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SCHOOL OF COMPUTING AND INFORMATICS

USING TECHNOLOGY, ORGANIZATION AND ENVIRONMENT FRAMEWORK TO FIND OUT THE TECHNOLOGY ADOPTION DETERMINANTS AMONG SACCOS IN NAIROBI COUNTY

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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.

Signed _____ Date _____

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This research project has been submitted for examination towards fulfilment for the award of Masters of Science in Information Technology Management with my approval as the university supervisor.

Signed _____ Date _____

Dr. Andrew Mwaura Kahonge

DEDICATION

I would like to dedicate this work to my family and friends for their encouragement, support and motivation while undertaking the research project. God bless you all.

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I would like to thank the almighty God for seeing me through my studies and this research process. I also thank and acknowledge my supervisor, Dr. Andrew Kahonge for the support and guidance he has given me, and the good partnership we have established. I thank my lecturers too for their contribution of knowledge in this work. I thank my colleague, Faith Kiarie, for her support and advice through the research process.

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ABSTRACT

Traditional banking is increasingly being replaced by electronic banking worldwide, due to issues such as technological innovations and innovations in financial products. This has led to the influence of the banking sector in Kenya to change over the past few years. However, SACCOs have not adopted technology, including electronic banking, at a high rate as compared to commercial banks in Kenya. This has led to SACCOs lagging behind in terms of technology adoption. The study aimed to find out how technology characteristics, availability and processes affect technology adoption in SACCOs. It also established how the characteristics and available resources affect the adoption of technology by SACCOs, and the effect that the external task environment has on technology adoption among SACCOs. Finally, a model was developed to assist in evaluate technology adoption decision-making among SACCOS.

The study used a descriptive research design, which adopted a survey. A census was carried out on all the 39 SACCOs in Nairobi County. Questionnaires were used as the primary method of collecting data. Data was analysed using both descriptive and inferential statistics. The findings were presented in tables and charts. The study found out that technology enables customers transact business with ease, and reduces operation costs. It also leads to growth of organizations in terms of revenue and market share. Technology adoption is influenced by the size of the organization. The top management does not fully support technological innovation decision making. SACCOs do not use resource slack on technological acquisitions. The study also found out that there are no effective laws to fight cybercrime, and SACCOs that adopted technology are found to be more favourable by customers.

The study recommends that SACCOs incorporate ICT infrastructure and the required ICT human resources to spearhead the process of technology adoption and have the capability to perform a major technological upgrade. The study also recommends that SACCOs commit themselves to adopting technology to improve their business activities. The top management should fully support technology adoption processes and should implement them according to the organization's strategy. SACCOs should also give priority to technology acquisitions while allocating their slack resources. The government should come up with effective laws to battle cybercrime. The resulting model, among others, is recommended to evaluate technology adoption decision making among SACCOs.

Key words: SACCOs, Technology, Adoption, ICT

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Key Terms and Abbreviations

ATM	Automatic Teller Machine
DT-SACCOs	Deposit taking Savings and Credit Cooperatives
ICT	Information Communication Technology
M-Pesa	Mobile Pesa (Mobile Money)
Non-DT-SACCOs	Non-Deposit taking Savings and Credit Cooperatives
SACCOs	Savings and Credit Cooperatives
SASRA	Sacco Societies Regulatory Authority
SME	Small and Medium Enterprise
TOE	Technology, Organization and Environment
WAN	Wide Area Network

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The banking sector has been open to historic transformation. Technology adoption is moving forward in a speedy way in all areas of financial markets and intermediation, for instance, electronic finance, electronic money, electronic banking, electronic brokering, electronic insurance, electronic exchanges, and electronic supervision. Uptake of electronic banking began to happen in depth as a channel of distribution for financial services because of major changes in technology and intensive competitive banking markets (Salehi & Alipour, 2010). Traditional banking or branch banking is increasingly being replaced by electronic banking.

This has influenced the banking sector in Kenya to adapt to the changes. The use of internet as a technology in Kenya started in the early 1990s. Until 2009, internet connection was low and very expensive, due to the reliance on expensive satellite connections by the country (Souter & Kerretts-Makau, 2012). Over time, the internet access has improved, and ownership of smart phones has increased. The Communication Authority of Kenya, (2016) quoted the number of internet subscriptions at 25.6 million, and the number of mobile subscriptions at 38.5 million in the country.

Despite there being a change in the field and an upward surge in the number of internet subscribers, e-commerce and technology adoption has not increased in the same capacity. In the Information Economy report, UNCTAD (2015) stated that lack of confidentiality of data results, the decline of the confidence of users over the use of online platforms leads to reluctance on the usage of online facilities. Mostly, the fear of the customer is that their information may be used without authorization from the owners and at times, the changing of the data. Customers need of touch and feel and the presence of a physical shop or office is a contributor to the decision of using e-commerce and other technological platforms too (UNCTAD, 2015). Despite these challenges, there has been an upward trend of adoption of technology, considering that some banks have closed some of their branches, to serve their customers on the electronic platform.

1.2 SACCOs

A report done in 2015 by the Central Bank of Kenya shows that the financial sector in Kenya comprises of the banks, capital markets, insurance, pensions, and savings credit cooperatives (SACCOs). Other players include microfinance institutions, money remittances companies, foreign exchange bureaus and development finance institutions. The SACCO organizations are made up of deposit taking SACCOs, which are governed by the SACCOs Societies Regulatory Authority, and non-deposit taking SACCOs, which are governed by Ministry of Industry, Trade and Cooperatives.

The SACCO Supervision Annual Report (2015) reports that co-operative societies, including deposit taking SACCOs, are traditionally formed or founded along specific bond lineages that serve to identify or distinguish persons who qualify and are eligible to become members thereof. However, these traditional bond lineages are fast disappearing with many cooperatives loosening or opening up the bond to allow the eligibility of every adult citizen into their membership.

Ideally, savings and credit businesses are money services, and this has resulted to SACCOs being considered in some regions as financial services cooperatives, while in other regions, particularly the USA, the UK and the Latin Americas, they are specifically referred to as Credit Unions. In Kenya, SACCOs as a section of the larger cooperatives have expounded in the types of financial services that they offer to their members.

Among the financial services, the main one is the venturing into the deposit-taking business, similar to the one conducted in commercial banks. This expansion of the financial services to deposit-taking services led to the sprouting of the Deposit-Taking Sacco Societies, hence birthing two types of SACCOs, namely the deposit taking SACCOs (DT-SACCOs) and the non-deposit taking SACCOs (non- DT-SACCOs). Deposit taking SACCOs are by the nature of their financial business cross-county both in terms of physical operations and infrastructural inter-linkages. These infrastructural inter-linkages are reflected through the ATM operations, mobile money services, branch connectivity through wide area networks (WANs), among others.

The report further addressed that for future purposes, convenience and faster ways of accessing financial services will be a key item for any successful retaining of customers in the banking sector, and Deposit-taking SACCOs are not exempted from this. (SACCO Supervision Annual Report 2015). Deposit-taking SACCOs should thus focus on increasing the adoption of ICT in offering financial services especially through the internet, SACCO

agencies and mobile technology, and break away from the traditional branch banking (SACCO Supervision Annual Report 2015).

The main services offered, including loan repayments, deposits and withdrawals, transfer of funds, payment of bills, membership application, accounts opening, application for and approval of loans and statements of account, must at the least of items, be found over the internet and through the mobile technology (SACCO Supervision Annual Report 2015). The expectation of members to visit a branch office or communicate via phone to complete these basic services are negative to retention of members. The involvement of social media networks and dynamic websites to respond to customers' enquiries, advertise financial services and measure the extent of customer satisfaction is vital for the existence of SACCOs in the current digital age.

Finally, increased uptake of computerized financial services processes is expected to bring a big change in digitally-enabled financial technologies and establish new value chains for deposit taking SACCOs, including holding on to payment services. Income and profits are projected to shift towards deposit-taking SACCOs that manage to get and use ICT platforms in helping their members to access the main services, as this will influence in a positive way, on their operating efficiency and capacity (SACCO Supervision Annual Report 2015).

1.3 Technology Adoption

According to Agrawal, Agrawal, Singh and Tripathi (2012), electronic commerce is composed of the trading products or services over a digital system like the internet or any other computer networks. E-commerce is made up of technologies such as supply chain management, internet marketing, online transaction processing, mobile commerce, electronic funds transfer, electronic data interchange (EDI), inventory management systems, and automated data collection systems (Niranjanamurthy, Kavyashree, Jagannath, & Chahar, 2013). Internet banking is also considered a form of electronic commerce.

According to Wunderlich, Grobler, Zimmermann, & Vennix (2014), there are various issues that contribute to the adoption of the new technology services. These factors could be technological, social, or economic. Some of the social factors 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. Some of the technological factors include handset operability, service availability and reliability, security and privacy

concerns, ease of use, network coverage, and availability of the service on different mobile networks (Gouws & Oudtshoorn, 2011).

Amin, Baba, & Muhammad (2007), explained mobile banking as way of transacting with a mobile phone. It enables people to find out their balances, perform transactions such as deposits and withdrawals, as well as provide update on the latest transactions made by customers, through the provision of a statement of accounts. It is also used in payment of bills. Currently, in Kenya, you can access mobile banking services from Safaricom through M-pesa, Airtel through Airtel Money, and Equity bank through Equitel. Amongst these, M-pesa is the most dominant. This is due to the market domination by Safaricom, which has also played a main part in the prospering of M-PESA. Its brand is strong, which gives a national view in its marketing strategies (Mas& Morawczynski, 2009). Safaricom has 69% total subscribers, with customers totalling to 26.6 million (CAK, 2016).

Internet banking is an instance where users can use their account through the internet using a computer or a mobile phone, and through the use of a web browser (Zeithaml, Parasuraman, & Malhotra, 2002). This means that customers can have access to their accounts, and can access the services related to their accounts anywhere, at any time, as long as they have access to internet. The customers access the web portal of their financial institutions, and log in using their account number or service number provided to them by the institution. Okiro & Ndungu (2013) found out that the uptake of mobile banking has been faster than that of internet banking. The study also reported that banks had the largest use of internet banking amongst the organizations sampled. SACCOS are up taking internet banking slowly, while micro-finance institutions have not yet engulfed internet banking.

According to Pawar (2014), Internet marketing, which is also called online marketing, uses the internet to bring information that contains promotional messages to customers. It includes marketing via email, search engine optimization, marketing via social media, different modes of display advertising, and mobile advertising. With the rise of the internet and social media, this type of marketing is very influential to the youth. According to Keli (2012), e-commerce has largely played a main role of uplifting the levels of service delivery in the financial sector such as SACCOs. E-commerce business models show the extent to which e-commerce can expand trade and services and better business activities. Through breaking down the barrier of space and time, the internet increases competitiveness in the business environment and

levels the market, which allows SMEs to compete with big businesses (Kinuthia & Akinnusi, 2014).

1.4 Problem Statement

According to (Salehi & Alipour, 2010), traditional banking or branch banking is increasingly being replaced by electronic banking worldwide. The main issues behind the sudden transformation of the banking sector are economic environment changes such as technological innovations, and innovations in financial products. This has greatly influenced the banking sector in Kenya to change tremendously over the past few years.

As compared to commercial banks in Kenya, the penetration of m-banking in SACCOs has been very slow (Tobbin, 2012). Banks have the highest consumption of mobile banking services at 30%, followed by SACCOs at 16.7% (Okiro & Ndungu 2013). According to a research by Momanyi, Osoro, Nyagol, and Odoyo, (2016), 9% of the SACCOs sampled use e-banking, 4.5% do use the internet, and 9.0% do use m-banking. 22.4% of the SACCOs use SACCO link/visa cards and ATMs are being utilized. 3.4% of the SACCOs utilized CCTV. A majority of the SACCOs, at 51.7% indicated that they utilized none of the forms of technology shown above. These results are a pointer to non-use of technology by SACCOs.

According to the literature review, a lot has been researched on technology adoption, and on the analysis of websites, and their e-commerce capabilities, with the focus on banks in Kenya. Little has been done on the technology adoption amongst deposit-taking SACCOs in Kenya. Therefore, the main goal of this research was to evaluate the technology adoption process among SACCOs in Kenya through the use of the TOE framework, and thereafter developed a technology adoption evaluation model among SACCOs.

1.5 Objectives

1.5.1 General Objective

To find out the technology adoption elements among SACCOs in Kenya using the TOE framework, and to develop a model for technology adoption evaluation among SACCOs

1.5.2 Specific Objectives

1. To find out how technology characteristics, availability and processes affect technology adoption in SACCOs.
2. To find out how the adoption of technology by SACCOs is affected by the organization's characteristics and the available resources.

3. To find out the effect that the external task environment has on technology adoption among SACCOs.

4. To develop a model to be used to evaluate technology adoption decision-making among SACCOS.

1.6 Significance of the Study

This study provides the influence of technology adoption on the growth of organizations in Kenya, and more specifically, the SACCOs, through an analysis of an organization, its technology and the external task environment. The study also helps stakeholders in the credit union business to close the gap created by slow adoption of technology in the sector. It steers them to keep up to speed with the financial services sector growth in Kenya, as it is very dynamic in nature.

Through the model developed, among others, SACCOs can use it to make various technological innovation decisions. Finally, in the area of academic research, this study increased on the existing literature on the determinants of adoption of technology, and the impact on the growth of SACCOs in third world countries like Kenya.

1.7 Assumptions and Limitations of the Study

The study was limited to the deposit-taking SACCOs in Nairobi County. The study assumed that technology, organization and environment factors are the major factors that influence adoption of technology, according to the TOE framework. The study also assumed that all the organizations studied had a similar organizational structure.

CHAPTER TWO

LITERATURE REVIEW

2.1 Empirical Review

2.1.1 Technology adoption, infrastructure and processes

Mutua, Oteyo, and Njeru, (2013), conducted a study to find out the extent of e-commerce penetration among SMEs in Nairobi, Kenya. The research methodology used for the study was a cross-sectional survey. The population for the research was SMEs with offices in Nairobi County. The study was a descriptive survey, that incorporated 176 SMEs as the sample size. They conducted simple random sampling, whereby 22 organizations were selected from every division of Nairobi County. Structured questionnaires were used to collect data. Descriptive statistics were used to analyse data.

The study found out that as much as e-commerce happened to give companies strategic value, it was not widespread, and most SMEs in Nairobi had not adopted the technology. 43% of the organizations sampled did not have functioning websites. 31% of the organizations used static websites, while 22% of the organizations had adopted dynamic websites that had interactive communication with their shareholders. The study findings also showed that more than 80% of the companies sampled had not adopted a known e-commerce strategy.

Mutua, et al (2013) also found out various factors that affect the adoption of e-commerce in the sector of SMEs. The main issues found were the perceived high budget of achieving e-commerce technologies, knowledge degradation in terms of e-commerce, security concerns amongst the online community.

The study uses a good research methodology, as it factors out all the divisions of Nairobi County. This methodology can be considered while doing a research design. However, the researcher focuses on SMEs in general, and the findings may be different, depending on the sector that the SMEs belong to. Thus, this brings out a gap to specifically focus on SACCOs in Nairobi County.

Alwan & Al-Zubi (2016) conducted a study to find out the determinants of internet banking uptake by clients of commercial banks in Jordan, and the obstacles preventing its growth. The study used a sample of 476 customers of 13 commercial banks who were using internet banking. A questionnaire was used to collect data. The study used factor analysis varimax rotation to come up with the scopes of the study variables.

Regression was used to define the influence of the constructs on internet banking adoption. Alwan & Al-Zubi (2016) found out that the banks that used Internet banking had a higher profit than non-users of the service. Small banks that concentrated on online banking services costed less than those that did not use the service. E-commerce symbolises ways to look up to for creating marketing and bettering the satisfaction of customers and allegiance. Corporate clients are usually longing for effectual, supple and dynamic services from their banks.

They also found out that the website quality, perceived privacy, customer trust, perceived ease of use and security had major effects on internet banking uptake. The number one indicator of the uptake was the website quality followed by customer confidence. On the other hand, the adoption rate was low and was mainly used by clients of high education levels and proficiency in up taking computer software and the internet.

This research mainly focused on Jordanian commercial banks. We intend to conduct a similar research in the banking sector in Kenya, to find out whether internet banking is being adopted at the same rate as other trending technologies in the banking sector, mainly focusing on the credit unions in Nairobi.

Mattila (2015) did a study to define the factors that lead to the uptake of mobile banking services. The research design used was a descriptive design, and data collection was done using questionnaires. The research findings were that the main indicators of embracing mobile banking services were the relative advantage gotten, compatibility of services with the adopters of the current values and the perceived complication of the services.

Sharma, Joseph & Kumar (2017) conducted a research to find out the effect of mobile banking on how Indian banks perform. The research methodology used for the study was a descriptive survey. The population of the study was all the financial banks operating mobile banking services in India. Data sources were the banks' published financial statements, the Reserve Bank of India, the Ministry of finance and some from the websites of the banks. The researchers used a linear regression analysis to test the connection among the variables. They used SPSS to analyse the measurements of the linear regressions.

The findings showed that considering all factors continual at zero, the banks' performance in India will be 1.114. They also show that a unit increase in the annual amount of money moved through mobile banking would result to a -1.359 rise in the scores of financial performance, and an increase in the scores of the number of users of mobile banking would lead to a -5.800 increase in the performance of commercial banks in India. Sharma, et al

(2017) concluded that mobile banking has impacted positively the financial performance of commercial banks in India.

However, the research does not have visual displays of the findings, in terms of graphs and charts. These are crucial for easier understanding of the study's analysis and findings. The study focuses on commercial banks in India. This gives us a gap to focus on the banking sector in Kenya, and more specifically, the credit unions.

Mburu (2015) did a study to evaluate the adoption of mobile banking services by SACCOs in Nairobi County. The study also sought to find out mobile banking services that can be offered by the SACCOs, and to establish the factors that influence adoption of Mobile Banking in SACCOs in Kenya. The study was a mixed study, but used descriptive research. The study population was all the 44 SACCOs operating FOSA services in Nairobi County. Semi-structured questionnaires were used in data collection. Data analysis was quantitative as well as qualitative. Descriptive statistics, including percentages, mean, frequency distribution and standard deviation were used to examine quantifiable data.

The findings were displayed in graphs and tables, as qualitative data was coded thematically and analyzed by the use of thematic content analysis. The results were then displayed in a prose form. This research used factor analysis to pinpoint underlying factors and to screen the variables. Inferential statistics and regression analysis were adopted to test the association between the dependent and the independent constructs.

According to Mburu (2015), SACCOs in Nairobi County had adopted mobile banking. The study found out that perceived benefits, external environmental factors, organization readiness and security perceptions influence the adoption of mobile banking positively and significantly. The research recommended that SACCOs create awareness to their members on the supposed advantages of adopting mobile banking and the top management of SACCOs should support and campaign for the adoption of mobile banking so as to reduce resistance to change.

This research focused mostly on how SACCOs have adopted mobile banking. It however leaves a gap on how mobile banking has influenced the growth and performance of the SACCOs. The researcher also focuses solely on mobile banking services, and this leaves a gap on other technological trends that SACCOs have adopted, and their effects on the growth of the institutions.

A research carried out by Omanga (2014) explored the uptake of marketing services through the web in Nakuru County. He looked at the perceived cost and use of the service, and the apparent importance and uptake of web based technology, and how these factors influence

SMEs. It employed an exploratory survey design, whereby it used a sample size formula to select a sample of 98 SMEs. Systematic sampling was done to select four customers to assure randomness, rather than biasness. Data was collected through use of questionnaires. Data analysis was conducted using descriptive statistics. Pearson correlation coefficient and multiple regression analysis were used to analyze inferential statistics.

Data analysis indicated that there was low level uptake of marketing technology through the web, and the implied cost, ease of use and practicality of the technology was up surging. Perceived ease of use brought about up to 49.1% of change in the uptake of web based technology in marketing services. Perceived usefulness contributed 46.8%, while perceived costs contributed 16.5% to change in the adoption of web based technology in marketing services. The study concluded that there was a optimistic and noteworthy link between independent factors and the adoption of online marketing amongst SMEs. The study also explained that 33% of the customers in SMEs had the purpose to use web based marketing services.

However, this research focused on SMEs as a whole, and may not bring out the exact case scenario for the SACCOs. The research was also conducted in Nakuru County, whereas our focus is on Nairobi county SACCOs.

Kithinji (2014) carried out a study on internet marketing, and the purpose of the research was to find out the extent of internet marketing application by SMEs in Nairobi County. The research design used while carrying out the study was descriptive research design. The population size was 900 SMEs, whereby a sample of 90 respondents was considered. The researcher focused on the Hurlingham part of Nairobi County.

The data collection tool used was a questionnaire. Data collected was analysed using the SPSS. Demographic information data was analysed using frequencies and percentages. Data collected on impact of Internet marketing on SMEs performance was analyzed using regression analysis (Kithinji, 2014).

The results reported social media as the most used form of internet marketing with 76.3% of the respondents stating so. Some respondents used online markets to market their products, email advertising and mobile phone advertisements. 21.3% respondents used pop ups to advertise online as a means of internet marketing.

The above findings indicate how SMEs in Nairobi have adopted online marketing. However, the sample focuses on Hurlingham part of Nairobi only, whereas there are many other SMEs in other parts of Nairobi. The sample should have been a representation of the whole county

of Nairobi, as it is an industrious city with many SMEs, which are said to be the pillar of economic growth in various states in the world (Chong and Lin, 2008).

2.1.2 Organization's performance, characteristics and resources

A study carried out by Akotch & Munyoki (2016) sought to find out the elements of growing in the banking sector in Kenya. The research methodology used was descriptive cross sectional survey design. The population was made up of 43 banks that operate in Nairobi. The data was gathered using questionnaire administered to heads of strategy in the banks. The data sources were financial statements and annual statements for a period of 3 years. Descriptive statistics were used to analyse quantitative data. SPSS was used to analyse the data and output it as, standard deviation, mean scores and percentages. Regression was used to find out the connection between the constructs and progression in the banking field in Kenya.

The findings of the study were based on descriptive statistics, which showed that a company's market penetration, product development, size, profitability, innovation and technology affect growth of the banking industry in Kenya. The research further advised that banks must concentrate in terms of their requirements and using the most effective technology and innovation to achieve their plans, rather than using technology due to the usage of other banks. Akotch & Munyoki (2016) recommended the government's involvement in ensuring the reduction of preventable costs of capitalizing in innovation and technology by banks.

The researchers however, focused on commercial banks only during their research, whereas the banking sector is made up of banks, SACCOs, Microfinance institutions, among others. They also discussed technology as a whole. Our research mainly focuses on the technological trends as seen in the Kenyan market.

Kithinji (2014) carried out a study on internet marketing and its effect on the expansion of SMEs in Nairobi County. The research design used while carrying out the study was descriptive research design. The population size was 900 SMEs, whereby a sample of 90 respondents was considered. The researcher focused on the Hurlingham part of Nairobi County.The data collection tool used was a questionnaire. Data was analysed using SPSS. Demographic information data was analysed using frequencies and percentages. Data collected on impact of Internet marketing on SMEs performance was analyzed using regression analysis Kithinji (2014).

The results show that online marketing impacted revenue to a great extent with 60% of the respondents agreeing to this. Firms were able to increase their market share by using online marketing, with 40% of the respondents indicating so, while 42.5% agreed that internet marketing increased their market growth rate at a moderate extent. 50% of the respondents classified internet marketing as a factor to increase competitive advantage in the industry. Internet marketing also allowed firms access to new market niches with 65% of the respondents agreeing to this at a very great extent (Kithinji, 2014).

The research by Kithinji (2014) is an indicator of how SMEs have been overtaken by other organizations that have adopted internet marketing, as social trends have changed a lot with the rise of the internet. However, this sample focuses on Hurlingham only, whereas there are many other SMEs in other parts of Nairobi. The sample should have been a representation of the whole county of Nairobi, as it is an industrious city with many SMEs which remain the pillar of economic development in various states in the world (Chong & Lin, 2008).

Jalang'o (2015) researched on the influence of digital advertising on the performance of Kenyan banks, and to establish the common digital advertising platform employed by banks. He used descriptive cross sectional survey design as the research design for this study. The population for the study was gotten from the 42 commercial banks in Kenya. Questionnaires were the main instrument for collecting the primary data. Data was examined through descriptive statistics to recap and relate the variables that were gotten from data collection. Quantitative analysis was used to draw inferences and conclusions from the study.

From the study, Jalang'o (2015) established that the banks market segment had improved over time under the use of digital advertising. Commercial banks were diverting from the traditional advertising platforms such as newspapers, television, radio and bill boards, to more online marketing platforms such as dynamic websites, email marketing, display advertising for banks, online advertising and social media. This was prompted by the need to engage more with customers, high growth rate of social communities, reduced operational costs, increased technology change and the need to align their marketing with the bank's strategic plan (Jalang'o, 2015).

Banks' market segment had improved over time since the adoption of digital advertising. The cost of advertising had gone down, the use of the banks' products had increased, the banks market share had gone up, and the banks' customer base had improved over time. The study recommended more uptake of digital marketing through investments in it, so as to take full advantage of the service, as well as increase performance.

The study mainly focused on commercial banks. The study does not indicate the effects that digital advertising, being part of digital marketing, has on the overall growth of credit unions.

Okibo & Wario, (2014) carried out a study to find out the effect of electronic fund transfers, as part of electronic banking, on the increase in customer base in Kenyan banks. The research methodology used for the study was a descriptive research design. Purposive sampling was employed to choose three banks which are: Equity Bank, Barclays bank and Co-operative bank. A sample size of 135 was chosen to conduct the study. Questionnaires were used to collect primary data, while secondary data was obtained from archived sources such as published material and journals.

Data analysis was done using qualitative and quantitative methods, and was summarized and displayed through the use of tables and charts. Okibo & Wario, (2014) found out that growth was evident in the sector due to introduction of Electronic Funds Transfer, with 80% agreeing to it, while 20% of the people sampled could not find any noteworthy growth. They also found out that e-banking increased the advancement of banks in Kenya through a rise in customer numbers. 50% of the people agreed to the argument, 30% strongly agreed, 10% neutral, 15% disagreed, and 5% strongly disagreed.

However, this study focused on e-banking services in terms of Electronic Funds Transfer, Card technologies and the ATM availability, and their impact on growth of customer base. Our study focuses on other e-commerce technologies, and how they impact not only growth of customer base, but also in terms of revenue generation and new product development.

A research was conducted by Wachira, (2013) to find out the impact of technological invention on the financial performance of Kenyan banks. Descriptive cross sectional design methodology was employed and was directed all the banks in Kenya. The study population was all the 43 banks in Kenya. The study used a census instead of a sample, since the population was small. Primary data was gotten from structured questionnaires. Secondary data was gotten from Central Bank of Kenya, in form of annual financial reports.

Analysis of data was through descriptive statistics. Statistical Package for Social Sciences was deployed in totalling of frequencies, descriptive statistics and multiple regression analysis. The results were tabulated. According to Wachira (2013), 85% of the respondents agreed that Customer transparent technology was user-friendly, 97% agreed that the system was easily usable, and 82% agreed that the system added competitive advantage to the bank. 79% of the respondents agreed that the system had reduced operation costs for the banks and 85% agreed that the system had helped ease congestion in the banking halls.

The research highly focuses on the ease of using technological innovations. Wachira (2013), found out that 82% of the people approved that the ATMS are at convenient places, 73% concurred that the ATMS are user friendly and 85% concurred that bank customers find ATMS easily usable. 82% of the people concurred that the credit cards are user-friendly, 67% agreed that bank clients find credit cards easy to use and 79% of the respondents agreed that credit cards are suitable to use and carry around. However, our focus and gap is mainly on the impact of technology on the growth of SACCOs in Kenya.

Okiro & Ndungu (2013) conducted a research on the influence mobile banking on the performance of financial organizations in Kenya. They adopted descriptive and qualitative research design; stratified sampling was used, whereby strata were mutually exclusive. The population of the study was 61 financial organizations. 30 of them responded, and were used as a sample. They consisted of 11 SACCOS, 2 microfinance institutions and 17 commercial banks. Their data collection instrument was open and closed ended questionnaires. Data was gathered from the managers, subordinate staff and customers. Data analysis was done through quantitative and qualitative measures. Qualitative data was analysed using statistical data methods.

The data was displayed in tables, pie-charts, and graphs for easier consideration and presentation. Data analysis was conducted using SPSS and Microsoft excel. Their findings were that 80% of the respondents said mobile banking services had an effect on the performance of financial institutions, while 20% said that there was no impact.

However, their research mostly focused on commercial banks, with respondents from commercial banks being 56.7% of the total sample and a less focus on SACCOs, by sampling them at 36.5%. The researcher too does not indicate whether the influence of mobile banking on the performance of the financial organizations is positive or negative.

A research conducted by Okiro & Ndungu (2013), wanted to find out the effect of internet banking on the performance of financial organizations in Kenya. They adopted descriptive and qualitative research design; stratified sampling was used, whereby strata were mutually exclusive. The population of the study was 61 financial organizations. 30 of them responded, and were used as a sample. They consisted of 11 SACCOS, 2 microfinance institutions and 17 commercial banks. Their data collection instrument was open and closed ended questionnaires.

Data was gathered from the managers, subordinate staff and customers. Data analysis was done through quantitative and qualitative measures. Qualitative data was analysed using statistical data methods. The data was displayed in tables, pie-charts, and graphs for easier consideration and presentation. Data analysis was conducted using SPSS and Microsoft excel. 66.7% of the respondents said that performance of financial institutions was impacted by internet banking, while 6.7% said that there was no impact.

However, their research mostly focused on commercial banks, with respondents from commercial banks being 56.7% of the total sample and a less focus on SACCOs, by sampling them at 36.5%. The researcher does not also indicate whether the impact of internet banking on the performance of the institutions is positive or negative.

Stoica, Mehdian & Sargu (2015) carried out a study to determine how internet banking contributes to the improvement of the general performance and effectiveness of Romanian banks. The methodology applied in the study is the Data Envelopment Analysis alongside with Principal Component Analysis. The sample for the study was 24 Romanian banks. The researchers considered the intermediation approach as the most efficient, considering the state from the Romanian banking sector, where many the banks practice universal banking activities.

The findings were that in the Romanian banking sector, there are two business strategies conducted: "cost oriented" and "Internet banking oriented" (Stoica, et al, 2015). They also found out that only a few of the Romanian were able to proficiently apply internet banking services so as to boost their overall enactments. Most of the other banks sampled preferred a mixed approach between internet banking services and cost reduction methods.

The approach applies well in the Romanian banking sector, but we find it difficult to apply in the Kenyan sector, considering its dynamism and the number of banks, SACCOs and Microfinance institutions in Kenya. The research focuses on commercial banks too. We find out that research has been carried out a lot on commercial banks, as opposed to SACCOs.

Njau & Karugu (2014) conducted a study to determine how email marketing, blog marketing, Search Engine Marketing and online advertising affect the way SMEs perform in the manufacturing industry in Kenya. The study applied a co-relational and descriptive survey research design. The study's target respondents were drawn from a population of 500 SMEs from the manufacturing sector in Kenya. A sample size of 50 respondents was chosen. A questionnaire was used to collect data.

Descriptive statistics were used to define the sample data. The statistics were generated using Statistical Package for Social Sciences. Correlation analysis was applied to gauge the connection between the independent constructs and the extent of e-marketing influence on performance.

According to Njau & Karugu (2014), 98% of the respondents sampled showed that Search Engine Marketing helped to get to more customers, express the meaning of their products' brands and encourage translations while improving search performance. 80% of the respondents agreed that web advertising had been helpful in overpowering the challenges of market fullness. Blog marketing, Search Engine Marketing, email marketing, and online advertising show a progressive relationship with the degree of business performance. The most significant form of advertising was Search Engine Marketing with a significance level of 10.5%.

However, the findings generally focus on SMEs in the manufacturing industry. Internet marketing may take a different turn in the banking sector, as it is very dynamic. Thus, the gap that we are exploiting remains in the banking industry, amongst the credit unions.

2.1.3 External environment

Kurnia, Choudrie, Mahbubur, & Alzougool (2015) conducted a study to determine the challenges faced by Malaysian grocery SME retail sector while adopting e-commerce technology. The purpose of the study was to scrutinize the effect of environmental pressure and industry on the embracing of various e-commerce technologies by SMEs within developing countries. The target population retail was the Malaysian grocery segment SMEs. They used a quantitative survey to conduct the research.

Kurnia, Choudrie, Mahbubur, & Alzougool (2015) found out that there was a major impact of environmental pressure on the embracing of various e-commerce technologies, and the impact of industry readiness was insignificant. This research, however, focuses on the Malaysian SME sector. This leaves a gap of the change of geographical location, as the results may not be the same in the Kenyan sector.

Nugroho (2015) carried out a study to evaluate the effect of the support of government and competitor pressure on the enthusiasm of Indonesian SMEs in embracing information technology. The study had a sample size of 446 SMEs in Yogyakarta. Simple random sampling technique was used to do sampling. Data was analyzed through the Partial Least Square (PLS) approach.

The findings of the research were that the pressure from competitors and the support by government did not significantly affect technology readiness (Nugroho 2015). This study, however, does not state the research methodology used. Its context is also in Indonesia, where SMEs may operate differently from Kenya.

Palacios-Marqués, Soto-Acosta, & Merigó (2015) conducted a study on the influence of organizational, technological and competition issues on Web information interchange in SMEs. They used the Technology, Organization, Environment framework (TOE) to measure how various relative factors affects Web information exchange in SMEs.

Structural equation modelling was used to test the hypotheses, which was done on a sample of Spanish SMEs from various industries. Palacios-Marqués, Soto-Acosta, & Merigó (2015) found out that IT expertise and commitment-based human resource practices positively influence Web information exchange. On the other hand, a negative relationship was found between competition and Web knowledge exchange. These results bring about a gap, as the study was carried out in Spain.

Njogu (2015) carried out a study on the factors influencing the technology adoption and innovation as a strategic competitive tool at Bata Shoe Company in Kenya. The research methodology of the study was a descriptive research design, and the sample size for the study was 33 employees. Structured questionnaires were applied to collect data, which was analyzed with the help of SPSS. A linear regression was also carried out as a measure of dispersion.

Njogu (2015) found out that technology adoption has a positive relationship with competitiveness and adoption of technology improves an organization's competitiveness. The study also found out that the business need was the driving factor for technology adoption.

Righa (2014) conducted a study to find out the result of information technology adoption on competitive advantage of Internet Service Providers in Kenya. The study was carried out by conducting a census. The study's population was the 22 Internet Service Providers in Kenya. Data collection was done through a questionnaire. It was then analysed using percentages, frequencies, mean scores and standard deviation. Data presentation was done through the use of tables.

According to Righa (2014), the main reason for the use of information technology was to improve decision making by the companies. Information technologies also function as a catalyst for the entry of new players into the market place. Thus, the research gaps in the Kenyan environment are brought about by a change of industry, as the financial sector, and especially the SACCOs, may portray different results from the above.

2.2 Theoretical Review

Various theories have been applied in the study of technology adoption. Some of them are discussed below:

2.2.1 Technology acceptance model (TAM)

According to Davis Jr (1986), the model was established to increase the interpretation of user acceptance processes, giving new information and knowledge into the planning and execution of information systems. Perceived usefulness is the point to which people have faith that using a certain system would better their job performance (Davis Jr, 1986). TAM also creates a theoretical ground for a practical user testing method, that should aid system developers evaluate their new systems before they can implement them. The advantage of doing the testing is that it provides information about the likelihood of the acceptance of a technology, in the early stages of its implementation.
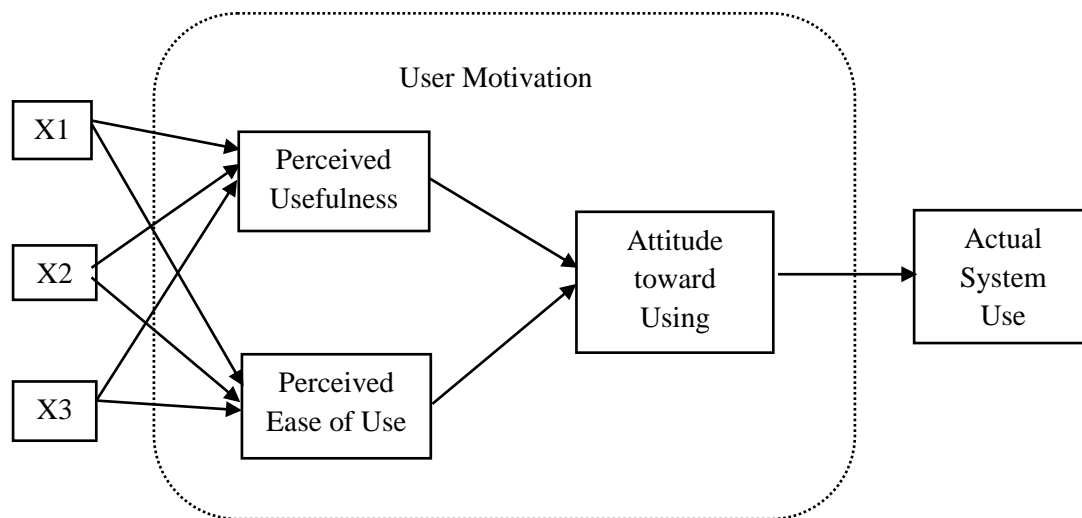
Figure 1 Technology Acceptance Model

2.2.2 Unified theory of acceptance and use of technology (UTAUT)

This model was developed by Venkatesh, Morris, Davis, & Davis (2003). It focuses at explaining user intents to apply an information system and the succeeding usage behaviour. The theory states that there are four main variables: effort expectancy, performance expectancy, facilitating conditions and social influence. The first three concepts are direct elements of intention to use and behaviour, and the other construct is a direct determinant of

user behaviour. Gender, age, experience, and voluntariness of use influence the effect of the four key variables on usage intent and behaviour.

Unified Theory of Acceptance and Use of Technology (UTAUT) came about as a build-up of several research determinations brought about in various theories of Technology adoption. The UTAUT taken as a trial to bring together diverse models and theories of Technology adoption. These models and theories include the Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB), the Motivational Model (MM), the model of PC utilization, the Innovation Diffusion Theory (IDT), and the Social Cognitive Theory (SCT).
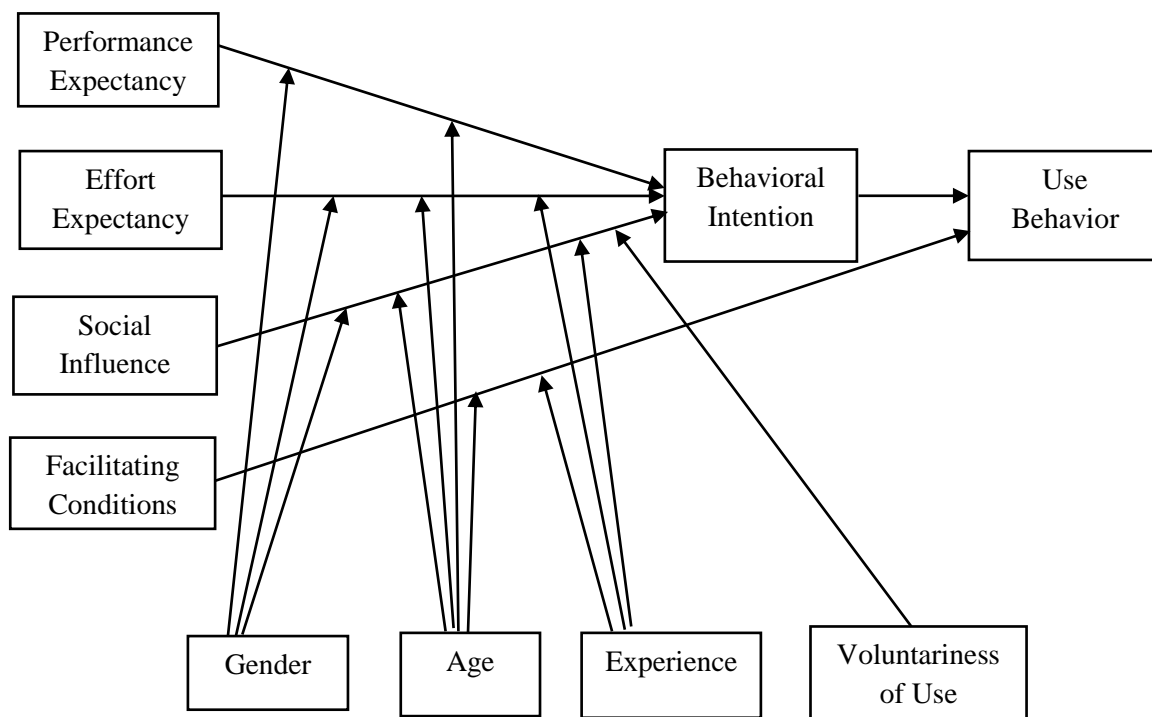
Figure 2 Unified Theory of Acceptance and Use of Technology

2.2.3 Diffusion on Innovation (DOI) framework

This is a theory of how, why, and at what extent new ideas and technology infiltrate through cultures, operative at the individual and firm level. Rogers (1995). It brings out innovations as being passed through various modes over time and within a specific social system. Individuals usually have various degrees of willingness to accept innovations, and therefore, it is generalized that the portion of the population adopting an innovation is roughly normally distributed over time (Rogers 1995).

Dividing this distribution into various components leads to the isolation of individuals into the following five groups of individual innovativeness: innovators, early adopters, early majority, late majority, laggards (Rogers 1995). On an organization level, Rogers (1995) states that innovativeness is linked with such independent constructs as individual (leader) characteristics, internal organizational structural appearances, and external appearances of the organization. Individual characteristics talk about the attitude of a leader towards change. Internal appearances of organizational structure comprise of observations such as formalization, centralization, complexity, interconnectedness and organization slack. External features of an organization refer to system openness.
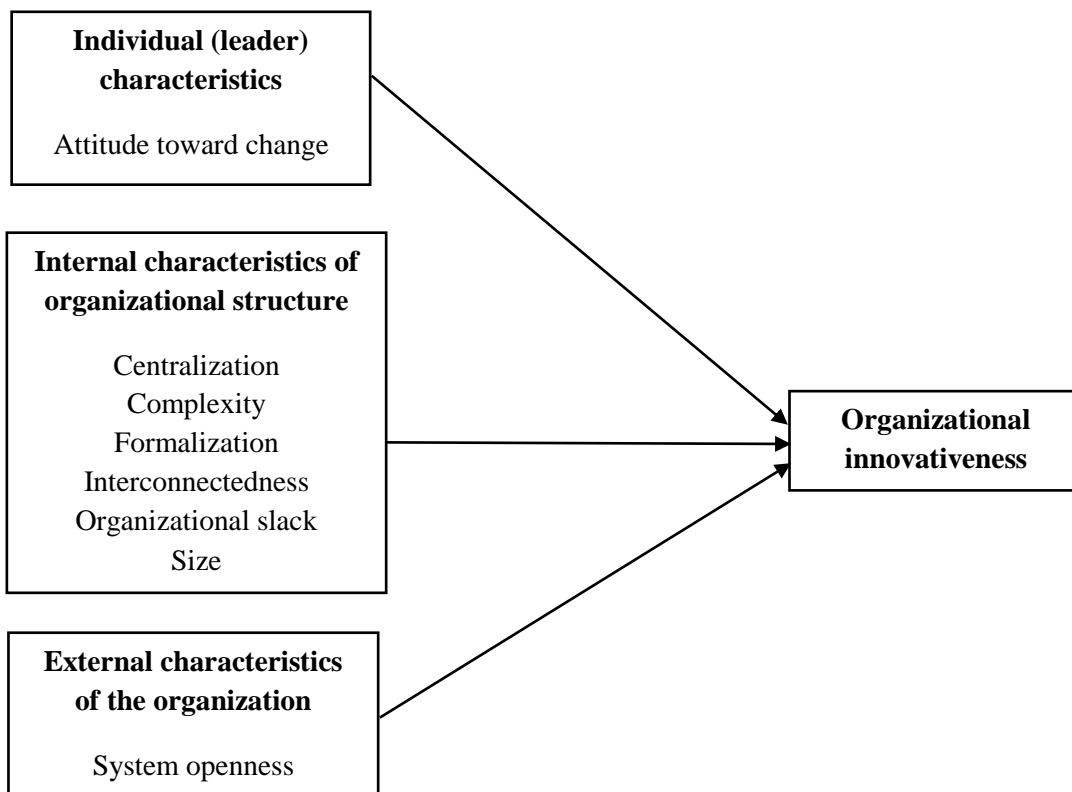
Figure 3 Diffusion of Innovation theory

2.2.4 Technology, organization, and environment (TOE) framework

Tornatzky, Fleischer & Chakrabarti (1990) created this framework which brings about three positions of an organization's perspective that impact the process by which it embraces and implements a technological innovation: technological perspective, organizational perspective, and environmental perspective. Technological perspective describes both the internal and external technologies important to the organization, including current trends. Organizational context is the terms that describe the business such as scope, size, and organization structure.

Environmental perspective is the internal and external environment in which an organization transacts its business. Examples include its competitors, industry, and government regulations Tornatzky, et al (1990).
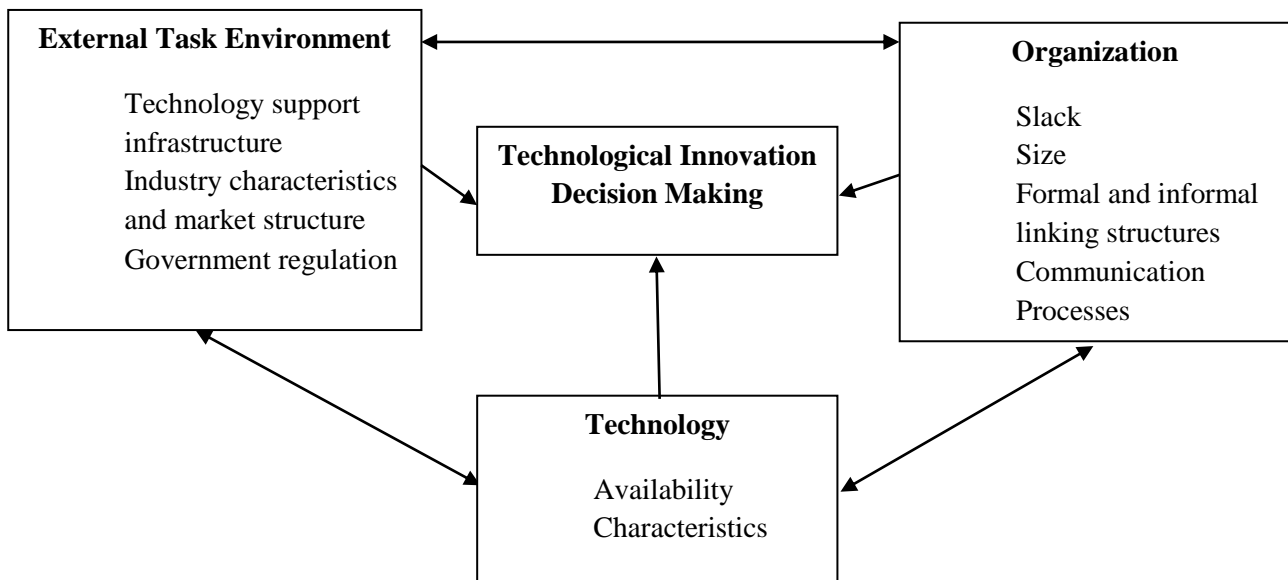
Figure 4 Technology Organization and Environment Framework

2.2.5 Iacovou Benbasat & Dexter (1995) model

Iacovou, Benbasat & Dexter, (1995) analysed three major items that were identified to have an influence on the adoption of Electronic Data Interchange by small enterprises. These are external pressures to adopt the technology, organizational readiness, and the perceived benefits. Organization readiness is in terms of limited organization resources. It is a mixture of technology and the organization perspective. External pressures result from the positioning of small firms in the market, due to their competitors and the nature of technology they possess. The perceived benefits result from the under-utilization of resources and lack of IT integration (Iacovou, et al, 1995)
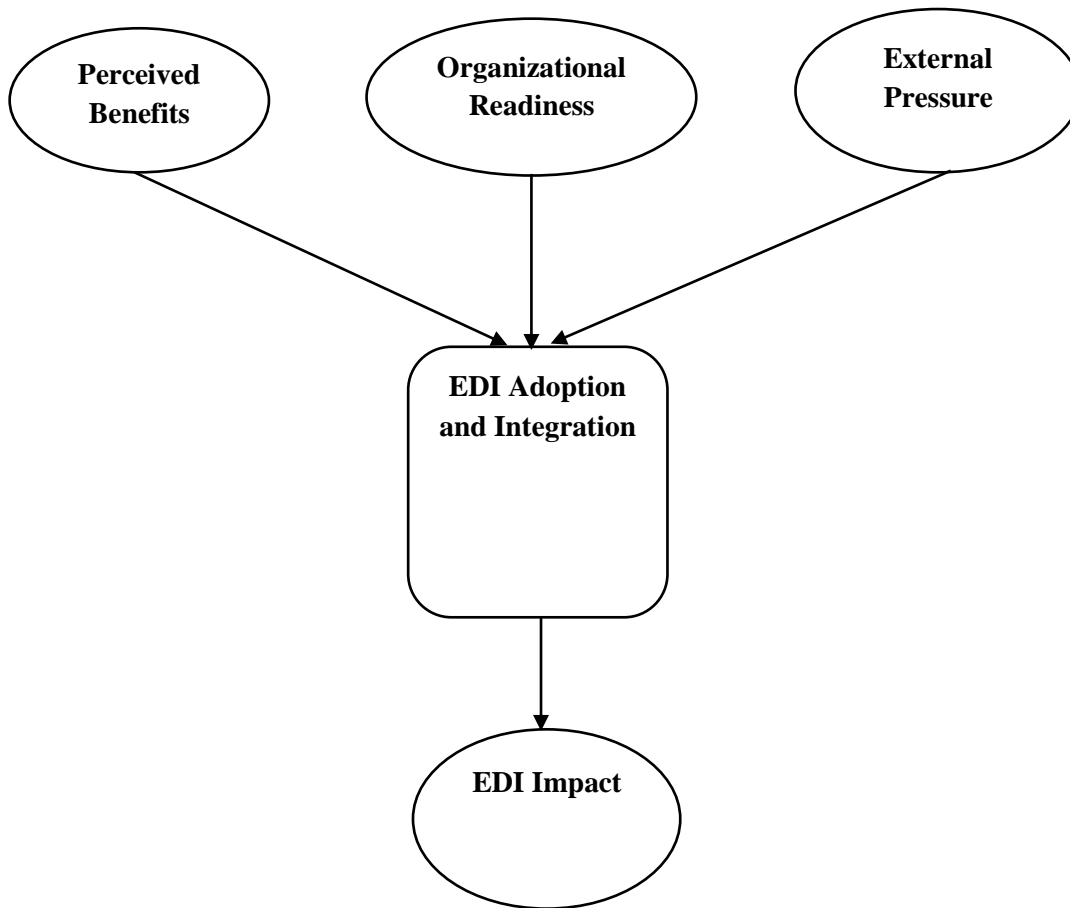
Figure 5 Iacovou Benbasat & Dexter model

2.3 Research Framework

According to Grant and Osanloo, (2014), a theoretical model is a "blueprint" for the whole project. It acts as the director for one to base their study, and also gives the structure to show how a person will philosophically, epistemologically, methodologically, and analytically approach the project in wholesomeness. This study is focused on adoption of technology amongst SACCOs. It adopts the TOE Framework which looks at three contexts of an institution that affect the method by which technological innovations are adopted and implemented. These contexts are technological, organizational and environmental. Thus, the independent variables are Technology, Organization and Environment. The dependent variable is technological innovation decision-making.

The three contexts bring about both barriers and chances for technological novelty and implementation. Therefore, the three contexts affect how an institution sees the need for, searches for, and embraces new technology (Tornatzky et al, 1990). The TOE framework is a main theoretical lens for understanding technology adoption at the organizational level

(Pudjianto and Hangjung 2009; Sila 2013). It matches with the purpose of this study, which is technology acceptance at the organizational level. According to Pudjianto and Hangjung (2009), the TOE framework is flexible and can be extended to accept more variables that help explore influencers and barriers to technology acceptance (Zhu, Kraemer, and Xu, 2006). This shows that the research can add more themes and sub-themes depending on the findings of a study.

Furthermore, the triumph of an organization is determined by the combination of both internal and external factors (Donaldson 2001). Therefore, an organization needs to focus on technological, organizational and environmental issues that can increase or satisfy innovation adoption. In addition, another benefit of the TOE framework is that it brings about a wider choice and provides links between the three contextual elements, thus presenting the potential to include larger aspects linked with cultural differences and industry type (Oliveira & Martins 2011).

As informed by the literature review, technological innovations have a perceived influence to the growth of organizations. Thus, the various factors listed on the three contexts are perceived to directly or indirectly affect the growth of SACCOs, through technological adoptions. Thus, based on the arguments above, the study will adopt the TOE framework to understand technology adoption amongst SACCOs in Nairobi County.
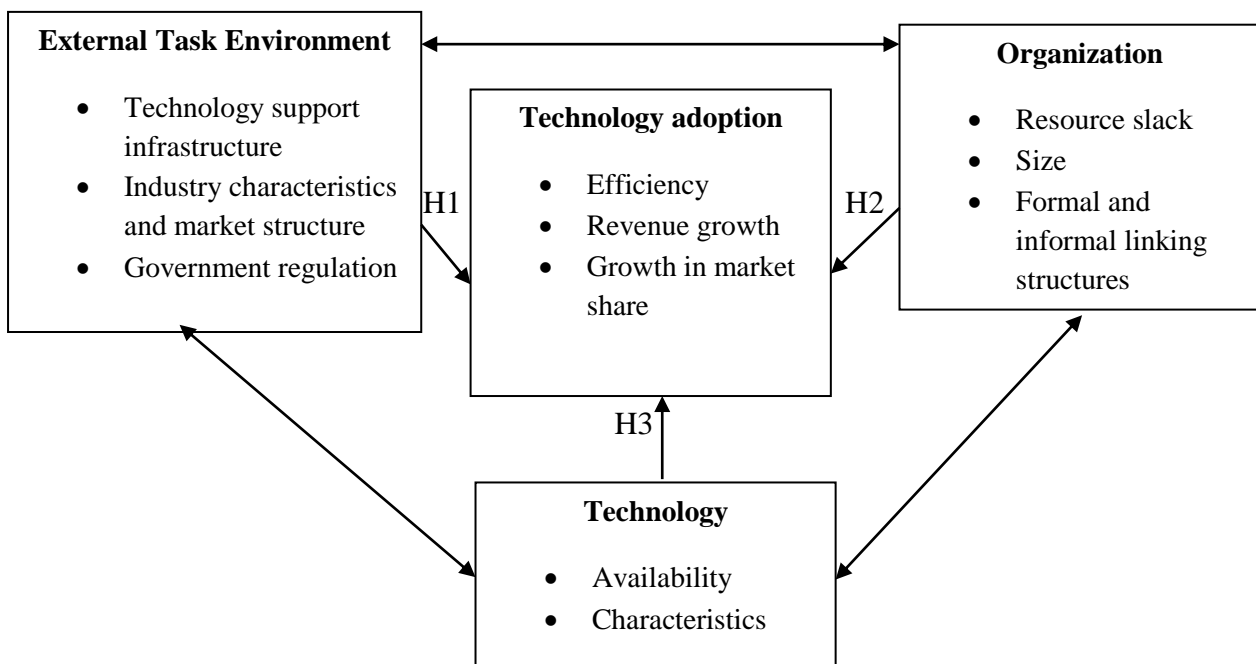
Figure 6 Research Framework

The hypothesized relationships between variables, in the context of technology adoption amongst SACCOs shall be as follows:

H1: The availability of technology infrastructure and processes in an organization highly contributes to technology adoption decision making.

H2: An organization's characteristics and performance influences how technological decisions are made in an organization

H3: An organization's technological decisions are highly influenced by the external environment relating to the organization.

Table 1 Operationalization of variables

VARIABLE	OPERATIONALIZATION	SOURCES
Technology	• Availability • Characteristics	Zhu, Kraemer, and Xu, 2002 Gibbs and Kraemer, 2004 Lin & Lin, 2008 Rogers, 1995 Oliveira and Martins, 2010
Organization	• Resource slack • Size • Formal and informal linking structures	Awa, Ojiabo, and Emecheta, 2015 Scott, 2007 Zhu, Kraemer, and Xu, 2002
Environment	• Technology support infrastructure • Industry characteristics and market structure • Government regulation	Angeles, 2013 Wesley & Richard,1989 Gibbs, and Kraemer, 2004 Jeyaraj, Rottman and Lacity, 2006
Technology adoption	• Revenue growth • Growth in market share • Efficiency in internal business processes through innovation	Okiro & Ndungu, 2013 Jalang'o, 2015 Akotch & Munyoki, 2016 Kaplan & Norton, 1996

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The study used a descriptive research design. It was a positivist research, which adopted a survey. This research design uses both qualitative and quantitative data (Knupfer and McLellan, 1996). The purpose of descriptive research is to generate statistical information about traits of the research topic that is interesting to academics. Descriptive research is concerned with collecting data that talk about events and then organizes, tabulates, depicts, and describes the collection of data.

It often uses pictorial diagrams such as graphs and charts to help the person studying in understanding and interpreting the data distribution (Knupfer and McLellan, 1996). Descriptive research can either include several variables for analysis, or only one variable. A descriptive study can use methods of analyzing correlations between several variables by conducting tests such as regression, or multiple regression analysis, and Pearson's Product Moment correlation (Knupfer and McLellan, 1996).

The limitation of this research methodology is that for more accurate results, the population of the study should be large. This limitation was overcame by conducting a census on the population, instead of having a sample size. Another downside of the research methodology is that the questionnaires used as research instruments may not be possible to administer to all the targeted organizations through self-administration. This challenge was overcame by the use of emails to send the questionnaires to the organizations that were not at reach.

3.2 Target Population

According to Mugenda & Mugenda (2012), a population describes people, happenings or entities having a common evident characteristic. According to the SACCO Supervision Annual Report (2015), Nairobi County has 39 licensed deposit-taking SACCOs, whose licences have not been suspended. For this study, the population was all the 39 deposit-taking SACCOs in Nairobi County.

3.3 Sampling Frame

The study's sampling frame was the respondents who were the IT manager, the Finance manager, an accountant, and an I.T personnel from each of the SACCOs in Nairobi County.

Thus, the unit of analysis was the 156 people from the 39 SACCOs that make up the target population, or their equivalent. This is justified on the argument that the IT and the Finance managers are mostly involved in the decision making of technology-related matters. The other personnel are the main users of the technology. The conclusive list of the SACCOs is in appendix III.

3.3.1 Sample Size

For a population less than 200, a census is recommended (Bernard and Bernard 2012). A sample size of 30 and above is acceptable; according to Oates (2005). The study will conduct a census on all the institutions targeted. The sample size was hence, the 39 SACCOs. This is because the population of the study was small. This also brought about more accuracy in the survey. "If you wanted perfect accuracy (that is, a range of $+/-0$ percentage points), you would have to survey the whole population" Oates (2005). The sample had an accuracy range of +/-0% and a confidence level of 95%.

Table 2 Sample Size

SECTOR	NUMBER OF SACCOS
Government-based	10
Teachers-based	3
Farmer-based	9
Private-based	8
Community-based	9
TOTAL	**39**

3.4 Data Collection Instruments

This study involved both primary data and secondary data. The research instruments for this study were semi-structured questionnaires. Some of the questionnaires were self-administered, while others were sent via email. The administration of questionnaires was considered to gather more data, since a respondent filled it independently. They are also more effective and efficient compared to other ways of collecting data such as interviews and focus

group discussions. Questionnaires are also the main means of collecting data (Mugenda & Mugenda 2003).

According to Williams, (2011), researchers collect and analyze numerical data that is used in quantitative research, and narrative data, which is used for qualitative research, so as to cater for the research questions set for a specific research study. Thus, the study used both quantitative and qualitative research methods. The closed ended questions were effective in gathering quantitative data, while the open-ended questions gathered qualitative data.

3.5 Data Collection Procedure

A letter to request a leeway to collect data was sent to the targeted organizations. A sample letter is attached on appendix I. After approval, questionnaires were administered to the IT and Finance managers, an accountant and an IT personnel in the organizations. They were collected after a period of one week, for analysis.

3.6 Pilot Test

3.6.1 Data Validation

Validity is the degree to which a tool measures what it is anticipated to measure (Tavakol and Dennick, 2011). Pre-testing was carried out to test the relevance of the questions contained in the questionnaire. This was through the use of actual data rather than seed data. Pretesting was be conducted at four SACCOs, which represented 10% of the population. The institutions were chosen for the validity test based on them having conducted business using technology services such as mobile banking for more than 5 years, and were among the top performing SACCOs in Kenya.

3.6.2 Reliability

Reliability deals with the ability to measure with an instrument what is intended to be measured consistently (Tavakol and Dennick, 2011). Internal consistency was measured through Cronbach's Alpha. It is used to give a measure of the internal consistency of a test or a scale, and is expressed as a number between 0 and 1 (Cronbach, 1951). Internal consistency talks about the extent to which all the items in a test measure the same concept or construct. The suitable values of alpha usually range between 0.70 and 0.95 (Bland and Altman, 1997).

3.7 Data Analysis and Presentation

Data analysis was carried out using both descriptive and inferential statistics. Descriptive statistics inform us on what is, and inferential statistics bring out cause and effect (Knupfer

and McLellan, 1996). Descriptive statistics were analyzed using frequencies, percentages, the mean-measures of central tendency, and Standard deviation, which is the measure of dispersion. Inferential statistics were also analyzed, to show correlation between variables. Statistical Package for Social Sciences (SPSS) version 20 was used to analyse data. The results were presented using tables and pie charts.

Any incomplete question on the questionnaire was factored in during analysis. The choice of a large sample was meant to provide enough responses in the case of incomplete questions. The use of a multiple linear regression model was adopted to evaluate the determinants of adoption of technology among SACCOs in Nairobi County. The multiple linear regression model is as shown below:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$

Where:

Y=Technology Innovation Decision Making

α =Regression constant

β_1=Coefficient of Technology

β_2=Coefficient of Organization

β_3=Coefficient of Environment

X1=Technology

X2=Organization

X3=Environment

e=Error term

All the statistical tests were conducted at 5% level of significance (95% confidence level). The significance of relationships was tested at 5% level of significance.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Pilot Results

Before testing for correlation of the study variables, it was important to know the level of their reliability. The measurement reliability was conducted using Cronbach's alpha coefficient and for an alpha of between 0.70 and 0.95, the instrument was interpreted as reliable (Bland and Altman, 1997). The internal consistency of the variables is acceptable since it was more than 0.7. The alpha level also shows that the variables of the study were correlated. The results in the table below show the variables in the study had Cronbach's alpha value above 0.7 implying that the instruments were sufficiently reliable for measurement.

Table 3 Reliability Statistics using Cronbach's alpha

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.78	.75	4

4.2 Response Rate

One hundred and fifty six (156) questionnaires were issued to the 39 SACCOs that formed the sample size. Out of these, one hundred and thirty seven (137) questionnaires were returned. These represented 88% response rate. According to Mugenda and Mugenda (2003), a response rate of 50% is adequate for a study.

4.3 Demographics Information

This section contains general information about the respondents and their organizations. The data showed the appropriateness of the respondent in participating in the research process.

4.3.1 Age of the Respondents

The table below shows that majority of the participants of the study were aged between 19-35 years. Hence, the findings imply that most of Sacco staff are aged between 19 and 35 years, at 78.1%. Participants aged 36 years and above were only 28.

Table 4 Age of Respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	1.5	1.5	1.5
19-35 years	107	78.1	78.1	79.6
36 and above	28	20.4	20.4	100.0
Total	137	100.0	100.0	

4.3.2 Respondents' Education Level

The analysis showed that most of the participants had a bachelor's degree. They represented 80.7% of the total participants. Those with a master's degree were 17% of the total participants. Only 2.2% of the total participants had diplomas. Hence, it can be concluded that most of the people working in Saccos have a bachelor's degree.

Table 5 Respondents' Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	3	2.2	2.2	2.2
	Bachelor's degree	109	79.6	80.7	83.0
	Masters	23	16.8	17.0	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.3.3 Respondents' Position in the Organization

The table below shows that most of the participants were accountants. They made up 47.4% of the respondents. IT personnel, I.T managers, and finance managers made up 27.7%, 14%,

and 19% of the respondents respectively. This shows that the data was collected from most of the positions that deal with the use of technology, or the decision making process of which technology to adopt. Hence, the conclusions of the research can be said to cover the relevant departments.

Table 6 Position held in the organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Finance manager	19	13.9	14.1	14.1
	I.T Manager	14	10.2	10.4	24.4
	Accountant	64	46.7	47.4	71.9
	IT personnel	38	27.7	28.1	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

The pie chart below represents the information in the table further.
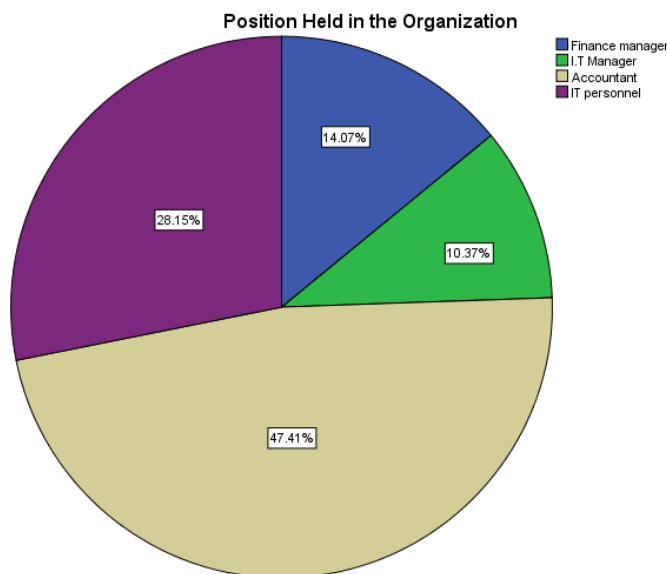
Figure 7 Position held in the organization

4.3.4 Organization's Period of Existence

According to the table below, most of the Saccos have been in existence for over 30 years. Respondents who stated that their organizations' existence was less than 29 years were

15.3%. The duration of the existence of the organizations imply that they have passed through different eras of technological changes, and have had the opportunity to exist during several technological advancements.

Table 7 Organization's Existence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 9 years	3	2.2	2.2	2.2
	10-19 years	7	5.1	5.2	7.4
	20-29 years	21	15.3	15.6	23.0
	over 30 years	104	75.9	77.0	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.3.5 Organization's Number of Employees
The analysis showed that most of the respondents were from organizations that had between 100 and 199 employees. These respondents made up 63% of the total number of participants. Respondents from organizations with between 200 and 299 employees were 37%.

Table 8 Number of employees in the organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	between 100 and 199 employees	85	62.0	63.0	63.0
	between 200 and 299 employees	50	36.5	37.0	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.4 Technology Adoption by the SACCOs

4.4.1 Technology adoption enables customers transact business with ease

After data analysis, it can be confirmed that 57% of the respondents agreed that adoption of technology enables customers to transact business with ease. 42.2% of the respondents were neutral, and 7% of respondents strongly agreed. Hence, it can be concluded that customers can be able to transact business with ease if there is technology adoption.

Table 9 Technology adoption enables customers transact business with ease

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	57	41.6	42.2	42.2
	Agree	77	56.2	57.0	99.3
	Strongly Agree	1	.7	.7	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.4.2 Technology adoption reduces operation cost

The table below shows that the highest percentage of the respondents agreed that adoption of technology reduces operational costs. They made up 55.6% of the total participants. Those who were neutral, strongly agreed, disagreed, and strongly disagreed, were 23.7%, 11.9%, 6.7%, and 2.2% respectively. Therefore, this implies that operation costs in SACCOs reduce with technological adaptations.

Table 10 Technology adoption reduces cost of operations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	2.2	2.2	2.2
	Disagree	9	6.6	6.7	8.9
	Neutral	32	23.4	23.7	32.6
	Agree	75	54.7	55.6	88.1
	Strongly Agree	16	11.7	11.9	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.4.3 Organization is aware of competitors' technology implementations

According to the respondents, most of their organizations were aware of technological implantations since 32.6% agreed and 19.7% strongly agreed to the question. The respondents who disagreed and those who were neutral were 47.4% in total. This implies that the organizations are keen on their competitor's technological advancements, and are aware of the competitive edge that comes with the technology.

Table 11 Organization's awareness of technological implementations by competitors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	26	19.0	19.3	19.3
	Neutral	38	27.7	28.1	47.4
	Agree	44	32.1	32.6	80.0
	Strongly Agree	27	19.7	20.0	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.4.4 Organization is aware of Technology Opportunities and Threats

The table below shows that 63.7% of the respondents agreed while 36.3% disagreed that their organizations were familiar with opportunities and threats that come with technology adoption. This implies that, if the organizations were to adopt technology, or have adapted technology, they are aware of the benefits and the risks that would come along with it.

Table 12 Organization's familiarity with opportunities and threats of technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	49	35.8	36.3	36.3
	Agree	86	62.8	63.7	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.4.5 Organization has competent ICT department employees

60.7% of the respondents agreed that their organizations have competent ICT department employees. 18.5% of them strongly agreed on the same. However, 10.4%, 6.7%, and 3.7% were neutral, disagreed, and strongly disagreed on competency respectively. This implies that SACCOS have knowledgeable and competent ICT specialists who are capable of handling a technological upgrade, and the challenges that arise during technology adoption.

Table 13 Organization has competent ICT department employees

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	5	3.6	3.7	3.7
	Disagree	9	6.6	6.7	10.4
	Neutral	14	10.2	10.4	20.7
	Agree	82	59.9	60.7	81.5

	Strongly Agree	25	18.2	18.5	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

The pie chart below represents the information in the table further.
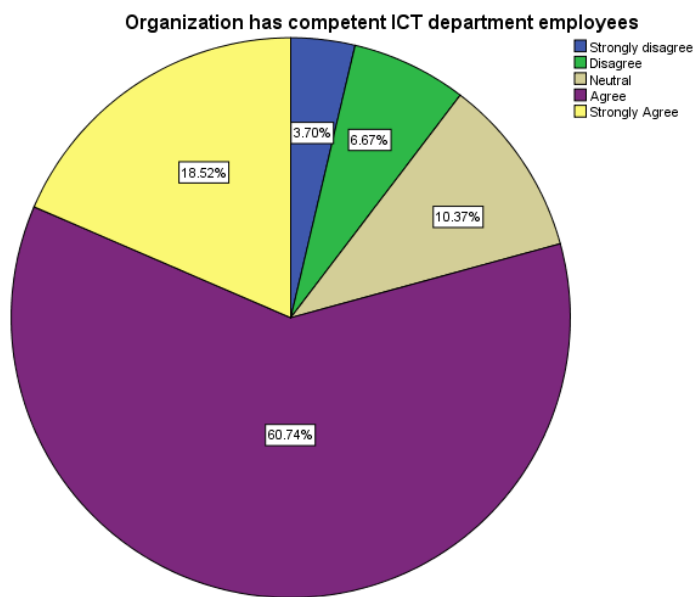
Figure 8 Organization has competent ICT department employees

4.4.6 Organization has reliable Internet Access

The information from the respondents indicated that most of the organizations had reliable internet access. This is because 48.1% and 15.6% of the respondents agreed and strongly agreed that their organizations had reliable internet. The two made up the highest percentage of the respondents. This implies that technologies that require internet connection for them to function, such as mobile banking and internet banking can be implemented in most SACCOs without any flaw involving the internet.

Table 14 Organization has reliable internet access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	7	5.1	5.2	5.2
	Disagree	18	13.1	13.3	18.5
	Neutral	24	17.5	17.8	36.3
	Agree	65	47.4	48.1	84.4
	Strongly Agree	21	15.3	15.6	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.4.7 Organization has Infrastructure and Personnel to perform a technological upgrade

The highest percentage of the respondent were neutral on the fact that their organizations possess ICT infrastructure and IT human resources. They made up 42.2% of the participants. 37% of the respondents also disagreed on the same. This implies that there is a risk of technological failure during the implementation process in most SACCOs. Thus, there is a need for organizations to improve their human resources and infrastructure in anticipation of technological implementations and requirements.

Table 15 Organization Possesses ICT infrastructure and personnel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	2.2	2.2	2.2
	Disagree	50	36.5	37.0	39.3
	Neutral	57	41.6	42.2	81.5
	Agree	23	16.8	17.0	98.5

				Valid	Cumulative
	Strongly Agree	2	1.5	1.5	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

The pie chart below represents the information in the table further.
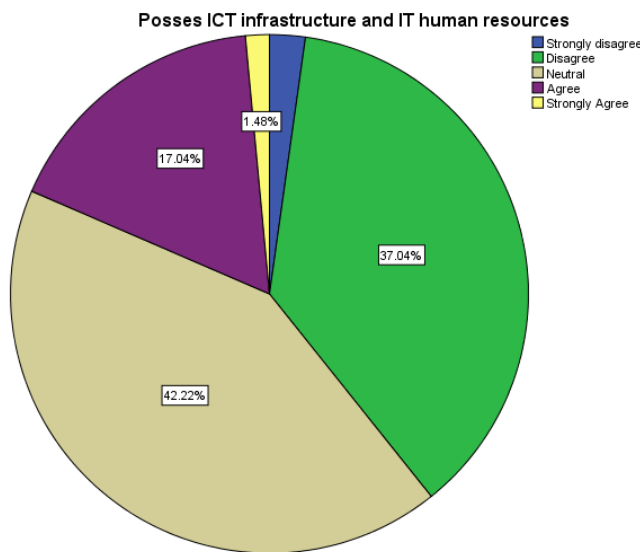
Figure 9 Organization Possesses ICT infrastructure and personnel

4.4.8 Technology has brought about Growth in Revenue

After the analysis, it was clear that the current technologies that SACCOs adopted have brought growth in terms of revenue. 63.7% agreed while 21.5% strongly agreed on the same. Therefore, it can be concluded that technology adoption leads to revenue growth among SACCOs.

Table 16 Technology Adoption brought about growth in terms of revenue

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	1	.7	.7	.7
	Neutral	19	13.9	14.1	14.8
	Agree	86	62.8	63.7	78.5

		Frequency	Percent	Valid Percent	Cumulative Percent
	Strongly Agree	29	21.2	21.5	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.4.9 Technology has brought about Increase in Market share

The table below shows that 56.3% of the respondents agreed that technology adoption has led to increase in their organization's market share. However, the second percentage of the respondents who were 28.9% were neutral on the same. 6.7% disagreed, 5.8% strongly agreed, and 2.2% strongly disagreed on the same. Based on the information on the table, organizations experience increases in market share when they integrate technology in their operations.

Table 17 Technology has brought about Increase in Market share

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	2.2	2.2	2.2
	Disagree	9	6.6	6.7	8.9
	Neutral	39	28.5	28.9	37.8
	Agree	76	55.5	56.3	94.1
	Strongly Agree	8	5.8	5.9	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.4.10 Technology has brought about Efficiency in conducting Internal Business Processes

The table below confirms that indeed technology adoption has led to efficiency when it comes to conducting internal business processes. 69.6% agreed while 17.8% strongly agreed. Those who were neutral, disagreed, and strongly disagreed were 12.6%, 5.2%, and 2.2% respectively. This implies that SACCOs conduct their business in a more efficient manner through adoption of technology, thus leading to a higher output and faster processing of work.

Table 18 Technology has brought efficiency in conducting internal business processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	2.2	2.2	2.2
	Disagree	4	2.9	3.0	5.2
	Neutral	10	7.3	7.4	12.6
	Agree	94	68.6	69.6	82.2
	Strongly Agree	24	17.5	17.8	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.5 Organizational factors affecting Technology Adoption

4.5.1 Organization is committed to adopting technology to improve business activities

56.3% of respondents were neutral on the fact that their organization was committed to adopting technology to improve business. Those who agreed, disagreed, and strongly disagreed were 28.1%, 14.8% and 0.7% respectively. This indicates that many SACCOs are not committed to adopting technology to improve their businesses. This means that technology adoption is not at the forefront of the activities that the SACCOs are planning to implement.

Table 19 Organization is committed to adopting technology to improve business activities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	.7	.7	.7
	Disagree	20	14.6	14.8	15.6
	Neutral	76	55.5	56.3	71.9
	Agree	38	27.7	28.1	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.5.2 Top Management support of Technology Adoption Processes

The highest percent of the respondents at 37.8% were neutral on the fact that their organization's top management fully supports technology adoption. Conversely, 34.8% of the respondents agreed on the same. Therefore, this shows that most organization's top management are not fully committed towards supporting IT adoption. Without the support of the top management, it is not favourable to adopt technology, as most of the technology adoption decisions are made by them.

Table 20 Top management fully supports technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	37	27.0	27.4	27.4
	Neutral	47	37.3	37.8	65.2
	Agree	51	34.2	34.8	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

The pie chart below represents the information in the table further.

Top management fully supports technology adoption
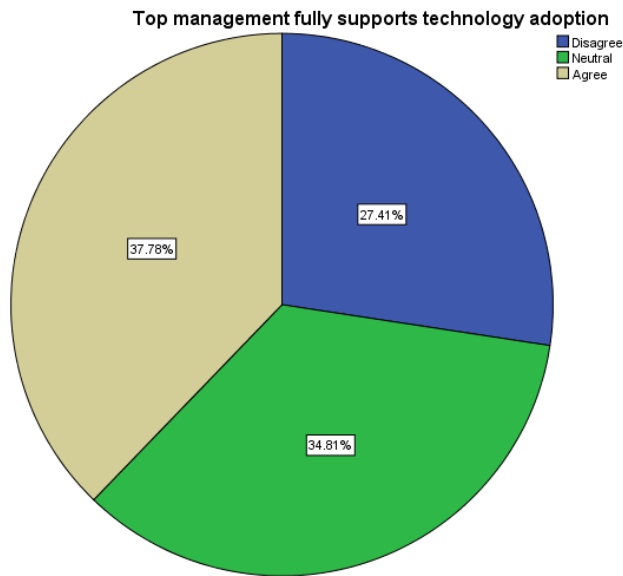
Figure 10 Top management fully supports technology adoption

4.5.3 Technology adoption is strategy-led

40% of the respondents agreed that technology adoption in their organizations is strategy led. Those who strongly agreed were less than 1%. On the other hand, those who were neutral as well as disagreed were 31.9% and 27.4% respectively. This implies that technology adoption in SACCOs is not in line with their strategic plan, and that the organizations adopt technology when favours a certain opportunity of the moment.

Table 21 Technology adoption is strategy-led

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	37	27.0	27.4	27.4
	Neutral	43	31.4	31.9	59.3
	Agree	54	39.4	40.0	99.3
	Strongly Agree	1	.7	.7	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.5.4 Top Management is aware of technology adoption benefits

45.2% of the respondents agreed that their organization's top management is aware of the benefits that can be realized from technology adoption. Those who strongly agreed were 7.4%. On the other hand, those who were neutral, disagreed, and strongly disagreed on the same were 25.9%, 19.3% and 2.2%. This implies that with the benefits of technology adoption known by the top management, their decision to adopt or not to adopt technology is usually well informed.

Table 22 Top Management is aware of technology adoption benefits

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	2.2	2.2	2.2
	Disagree	26	19.0	19.3	21.5
	Neutral	35	25.5	25.9	47.4
	Agree	61	44.5	45.2	92.6
	Strongly Agree	10	7.3	7.4	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.5.5 Organization's size influences Technology Adoption

According to the results of the analysis, 56.3% of the respondents agreed that the size of the firm influences adoption of technology. 12.6% also strongly agreed. However, 11.1%, 13.3% and 6.7% were neutral, disagreed, and strongly disagreed on the same. This implies that small organizations are less likely to adopt technology compared to large firms.

Table 23 Organization's size influences Technology Adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	9	6.6	6.7	6.7
	Disagree	18	13.1	13.3	20.0
	Neutral	15	10.9	11.1	31.1
	Agree	76	55.5	56.3	87.4
	Strongly Agree	17	12.4	12.6	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.5.6 Organization has resource slack to acquire technology

Most of the respondents were neutral on the fact that their organizations had resource slack in acquisition of technology resources. These respondents made up 39.3% of total number of respondents. Those who disagreed were 34.1% of the total respondents. Those respondents who either strongly disagreed or strongly agreed were 4.4% and 3% respectively. This implies that most SACCOs do not have extra resources that can be committed to technological adoption.

Table 24 Organization has resource slack for acquisition of technology resources

Organization has resource slack for acquisition of technology resources

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	4.4	4.4	4.4
	Disagree	46	33.6	34.1	38.5
	Neutral	53	38.7	39.3	77.8

		Frequency	Percent	Valid Percent	Cumulative Percent
	Agree	26	19.0	19.3	97.0
	Strongly Agree	4	2.9	3.0	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.5.7 Formal and Informal linking structures influence technology adoption

37.8% of the respondents agreed that formal and informal linking structures of their organizations have no influence on technology adoption. Those who disagreed, were neutral, strongly disagreed and strongly disagreed were 31.9%, 17%, 11.1%, and 2.2% respectively. This implies that the linking structures of an organization, including factors such as the organizational structure and the bureaucracy in the organization influence the process of technology adoption

Table 25 Formal and Informal linking structures influence technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	15	10.9	11.1	11.1
	Disagree	43	31.4	31.9	43.0
	Neutral	23	16.8	17.0	60.0
	Agree	51	37.2	37.8	97.8
	Strongly Agree	3	2.2	2.2	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.5.8 Organization has competent IT Staff

47.4% of the respondents agreed that their organization has competent IT staff that drive the process of technology adoption. 18.5% strongly agreed on the same too. On the other hand, 19.3% of respondents were neutral. Hence, it can be concluded that SACCOs have competent IT staff that drive the process of technology adoption but this has not been fully leveraged.

Table 26 Organization has competent IT Staff to drive Technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	6	4.4	4.4	4.4
	Disagree	14	10.2	10.4	14.8
	Neutral	26	19.0	19.3	34.1
	Agree	64	46.7	47.4	81.5
	Strongly Agree	25	18.2	18.5	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6 Environmental factors affecting Technology Adoption

4.6.1 Government shows commitment to Technology Adoption

63.7% of the respondents agreed that the government demonstrates a major commitment to promote adoption of technology. 23.7% also strongly agreed on the same. 12.6% 5.2%, and 2.2% of the respondents were neutral, disagreed and strongly disagreed on the fact that government demonstrates a major commitment to promote adoption of technology respectively. This implies that there is support of the government in implementation of technology amongst SACCOs.

Table 27 Government shows commitment to Technology Adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	2.2	2.2	2.2
	Disagree	4	2.9	3.0	5.2
	Neutral	10	7.3	7.4	12.6
	Agree	86	62.8	63.7	76.3
	Strongly Agree	32	23.4	23.7	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6.2 Effective laws to battle cybercrime

The highest percentage of the respondents disagreed that there are effective laws to battle cyber-crime. They were 48.1% of the total respondents. 24.4% of the respondents were neutral on the same. 14.8% of the respondents also strongly disagreed that there are effective laws to battle cyber-crime. 10.4% agreed and 2.2% percentage strongly agreed on the fact. This implies that organizations find it difficult to tackle cybercrime as the current regulations and laws do not have enough support to the act.

Table 28 Effective laws to battle cyber-crime

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	20	14.6	14.8	14.8
	Disagree	65	47.4	48.1	63.0
	Neutral	33	24.1	24.4	87.4
	Agree	14	10.2	10.4	97.8

	Strongly Agree	3	2.2	2.2	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

The pie chart below represents the information in the table further.
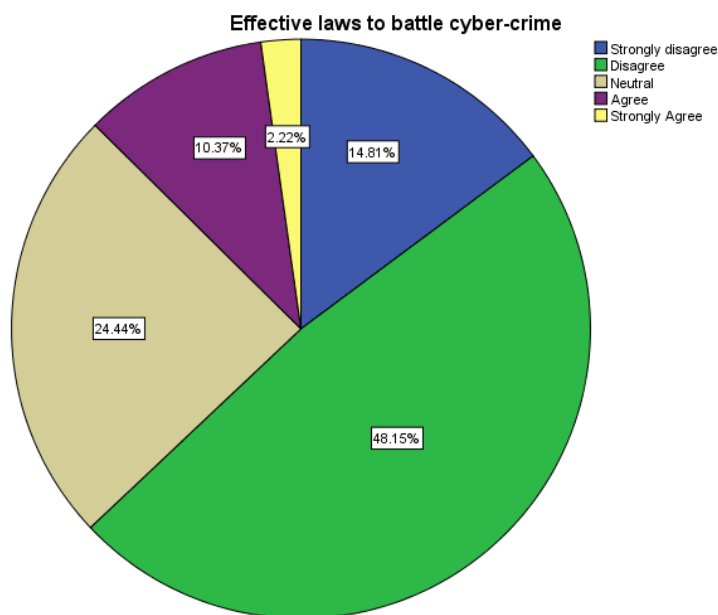
Figure 11 Effective laws to battle cyber-crime

4.6.3 Legal Environment is conducive for Technology Adoption

61.5% of the respondents agreed that the current legal environment is conducive for technology adoption. 17% of them also strongly agreed on the same. Therefore, it can be concluded that the legal environment is conducive for technology adoption. It implies that the government has and is continuing to provide a conducive environment for SACCOs to conduct business through the provision of trusted legal and judicial systems.

Table 29 Legal environment is conducive for technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	2	1.5	1.5	1.5
	Disagree	16	11.7	11.9	13.3
	Neutral	11	8.0	8.1	21.5
	Agree	83	60.6	61.5	83.0
	Strongly Agree	23	16.8	17.0	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6.4 Government Regulations Influence Technology Adoption

The table below shows that 51.1% of the respondents agreed that government regulations have influenced technology adoption process. 25.9% of them also strongly agreed on the same. This implies that the government provides regulation through regulatory authorities, which influence technology adoption in SACCOs. This is through various requirements and standards that are set by the regulatory authorities.

Table 30 Government Regulations Influence Technology Adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	3	2.2	2.2	2.2
	Disagree	5	3.6	3.7	5.9
	Neutral	23	16.8	17.0	23.0
	Agree	69	50.4	51.1	74.1
	Strongly Agree	35	25.5	25.9	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		

		Frequency	Percent	Valid Percent	Cumulative Percent
Total		137	100.0		

4.6.5 Competitors have adopted technology to cause perfect competition

The highest percentage of respondents agreed and strongly agreed that their competitors in the market have adopted technology and cause a perfect competition. Those who agreed and those who strongly agreed were 58.5% and 25.9% respectively. However, some were neutral and disagreed on the fact. The two made up 15.6% of the respondents. This implies that technology adoption has led SACCOs to have no monopoly in the market since most elements of monopoly are absent through technology adoption. The SACCOs and their members are more informed through technology too, thus bringing perfect competition.

Table 31 Competitors have adopted technology to cause perfect competition

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	7	5.1	5.2	5.2
	Neutral	14	10.2	10.4	15.6
	Agree	79	57.7	58.5	74.1
	Strongly Agree	35	25.5	25.9	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6.6 Technology Adoption has improved visibility and market churn

57.0% of the respondents agreed, 21.5% were neutral, 15.6% disagreed, and 5.9% strongly disagreed to the fact that adoption of technology has led to improvement of visibility and turnover of customers in their organization. This implies that technology adoption has made SACCOs known to a wider population and has led to a high turnover of customers.

Table 32 Technology Adoption has improved visibility and market churn

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	21	15.3	15.6	15.6
	Neutral	29	21.2	21.5	37.0
	Agree	77	56.2	57.0	94.1
	Strongly Agree	8	5.8	5.9	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6.7 Perceived success of Competitors has influenced Technology Adoption

The highest percentage of the respondents agreed and strongly agreed on the fact that perceived success of their competitors has influenced their organization to adopt technology. Those who agreed were 63.7% while those who strongly agreed were 12.6%. This suggests that most SACCOs have adopted technology to be at par with their competitors. The success of competitors has made organizations benchmark from them as they make technological decisions.

Table 33 Perceived success of competitors has influenced technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	9	6.6	6.7	6.7
	Neutral	23	16.8	17.0	23.7
	Agree	86	62.8	63.7	87.4
	Strongly Agree	17	12.4	12.6	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6.8 Clients perceive competitors who have adopted technology favourable

According to the table below, 54.1% agreed, 43.7% strongly agreed, and 2.2% of the respondents were neutral on the fact that their competitors have adopted technology that is perceived favourable by customers. This implies that the perception of the technology being favourable has led to there being an increase in market share in such organizations.

Table 34 Clients perceive competitors who have adopted technology favourable

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Neutral	3	2.2	2.2	2.2
	Agree	73	53.3	54.1	56.3
	Strongly Agree	59	43.1	43.7	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6.9 There is powerful rivalry within organizations in the industry

52.6% agreed, 7.4% strongly agreed, 20.7% were neutral, 5.9% strongly disagreed, and 13.3% of the respondents disagreed on the fact that there is powerful rivalry within organizations in the industry that is very great. The highest percentage agreed and strongly agreed. This implies that due to the rivalry, organizations should strive to give the best services in the market through technology adoption, to differentiate themselves from their competitors in the industry.

Table 35 There is powerful rivalry within organizations in the industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	13	9.5	9.6	9.6
	Disagree	6	4.4	4.4	14.1
	Neutral	13	9.5	9.6	23.7
	Agree	87	63.5	64.4	88.1
	Strongly Agree	16	11.7	11.9	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6.10 Telecommunication Infrastructure is reliable and efficient

According to the table below, 51% of the respondents agreed, 20% were neutral, 18% disagreed, 10% strongly agreed, and 8% strongly disagreed that telecommunication infrastructure is reliable and efficient to support technology adoption. This implies that there is the availability of reliable telecommunication infrastructure for SACCOs to use in their process of technology adoption.

Table 36 Telecommunication Infrastructure is reliable and efficient to support technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	8	5.8	5.9	5.9
	Disagree	18	13.1	13.3	19.3
	Neutral	28	20.4	20.7	40.0
	Agree	71	51.8	52.6	92.6
	Strongly Agree	10	7.3	7.4	100.0

53

		Frequency	Percent	Valid Percent	Cumulative Percent
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.6.11 Affordable Technology Support Infrastructure to support Technology adoption

53.3% of the respondents agreed, 23.0% strongly agreed, 14.8% were neutral, 3.0% strongly disagreed, and 5.9% of the respondents disagreed on the fact that there is efficient and affordable technology support infrastructure from the local IT industry to enable technology adoption. The highest percentage agreed and strongly agreed to the same. This implies that Technology Support Infrastructure such as the Fibre Optic cabling is available, efficient and affordable for SACCOs in their quest for technology adoption.

Table 37 Affordable Technology Support Infrastructure to support Technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	4	2.9	3.0	3.0
	Disagree	8	5.8	5.9	8.9
	Neutral	20	14.6	14.8	23.7
	Agree	72	52.6	53.3	77.0
	Strongly Agree	31	22.6	23.0	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.7 Other User-defined factors that influence technology adoption

43.7% of the respondents noted that the cost of purchasing and implementing technology, and training staff about the technology affects technology adoption. 32.6% and 11.1% stated that

the number of customers in a SACCO, and the SACCO management influence technology adoption respectively.

Table 38 User-defined factors that influence technology adoption

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cost of purchasing, implementing, and training	59	43.1	43.7	43.7
	Number of customers	44	32.1	32.6	76.3
	Sacco management	15	10.9	11.1	87.4
	None	17	12.4	12.6	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

The pie chart below represents the information in the table further.
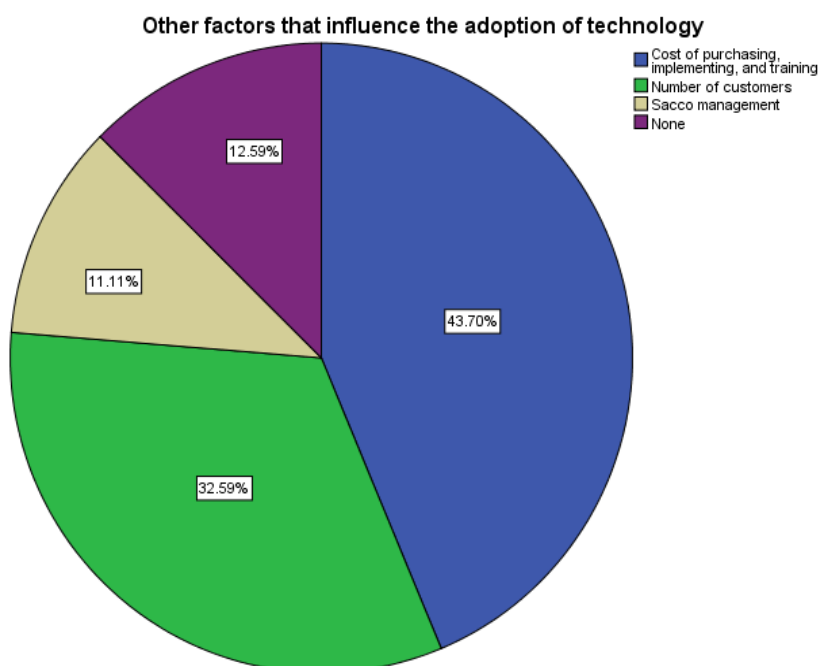

Figure 12 User-defined factors that influence technology adoption

According to the table below, 70.4% of the respondents recommended that Sacco's need to invest heavily in technology and 29.6% recommended that the management team should be ready to support technology adoption if they want to improve their organizations.

Table 39 Ideal recommendation on SACCO improvement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Invest heavily in technology	95	69.3	70.4	70.4
	management to support technology adoption	40	29.2	29.6	100.0
	Total	135	98.5	100.0	
Missing	System	2	1.5		
Total		137	100.0		

4.8 Correlation Analysis

Table 40 Correlations

Control Variables			Technology	Organization	Environment
Technology adoption decision making	Technology	Correlation	1.000	-.079	.150
		Significance (2-tailed)	.	.367	.084
		Df	0	132	132
	Organization	Correlation	-.079	1.000	.006
		Significance (2-tailed)	.367	.	.943
		Df	132	0	132
	Environment	Correlation	.150	.006	1.000
		Significance (2-tailed)	.084	.943	.
		Df	132	132	0

Table 41 Inter-Variable correlation

	Technology	Organization	Environment
Technology	1.000	-.078	.150
Organization	-.078	1.000	.007
Environment	.150	.007	1.000

The study findings indicated that Technology and Environment are positively correlated with Technology adoption decision making, as indicated by positive correlation values of 1.00 and 0.150 respectively. However, there is a negative correlation of Organization with Technology adoption decision making, as indicated by negative correlation value of -0.079. A positive correlation shows that when one variable increases in value, the other variable also increases, and vice versa. A negative correlation shows that when one variable increases, the other variable decreases, and vice versa.

4.9 Regression Analysis

Table 42 Overall Regression Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.391[a]	.103	-.213	.627

a. Predictors: (Constant), Environment, Organization, Technology

The table above shows the R figure as 0.391, which shows the joint association between the predictor variables and the dependent variable as positive. The result of R^2 is displayed as 0.103. This shows that the strength of the relationship between the model and the response variable is not strong, as data is not closely fitted to the regression line. However, important conclusions can be drawn about how changes in the predictor values are related with changes in the response value.

Table 43 Regression ANOVA Summary

ANOVAᵃ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.077	3	.026	.066	.978ᵇ
	Residual	51.449	131	.393		
	Total	51.526	134			

a. Dependent Variable: Technology adoption decision making

b. Predictors: (Constant), Environment, Organization, Technology

The table above shows the statistical significance of the regression model used. The level of significance was 0.978, which is more than 0.05 at 5% level of significance. This indicates that the overall Technology Organization and Environment Framework was not significant. This shows that the combined effect of Technology, Organization and Environment was not statistically significant in explaining Technology adoption decision making in SACCOs.

Table 44 Coefficients table

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.606	1.054		3.421	.001
	Technology	.004	.019	.020	.229	.819
	Organization	.006	.020	.027	.311	.756
	Environment	.004	.019	.018	.201	.841

a. Dependent Variable: Technology adoption decision making

The regression model is as below:

$$Y = 3.606 + 0.004\ X_1 + 0.006\ X_2 + 0.004\ X_3$$

Where Y is the Technology Adoption Decision Making, X1 is Technology, X2 is Organization, and X3 is Environment. The results in the table above for regression coefficients of the study shows that there is a positive relationship between Technology, Organization and Environment, and Technology adoption decision making, as supported by beta coefficients of 0.004, 0.006, and 0.004 respectively. This means that an increase in either of the variables will positively influence Technology adoption decision making. The analysis also brings out results that indicate that all variables used in the study are statistically insignificant as the probability (p) values were 0.819, 0.756 and 0.841 respectively. These values are more than the conventional value of 0.05. This shows that there is no sufficient evidence in the chosen sample of respondents to conclude that a non-zero correlation exists.

4.10 Resulting Model

The regression analysis indicated that all variables used in the study were statistically insignificant as the probability (p) values of Technology, Organization and Environment were 0.819, 0.756 and 0.841 respectively. These values are above the conventional value of 0.05. However, the study indicates that Technology and Environment are positively correlated with Technology adoption decision making. Organization brings a negative correlation to the dependent variable, with a correlation value of -0.079.

Hypothesis

H1: The availability of technology infrastructure and processes in an organization highly contributes to technology adoption decision making.

The results indicate a positive correlation of technology with technology innovation decision making. This means that when technology increases in value, technology innovation decision making also increases, and vice versa. 64% of the respondents indicated that technology adoption enables customers to transact with ease, while 67.5% indicated that technology adoption reduces operational cost. Technology availability through infrastructure and competent IT personnel is also key to SACCOs adopting technology. This thus supports the hypothesis.

H2: An organization's characteristics and performance influences how technological decisions are made in an organization

The results indicate that amongst formal and informal linking structures, resource slack available and the size of the organization, it is only the size of the organization and formal and informal linking structures that influences how and when technological decisions are made in an organization. This is supported by 68.9% of the respondents. SACCOs too do not have resource slack, to channel towards technology adoption. This shows that organization characteristics influence technological decisions in SACCOs.

H3: An organization's technological decisions are highly influenced by the external environment relating to the organization.

The results indicate a positive correlation between the environment and technology innovation decision making. This is through the market structure, the competitors, the government regulations and its commitment to technology adoption by SACCOs. 97.8% of the respondents consider competitor organizations that have adopted technology more favourable to their customers. This thus supports the hypothesis.

Therefore, all the variables included in the TOE Framework are related and influence the technology adoption process, and thus remain unchanged, as shown below:
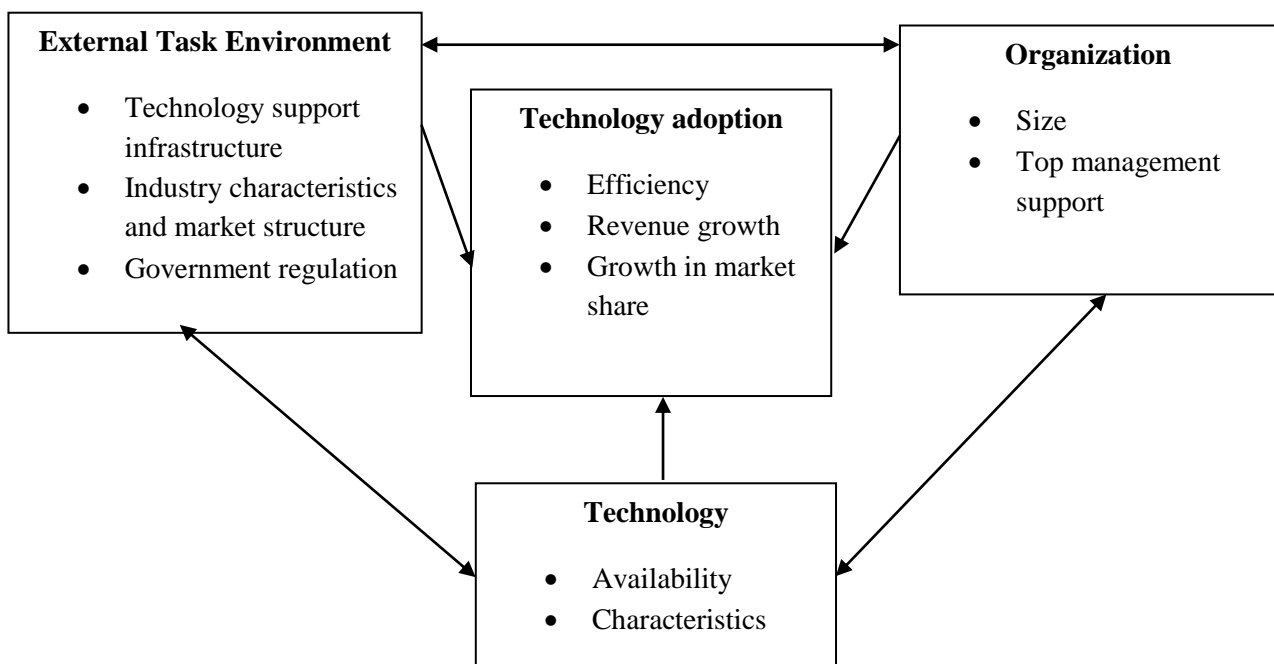

Figure 13 Resulting Model

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Key Findings

5.1.1 Technology and its effect on Technology Adoption

The study established that availability and characteristics of technology affect an organization's decision to adopt technology. It was found out that incorporation of technology in an organization enables customers to transact business with ease, and has reduced the operational cost for SACCOs, as it is efficient in conducting internal business processes. This is as Alwan & Al-Zubi (2016) found out that the banks that used Internet banking had a higher profit than non-users of the service. Small banks that concentrated on online banking services costed less than those that did not use the service. They also found out that the website quality, perceived privacy, customer trust, perceived ease of use and security had major effects on internet banking uptake.

Technology also leads to growth of SACCOs in terms of market share and revenue. This coincides with Sharma, Joseph & Kumar (2017) who concluded that mobile banking has impacted positively the financial performance of commercial banks in India.

Most SACCOs have competent ICT department employees who spearhead technology adoption processes. However, most SACCOs do not possess the ICT infrastructure and manpower, in terms of human resources, to perform a major technological upgrade.

5.1.2 Organization Characteristics, Resources and their effect on Technology Adoption

From the study, it was found out that the size of an organization, in terms of the number of employees, influences the adoption of technology. Most SACCOs have competent IT staff that drive the technology adoption process. The top management of most SACCOs are also aware of the benefits of adopting technology. However, most of them do not fully support the technology adoption processes. Most SACCOs are not committed to adopting technology to improve their business activities. While making technological decisions, most of the SACCOs do not have the technological implementations being strategy-led. SACCOs do not keep aside, or use resource slack in acquisition of technological resources. Formal and informal linking structures have influence on technology adoption in most organizations. This coincides with Akotch & Munyoki (2016) study which showed that a company's market penetration, product development, size, profitability, innovation and technology affect growth of the banking industry in Kenya.

5.1.3 External Task Environment and its effect on Technology Adoption

The study revealed that the government demonstrates a major commitment in promoting technology adoption. This was through government regulators such as SASRA, through their regulatory policies. The government also provides a conducive legal environment for technology adoption. However, there are no effective laws to battle cyber-crime, which remains to be a major thorn amongst SACCOs. Most of the SACCOs' competitors have adopted technology, which has led to a perfect competition amongst them. This has brought about powerful rivalry within the SACCOs in the industry. Most of the organization's competitors that have adopted technology, and are considered favourable by customers, leading to the loss of market share and revenue. The perceived success of competitors has influenced many SACCOs to adopt technology so as not to lose their market share to the competitors.

This coincides with Kurnia, Choudrie, Mahbubur, & Alzougool (2015) research that found out that there was a major impact of environmental pressure on the embracing of various e-commerce technologies. Njogu (2015) found out that technology adoption has a positive relationship with competitiveness and adoption of technology improves an organization's competitiveness. According to Righa (2014), information technologies also function as a catalyst for the entry of new players into the market place. There is efficient and affordable technology support infrastructure such as the fibre optic from the local IT industry, which enables technology adoption. The telecommunication infrastructure is reliable and efficient to support the process of technology adoption.

5.2 Recommendations

The study recommends that SACCOs incorporate ICT infrastructure and the required ICT human resources to spearhead the process of technology adoption and have the capability to perform a major technological upgrade. This can be done through hiring of competent ICT employees, based on their skills, and having an annual IT budget that can be used to acquire infrastructure, either in form of hardware or software.

The study also recommends that SACCOs commit themselves to adopting technology to improve their business activities. The top management should fully support technology adoption processes and should implement them according to the IT strategy, which should be in line with the organization's strategy. SACCOs should also give priority to technology acquisitions while allocating their slack resources, as technology is the backbone of the financial sector.

The study also recommends that the government should come up with effective laws to battle cybercrime. This is due to the increased rate of cybercrime, which has led to some organizations slowing down on technology adoption, due to the involved risks.

Finally, the study recommends the use of the model in figure 13, among others, to evaluate technology adoption decision making among SACCOs.

5.3 Suggestions for Further Studies

This study was conducted among SACCOs in Nairobi County and hence, it is suggested that the study be conducted in other regions in Kenya. It is also suggested that a study be carried out on other variables that affect technology adoption among SACCOs, as the three independent variables in this study contribute 10.3% of Technology innovation decision making. That is a percentage of the explained variation, compared to the total variation that can be explained about Technology innovation decision making.

REFERENCES

Agrawal, D., Agrawal, R., Singh, J., and Tripathi, S. (2012). "E-commerce: True Indian Picture", *Journal of Advances in IT, vol. 3, no. 4*, pp. 250-257.

Akotch, W. F., & Munyoki, J. M. (2016). Determinants of growth in the banking industry in Kenya. *African Journal of Marketing Management, 8*(1), 1-11.

Alwan, H. A., & Al-Zubi, A. I. (2016). Determinants of Internet Banking Adoption among Customers of Commercial Banks: An Empirical Study in the Jordanian Banking Sector. *International Journal of Business and Management, 11*(3), 95.

Amin, H., Baba, R., & Muhammad, M. Z. (2007). An analysis of mobile banking acceptance by Malaysian customers. *Sunway academic journal, 4*, 1-12.

Angeles, R. (2013). Using the Technology-Organization-Environment framework and Zuboff's concepts for understanding environmental sustainability and RFID: Two case studies. *International Journal of Social, Education, Economics and Management Engineering, 7*(11), 1599-1608.

Awa, H.O., Ojiabo, O.U., & Emecheta, B.C. (2015). Integrating TAM, TPB and TOE frameworks and expanding their characteristic constructs for e-commerce adoption by SMEs. *Journal of Science & Technology Policy Management, 6*(1), 76-94.

Bland, J. M., & Altman, D. G. (1997). Statistics notes: Cronbach's alpha. *Bmj, 314*(7080), 572.

Bernard, H. R., & Bernard, H. R. (2012). *Social research methods: Qualitative and quantitative approaches.* Sage.

Communications Authority of Kenya, (2016). Retrieved from http://www.ca.go.ke/index.php/statistics

Central Bank of Kenya, (2015). Retrieved from https://www.centralbank.go.ke/uploads/financial_sector_stability/2057936782_Financial%20Stability%20Rpt%202015.pdf

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika, 16*(3), 297-334.

Davis Jr, F. D. (1986). *A technology acceptance model for empirically testing new end-user information systems: Theory and results* (Doctoral dissertation, Massachusetts Institute of Technology).

Donaldson, L. (2001). *The contingency theory of organizations*. Sage.

Gibbs, J. L., & Kraemer, K. L. (2004). A cross-country investigation of the determinants of scope of e-commerce use: an institutional approach. *Electronic Markets, 14*(2), 124-137.

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

Grant, C., & Osanloo, A. (2014). Understanding, Selecting, and Integrating a Theoretical Framework in Dissertation Research: Creating the Blueprint for Your "House". *Administrative issues Journal, 4*(2), 4.

Iacovou, C. L., Benbasat, I., & Dexter, A. S. (1995). Electronic data interchange and small organizations: Adoption and impact of technology. *MIS quarterly*, 465-485.

Jalang'o, B. O. (2015). *Effect of digital advertising on the performance of commercial Banks in Kenya* (Doctoral dissertation, University of Nairobi).

Jeyaraj, A., Rottman, J. W., & Lacity, M. C. (2006). A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology, 21*(1), 1-23.

Kaplan, R. S., & Norton, D. P. (1996). The balanced scorecard: translating strategy into action. Harvard Business Press.

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]

Kinuthia, J. N. K., & Akinnusi, D. M. (2014). The magnitude of barriers facing e-commerce businesses in Kenya. *Journal of Internet and Information Systems, 4*(1), 12–27.

Kithinji, L. W. (2014). *Internet marketing and performance of small and medium enterprises in Nairobi county* (Doctoral dissertation, University of Nairobi).

Knupfer, N. N., & McLellan, H. (1996). 41. *DESCRIPTIVE RESEARCH METHODOLOGIES*.

Kurnia, S., Choudrie, J., Mahbubur, R. M., & Alzougool, B. (2015). E-commerce technology adoption: A Malaysian grocery SME retail sector study. *Journal of Business Research, 68*(9), 1906-1918.

Lin, H. F., & Lin, S. M. (2008). Determinants of e-business diffusion: A test of the technology diffusion perspective. *Technovation, 28*(3), 135-145.

Mas, I., & Morawczynski, O. (2009). Designing mobile money services lessons from M-PESA. *Innovations, 4*(2), 77-91.

Mattila, M. (2015). Factors affecting the adoption of mobile banking services. *The Journal of Internet Banking and Commerce, 2003*.

Mburu, T. G. (2015). *Adoption of mobile banking services by Nairobi county Saccos* (Doctoral dissertation, University of Nairobi).

Momanyi, M. P., Osoro K., Nyagol, M., & Odoyo, F., (2016) Influence Of Information Technology In Enhancement Of Sustainable Competitive Advantage Of Saccos In Kisii County *IOSR Journal Of Humanities And Social Science (IOSR-JHSS) Volume 21, Issue 3, Ver. I* PP 103-117

Mugenda, O. M., &Mugenda, A.G. (2003). *Research Methods: Quantitative and*

Qualitative Approaches (2nd ed.). Nairobi: Acts.

Mugenda, O. M., & Mugenda, A. G. (2012). *Research methods dictionary.*

Mutua, J., Oteyo, N., and Njeru, A., (2013). "The Extent of E-Commerce Adoption among Small and Medium Enterprises in Nairobi, Kenya," *International Journal of Business and Social Science, vol. 4, no. 9*, pp. 116-122,, Available from http://www.ijbssnet.com.

Niranjanamurthy, M., Kavyashree, N., Jagannath, S., & Chahar, D. (2013). Analysis of e-commerce and m-commerce: advantages, limitations and security issues. *International Journal of Advanced Research in Computer and Communication Engineering, 2*(6).

Njau, J. N., & Karugu, W. (2014). Influence of E-Marketing on the performance of Small and Medium enterprises in Kenya: Survey of Small and medium enterprises in the Manufacturing Industry in Kenya. *International Journal of Business & Law Research, 2*(1), 62-70.

Njogu, N. (2015). *Factors Influencing the Adoption of Technology and Innovation as a Strategic Competitive Tool in a Kenyan Shoe Retail Firm* (Doctoral dissertation, United States International University-Africa).

Nugroho, M. A. (2015). Impact of Government Support and Competitor Pressure on the Readiness of SMEs in Indonesia in Adopting the Information Technology. *Procedia Computer Science, 72*, 102-111.

Oates, B. J. (2005). *Researching information systems and computing.* Sage.

Okibo, B. W., & Wario, A. Y. (2014). Effects of e-banking on growth of customer base in Kenyan banks. *The International Journal of Management Science and Information Technology (IJMSIT)*, (11-(Jan-Mar)), 48-64.

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

Oliveira, T., & Martins, M. F. (2010). Understanding e-business adoption across industries in European countries. *Industrial Management & Data Systems, 110*(9), 1337-1354.

Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation, 14*(1), 110-121.

Omanga, C.M. (2014). *SMES' adoption of web-based marketing: empirical evidence from Kenya.*

Palacios-Marqués, D., Soto-Acosta, P., & Merigó, J. M. (2015). Analyzing the effects of technological, organizational and competition factors on Web knowledge exchange in SMEs. *Telematics and Informatics, 32*(1), 23-32.

Pawar, A. V. (2014). *Study of The Effectiveness Of Online Marketing on Integrated Marketing Communication.*

Pudjianto, B & Hangjung, Z (2009), 'Factors affecting e-government assimilation in developing countries', Paper presented at the *4th Community Policy Research, South Conference*, Negombo, Sri Lanka.

Righa, S. S. (2014). Information technology and competitive advantage in internet service providers in Kenya. *Unpublished MBA Research Project, School of Business, University of Nairobi, Kenya.*

Rogers Everett, M. (1995). Diffusion of innovations. *New York, 12.*

Salehi, M., & Alipour, M. (2010). E-banking in emerging economy: empirical evidence of Iran. *International Journal of Economics and Finance, 2*(1), 201.

Sacco societies Regulatory Authority (2015) Retrieved from: *http://www.sasra.go.ke/index.php/resources/sacco-supervision-reports/category/11-sacco-supervision-reports?download=96:supervision-report-2015* Accessed 17/02/2017

Scott, J. E. (2007). An e-transformation study using the technology-organization-environment framework. *BLED 2007 Proceedings*, 55.

Sharimllah Devi, R. Chong, S.C. and Lin, B. (2008). Examining the perceived importance and effectiveness of KM performance outcomes from the perspective of institutions of higher learning, *International Journal of Innovation and Learning Vol. 5*, No. 1, pp18-37.

Sharma, M. A., Joseph, J., & Kumar, D. S. (2017). *The Impact of Mobile Banking on Financial Performance of Banks in India.*

Sila, I. (2013). Factors affecting the adoption of B2B e-commerce technologies. *Electronic commerce research, 13*(2), 199-236.

Souter, D., & Kerretts-Makau, M. (2012). *Internet governance in Kenya -an assessment for the Internet Society.* ict Development Associates Ltd, Kenya.

Stoica, O., Mehdian, S., & Sargu, A. (2015). The impact of internet banking on the performance of romanian banks: DEA and PCA approach. *Procedia Economics and Finance, 20*, 610-622.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education, 2,* 53.

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

Tornatzky, L. G., Fleischer, M., & Chakrabarti, A. K. (1990). *Processes of technological innovation*. Lexington Books.

UNCTAD (2015). Information Economy Report: Unlocking the potential of E-Commerce for Developing Countries. *United Nation Publication, New York and Geneva*. Sales No.E.15.11.D.1

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.

Wachira, E. W. (2013). *The effect of technological innovation on the financial performance of commercial banks in Kenya* (Doctoral dissertation, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI).

Wesley, M. C., & Richard, C. L. (1989) *Empirical studies of innovation and market structure*. *Chapter 18*. Handbook of Industrial Organization, vol.2

Williams, C. (2011). Research methods. *Journal of Business & Economics Research (JBER), 5*(3).

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

Xu, S., Zhu, K., & Gibbs, J. (2004). Global technology, local adoption: A Cross-Country investigation of internet adoption by companies in the united states and china. *Electronic Markets, 14*(1), 13-24.

Zeithaml, V. A., Parasuraman, A., & Malhotra, A. (2002). An empirical examination of the service quality-value-loyalty chain in an electronic channel. *University of North Caroline, Chapel Hill, NC, working paper*.

Zhu, K., Kraemer, K. L., & Xu, S. (2002). A cross-country study of electronic business adoption using the technology-organization-environment framework. *Center for Research on Information Technology and Organizations.*

Zhu, K., Kraemer, K. L., & Xu, S. (2006). The process of innovation assimilation by firms in different countries: a technology diffusion perspective on e-business. *Management science, 52*(10), 1557-1576.

APPENDICES

APPENDIX I: Authority Letter

GLAD MAGERIA NKONGE,

P.O BOX 5684-00100,

NAIROBI, KENYA

9TH FEBRUARY 2018

THE CHIEF EXECUTIVE OFFICER,

METROPOLITAN NATIONAL SACCO SOCIETY LTD,

P.O. BOX 5684-00100,

NAIROBI.

Dear Sir/Madam,

REF: AUTHORITY TO CARRY OUT ACADEMIC RESEARCH IN YOUR ORGANIZATION.

As per the above subject, I am a student at the University of Nairobi, pursuing Master of Science Degree in Information Technology Management, and doing a research on the adoption of technology amongst SACCOs in Nairobi County. I am conducting the research with focus on your organization because it is one of the deposit-taking SACCOs in Nairobi, recognized by Sacco Societies Regulatory Authority (SASRA). My focus is on the I.T Manager, Finance Manager, IT personnel, an accountant and a clerk of the organization. The information availed will be aggregated with total confidentiality.

Your kind support and authority hereby sought is essential to assist me carry out the research work. A copy of this research paper will be availed to your organization upon your request.

Yours Sincerely,

Glad Mageria Nkonge.

APPENDIX II: Questionnaire

Using Technology, Organization and Environment Framework to find out the technology adoption determinants among SACCOs in Nairobi County.

A Personal Data (Kindly tick ONE)

1) What is your age bracket?
   a) 18 years and below
   b) 19-35
   c) 36-45
   d) 46 and Above

2) What is your education level?
   a) Primary school
   b) High school
   c) Diploma
   d) Bachelors degree
   e) Masters degree
   f) Doctorate

3) Which position below do you hold in the organization?
   a) Finance Manager
   b) I.T Manager
   c) Accountant
   d) IT personnel
   e) Clerk

4) For how long has your organization been in existence?
   a) Less than five years
   b) 6-10 years
   c) 11-20 years
   d) 21-30 years
   e) Over 30 years

5) How many employees does your organization have?
   a) Below 50
   b) 51-100
   c) 100-200
   d) 200-300
   e) Above 300

B   Technology Adoption by the SACCO

6) To what extent do you agree or disagree with the following views regarding your organization's technological context?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Technology adoption enables our customers transact business with ease					
Technology adoption reduces cost of operations for our organization					
Our organization is aware of technological implementations of our competitors					
Our organization is familiar with the opportunities and threats brought about by technology adoption					
Our organization has competent ICT department employees					
Our organization has reliable internet access					
Our organization currently possesses the ICT infrastructure and IT Human resources to perform a major technological upgrade					
Technology adoption has brought about growth in our organization in terms of revenue					
Technology adoption has increased our organization's market share					
Technology adoption has brought about efficiency in conducting internal business processes					

C   Organizational Factors Affecting Technology adoption

7) What is the size of your organization?
  a) Micro Enterprise (1-10 employees)

  b) Small Enterprise (11-50 employees)

  c) Medium Enterprise (51-100 employees)

  d) Large Enterprise (Above 100 employees)

8) To what extent do you agree or disagree with the following views regarding your organization's internal context?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Our organization is committed to adopting technology to improve its business activities					
Our organization's top management fully supports technology adoption processes					
Technology adoption implementations in our organization are strategy-led.					
The top management in our organization is aware of benefits of technology adoption					
Our organization's size (the number of employees) influences the adoption of technology					
Our organization has resource slack used in acquisition of technology resources					
Formal and informal linking structures of our organization have influence on technology adoption					
Our organization has competent IT staff that can drive the technology adoption process					

D   Environmental Factors Affecting Technology adoption

9)   To what extent do you agree or disagree with the following views regarding your organization's business and operational environment?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
Government demonstrates a major commitment to promote technology adoption					
There are effective laws to battle cyber-crime					
The legal environment is conducive for technology adoption					
Government Regulations (SASRA regulatory policies) have influenced technology adoption processes					
Our competitors in the market have adopted technology and cause a perfect competition					
Adoption of technology has improved visibility and turnover of customers (market churn) in our organization					
Perceived success of our competitors has influenced your organization to adopt technology					
Our competitors who have adopted technology are perceived favourable by customers					
There is very powerful rivalry within organizations in our industry that is very great					
The telecommunication infrastructure is reliable and efficient to support technology adoption.					
There is efficient and affordable Technology Support Infrastructure (e.g. Fibre optic cabling) from the local IT industry to enable technology adoption					

10) Other than the above factors, what other factors influence the adoption of technology in SACCOs?

_____

_____

_____

11) In your view, what is your ideal recommendation on improvement by SACCOs for them to adopt technology?

_____

_____

_____

APPENDIX III: Deposit-taking SACCOs in Nairobi County

1) Afya Sacco Society Ltd
2) Ardhi Sacco Society Ltd
3) Asili Sacco Society Ltd
4) Chai Sacco Society Ltd
5) Chuna Sacco Society Ltd
6) Elimu Sacco Society Ltd
7) Fundilima Sacco Society Ltd
8) Harambee Sacco Society Ltd
9) Hazina Sacco Society Ltd
10) Jamii Sacco Society Ltd
11) Kenpipe Sacco Society Ltd
12) Kenversity Sacco Society Ltd
13) Kenya Bankers Sacco Society Ltd
14) Kenya Police Sacco Society Ltd
15) Kingdom Sacco Society Ltd
16) Magereza Sacco Society Ltd
17) Maisha Bora Sacco Society Ltd
18) Metropolitan National Sacco Society Ltd
19) Miliki Sacco Society Ltd
20) Mwalimu National Sacco Society Ltd
21) Mwito Sacco Society Ltd
22) Nacico Sacco Society Ltd
23) Nafaka Sacco Society Ltd
24) Nassefu Sacco Society Ltd
25) Nation Sacco Society Ltd
26) Nyati Sacco Society Ltd
27) Safaricom Sacco Society Ltd
28) Sheria Sacco Society Ltd
29) Shirika Sacco Society Ltd
30) Shoppers Sacco Society Ltd
31) Stima Sacco Society Ltd
32) Ufanisi Sacco Society Ltd

33) Ukristo Na Ufanisi Wa Angalicana Sacco Society Ltd

34) Ukulima Sacco Society Ltd

35) Unaitas Sacco Society Ltd

36) United Nations Sacco Society Ltd

37) Wanaanga Sacco Society Ltd

38) Wanandege Sacco Society Ltd

39) Waumini Sacco Society Ltd

APPENDIX IV: Project Schedule