before the questionnaires are administered to the participants, to certify that the questions are relevant, make sense and clearly understandable. Pre-testing aims at determining the reliability of the research tools including the sequence of the questions, wording and structure. In this study pretesting involved 4 staff (10% of the sample size). The test was conducted in Mwalimu SACCO. The responses from the pre-test were put though AMOS. After doing factor loading, the selected factors were used to conduct the main study.

3.6.1 Validity Test

According to Creswell (2006) validity is the extent to which results acquired from process of analysis of the data actually embodies the phenomenon under study. There are two types of

validity: content validity and face validity. Face validity refers to probability that a question is misinterpreted or misunderstood. According to Cooper and Schindler (2006) pre-testing is a proper way to increase the possibility of face validity. On the other hand, content validity, also referred to as logical validity, refers to the degree to which a measure depicts all facets of a given social construct. In this study, the content validity was improved by seeking the opinions of experts in the field of study, particularly the supervisor. To test the validity of the research instrument individuals who have used mobile banking for at least 2 years were used, so as to ensure the right data is collected.

3.6.2 Reliability Test

Reliability refers to a measure of the extent to which instruments of research produce consistent results. The questionnaire reliability was statistically measured by measuring the internal consistency. Internal consistency was measured by use of Cronbach's Alpha. The alpha value ranges between 0 and 1 with reliability increasing consistently with increase in value. Coefficient of 0.6-0.7 is a normally accepted rule of thumb that designates acceptable reliability and 0.8 or higher indicated good reliability (Greener, 2008).

3.7 Data Analysis and Presentation

The data analysis comprised of four stages. The first stage was the data management, which was done using SPSS, where cleaning and quality was ensured. Specifically, missing data, outliers and normality tests was done. Next, the researcher focused on analyzing the demographic information done using SPSS. The third stage, also carried out using AMOS, focused on establishing how well the model fits the data. The final stage, done using AMOS, focused on hypotheses testing using path coefficients and P-values.

Data analysis was quantitative as well as qualitative. Preceding the analysis, a codebook for the different quantitative variables was prepared on the basis of the numbering structure of the questionnaires. All the questionnaires were numbered prior to data collection to make the referencing easier.

After confirming that all the data entered is accurate, descriptive statistics were utilized to analyze quantitative data. Descriptive statistics are frequency distribution, percentages, measures of central tendencies (mean) and measures of dispersion (STD deviation). The data was then presented in tables and graphs. Descriptive statistics help the researcher to significantly explain distribution of measurements and to also explain, organize and review data (Bryman, 2003). On the other hand, qualitative data was coded thematically and was analyzed by use of Thematic content analysis. The results were then presented in a prose form.

This study used factor analysis to identify underlying factors and to screen the variables. The study also made use of chi-square to test the association between categorical variables like age bracket and adoption of mobile banking. In addition, analysis of variance (ANOVA) was used to test difference means in various dependent and independent variables. Further a multivariate regression analysis was used to test the strength of the relationship between the dependent and independent variables. The study applied a 95% confidence level. A 95% confidence interval indicates a significance level of 0.05. This implies that for an independent variable to have a significant consequence on the dependent variable, the p-value ought to be below the significance level (0.05).

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION OF FINDINGS

4.1 Introduction

This chapter focuses on data analysis, results presentation and interpretation as per the purpose and objectives of the study. The purpose of this study will be to assess the adoption of mobile banking services by Nairobi County Sacco's. The objectives of the study were to find out mobile banking services that can be offered through mobile banking; to determine the factors that influence adoption of Mobile Banking in Sacco's in Kenya; and to develop a model that can be used to evaluate mobile banking adoption. The research findings were presented in form of tables, graphs and charts.

The sample size of this study was the 44 general managers in the SACCOs based in Nairobi County, out of which 30 filled and returned their questionnaires. This gives a 68.18% response rate. According to Babbie (2002) any response of 50% and above is adequate for analysis thus 68.18% is even better in making conclusions about the target population.

4.2 Mobile Banking Services Available in Kenya for SACCOs

The first objective of this study was to find out mobile banking services that can be offered through mobile banking.

4.2.1 Adoption of Mobile Banking

The respondents were asked to indicate whether their SACCOs had adopted mobile banking. The results were as presented in **Error! Reference source not found.** below.

Percent, No, 0, 0%

Percent, Yes, 100, 100%

Yes
No
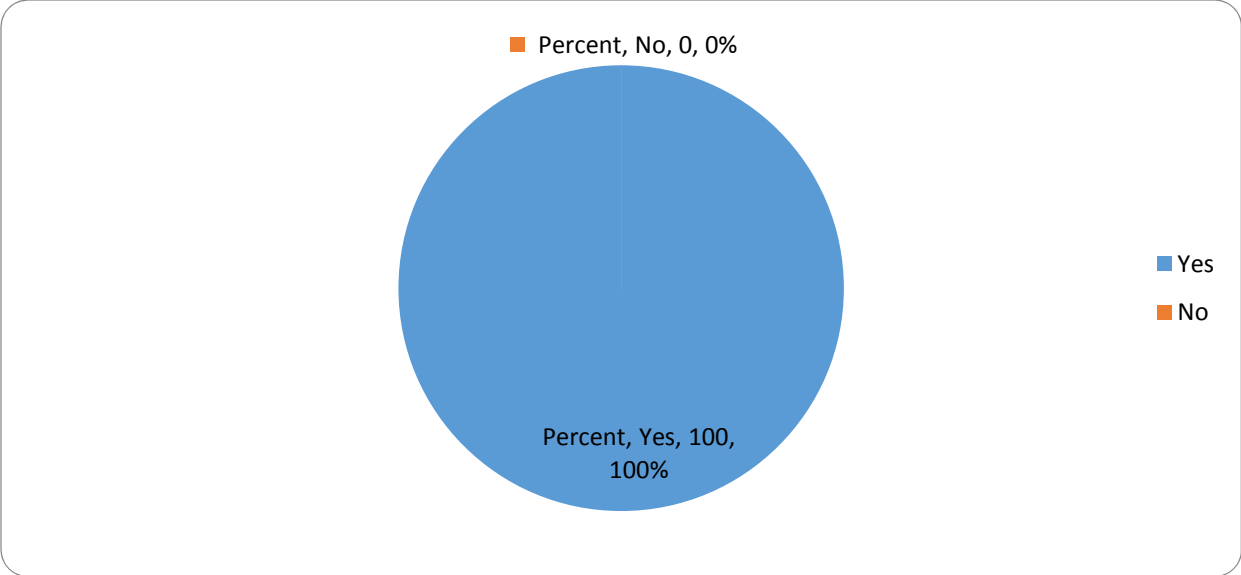
Figure 5: Adoption of Mobile Banking

From the findings, all the respondents (100%) indicated that their SACCOs had adopted mobile banking. These findings clearly show that SACCOs located in Nairobi County had adopted mobile banking and hence were offering services through mobile banking services.

4.2.2 Services SACCOs offer Through Mobile Banking

The respondents were further asked to indicate whether their SACCOs were offering the stated services through mobile banking.

Table 2: Services SACCOs offer through mobile banking

	Frequency		Percent	
	Yes	No	Yes	No
Cash Deposits	21	9	70.0	30.0
Cash Withdrawals	27	3	90.0	10.0
Opening an Account	3	27	10.0	90.0
Checking Account balance	30	0	100.0	0
Money Transfer	18	12	60.0	40.0
Buying Airtime	27	3	90.0	10.0
ATM Card Pin Change	3	27	10.0	90.0
Requesting Mini Statements	30	0	100.0	0
Paying Bills (Paybill)	24	6	80.0	20.0
Loan Applications	15	15	50.0	50.0
Loan Repayments	27	3	90.0	10.0
Buying Sacco Shares	9	21	30.0	70.0
Selling Sacco Shares	6	24	20.0	80.0

From the findings, all the respondents (100%) reported that their SACCOs were offering services on requesting mini statements and checking account balance. In addition, 90% of the respondents indicated that their SACCOs were offering services such as cash withdrawals, buying airtime and loan repayments. Further, 80% of the respondents reported that their SACCOs were offering services on paying Bills (Paybill), 70% indicated that their SACCOs were offering services on

sash deposits and 60% indicated that their SACCOs were offering services on money transfer. As well, 50% of the respondents indicated that their SACCOs were offering loan Applications services on mobile banking platforms, 305 indicated that they were offering buying Sacco Shares services, 20% indicated that they were selling Sacco Shares on mobile banking platforms, 10% indicated that they were offering services on opening an Account in mobile banking and 10% indicated that they were offering ATM Card Pin Change services on mobile banking platforms.

4.2.3 Organization's Policies support on Usage of Mobile Banking

The respondents were further asked to indicate the Level to which they felt their organization's Policies support the Usage of Mobile Banking. The results were as shown in figure 4.2.
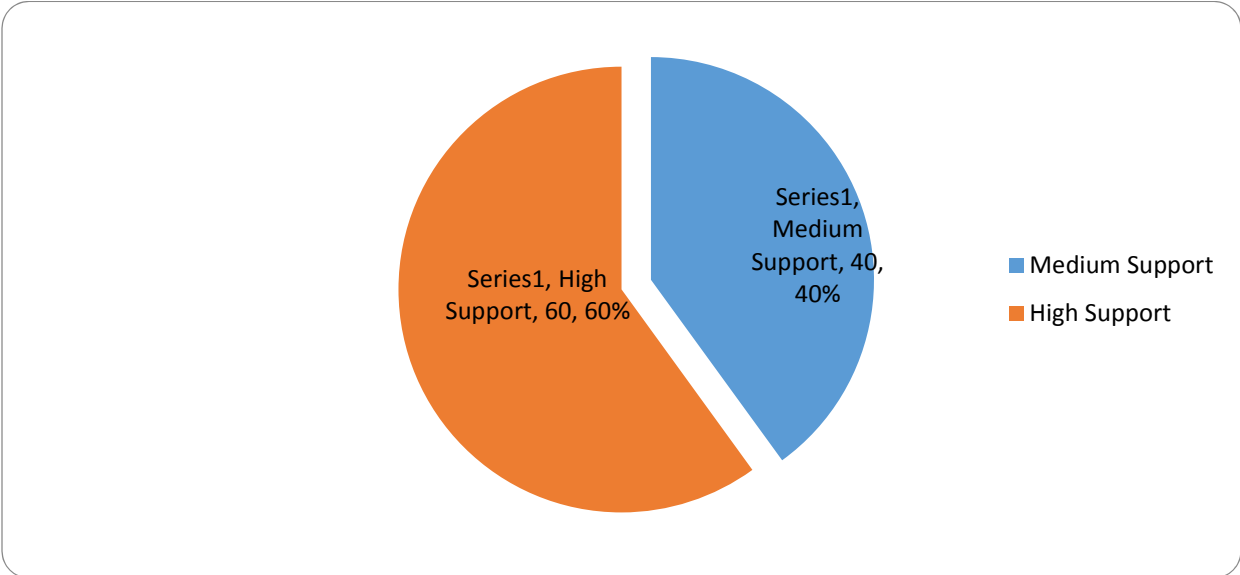
Figure 6: Organization's Policies Support on Usage of Mobile Banking

According to the findings, 60% of the respondents indicated that they felt that their organizations' policies were highly supporting the usage of mobile banking while 40% felt that their organizations' policies support for the usage of mobile banking was medium. This shows that

organizations' policies in most of the SACCOs were highly supporting the usage of mobile banking.

4.2.4 Level of Uptake of Mobile Banking in your SACCO by customers

The respondents were also asked to indicate the level of uptake of mobile banking in their SACCOs by customers. The results were as shown in figure 4.3.
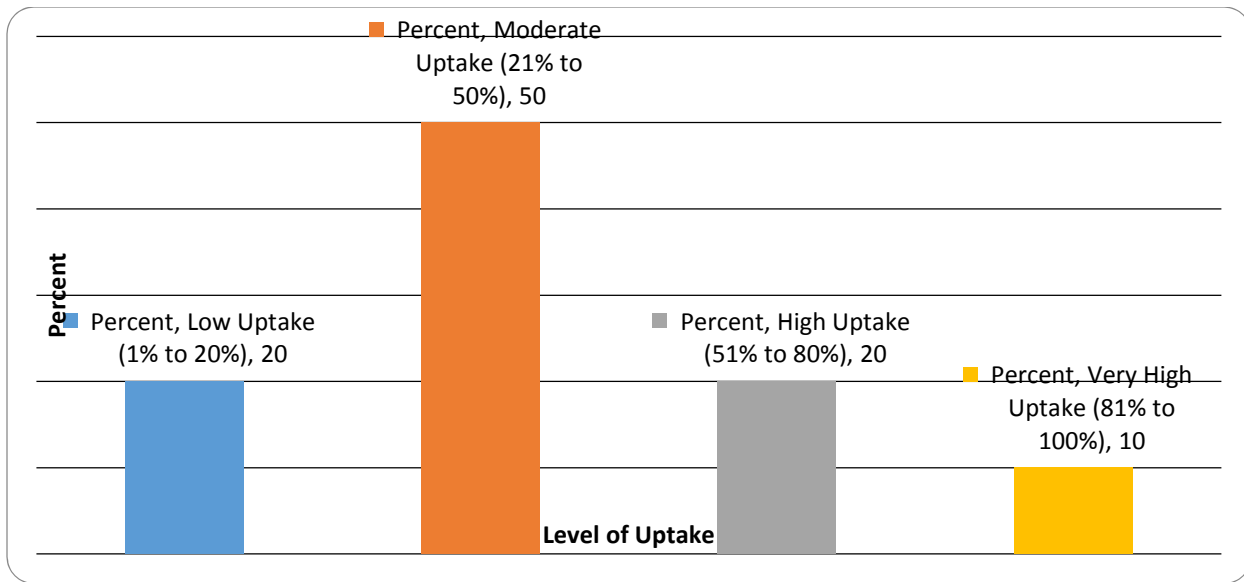
Figure 7: Level of Uptake of Mobile Banking in your SACCO by customers

From the findings, 50 of the respondents reported that there was a moderate uptake (21% to 50%) of mobile banking in the SACCO by customers, 20% indicated that there was low uptake (1% to 20%), the same percent (20%) indicated that there was high uptake (51% to 80%) and 10% indicated that there was very high uptake (81% to 100%) by customers. From these findings we can deduce that in most of the SACCOs in Nairobi County there was moderate uptake (21% to 50%) of mobile banking in the SACCO by customers.

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4.2.5 Level of Usage of Mobile Banking in SACCOs

The respondents were asked to select the level of usage of mobile banking in their SACCOs. The findings were as presented in Table 3 below.

Table 3: Level of Usage of Mobile Banking in SACCOs

	Frequency	Percent
No Usage (0 Transactions Per Customer Per Month)	3	10.0
Low Usage (1 to 3 Transactions Per Customer Per Month)	9	30.0
Moderate Usage (4 to 6 Transactions Per Customer Per Month)	12	40.0
High Usage (7 to 9 Transactions Per Customer Per Month)	3	10.0
Very High Usage (Over 10 Transactions Per Customer Per Month)	3	10.0
Total	**30**	**100.0**

As indicated in Table 3 above, 40% of the respondents indicated that there was moderate Usage (4 to 6 Transactions Per Customer Per Month) mobile banking in their SACCOs, 30% indicated that there was low usage (1 to 3 Transactions Per Customer Per Month), 10% indicated that there was high usage (7 to 9 Transactions Per Customer Per Month), 10% indicated that there was no usage (0 Transactions Per Customer Per Month) and the same percent indicated that there was very high usage (Over 10 Transactions Per Customer Per Month). These finding show that there is moderate usage (4 to 6 Transactions per Customer per Month) mobile banking in most SACCOs in Nairobi County.

4.3 Factors that Influence the Adoption of Mobile Banking in SACCOs

The second objective of this study was to determine the factors that influence adoption of Mobile Banking in Sacco's in Kenya

4.3.1 Perceived Benefits

The respondents were requested to indicate how much of a factor the stated benefits were influencing the adoption of Mobile Banking in SACCOs. The results were as shown in Table 4 below.

Table 4: Perceived Benefits

	SD	D	N	A	SA	Mean	Std Deviation
Mobile banking as an innovation has benefits	0	0	0	9	21	4.70	.466
Mobile banking has an advantage over other forms of banking	0	0	3	18	9	4.20	.610
Mobile banking is compatible with the Organization's existing systems	0	0	3	24	3	4.00	.454
Mobile banking is efficient as compared to other forms of banking	0	0	3	12	15	4.40	.674
Mobile banking is convenient as compared to other forms of banking	0	0	3	12	15	4.40	.674

From the findings, the respondents strongly agreed with a mean of 4.70 and a standard deviation of 0.466 that mobile banking as an innovation has benefits. The respondents agreed with a mean

4.40 and a standard deviation of 0.674 that mobile banking is efficient as compared to other forms of banking. The respondents also agreed with a mean of 4.40 and a standard deviation of 0.674 that mobile banking is convenient as compared to other forms of banking. The respondents further agreed with a mean of 4.20 and standard deviation of 0.610 that mobile banking has an advantage over other forms of banking. In addition, the respondents agreed with a mean of 4.00 and a standard deviation of 0.454 that mobile banking is compatible with the Organization's existing systems.

The respondents also indicated that mobile banking was changing lifestyles particularly the youths, was offering more control of the customers' money and it was time effective.

4.3.2 External Environmental Factors

The respondents were also asked to indicate how much of a factor External Environmental factors influence the adoption of Mobile Banking in SACCOs. The results were as presented in Table 5 below.

Table 5: External Environmental Factors

	SD	D	N	A	SA	Mean	Std Deviation
Government regulations (SASRA Regulatory policies) can influence the adoption of mobile banking	0	3	12	12	3	3.50	.820
Industry characteristics/trends can influence the adoption of mobile banking	0	0	0	12	18	4.60	.498
Competitive pressure can influence the adoption of mobile banking	0	0	0	6	24	4.80	.406
Market structure can influence the adoption of mobile banking	0	0	3	18	9	4.20	.610
Perceived success of competitor adopters can influence the adoption of mobile banking	0	0	0	18	12	4.40	.498

From the findings, the respondents strongly agreed with a mean of 4.80 and a standard deviation of 0.406 that competitive pressure can influence the adoption of mobile banking. The respondents agreed with a mean of 4.60 and a standard deviation of 0.498 that industry characteristics/trends can influence the adoption of mobile banking. The respondents also agreed with a mean of 4.40 and a standard deviation of 0.498 that perceived success of competitor adopters can influence the adoption of mobile banking. Further, the respondents agreed with a mean of 4.20 and a standard deviation of 0.610 that market structure can influence the adoption of mobile banking. In addition,

the respondents agreed with a mean of 3.50 and a standard deviation of 0.820 that government regulations (SASRA Regulatory policies) can influence the adoption of mobile banking.

4.3.3 Organizational Readiness

The respondents were also requested to indicate how much of a factor organizational readiness influences the adoption of Mobile Banking in their SACCOs. The results were as shown in Table 6 below.

Table 6: Organizational Readiness

	SD	D	N	A	SA	Mean	Std Deviation
Top management support can influence the adoption of mobile banking	0	0	0	9	21	4.70	.466
Available financial resources can influence the adoption of mobile banking	0	0	3	9	18	4.50	.682
Available ICT resources can influence the adoption of mobile banking	0	0	0	12	18	4.60	.498
Available staff technological competence can influence the adoption of mobile banking	0	0	3	21	6	4.10	.547
The organization's size (the number of employees in the organization) can influence the adoption of mobile banking	0	6	6	12	6	3.60	1.037

Organizational slack (the degree to which uncommitted resources are available to the organization) can influence the adoption of mobile banking	0	6	9	12	3	3.40	.932

According to the findings, the respondents strongly agreed with a mean of 4.70 and a standard deviation of 0.466 that top management support can influence the adoption of mobile banking. The respondents also strongly agreed with a mean of 4.60 and a standard deviation of 0.498 that available ICT resources can influence the adoption of mobile banking.

The respondents agreed with a mean of 4.50 and a standard deviation of 0.682 that available financial resources can influence the adoption of mobile banking. The respondents also agreed with a mean of 4.10 and a standard deviation of 0.547 that available staff technological competence can influence the adoption of mobile banking. In addition, the respondents agreed with a mean of 3.60 and a standard deviation of 1.037 that the organization's size (the number of employees in the organization) can influence the adoption of mobile banking. Further, the respondents agreed with a mean of 3.40 and a standard deviation of 0.932 that organizational slack (the degree to which uncommitted resources are available to the organization) can influence the adoption of mobile banking.

4.3.4 Security Perceptions

The respondents were asked to indicate how much of a factor the stated security perceptions influence the adoption of Mobile Banking in their SACCOs. The results were as presented in Table 7 below.

Table 7: Security Perceptions

	SD	D	N	A	SA	Mean	Std Deviation
The risk of exposure to fraud can influence the adoption of mobile banking	0	0	0	21	9	4.30	.466
The risk of transaction failures can influence the adoption of mobile banking	0	0	3	24	3	4.00	.454
Protection of client details can influence the adoption of mobile banking	0	0	3	15	12	4.30	.651
Security anxiety can influence the adoption of mobile banking	0	0	0	24	6	4.20	.406

As indicated in Table 7, the respondents agreed with a mean of 4.30 and a standard deviation of 0.466 that the risk of exposure to fraud can influence the adoption of mobile banking. The respondents also agreed with a mean of 4.30 and a standard deviation of 0.651 that protection of client details can influence the adoption of mobile banking. In addition, the respondents agreed with a mean of 4.20 and a standard deviation of 0.406 that security anxiety can influence the adoption of mobile banking. Further, the respondents agreed with a mean of 4.00 and a standard deviation of 0.454 that the risk of transaction failures can influence the adoption of mobile banking.

4.4 Adoption of Mobile Banking by SACCOs

The respondents were asked to indicate their level of agreement with the stated influences of influence adoption of Mobile Banking on SACCOs in Kenya. The results were as presented in Table 8 below.

Table 8: Adoption of Mobile Banking by SACCOs

	SD	D	N	A	SA	Mean	Std Deviation
Mobile banking can increase revenue for the organization	0	0	0	3	27	4.90	.305
Mobile banking can increase the range of services offered	0	0	0	6	24	4.80	.406
Mobile banking can increase the number of transactions done per customer	0	0	0	6	24	4.80	.406
Mobile banking can increase the rate of loan repayments	0	0	6	15	9	4.10	.711
Mobile banking can reduce the cost of offering services	0	0	0	15	15	4.50	.508
Mobile banking can result in a wider customer reach	0	0	0	3	27	4.90	.305

According to the findings, the respondents strongly agreed with a mean of 4.90 and a standard deviation of 0.305 that mobile banking can increase revenue for the organization. The respondents

also strongly agreed with a mean of 4.90 and a standard deviation of 0.305 that mobile banking can result in a wider customer reach. The respondents also strongly agreed with a mean of 4.80 and a standard deviation of 0.406 that mobile banking can increase the range of services offered. In addition, the respondents strongly agreed with a mean of 4.80 and a standard deviation of 0.406 that mobile banking can increase the number of transactions done per customer. Further, the respondents further agreed with a mean of 4.50 and a standard deviation of 0.508 that mobile banking can reduce the cost of offering services. In addition, the respondents agreed with a mean of 4.10 and a standard deviation of 0.711 that mobile banking can increase the rate of loan repayments.

4.5 Other Factors Influencing the Adoption of Mobile Banking in SACCOs

The respondents were asked to indicate other factors that influence the adoption of Mobile Banking in their SACCOs. From the findings, the respondents indicated that other factors influencing the adoption of Mobile Banking in SACCOs include affordability of mobile gadgets, peer influence, aggressive marketing through education, data connectivity, customer willingness, level of literacy among the members/customers and security issues. The respondents also indicated that leadership and organizational goodwill, cash flow stability of an organization influence the adoption of Mobile Banking in SACCOs. Further, the general perception of the mobile banking in the industry has been that it exposes SACCOs to fraud.

4.6 Improving Adoption of Mobile Banking in SACCOs

The respondents were asked to indicate their suggestions for the improvement of the adoption of Mobile Banking in their SACCOs. From the findings, the respondents indicated that SACCOs should reduce on downtimes and improve on efficiency. The respondents also indicated that SACCOs should create awareness to the member through members' education and training and

improve security for mobile transactions. The respondents also suggested that SACCOs should do more marketing to create awareness of the services and simplify the mobile banking applications.

4.7 Factor Analysis

This section presents the factor analysis results for perceived benefits, external environmental factors, organizational readiness, security perceptions and adoption of mobile banking constructs. Factor analysis is a technique that is used for data reduction. It attempts to identify the underlying variables that explain a given pattern of correlations within a set of observed variables. This study uses factor analysis to reduce data so as to identify a small number of factors that explain most of the variance that is observed in a much larger number of manifest variables or constructs.

4.7.1 Factor Analysis for Perceived Benefits Construct

Perceived benefits is a construct as it is measured by a number of items. The study used factor analysis to find out the variable that strongly explains the underlying observed variable that is, perceived benefits. Principal component analysis was used with varimax rotation method and rotated solutions for ease of identification.

Table 9: Communalities for Perceived Benefit Constructs

	Initial	Extraction
Mobile banking as an innovation has benefits	1.000	.451
Mobile banking has an advantage over other forms of banking	1.000	.632
Mobile banking is compatible with the Organization's existing systems	1.000	2.956E-031
Mobile banking is efficient as compared to other forms of banking	1.000	.842
Mobile banking is convenient as compared to other forms of banking	1.000	.842

The study used Eigen value of one as the initial solution and found the communalities as shown in Table 9 above. The study used communalities to indicate the amount of variance in each variable that is accounted for. The Eigen value of one is the initial communalities that give the estimate of the variance in each variable accounted for by all components or factors.

Table 10: Total Variance Explained for Perceived Benefit Constructs

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.768	55.355	55.355	2.768	55.355	55.355
2	1.000	20.000	75.355			
3	.843	16.865	92.220			
4	.389	7.780	100.000			
5	1.369E-016	2.737E-015	100.000			

The result for total variance explained shows that the percent of total variance that is explained by the first component is 55.35%. Further, the result shows that the extracted component explains about 55.35% of the variability in the original five variables. This implies that we can reduce the complexity of the data set by using one component since only 44.65% of information is lost.
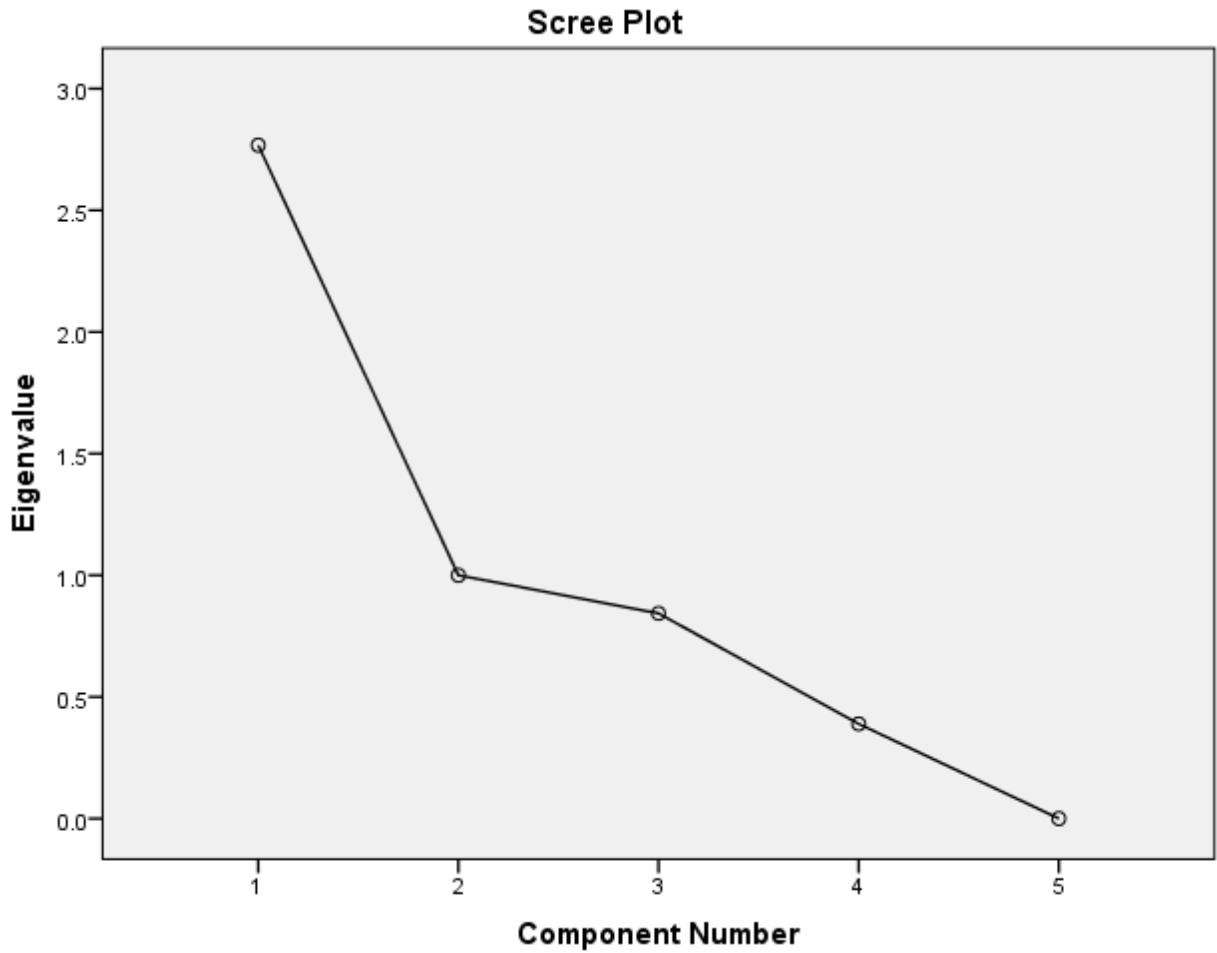
Figure 8: Scree Plot for Perceived Benefit Constructs

This finding is supported by the scree plot shown in Figure 8 above. The scree plots the Eigen value of each component thus it helps in determining the optimal number of components. Figure 8 above shows that only one component that has extracted value greater than the initial Eigen value.

Table 11: Component Matrix for Perceived Benefit Constructs

	Component
	1
Mobile banking as an innovation has benefits	.672
Mobile banking has an advantage over other forms of banking	.795
Mobile banking is compatible with the Organization's existing systems	.000
Mobile banking is efficient as compared to other forms of banking	.925
Mobile banking is convenient as compared to other forms of banking	.918

Finally, the study uses the component matrix to identify what the components represent. As shown in Table 11 above, the first component is highly correlated with **"mobile banking is efficient as compared to other forms of banking"** hence it is a good representative of perceived benefits. This implies that the study can generate factor scores for the chosen component since the component is a representative of all five original variables. The findings shows that perceived benefits construct can be represented by component one since it has a value of 0.925 that is highly correlated with "**mobile banking is efficient as compared to other forms of banking**".

4.7.2 Factor Analysis for External Environmental Factors Constructs

External environmental factors is a construct as it is measured by a number of items. The study used factor analysis to find out the variable that strongly explains the underlying observed variable that is, external environmental factors.

Table 12: Communalities for External Environmental factors Constructs

	Initial	Extraction
Government regulations (SASRA Regulatory policies) can influence the adoption of mobile banking	1.000	.633
Industry characteristics/trends can influence the adoption of mobile banking	1.000	.767
Competitive pressure can influence the adoption of mobile banking	1.000	.747
Market structure can influence the adoption of mobile banking	1.000	.769
Perceived success of competitor adopters can influence the adoption of mobile banking	1.000	.594

The results for communalities for external environmental factors shows that most of the variables have extracted communalities that are relatively high as compared to the initial communalities (Table 12 above).

Table 13: Total Variance Explained for External Environmental Factors Constructs

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.947	38.946	38.946	1.947	38.946	38.946
2	1.563	31.251	70.197	1.563	31.251	70.197
3	.752	15.050	85.246			
4	.418	8.351	93.598			
5	.320	6.402	100.000			

The total variance explained for external environmental factors construct shows that the first component explains about 38.946% of the total variability and the second components explains 31.251% of the total variability. Cumulatively, both the first and the second components explain 70.197% of the total variability. This implies that the first and the second components are a good representation of external environmental factors construct. This implies that we can reduce the complexity of the data set by using two component since only 29.80% of information is lost.
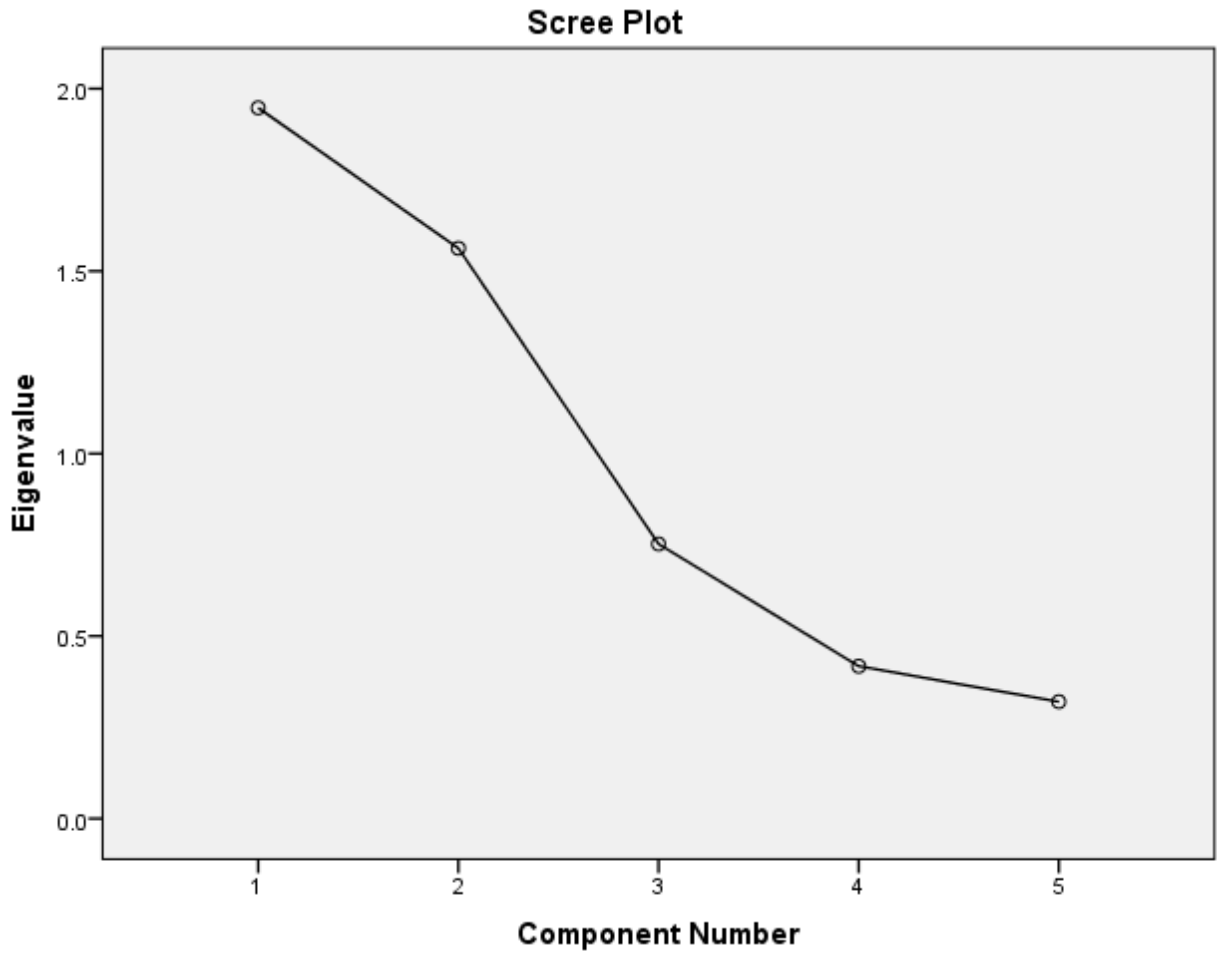
Figure 9: Scree Plot for External Environmental factors Constructs

The scree plots shows the Eigen value of each component thus it helps in determining the optimal number of components. Figure 9 above shows that only two components that have extracted values greater than the initial Eigen value.

Table 14: Component Matrix for External Environmental Factors Constructs

	Component	
	1	2
Government regulations (SASRA Regulatory policies) can influence the adoption of mobile banking	-.014	.796
Industry characteristics/trends can influence the adoption of mobile banking	.719	-.500
Competitive pressure can influence the adoption of mobile banking	.852	-.142
Market structure can influence the adoption of mobile banking	.408	.776
Perceived success of competitor adopters can influence the adoption of mobile banking	.733	.238

The study uses the component matrix to identify what the components represent. As shown in Table 14 above, the first component is highly correlated with **"Competitive pressure can influence the adoption of mobile banking"** and the second component is highly correlated with **"Government regulations (SASRA Regulatory policies) can influence the adoption of mobile banking "**. This implies that the study can generate factor scores for the chosen components since the components are a representative of all five original variables. The findings shows that external environmental factors construct can be represented by component one and two since they have values of 0.852 and 0.776 respectively.

4.7.3 Factor Analysis for Organizational Readiness Constructs

Organization readiness is a construct as it is measured by a number of items. The study used factor analysis to find out the variable that strongly explains the underlying observed variable that is, organization readiness.

Table 15: Communalities for Organizational Readiness Constructs

	Initial	Extraction
Top management support can influence the adoption of mobile banking	1.000	.712
Available financial resources can influence the adoption of mobile banking	1.000	.401
Available ICT resources can influence the adoption of mobile banking	1.000	.474
Available staff technological competence can influence the adoption of mobile banking	1.000	.873
The organization's size (the number of employees in the organization) can influence the adoption of mobile banking	1.000	.895
Organizational slack (the degree to which uncommitted resources are available to the organization) can influence the adoption of mobile banking	1.000	.724

The results for communalities for organization readiness show that most of the variables have extracted communalities that are relatively high as compared to the initial communalities (Table 15 above).

Table 16: Total Variance Explained for Organizational Readiness Constructs

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.369	39.477	39.477	2.369	39.477	39.477
2	1.710	28.498	67.975	1.710	28.498	67.975
3	.901	15.013	82.988			
4	.748	12.462	95.450			
5	.164	2.728	98.179			
6	.109	1.821	100.000			

The total variance explained for organization readiness construct shows that the first component explains about 39.477% and the second component explains 28.498% of the total variability in the six original variables (Table 16 above). This implies that the first component and the second components are a good representation of organization readiness construct.

Figure 10: Scree Plot for Organizational Readiness Constructs

The scree plots the Eigen value of each component in the organization readiness helps in determining the optimal number of components. Figure 10 above shows that only two components that have extracted value greater than the initial Eigen value.

Table 17: Component Matrix for Organizational Readiness Constructs

	Component	
	1	2
Top management support can influence the adoption of mobile banking	.688	-.489
Available financial resources can influence the adoption of mobile banking	.286	.565
Available ICT resources can influence the adoption of mobile banking	.609	-.321
Available staff technological competence can influence the adoption of mobile banking	.934	.012
The organization's size (the number of employees in the organization) can influence the adoption of mobile banking	.063	.944
Organizational slack (the degree to which uncommitted resources are available to the organization) can influence the adoption of mobile banking	.753	.397

The study uses the component matrix to identify what the components represent. As shown in Table 17 above, the first component is highly correlated with **"available staff technological competence can influence the adoption of mobile banking"** and the second component is highly correlated with "**the organization's size (the number of employees in the organization) can influence the adoption of mobile banking**". This implies that the study can generate factor scores for the chosen components since the components are a representative of all six original variables.

The findings shows that organization readiness factors construct can be represented by component one and two since they have values of 0.934 and 0.944 respectively.

4.7.4 Factor Analysis for Security Perception Constructs

Perceived benefits is a construct as it is measured by a number of items. The study used factor analysis to find out the variable that strongly explains the underlying observed variable that is, perceived benefits. Principal component analysis was used with varimax rotation method and rotated solutions for ease of identification.

Table 18: Communalities for Security Perception Constructs

	Initial	Extraction
The risk of exposure to fraud can influence the adoption of mobile banking	1.000	.962
The risk of transaction failures can influence the adoption of mobile banking	1.000	.804
Protection of client details can influence the adoption of mobile banking	1.000	.785
Security anxiety can influence the adoption of mobile banking	1.000	.708

The results for communalities for security perception shows that most of the variables have extracted communalities that are relatively high as compared to the initial communalities (Table 18 above).

Table 19: Total Variance Explained for Security Perception Constructs

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.221	55.537	55.537	2.221	55.537	55.537
2	1.037	25.931	81.468	1.037	25.931	81.468
3	.442	11.044	92.512			
4	.300	7.488	100.000			

The total variance explained for security perception construct shows that the first component explains about 55.537% and the second component explains 25.931% of the total variability in the four original variables (Table 19). The cumulative variability for the two components is 81.486% which shows that we can reduce the complexity of the data set by using the two component since only 18.51% of information is lost.
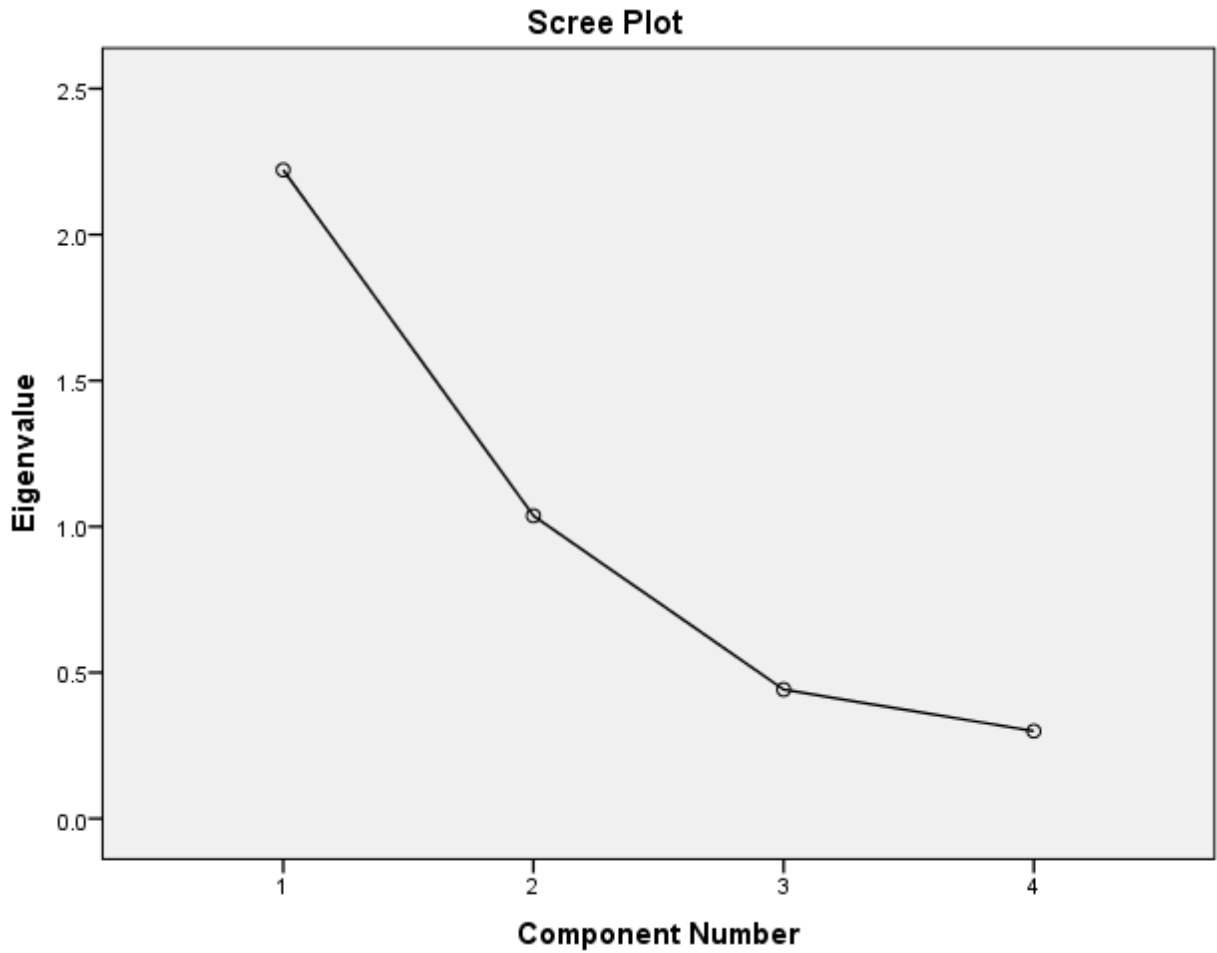
Figure 11: Scree Plot for Security Perception Constructs

The scree plots the Eigen value of each component of security perception helps in determining the optimal number of components. Figure 11 above shows that two components have extracted values greater than the initial Eigen value.

Table 20: Component Matrix for Security Perception Constructs

	Component	
	1	2
The risk of exposure to fraud can influence the adoption of mobile banking	.171	.966
The risk of transaction failures can influence the adoption of mobile banking	.873	-.205
Protection of client details can influence the adoption of mobile banking	.871	-.163
Security anxiety can influence the adoption of mobile banking	.820	.190

The study uses the component matrix to identify what the components represent. As shown inTable 20 above, the first component is highly correlated with **"the risk of transaction failures can influence the adoption of mobile banking"** and the second component is highly correlated with **"the risk of exposure to fraud can influence the adoption of mobile banking"**. This implies that the study can generate factor scores for the chosen components since the components are a representative of all four original variables. The findings shows that security perception factors construct can be represented by component one and two since they have values of 0.873 and 0.966 respectively.

4.7.5 Factor Analysis for Adoption of Mobile Banking Constructs

Adoption of mobile banking is a construct as it is measured by a number of items. The study used factor analysis to find out the variable that strongly explains the underlying observed variable that is, adoption of mobile banking.

Table 21: Communalities for Adoption of Mobile Banking Constructs

	Initial	Extraction
Mobile banking can increase revenue for the organization	1.000	.778
Mobile banking can increase the range of services offered	1.000	.816
Mobile banking can increase the number of transactions done per customer	1.000	.713
Mobile banking can increase the rate of loan repayments	1.000	.860
Mobile banking can reduce the cost of offering services	1.000	.811
Mobile banking can result in a wider customer reach	1.000	.380

The results for communalities for adoption of mobile banking shows that most of the variables have extracted communalities that are relatively high as compared to the initial communalities (Table 21).

Table 22: Total Variance Explained for Adoption of Mobile Banking Constructs

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.835	47.248	47.248	2.835	47.248	47.248
2	1.522	25.374	72.622	1.522	25.374	72.622
3	.864	14.395	87.017			
4	.364	6.069	93.086			
5	.298	4.968	98.054			
6	.117	1.946	100.000			

The total variance explained for adoption of mobile banking construct shows that the first component explains about 47.248% and the second component explains 25.374% of the total variability in the six original variables (Table 22). The cumulative variability for the two

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components is 72.622% which shows that we can reduce the complexity of the data set by using the two component since only 27.38% of information is lost.
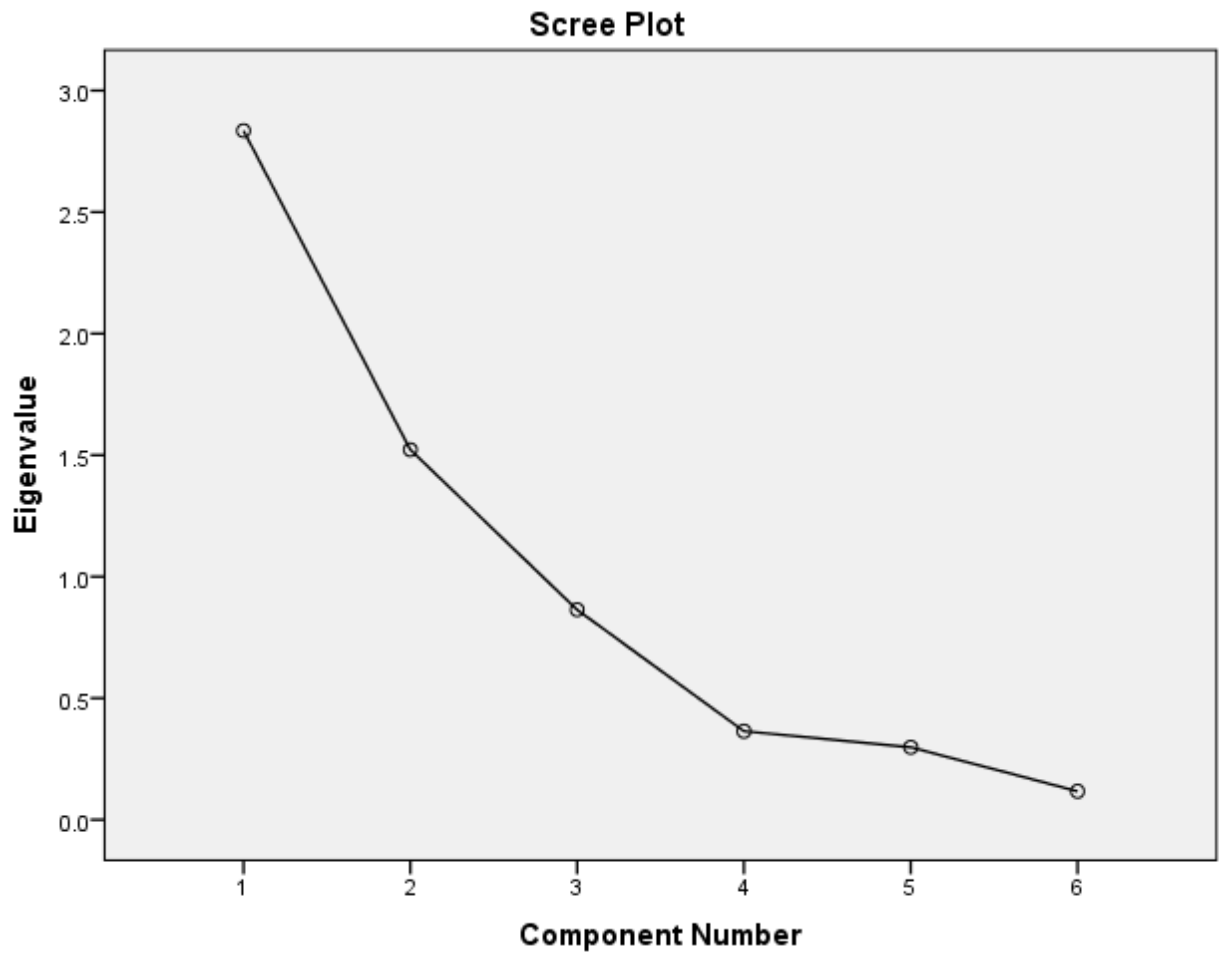

Figure 12: Scree Plot for Adoption of Mobile Banking Constructs

The scree plots the Eigen value of each component helps in determining the optimal number of components. Figure 12 shows that two components that have extracted value greater than the initial Eigen value.

Table 23: Component Matrix for Adoption of Mobile Banking Constructs

	Component	
	1	2
Mobile banking can increase revenue for the organization	.881	-.034
Mobile banking can increase the range of services offered	.826	.366
Mobile banking can increase the number of transactions done per customer	.786	-.309
Mobile banking can increase the rate of loan repayments	.754	.539
Mobile banking can reduce the cost of offering services	-.360	.826
Mobile banking can result in a wider customer reach	-.246	.565

The study uses the component matrix to identify what the components represent. As shown in Table 23 above, the first component is highly correlated with **"mobile banking can increase revenue for the organization"** and the second component is highly correlated with **"mobile banking can reduce the cost of offering services"**. This implies that the study can generate factor scores for the chosen components since the components are a representative of all six original variables. The findings shows that adoption of mobile banking construct can be represented by component one and two since they have values of 0.881 and 0.826 respectively.

4.8 Regression Analysis

A multivariate regression analysis was used to determine the relationship between the dependent and the independent variables. The multivariate regression model was:

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

Where: Y = adoption of mobile banking; β_0 = Constant Term; β_1, β_2, β_3 and β_4 = Beta coefficients; X_1= perceived benefits; X_2= external environmental factors; X_3=organization readiness; X_4= security perceptions;

Table 24: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.871	.759	.742	.25648

The R-Squared is the proportion of variance in the dependent variable which can be explained by the independent variables. The R-squared in this study was 0.742, which shows that the four independent variables (perceived benefits, external environmental factors, organization readiness, and security perceptions) can explain 74.2% of the dependent variable. This shows that the other factors not studied in this study explain 25.8% of the dependent variable (adoption of mobile banking).

Table 25: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.155	4	.289	16.246	0.000
	Residual	0.445	25	.018		
	Total	1.600	29			

The analysis of variance in this study was used to determine whether the model is a good fit for the data. From the findings, the p-value was 0.000 which is less than 0.05 and hence the model is good in predicting how the four independent variables (perceived benefits, external environmental factors, organization readiness, and security perceptions) influence adoption of mobile banking.

Further, the F-calculated (16.246) was more than the F-critical (2.76) which shows that the model was fit in predicting the influence of the independent variables on the dependent variable.

Table 26: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	4.065	.575		7.074	.000
perceived benefits	.352	.082	.326	4.293	.000
External environmental factors	.243	.092	.212	2.641	.012
Organization readiness	.432	.093	.421	4.645	.000
Security perception	.182	.082	.167	2.220	.024

Based on this table, the equation for the regression line is:

$Y = 4.065 + 0.352X_1 + 0.243X_2 + 0.432X_3 + 0.182X_4$

According to the intercept (β_0), when the four independent variables are held constant, the value of adoption of mobile banking will have an index of 4.065. In addition, holding all the other independent variables constant, a unit increase in perceived benefits would lead to a 0.352 improvement in the adoption of mobile banking. The relationship was significant as shown by a

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p-value of 0.000. Further, holding all the other independent variables constant, a unit increase in external environmental factors would lead to a 0.243 improvement in the adoption of mobile banking. The relationship was significant as shown by p-value of 0.012. In addition, holding all the other variables constant, a unit increase in organization readiness would lead to a 0.432 improvement in the adoption of mobile banking. The relationship is significant as shown by a p-value of 0.000. Lastly, the findings show that a unit increase in security perception would lead to a 0.182 improvement in the adoption of mobile banking. The relationship was significant as shown by a p-value of 0.024.

From these findings we can infer that organization readiness was influencing the adoption of mobile banking most, followed by perceived benefits, external environmental factors and security perception.

4.9 The Resulting Model

A multivariate regression analysis was used to determine the relationship between the dependent and the independent variables. The R-Squared is the proportion of variance in the dependent variable which can be explained by the independent variables. The R-squared in this study was 0.742, which shows that the four independent variables (perceived benefits, external environmental factors, organization readiness, and security perceptions) can explain 74.2% of the dependent variable.

4.91 Perceived Benefit

The result for total variance explained shows that the percent of total variance that is explained by the first component is 55.35%. The study uses the component matrix to identify what the components represent. The first component is highly correlated with *"mobile banking is efficient as compared to other forms of banking"* hence it is a good representative of perceived benefits.

4.92 External Environment

The first component explains about 38.946% and the second components explains 31.251% of the total variability. Cumulatively, both explain 70.197% of the total variability. Using component matrix to identify what the components represent, the first component is highly correlated with *"Competitive pressure can influence the adoption of mobile banking"* and the second component is highly correlated with *"Government regulations (SASRA Regulatory policies) can influence the adoption of mobile banking"*. This implies that the study can generate factor scores for the chosen components since the components are a representative of all five original variables.

4.93 Organizational Readiness

The first component explains about 39.477% and the second component explains 28.498% of the total variability. Cumulatively, both explain 67.975% of the total variability. Using component matrix to identify what the components represent, the first component is highly correlated with *"available staff technological competence can influence the adoption of mobile banking"* and the second component is highly correlated with *"the organization's size (the number of employees in the organization) can influence the adoption of mobile banking"*. This implies that the study can generate factor scores for the chosen components since the components are a representative of all six original variables.

4.94 Security Perception

The first component explains about 55.537% and the second component explains 25.931% of the total variability. The cumulative variability for the two components is 81.486%. Using component matrix to identify what the components represent, the first component is highly correlated with *"the risk of transaction failures can influence the adoption of mobile banking"* and the second component is highly correlated with *"the risk of exposure to fraud can influence the adoption of mobile banking"*. This implies that the study can generate factor scores for the chosen components since the components are a representative of all four original variables.

4.95 Adoption of Mobile Banking

The total variance explained for adoption of mobile banking construct shows that the first component explains about 47.248% and the second component explains 25.374% of the total variability. The cumulative variability for the two components is 72.622%. Using component matrix to identify what the components represent, the first component is highly correlated with *"mobile banking can increase revenue for the organization"* and the

second component is *"mobile banking can reduce the cost of offering services"*. This implies that the study can generate factor scores for the chosen components since the components are a representative of all six original variables.

The resulting modified model, which can be used to evaluate mobile banking adoption is shown in Figure 13 below.

Perceived Benefit
- Increased efficiency

External Environment
- Competitive pressure
- Government regulations

Organizational Readiness
- Technological competence and support
- Organizational size

Security Concerns
- Exposure to fraud
- Transaction failure

Adoption of Mobile Banking by SACCOs
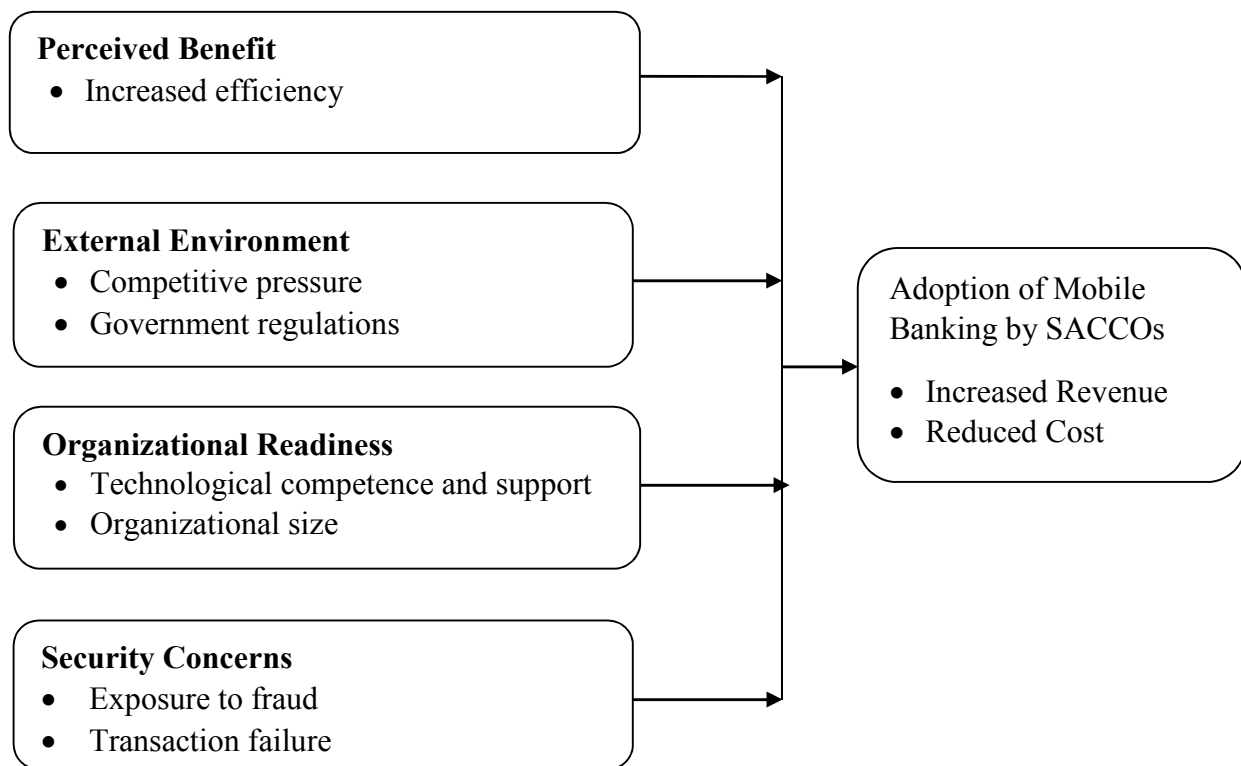- Increased Revenue
- Reduced Cost

Figure 13: Resulting Model

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the findings, conclusions and recommendations for practice and further research on the problem. The purpose of the study was to assess the adoption of mobile banking services by Nairobi County Sacco's. The study also sought to find out mobile banking services that can be offered through mobile banking; to determine the factors that influence adoption of Mobile Banking in Sacco's in Kenya; and to develop a model that can be used to evaluate mobile banking adoption.

5.2 Summary of the Key Findings

5.2.1 Mobile Banking Services that Can Be Offered through Mobile Banking

The study established that SACCOs located in Nairobi County had adopted mobile banking and hence were offering services through mobile banking services. The study also found that SACCOs in Nairobi County were offering services on requesting mini statements, checking account balance, cash withdrawals, buying airtime, loan repayments, paying Bills (Paybill), cash deposits, money transfer, loan applications services and buying SACCO shares services, selling SACCO Shares, opening accounts ATM Card Pin Change services on mobile banking platforms.

The study also revealed that organizations' policies in most of the SACCOs were highly supporting the usage of mobile banking. In addition, most of the SACCOs in Nairobi County there was moderate uptake (21% to 50%) of mobile banking in the SACCO by customers. The study also revaled that there is moderate usage (4 to 6 Transactions per Customer per Month) mobile banking in most SACCOs in Nairobi County.

5.2.2 Factors that Influence the Adoption of Mobile Banking in SACCOs

The study established that mobile banking can increase revenue for the organization and reduce the cost of offering services. These findings agree with Maina (2012) argument that the adoption of mobile banking by financial institutions is very important in improving operations and reducing costs in the long run hence increase in earnings/revenue. The study also found that mobile banking can result in a wider customer reach. These findings agree with McGee (2009) findings that mobile banking leads to an increase in financial deepening. The study revealed that mobile banking can increase the range of services offered. According to Weigel et al. (2014), mobile banking has led to increased provision of financial services, and access to basic financial services such as credit, savings and withdrawals. In addition, the study found that mobile banking can increase the number of transactions done per customer and increase the rate of loan repayments.

The study found that perceived benefits influence the adoption of mobile banking positively and significantly. These findings agree with Faaeq et al. (2013) argument that perceived benefits influences the adoption of information technology significantly. The study also found that mobile banking is efficient and convenient as compared to other forms of banking. In addition, the study revealed that mobile banking is compatible with the organization's existing systems. The study further established that mobile banking was changing lifestyles particularly the youths, was offering more control of the customers' money and it was time effective.

The study established that external environmental factors influence adoption of mobile banking positively and significantly. It was also established that competitive pressure can influence the adoption of mobile banking. These findings agree with Maina (2012) argument that competitive pressure in the banking pressure influences the adoption of mobile banking. The study also found

that industry characteristics/trends can influence the adoption of mobile banking. The study also revealed that perceived success of competitor adopters as well as the market structure influence the adoption of mobile banking. In addition, the study established that government regulations (SASRA Regulatory policies) can influence the adoption of mobile banking. According to Demombynes and Thegeya, (2012), regulatory factors, which can vary dramatically from country to country, play a strong role in determining which services can be delivered via which institutional arrangements.

The study revealed that organization readiness influences the adoption of mobile banking both positively and significantly. In addition, top management support was found to influence the adoption of mobile banking in SACCOs. The study also established that available ICT resources can influence the adoption of mobile banking. The study revealed that available financial resources can influence the adoption of mobile banking. These findings agree with Venkatesh et al. (2012) findings that facilitating conditions such as ICT resources, infrastructure as well as financial resources influence the adoption of mobile banking. The study further revealed that available staff technological competence as well as the organization's size (the number of employees in the organization) influence the adoption of mobile banking. Further, the study revealed that organizational slack (the degree to which uncommitted resources are available to the organization) can influence the adoption of mobile banking.

The study revealed that security perceptions influence the adoption of mobile banking both positively and significantly. The study also found that the risk of exposure to fraud as well as risk of transaction failures can influence the adoption of mobile banking. According to Gouws and Oudtshoorn (2011), security factors influencing the adoption of mobile banking include security and privacy concerns as well as transaction failures. The study also established that protection of

client details influences the adoption of mobile banking in SACCOs. In addition, the study found that security anxiety can influence the adoption of mobile banking.

The study found that other factors influencing the adoption of Mobile Banking in SACCOs include affordability of mobile gadgets, peer influence, aggressive marketing through education, connectivity, customer willingness, level of literacy among the members/customers, security issues, leadership and organizational goodwill, cash flow stability and the general perception of the mobile banking in the industry has been that it exposes SACCOs to fraud. These findings concur with Teo and Noyes (2014) findings that factors such as peer influence, level of literacy and leadership influence the adoption of information technology.

5.3 Conclusion

The study concludes that SACCOs in Nairobi County had adopted mobile banking and were offering services such as requesting mini statements, checking account balance, cash withdrawals, buying airtime, loan repayments, paying Bills (Paybill), cash deposits, money transfer, loan applications services and buying SACCO shares services, selling SACCO Shares, opening accounts ATM Card Pin Change services on mobile banking platforms.

The study also concludes that perceived benefits influence the adoption of mobile banking positively and significantly. Mobile banking was found to be efficient and convenient as compared to other forms of banking. In addition, the study revealed that mobile banking is compatible with the organization's existing systems. The study found that mobile banking has other benefits which include increase revenue, reduction in the cost of services, wider customer reach, and increase in the range of services offered as well as increase in the number of transactions done per customer and rate of loan repayments.

The study also concludes that external environmental factors influence adoption of mobile banking positively and significantly. More specifically, external environmental factors such as competitive pressure, industry characteristics/trends, perceived success of competitor adopters, market structure and government regulations (SASRA Regulatory policies) influence the adoption of mobile banking.

The study further concludes that organization readiness influences the adoption of mobile banking both positively and significantly. In addition, top management support, availability of ICT resources, availability of financial resources, staff technological competence as well as the organization's size (the number of employees in the organization) influence the adoption of mobile banking.

Lastly, the study concludes that security perceptions influence the adoption of mobile banking both positively and significantly. The study also found risk of exposure to fraud, risk of transaction failures, protection of client details, security anxiety influence the adoption of mobile banking.

The study also develops a model that can be used to evaluate mobile banking adoption as shown in Figure 13 above.

5.4 Recommendations

This study recommends that;

SACCOs should create awareness to the members on the perceived benefits of using mobile banking, which include convenience, accessibility and affordability. This can be done through members education and training. This will help to get rid of the perceived complexity of mobile banking usage.

The government of Kenya should ensure that government regulations such as SASRA Regulatory policies do not hinder the adoption of mobile banking in SACCOs. The study also recommends that more policies should be developed to increase security in mobile banking by protecting clients' details.

The top management of SACCOs should show support and campaign for the adoption of mobile banking. This will help to reduce staff and clients resistance to changes that come with the adoption of mobile banking.

SACCOs should realize that it is their responsibility to protect their clients' details and hence they should ensure that their systems are safe before launching mobile banking. In addition, SACCOs should ensure that transactions failure are minimal so as to prevent clients' inconveniences.

5.5 Suggestions for Further Studies

This study was limited to Nairobi County and hence it suggests that further studies should be conducted on factors affecting the adoption of mobile banking in Kenya, covering all the 47 counties. Further, the four independent variables used in this study could only explain 74.2% of the adoption of mobile banking. The study therefore suggest further studies to uncover the other variables that explain the 25.8% of the adoption of mobile banking.

REFERENCES

Ajzen, I., (1991). *The Theory of Planned Behaviour, Organizational Behaviour and Human Decision Processes. Organizational Behavior and Human Decision Processes*, 50, p. 179-211

Asongu, S.A. (2012). How has Mobile Banking Stimulated Financial Development in Africa? *MPRA Paper No. 38576, May 2012*

Awadhi, A. A. (2013). Adoption and Acceptance of M-Banking System in Kingdom of Bahrain. *International Journal of Information and Communication Technology Research, 3*(2), pp. 56-76

Bandura, A., (1977). *Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review,* 84, pp. 191-215.

Bryman, A. (2003). Integrating quantitative and qualitative research: how is it done?' *Qualitative research*, *6*(1), pp. 97-113.

Creswell, J.W. (2006). *Research design. Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks CA: Sage.

Das, R. and Pal, S., (2011). *Adoption of Mobile Financial Services among the Rural Under-Banked. Asian Journal of Communication, 18*(4), pp. 318-322.

Davis, F. D., (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly,* 13(3), pp. 319-40.

Demombynes, G. and Thegeya, A. (2012). Kenya's Mobile Revolution and the Promise of Mobile Savings, *World Bank Policy Research Working Paper, No. 5988.*

Faaeq, M. K., Ismail, N. A., Osman, W. S., Al-Swidi, A. K. and Faieq, A. K. (2013). A meta-analysis of the unified theory of acceptance and use of technology studies among several countries. *Electronic Government: An International Journal*, *10*(3), pp. 343-360.

Gouws, T., and Oudtshoorn, G. P. (2011). Correlation between brand longevity and the diffusion of innovations theory. *Journal of Public Affairs (14723891)*, *11*(4), pp. 236-242.

Greener S.L. (2008). *Business Research Methods*. Copenhagen: Ventus Publishing ApS.

Imetur, R. O. (2012). *Factors affecting the implementation of mobile banking at Kenya Commercial Bank, Kenya*. Available at:

http://erepository.uonbi.ac.ke:8080/xmlui/handle/123456789/13240 [Accessed 16 June 2015].

Jonathan, D. and Camilo, T. (2008). Mobile banking and economic development: Linking adoption, impact and use. *Asian Journal of Communication, 18*(4), pp. 318-322.

Kaina, M. (2010). *A Survey on the Investment Practices among Savings and Credit Cooperatives in Nairobi*, *BBA Project*, KCA University. Unpublished Research Project

Karjaluoto, H. (2002). Factors underlying attitude formation towards online banking in Finland. *International Journal of Bank Marketing, 20*(6), pp. 261-272

Keli, T. K. (2012). *Factors affecting adoption of mobile Phone banking by customers of commercial Banks in Kenya.* Available at: http://erepository.uonbi.ac.ke:8080/xmlui/handle/123456789/13434 [Accessed 16 June 2015].

Kothari, C. R. (2004). *Research methodology*: *Methods and techniques*. New Delhi: New Age International (P) Limited Publishers.

Maina E. (2012). *Contribution of mobile banking towards financial performance of Commercial Banks in Kenya,* University of Nairobi: Unpublished MBA project.

Martins, M. and Oliveira, T. (2014). Literature Review of Information Technology Adoption Models at Firm Level.

Martins, M., Oliveira, T. and Popovic, A. (2011). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*, *34*(1), pp. 1-13.

Mburu, M. (2013). *Determinants of Performance of SACCOs in Kenya*. University of Nairobi: Unpublished MBA project

McGee, B. (2009). *Mobile Banking: Mobile Banking Adoption driven by Device not by Age.* Available at: http://brandonmcgee.blogspot.com/2009/04/mobile-banking-adoption-driven-by.html [Accessed 16 June 2015].

Mwiti, A.M. (2009). *The extent of adoption of branding concept by Kenyan cooperative societies: The case of Saccos offering front office services in Nairobi province*. Available at: erepository.uonbi.ac.ke/ [Accessed 16 June 2015].

Okiro, K. and Ndungu, J. (2013). The impact of mobile and internet banking on performance of financial institutions in Kenya. *European Scientific Journal, 9*(13), pp. 146-156

Owen, J. (2009). *The role of partnerships and strategic Alliances to promote mobile phone banking at the bottom of the pyramid.* Available at: www.microsave.org [Accessed 16 June 2015].

Porteous, D. (2006). The enabling environment for mobile banking in Africa. *Report commissioned for the Department for International Development (DFID).*

Pozzebon, M., Mackrell, D. and Nielsen, S. (2014). Structuration bridging diffusion of innovations and gender relations theories: a case of paradigmatic pluralism in IS research. *Information Systems Journal, 24*(3), pp. 229-248

Rogers, E. (2013). *Diffusion of Innovations*. London: Free Press

SASRA (2012). *SACCO Supervision report for deposit taking SACCO Societies (Deposit-Taking Sacco Business) Regulations.*

Teo, T., and Noyes, J. (2014). Explaining the Intention to Use Technology among Pre-Service Teachers: A Multi-Group Analysis of the Unified Theory of Acceptance and Use of Technology. *Interactive Learning Environments, 22*(1), pp. 51-66.

Tiwari, R, Buse, S. and Herstatt, C. (2006). *Mobile Banking as Business Strategy: Impact of Mobile Technologies on Customer Behavior and its Implications for Banks*, in: Technology Management for the Global Future - Proceedings of PICMET '06

Tobbin, P. (2012). Towards a model of adoption in mobile banking by the unbanked: a qualitative study. *Info*, 14(5), pp. 74 - 88

Uppal, R. K. (2010). Indian Banking: Emerging Issues and Enhancing Competitive Efficiency. *The IUP Journal of Business Strategy. 5*(6), pp. 34-43

Venkatesh, V. and Davies, F. D., (2000). A theoretical extension of the Technology Acceptance Model: four longitudinal field studies. *Management Science. 46*(2), pp. 186-204,

Venkatesh, V. Y. L. Thong, J. and Xu, X. (2012). Consumer acceptance and use of information Technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), pp. 157-178.

Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. D., (2003). User acceptance of Information Technology: toward a unified view. *MIS Quarterly,* 17(3), pp. 34-39

Weigel, F. K., Hazen, B. T., Cegielski, C. G., and Hall, D. J. (2014). Diffusion of Innovations and the Theory of Planned Behavior in Information Systems Research: A Meta-analysis. *Communications of the Association for Information Systems*, *34*, pp 619-636.

Wunderlich, P., Grobler, A., Zimmermann, N. and Vennix, J. M. (2014). Managerial influence on the diffusion of innovations within intra-organizational networks. *System Dynamics Review (Wiley)*, *30*(3), pp. 161-185.

Appendices

Appendix I: Questionnaire
Questionnaire

A. Mobile banking services available in Kenya for SACCOs

1. Has your Sacco adopted mobile banking?

○ Yes

○ No

2. Which services below does your SACCO offer through mobile banking?

	Yes	No
Cash Deposits	○	○
Cash Withdrawals	○	○
Opening an Account	○	○
Checking Account Balance	○	○
Money Transfer	○	○
Buying Airtime	○	○
ATM Card Pin Change	○	○
Requesting Mini Statements	○	○
Paying Bills (Paybill)	○	○
Loan Applications	○	○
Loan Repayments	○	○
Buying Sacco Shares	○	○
Selling Sacco Shares	○	○

Other (please specify)

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3. Select the Level that you feel your Organization's Policies support the Usage of Mobile Banking

No Support	Medium Support	High Support
○	○	○

4. Select the Level of Uptake of Mobile Banking in your SACCO by customers

No Uptake (0%)	Low Uptake (1% to 20%)	Moderate Uptake (21% to 50%)	High Uptake (51% to 80%)	Very High Uptake (81% to 100%)

5. Select the Level of Usage of Mobile Banking in your SACCO

No Usage (0 Transactions Per Customer Per Month)	Low Usage (1 to 3 Transactions Per Customer Per Month)	Moderate Usage (4 to 6 Transactions Per Customer Per Month)	High Usage (7 to 9 Transactions Per Customer Per Month)	Very High Usage (Over 10 Transactions Per Customer Per Month)

B. What extent do you think the following factors influence the adoption of Mobile Banking in SACCOs

6. How much of a factor do you think the following benefits influence the adoption of Mobile Banking in SACCOs

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Mobile banking as an innovation has benefits	○	○	○	○	○
Mobile banking has an advantage over other forms of banking	○	○	○	○	○
Mobile banking is compatible with the Organization's existing systems	○	○	○	○	○
Mobile banking is efficient as compared					

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
to other forms of banking	○	○	○	○	○
Mobile banking is convenient as compared to other forms of banking	○	○	○	○	○

In your view, what other benefits do you think, can influence the adoption of mobile banking

[   ]

7. How much of a factor do you think External Environmental factors influence the adoption of Mobile Banking in SACCOs

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Government regulations (SASRA Regulatory policies) can influence the adoption of mobile banking	○	○	○	○	○
Industry characteristics/trends can influence the adoption of mobile banking	○	○	○	○	○
Competitive pressure can influence the adoption of mobile banking	○	○	○	○	○
Market structure can influence the adoption of mobile banking	○	○	○	○	○
Perceived success of competitor adopters can influence the adoption of mobile banking	○	○	○	○	○

In your view, what other external factors do you think, can influence the adoption of mobile banking

[   ]

8. How much of a factor do you think Organizational Readiness influences the adoption of Mobile Banking in SACCOs

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	○	○	○	○	○

Top management support can influence the adoption of mobile banking					
Available financial resources can influence the adoption of mobile banking	◯	◯	◯	◯	◯
Available ICT resources can influence the adoption of mobile banking	◯	◯	◯	◯	◯
Available staff technological competence can influence the adoption of mobile banking	◯	◯	◯	◯	◯
The organization's size (the number of employees in the organization) can influence the adoption of mobile banking	◯	◯	◯	◯	◯
Organizational slack (the degree to which uncommitted resources are available to the organization) can influence the adoption of mobile banking	◯	◯	◯	◯	◯

In your view, what other organizational readiness factors do you think can influence the adoption of mobile banking

9. How much of a factor do you think the following security perceptions influence the adoption of Mobile Banking in SACCOs

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Exposure to fraud can influence the adoption of mobile banking	○	○	○	○	○
The risk of transaction failures can influence the adoption of mobile banking	○	○	○	○	○
Protection of client details can influence the adoption of mobile banking	○	○	○	○	○
Security anxiety can influence the adoption of mobile banking	○	○	○	○	○

In your view, what other security concerns do you think, can influence the adoption of mobile banking

[   ]

C. Factors that influence adoption of Mobile Banking in SACCOs in Kenya

10. How much of a factor do you think the following can influence the adoption of Mobile Banking in SACCOs

	Strongly Disagree Agree	Disagree	Neutral	Agree	Strongly
Mobile banking can increase revenue for the organization	○	○	○	○	○
Mobile banking can increase the range of services offered	○	○	○	○	○
Mobile banking can increase the number of transactions done per customer	○	○	○	○	○
Mobile banking can increase the rate of loan repayments	○	○	○	○	○
Mobile banking	○	○	○	○	○

can reduce the
cost of offering
services

Mobile banking
can result in a
wider customer
reach
    ○   ○   ○   ○   ○

11. Apart from the above factors, which other factors, in your opinion, do you think influence the adoption of Mobile Banking in SACCOs?

12. In your view, what do you think needs to be done to improve adoption of Mobile Banking in SACCOs?

Appendix II: Key Informant Interview Guide

1. What banking services can be offered through mobile banking?

2. What are the key factors influencing the adoption of Mobile Banking in Sacco's in Kenya?

3. What are the performance expectancies that are related to mobile banking?

4. What are the costs related to the adoption of Mobile Banking in Sacco's in Kenya?

5. What are the infrastructural challenges facing the adoption of mobile banking in Sacco's in Kenya?

6. What are the efforts involved in the adoption of mobile banking in Sacco's in Kenya?

7. What are the risks involved in the adoption of mobile banking in Sacco's in Kenya?

Appendix III: List of Deposit Taking SACCOs in Nairobi County

1. Asili
2. Maisha bora
3. Comoco
4. Nafaka
5. Mwito
6. Nassefu
7. Naku
8. Chuna
9. Orthodox
10. Jamii
11. Sheria
12. Kenpipe
13. Wanaanga
14. Kingdom
15. Fundilima
16. Safaricom
17. Stima
18. Tembo
19. Afya
20. Elimu
21. Airport Sacco
22. Waumini

23. Harambee
24. Kenversity
25. Mwalimu
26. Ufundi
27. Nacico
28. Telepost
29. Magereza
30. Transcom
31. Chai
32. Ufanisi
33. Hazina
34. Ukristo na Ufanisi
35. Nest
36. Kenya police
37. Nation staff
38. Reli
39. Ardhi
40. Kenya bankers
41. Ukulima
42. United Nation
43. Wanandege
44. Lenga Tumaini