EFFECT OF BUSINESS OPERATIONAL FACTORS ONADOPTION OF E-BANKING BY SACCOS IN KISUMU COUNTY, KENYA

BY

ROBERT OKOTH NYAWARA

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DECLARATION

DECLARATION BY STUDENT:

This research project is my original work and has not been submitted in any other institution in its present form and manner of fulfillment of the requirement for the award of a degree.

Signature:…….....

Date……...

ROBERT OKOTH NYAWARA

MBA/BE/00030/017

DECLARATION BY SUPERVISOR:

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

Signature: …….

Date: ……..

DR. BENJAMIN OWUOR OMBOK

DEPARTMENT OF ACCOUNTING &FINANCE

SCHOOL OF BUSINESS AND ECONOMICS
MASENO UNIVERSITY

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May God bless you all.

DEDICATION

I dedicate this research project to my beloved wife Doris and Saul Nahum, James, Norah, Betharose, Peninah and my Sons Boaz, Saul Michael, Apollo, Benard Sanje and my late father Boaz Aput Nyawara.

ABSTRACT

Despite the fact that business operational factors (technological, cost and security) among other factors employed by SACCOs are key to the adoption of e-banking, SACCOs in Kenya have continued to comparatively register low e-banking adoption rates. Although previous research outcomes present positive relationship between independent variables (technology, cost, and security) and dependent variable (adoption of technology) there exist contradictory findings with cases of inconsistency coupled with low adoption and non-usage of technology hence calling for further research attention. This study sought to determine the effect of business operational factors on adoption of e-banking by the SACCOs in Kisumu County, Kenya. The specific objectives were; to investigate the association of technological factors, security factors and cost factors and adoption of e-banking, to investigate whether technological factors, security factors and cost factors have any significant effect on adoption of e-banking by SACCOs in Kisumu County, Kenya. The study area was Kisumu County which is a home to a large number of SACCOs. This study draws from diffusion of innovation theory explaining how technology, cost and security affect SACCOs adoption of e-banking. A Correlational research design was adopted for this study. The target population for the study was 91 employees drawn from the senior and middle level management comprising of the chief executive officer, Deputy chief executive, finance manager, credit officer, Fosa manager, one senior teller operator and internal auditor of all the 13 registered, SASRA licensed and active SACCOs operating within Kisumu County of which nine (9) were used for pilot study to test the reliability and validity of the data collection instrument and Cronbach alpha was used to measure its internal consistency and 82 left for main study. A census survey (saturated sampling) was be used in data collection. Primary data consisting of opinions on association of technological factors, security factors, cost factors and adoption of e-banking, effect of technological factors, security factors, cost factors on adoption of e-banking was collected using a structured questionnaire. Descriptive, correlational and regression was used to analyze data and the results presented in tables. The Findings indicate that technological factors ($r = 0.82$, $p<0.05$), security factors ($r = 0.37$, $p<0.05$) and cost factors ($r = 0.31$, $p<0.05$) had a positive and significant relationship with adoption of e-banking. The study concluded that since all the variables had some effect on adoption of e-banking. This means that understanding the effect of business operational factors by SACCOs can help them adopt e-banking and help them achieve efficiency and customer satisfaction in addition to controlling costs of acquisition and implementation costs.

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LIST OF ACCRONYMS AND ABBREVIATIONS

SACCO	Savings and Credit Cooperative Societies
WOCCU	World Council of Credit Unions
ICA	International Co-operative Alliance
ICT	Information and Communication Technology
GoK	Government of Kenya
KUSCCO	Kenya union of savings & credit cooperatives

OPERATIONAL DEFINITION OF TERMS

Sacco	an autonomous association of persons voluntarily joining together to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise.
E-banking	the combination of traditional banking and information technology with automated process of delivering new and traditional banking products and services directly to customers
Technological Factors	refer to adopter's perception of e-banking attributes.
Security Factors	refer to the possibility that consumers' personal information will be disclosed either inside or outside the company.
Cost Factors	a monetary valuation of effort, material, resources, time and utilities consumed, risks incurred, and opportunity forgone in production and delivery of a good or service.
Adoption	refers to the stage in which a technology is selected for use by an individual or an organization
Anova	Analysis of variance.

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CHAPTER ONE

INTRODUCTION

This chapter introduces the background of the study, statement of the problem, objectives of the study, hypotheses of the study, scope, justification of the study and concludes with a conceptual framework for this study.

1.1 Background of the study

The rapid strides made in technological innovations in every conceivable domain and the issues related to technology adoption have gained increasing prominence in recent times (Sharma and Mishra 2014).Adoption refers to the stage in which a technology is selected for use by an individual or an organization (Carr, 1999).(Rodgers, 2003) further links adoption to general use and application by the masses.The four stages of technology adoption are initiation, transaction, adoption and implementation (Pierce and Delbecq 1977).However Parsons et al 2009 classified the stages into three as initiation, adoption and implementation.Hosein (2009) sums up stage activities as information presentation to the customers about products and services including feedback next are maintenance of the website, structure and marketing-related functions and transformation of the firm's business unit(s).Despite the fact that business operational factors (technological, cost and security) among other factors employed by SACCOs are key to the adoption of e-banking, SACCOs in Kenya have continued to comparatively register low e-banking adoption rates. Although previous research outcomes present positive relationship between independent variables (technology, cost, and security) and dependent variable (adoption of technology) there exist contradictory findings with cases of inconsistency coupled with low adoption and non-usage of technology hence calling for further research attention, Therefore the rate of technology adoption by SACCOs is low compared to commercial banks leading to a technological lag (Nkonge and Kahonge 2018). According to Okiro and Ndungu (2013) consumption of mobile banking services in Kenya is led by banks at 30%,followed by SACCOs at 16.7%.However majority of SACCOs in Kenya at 51.7% do not utilize either e-banking, internet, m-banking, link/VISA cards or CCTV (Momanyi et al 2016). Nkonge and Kahonge (2018), further recommend that SACCOs commit themselves to adopting technology to improve their business activities, increase revenue and market share. A study conducted by (Ndegwa

2011)indicated that the overall application and ICT adoption in both government and cooperative movement has remained low, SACCOs are faced with challenges of integration, compatibility and co-ordination, It is against these findings that the current study seeks to assess the factors that influence adoption of ICT by SACCOs in Kenya. Security is still a challenge that needs to be addressed when adopting digital platforms. SACCOs have been at the forefront of adoption of technology and automating their manual processes as much as possible. Akuku et al (2017) further posit that technologies also pose a great challenge for small firms is meeting the costs of acquiring, adopting and creating human resource capacity to apply them in the production processes.

Rogers (2003) outlined the specific measures of adoption that explain the perceived characteristics of technology innovation as relative advantage (degree to which an innovation is seen as being superior to its predecessor), complexity i.e. ease of use (degree to which an innovation is seen as being relatively difficult to use and understand), compatibility (degree to which an innovation is seen as being consistent with existing beliefs values, experiences and needs),result demonstrability(degree to which the outcomes of using the innovation are apparent), image(degree of which the use of the innovation is seen as chancing to an individual's image or social status) and trustworthiness (degree to which consumers have confidence in the electronic marketer's reliability and integrity).

The concept of e-banking is driven by fast advancing global information infrastructure which has enabled the development of electronic commerce creating a digital economy with rapidly changing technologies, increased knowledge intensity in all areas of business, creating virtual supply chains and new forms of businesses and service delivery channels such as e-banking (Shah and Clarke 2009:1). Ugwuanyi (2017) in his study, assert that ICT have become one of the basic building blocks of modern society. ICTs are being viewed as the hope for SACCOs to provide more competitive services to their members (Ndegwa 2011). Christopher et al (2006) further posit that e-banking has become an important channel to sell products and services and is perceived to be a necessity in order to stay profitable through electronic, interactive communication channels (Muthini 2013;Sharma 2011:6; Shah and Clarke (2009).

E-banking is a valuable business tool, preferred and employed by banks, SACCOs and microfinance institutions due to several benefits, according to Young (2007) it affords to both

the entities and their customers such as lower transactions delivery cost, high revenues and convenience for customers. SACCOs attracts and retains high profit customers, increase the size of revenue streams, diversified value creation activities in production and delivery of financial services, improve image as customer focused and innovative, effective e-marketing and cross selling with superior data financial profiles and purchasing behaviors,(Shih and Fang, 2004)Easier expansion and efficiency with low startup, overhead, transaction, systems integration, extra security measures and maintenance costs**,** load reduction on other delivery channels due to automation of most branch routine transactions, Staff usage of extra time to provide quality services, improved use of IT resources and business processes; better relationships with suppliers and customers, quick delivery of products and services and a reduction in data entry and customer services related errors. Efficiency in operations results in high profits by SACCOs and enables them to recover start up implementation costs.

Cooperation is a feature of humankind. Essentially it is an activity of the people for mutual help and collective progress (Oseno 2018:2).The International Co-operative Alliance (ICA) defines a cooperative society as ‘’an autonomous association of persons voluntarily joining together to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise’’. The United Nations (UN) estimated that there were a total of 800 million co-operators worldwide in 1995, with 100 million people employed by cooperatives. According to UN the Cooperative enterprises contribute towards sustainable human development through creation of productive employment, overcoming poverty and social integration. World Council of Credit Unions (WOCCU) report 2017 indicate that globally there are 89,026 credit unions with over 260 million members, savings and shares over US Dollars 1,736 billion, Loans advanced to members over US Dollars 1,504 billion, Reserves over US Dollars195 Billion and asset base US Dollars 2,115 billion and enjoy a penetration rate of 9.09%. The WOCCU report (2017)statistics further indicate that Africa has 37,607 credit unions with 29.6Million members, savings and shares of US Dollars 7.9Billion, loans advanced to members of US Dollars 9.048Billion, reserves of US Dollars 821.7Millionand asset base of US Dollars 9.2Billion and also enjoy a penetration rate of 9.25%.In Kenya Sacco sector started at the onset of independence. The Government of Kenya (GoK) estimate 63% of the Kenyan population participates directly or indirectly in cooperative based enterprises and was the fastest growing registering an average annual growth of 25% during the period 2000 to 2010. In July 2013 World

Council of Credit Unions (WOCCU) recognized Kenya SACCOs as the fastest growing subsector in the World. According to the Ministry of industrialization and enterprise development 2014, Kenya Co-operative movement was ranked 1st in Africa and 7th internationally. A Sacco is a member owned financial cooperative whose primary objective is to mobilize savings and afford members access to loans for productive and provident purposes on competitive terms as a way of enhancing their economic well-being (Oseno 2018:3).According to WOCCU report 2017 Kenya has Seven thousand and thirty five credit unions, with a membership of over 6.8 million, mobilized savings and shares of over US Dollars $ 4.6 billion, Loans advanced to members at US Dollars $ 5.6 billion, Reserves of US Dollars $599 million and asset base of over US Dollars $6.9 billion and national penetration of 24.86%.The Sacco subsector in Kenya is governed by the Cooperative societies Act Chapter 490(relate to the constitution, registration and regulation of Cooperative societies and for the purposes incidental thereto), Sacco Society Regulation Authority Act no. 14 of 2008, Sacco Society Regulations 2010 and Rules and by laws of SACCOs. The Sacco Society Regulation Authority Act no. 14 of 2008, Sacco Society Regulations 2010 and Rules and by laws of SACCOs (provide the minimum operational regulations and prudential standards required of a deposit-taking Sacco society). The legislations provide SACCOs with a solid foundation which support transformation in business processes, development of products and services to cope with the constantly changing business environment due to global, regional and domestic competition from other financial institutions including commercial banks(e-banking),mortgage institutions(e-mortgage),security markets(e-securities/investments) and specialized banks(e-financing), economic downturn, dynamic market trends coupled with volatile financial markets and rapidly changing technologies to ensure they have a competitive advantage for survival, sustainability and growth.

Although e-banking is the modern medium of delivering products and services employed by banks, SACCOs and microfinance institutions to achieve growth, stability and survival and has several benefits to both customers and SACCOs, findings of previous studies show that e-banking adoption by SACCOs is still low and most SACCOs do not utilize e-banking, this trend indicate that SACCOs too are faced with unique challenges in adopting e-banking technology and require innovative solutions.it is against these findings that this study sought to determine the effect of business operational factors on adoption of e-banking.

1.2 Statement of the Problem

E-banking has been used by financial institutions including SACCOs to transform their operations to achieve efficiency, effectively cutting costs and providing their customers with superior services. However the rate of adoption of e-banking by SACCOs is lower than banks and majority of SACCOs have not utilized e-banking. Technological factors(system failures, processing errors, software defects, operating mistakes, inadequate capacity, vulnerable, weak controls),cost factors(legal requirements and implementation costs),security factors(malicious attacks, hacking incidents, fraudulent actions, inadequate recovery capabilities),market liberalization and lack of capacity, poor electrical power supply, poor telecommunications and poor internet connectivity, globalization and environment have influenced adoption of e-banking by SACCOs. These factors provide a background that this study sought to determine the effect of business operational factors on adoption of e-banking by SACCOs in Kisumu County. No known study has been done in Kisumu County.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of the study was to determine the effect of business operational factors on adoption of e-banking by the SACCOs in Kisumu County, Kenya.

1.3.2 Specific Objectives

1. To investigate the association between business operational factors and adoption of e-banking by SACCOs.

2. To investigate the effect of business operational factors on adoption of e-banking by SACCOs.

1.4 Hypotheses of the study

This research was guided by the following hypotheses:-

Ho_1: Business operational factors and adoption of e-banking have no significant association.

Ho_2: Business operational factors have no significant effect on adoption e-banking by SACCOs.

1.5 Scope of the Study

This study was conducted in Kisumu County. It only covered the effect of technological factors, security factors and cost factors and the association of technological factors, security factors and cost factors on adoption of e-banking by SACCOS in Kisumu County.

1.6 Justification of the Study

The findings of this research help SACCOs to achieve efficiency and effectiveness by understanding the factors influencing adoption of e-banking, institute mitigating measures or interventions for solving unique challenges facing them while adopting e-banking, beat competition and ensure sustainability. Researchers and scholars will able to conduct further research and expand knowledge on factors influencing adoption of e-banking. Academicians and students will use the findings as a basic foundation for learning purposes. The government will use the findings for policy formulation to enhance adoption of e-banking by SACCOs and provide an enabling environment.

1.7 Conceptual Framework

Independent variable Dependent variable

Business operational factors E-banking adoption

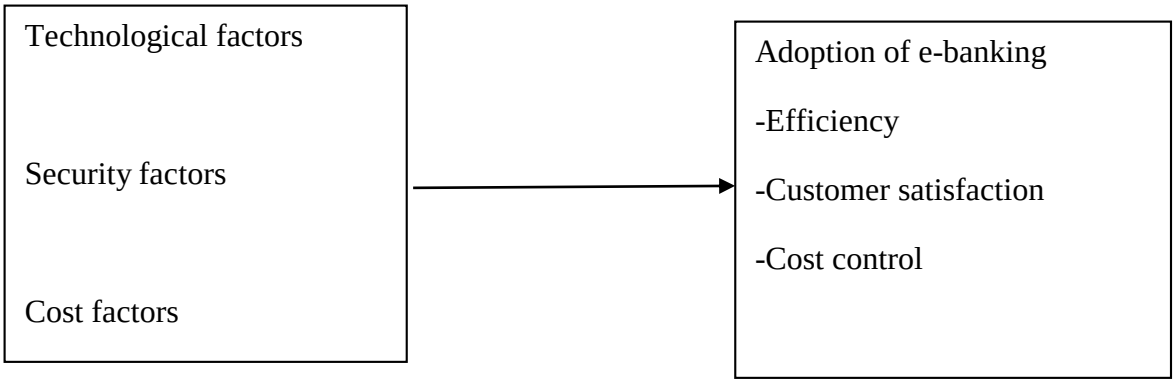

Fig. 1.1 Conceptual Framework
Source: Adapted from Muithya, 2013.

From the above frame work it is evident that the business operational factors greatly affect adoption of e-banking services, it is therefore necessary to understand these factors to ensure efficiency, customer satisfaction and cost control. The business operational factors include Technological factors (System failure, Processing error, Software defects, inadequate recovery capabilities, Power failure, Lack of internet connectivity, Lack of infrastructure);Security factors (Control weaknesses, Security shortcomings, Malicious attacks, Hacking incidents) and Cost factors(legal requirements and high implementation cost). The understanding will enable managers to address the emerging effects and provide mitigating measures in order to improve the adoption of e-banking.

CHAPTER TWO

LITERATURE REVIEW

This section critically review appropriate and relevant literature linked to the study objectives, evaluate the facts that link the current study and past studies, identify the empirical gaps in the literature and recommend areas for future research studies.

2.1Theoretical Literature

2.1.1Diffusion of innovation Theory (DOI)

Rodgers diffusion of innovation theory will be applied in this study. Diffusion of Innovation (DOI) Theory was developed by E.M. Rogers in 1962 and is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system.

Ndegwa 2011 assert that DOI has the ability to provide framework for adoption studies, covering adoptions' ICT applications, categories, decision making processes and social context. Muthini 2013 further confirmed that most technology adoption studies have been based on DOI, hence its suitability and choice to explain the relationship between the independent variables and the dependent variable. The application of Rodgers (DOI) theory will help advance understanding of the adoption rate of e-banking based upon the characteristics of the business operational factors; technological factors, Security factors and Cost factors. It provides a familiar framework to determine obstacles that can impede the diffusion of e-banking in an organization.

Muthini (2013) analysed the trend which explain the adopters as shown by the above diagram as innovators (venturesome, educated, multiple info sources), early adopters (social leaders, popular, educated), early majority (deliberate, many informal social contacts), late majority (skeptical, lower socioeconomic), laggards (neighbors and friends are main information source, fear of debt).Rodgers (1995), the rate of adoption can be measured by the following perceived characteristics of innovations in order to explain the rate of technology adoption: relative advantage, Complexity (case of use) Compatibility, result Demonstrability, Image, Trustworthiness**.**

2.1.2 Concept of Business Operational factors

2.1.2.1 Technological factors

Technological factors refer to adopter's perception of e-banking attributes(Ayana G.B 2014). Typical characteristics of technology considered in technology adoption studies are based on the assumption of Roger's diffusion of innovation (Rogers 2003), Which include relative advantages (perceived benefits) and relative disadvantages (perceived risks).

In order to stay competitive and improve customer engagement, SACCOs are adapting newer forms of technology (Sacco cyber security Report 2018).The relative advantages (perceived benefits) cited in literature by Langat (2012)technologies provide SACCOs with networking and innovative opportunities to strengthen their niche and competitive advantages. Basweti et al (2013)technology is used as part of business strategy for expansion and revenue increase, enhancing the speed, accuracy, efficiency, handling huge volumes of data and as a core competence use to outwit rivals in the business industry (Mang'ana et al (2015) and the force behind the transformation of these institutions mobile and internet banking in Kenya (Okiro and Ndungu 2003).The relative disadvantages (perceived risks) cited in literature by (supervisory and regulatory guidelines*:* 2006) are System failure, Processing error, Software defects, Operating mistakes, inadequate recovery capabilities, Capacity inadequacies, network vulnerabilities, control weaknesses, security shortcomings, malicious attacks, hacking incidents, fraudulent actions, and inadequate recovery capabilities.

2.1.2.2 Security factors

Security is still a challenge that needs to be addressed when adopting digital platforms. SACCOs have been at the forefront of adoption of technology and automating their manual processes as much as possible. According to Sacco cyber security Report 2018 there exist gaps in fully understanding the internal business processes that are being automated as well as the related technology and security requirements. This has also led to the exposure to various types of threats which may lead to damages and significant financial loss. Attackers are now leveraging these platforms to perpetrate attacks such as malware attacks and compromising poor application designs and configurations. Kiragu et al (2013) Fraud risk is a global problem and its frequency is highest in commercial banks than any other industry globally. Majjugo Ronald (2019

interrelationships among trust, perceived risk and behavioral intention for technology acceptance in developing economies not been scrutinized.

2.1.2.3 Cost factors

Cost refers to an amount that has to be paid or given up in order to get something. Cost is usually a monetary valuation of effort, material, resources, time and utilities consumed, risks incurred, and opportunity forgone in production and delivery of a good or service. According to (Neufeld *et al*. (2007) cost of the technology adopters have to pay in order to possess the product plays a crucial role in determining technology implementation success and failure. Akuku et al (2017) classified the costs as operating cost(is the cost that occurs when a user utilize the technology) and acquisition cost (cost in which the potential adopter is expected to use or adopt the technology), Akuku et al (2017) further posit that technologies also pose a great challenge for small firms is meeting the costs of acquiring, adopting and creating human resource capacity to apply them in the production processes. Rashid and Al-Qirim (2001) this process entails identifying the relevant physical and use characteristics of the instructional situation, cost of technology and the support system. The approach is intended to ensure actual, correct and continual technology use and adoption. Cost of technology affects the four basic areas of: hardware, software, personnel and space. The hardware refers to all of the equipment necessary for data input, processing, communication and archiving (e.g., personal computers, servers, routers, network cabling or wireless access points, and storage devices). One should also factor in the equipment necessary to insure system reliability, including battery backup systems, off-site data storage and fail-over systems and even on-site emergency power generators. Software includes all of the programs required to keep the organization functioning. This should include system software such as the operating systems, database management systems, network operating systems, data communication software, and compilers (in the event that the organization is developing their own applications)**.**

2.1.3 Concept of E-Banking

E-banking is the combination of traditional banking and information technology with automated process of delivering new and traditional banking products and services directly to customers. Banks, SACCOs and microfinance institutions maintain centralized databases in their websites and display all their services in the menu. Customers can select and interact with the services as

per their choices through an intranet limited to organizations for which they are set up, (Sharma 2010). Ayana (2014) outlined the forms of e-banking as Internet banking, Automatic Teller machine (ATM), Telebanking (TB), Smart card, Debit card, direct deposit, electronic bill payment, electronic check conversion and cash value stored(Mpesa, Airtel money). E-Banking is a revolutionary development in banking evolution. Globally the trends of e-banking indicate that the future is a mixture of "clicks (e-banking) and mortar (branches)". This trend is likely to continue as more cross selling services such as e-mortgages, e-asset financing, e-ticketing, e-citizen(for government services),e-securities on mpesa, airtel money etc. are offered using e-banking channels and new innovations are in pipeline.

2.2 Empirical Literature Review

2.2.1 Technological factors and Adoption of E-Banking

Ndegwa 2011 studied adoption and utilization of ICTs by SACCOs in Kenya, a case study of Tharaka Nithi teachers Sacco Ltd. His findings showed a gap that ICT is not sufficiently utilized by SACCOs and that the Ministry of Cooperatives had no structures to assist SACCOs to adopt ICTs.

Mahmood S. and Feroz S.(2006) studied Organizational critical success factors in adoption of e-banking at the Woolwich bank in UK .Two questions motivated the research namely the experience of organizations in adopting e-banking and the organizational factors critical to the success in e-banking adoption. A case study research approach was used to investigate organizational critical success factors in e-banking adoption. The factors found to be most critical for success in e-banking included: understanding customers, organizational flexibility, availability of resources, systems security, established brand name, having multiple integrated channels, e-channel specific marketing, systems integration, systematic change management, support from top management, and good customer services. They concluded that banks should implement considerable organizational changes in order to web-enable themselves and their e-commerce strategy should be to integrate the e-banking channel with other service delivery channels to maximize benefits.

Wai-Ching Poon (2008) explored the determinants of users' adoption momentum of e-banking in Malaysia. A questionnaire with four-point Likert scale was applied to 324 usable responses. Ten

attributes were tested, namely convenience of usage, accessibility, features availability, bank management and image, security, privacy, design, content, speed, and fees and charges. Results indicated that all elements for ten identified factors are significant with respect to the users' adoption of e-banking services. Privacy and security are the major sources of dissatisfaction, have momentously impacted users' satisfaction. Accessibility, convenience, design and content are sources of satisfaction. Besides, the speed, product features availability, and reasonable service fees and charges, as well as the bank's operations management factor are critical to the success of the e-banks. WAP, GPRS and 3G features from mobile devices are of no significance or influence in the adoption of e-banking services in this study. Results also revealed that privacy; security and convenience factors play an important role in determining the users' acceptance of e-banking services with respect to different segmentation of age group, education level and income level.

Kolodinsky et al (2004) studied the adoption of electronic banking technologies by US consumers which explored factors that affect the adoption or intention to adopt three e-banking technologies and changes in these factors over time. Federal Reserve Board commissioned data set were used, Findings showed that relative advantage, complexity/simplicity, compatibility, observability, risk tolerance, and product involvement are associated with adoption. Income, assets, education, gender and marital status, and age also affect adoption. Adoption changed over time, but the impacts of other factors on adoption have not changed

Okiro and Ndungu (2003) studied the impact of mobile and internet banking on performance of financial institutions in Kenya. The study sought to determine the impact of mobile and internet-banking on performance of financial institutions in Kenya, a survey was conducted on 30 financial institutions in Nairobi. The study also sought to identify the extent of use of mobile and internet banking in financial institutions. The study found that the most prevalent internet banking service is balance inquiry while the least is online bill payment. Cash withdrawal was the most commonly used mobile banking service whereas purchasing commodities was the least commonly used.

Mang'ana et al (2015) studied the extent to which SACCOs have invested in IT to Achieve Sustainable Competitive Advantage over Their Rivals: A Case of KISII County, Kenya. The

purpose of this study was to determine the extent to which SACCOs operating in Kisii County have invested in information technology to achieve sustainable competitive advantage over their rivalry. Thirty (30) SACCOs were studied with a target population of one hundred and twenty (120) respondents. A sample size of 92 respondents was obtained using simple random sampling technique. Structured questionnaires were used to collect data that was then subjected to Microsoft Excel and Statistical Package for Social Sciences (SPSS) software (Version 21) for analysis. The findings showed that 78.3% of the respondents were male while 21.7% of the respondents were female. Majority of the respondents had an age bracket of between36-55 years translated to 68.3%. The findings further revealed that, 30% of the respondents were members of business SACCOs,23.3% were members of Civil Servants' SACCOs, 22.3% were members of Farmers' SACCOs, and 13.3% were members of Company SACCOs while the remaining 10% were members of social welfare SACCOs. It was found that, 65. 2% of responses did not use Information technology much. The respondents were satisfied with the competitive strategies adopted; results depicted satisfaction of members with the role of Information technology in enhancement of sustainable competitive advantage was deduced, managers to embrace Information technology in their day-to-day running of their activities for a competitive edge.

2.2.2 Security factors and Adoption of E-Banking

Moga et al (2012) conducted a review on trust and security in e-banking adoption in Romania. The study focused on measures taken by the government and major banks to tackle trust and security related issues. The study found out that whether or not the measures are effective in mitigating banking consumers security concerns is yet uncharted and still needed to be investigated.

Nkonge G.M**&**. Kahonge A.M(2018) Using Technology, Organization and Environment Framework to find out the Technology Adoption Determinants among SACCOs in Nairobi County, Kenya. Electronic banking is replacing traditional banking due to technological innovations. In Kenya, SACCOs have not adopted technology at a high rate as compared to commercial banks, leading to a technological lag. The study aimed to establish how technology, organization and environment affect technology adoption in SACCOs. The study was a descriptive survey, conducting a census in all the 39 SACCOs of Nairobi County. Data collection

was through questionnaires and analyzed using descriptive and inferential statistics. Findings, presented in tables and charts, were that technology enables customers transact business with ease, reduces operation costs, leads to growth of organizations' revenue and market share, and organization's size influences technology. Top management does not fully support technological innovation decision making. SACCOs do not allocate resource slack on technological acquisitions. There are no effective laws to fight cybercrime. Tech-savvy SACCOs are more favorable to customers. The study recommended that SACCOs commit themselves to adopting technology to improve their business activities, increase revenue and market share. Top management should fully support technology adoption processes, and implement them according to the organization's strategy. SACCOs should allocate slack resources to technology acquisitions. The government should come up with effective laws to battle cybercrime.

Kiragu et al (2013) technology adoption and occupational fraud risk: empirical evidence from commercial banks in Kenya**.** Occupational fraud statistics indicate that a typical organization loses approximately 5% of its annual revenues to fraud. When applied to the consolidated Commercial banks revenue for the year 2011, the loss translates to approximately Kshs 12.82 Billion. The problem is that Kenya has the highest incidences of fraud is East Africa. The study set to find if technology adoption influence occupational fraud in Commercial Banks in Kenya. A representative sample of 30 banks out of the 43 Commercial banks licensed by Central Bank of Kenya by June 30, 2012 was used in this study. Bivariate linear regressions were used to test the null hypothesis; there is no relationship between technology adoption and occupational fraud risk in Commercial Banks in Kenya**.** The findings from this study are the positive correlation between technology adoption and moderate influence on occupational fraud risk in Commercial banks in Kenya. These results provide insights into the Occupational Fraud Risk Management and the regulatory authorities in the deterrence of fraud in Kenya and developing Countries.

2.2.3 Cost factors and Adoption of E-Banking

Many Saccos are now offering their customers more convenient ways of accessing services. There has been a rise in mobile and web applications within the SACCO industry.

Muthini 2013 studied challenges facing commercial banks in Kenya due to adoption of e-banking in a case study of standard chartered bank in Ruaraka Nairobi. He interviewed 25 staff

members. Although findings demonstrate that technology, security and cost affect the adoption of e-banking and recommended that banks should constantly upgrade e-banking technology, adequately put in pace both application and general control mechanism, train staff , comply with legal requirements and have cost effective strategies to overcome the risks, However the study had a population gap due to the small population studied, never provided a recommendation on how to address implementation costs and provided insufficient or no information on other factors such as technology illiteracy, poor internet connectivity, poor electrical supply, market liberalization and further recommended that similar studies be conducted in different sectors to capture the micro details of e-banking hence my choice to study the extent of how these factors influence adoption of e-banking in SACCOs.

Akuku et al (2017) explored the relationship between the perceived cost of technology and the rate of adoption based on a study of small engineering firms in Kisumu city, the study adopted explanatory survey research design. The study applied census inquiry technique to select small engineering firms within Kisumu central business district. The target population comprised owner-managers of 287 firms registered with the County government of Kisumu. Data was collected using questionnaires, structured interview schedule and document analysis and analysed descriptively. Binary logit regression was used to analyse technology adoption behavior. Chi-square test of independence was computed to compare differences between categorical frequencies of study variables. The logistic regression model was statistically significant, $\chi 2$ (5) = 60.833, p< .000. The model explained 26.6.0% (Nagelkerke *R2*) of the variance in technology adoption, indicating modest improvement in fit and correctly classified 72.5% of cases. The results of the binary logistic model indicated that perceived cost of technology (p=0.001) significantly influenced technology adoption behavior. It is recommended that the Kenya Government and other stakeholders should provide financial support to small industrialists. The government, through the Ministry of Industrialization, should also formulate policies to promote low cost technologies to enable small engineering firms to compete globally.

Tze San Ong et al (2014) studied Factors That Affect the Adoption of Internet Banking in Malaysia. It analysed data from 200 respondents in Malaysia. The findings show that cost saving, risk and privacy, features availability and convenience are the key factors that influence consumers' internet banking usage. These findings should encourage banks to improve their

internet banking systems and implement them in a more user-friendly way in order to increase the level of adoption of internet banking by consumers.

2.3 Summary of Literature gaps

The empirical literature portrays conflicting and inconsistent results regarding the adoption and utilization of e-banking by SACCOs in Kenya. Ndegwa 2011 and Mang'ana et al(2015) concluded that majority of SACCOs did not adopt or underutilized e-banking However, Okiro and Ndungu (2003) and Nkonge and Kahonge (2018) conducted adoption of e-banking studies in banks, the results showed that there is a low adoption rate as well as lack of integration of e-banking channels.

Most researches done on adoption of e-banking only considered commercial banks ignoring the fact that SACCOs are also financial institutions. Mahmood S. & Feroz S (2006) , Wai-Ching Poon (2008), Okiro and Ndungu (2003),Kiragu et al (2013).The study seeks to fill the gap by considering adoption of e-banking by SACCOs in Kenya.

Most researches on adoption of e-banking were done in foreign jurisdictions and therefore their findings and recommendations may not be a true reflection of the status in the Kenyan jurisdiction. Mahmood S. & Feroz S (2006),Wai-Ching Poon (2008) and Moga et al(2012) did their studies in Woolwich bank in UK, Malaysia and Romania respectively. The study sought to carry out the same studies in Kenyan jurisdiction to confirm the results.

The empirical literature reviewed therefore identified the various gaps as shown above. The current study therefore sought to fill the knowledge gap by determining the effect of business operational factors (technological factors, security factors and cost factors) on adoption of e-banking by SACCOs in Kisumu County, Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

Zikmund et al 2010 describes a research methodology as a part that must explain technical procedures in a manner appropriate for the audience. It addresses the research and sample designs, data collection, fieldwork conducted and the analysis done to the data collected for the study. Dawson 2009 states that research methodology is the philosophy or general principle which guides the research. This section aims at explaining the research design that was used in carrying out the study, the target population, sampling design, data collection procedures, the instrument that was used and the methods used to analyze the data.

3.1 Research Design

A research design is a framework that has been created to find answers to research questions therefore this chapter focuses on the set of methods and procedures used in collecting and analyzing measures of the variables specified in the problem research. Creswell, J.W. (2014), the design of a study defines the study type (descriptive, correlation, semi-experimental, experimental, review, meta-analytic) and sub-type (e.g., descriptive-longitudinal case study), research problem, hypotheses, independent and dependent variables, experimental design, and, if applicable, data collection methods and a statistical analysis plan. In this study the researcher used Correlational research design to measure, analyze, compare and interpret data in order to understand the factors influencing adoption of e-banking by SACCOs in Kenya.

3.2 Study Area

Mugenda & Mugenda (2007) the study area allows for immediate rapport with the respondents. The selection of SACCOs in Kisumu County was informed by convenience and accessibility of the SACCOs by the researcher. Kisumu County is one of the 47 counties in the republic of Kenya. Its boundaries follow those of the former Kisumu district, one of the original administrative districts of the former Nyanza province in western Kenya. Its headquarters is Kisumu city. It has a population of 968,909 (2009, Census).

3.3 Target Population

This is the specific population about which information is desired. The target population for this study was all the 91 senior and middle level employees of the 13 registered, SASRA licensed and active SACCOs operating within Kisumu County. Data was collected from employees of the SACCOs which will comprise of the chief executive officer, Deputy chief executive finance manager, credit officer, Fosa manager, one senior teller operator and internal auditor, all of whom are conversant with operations of the SACCOs

3.3.1 Sampling

Sampling is the process of selection of elements which represent the target population. This is informed by the limited time and money to facilitate the study.

3.3.2 Sampling Frame

According to Wikipedia In statistics, a sampling frame is the source material or device from which a sample is drawn. It is a list of all those within a population who can be sampled, and may include individuals, households or institutions. The researcher's sampling frame consisted of all 91 senior and middle level employees all the13 registered, SASRA licensed and active SACCOs operating within Kisumu County.

3.3.3Sampling Size

The study was a census of all the 91 senior and middle level employees of all the registered, SASRA licensed and active SACCOs operating within Kisumu County. The senior and middle level employees comprised of the chief executive officer, Deputy chief executive, finance manager, credit officer, Fosa manager, one senior teller operator and internal auditor, all of whom are conversant with operations of the SACCOs were be interviewed.

3.3.4 Sampling Technique

Sampling technique is a framework which the researcher uses to help in the selection of a sample. The study was a census of all senior and middle level employees of all the13 registered, SASRA licensed and active SACCOs operating within Kisumu County.

3.4 Data Sources

Primary data was used for purposes of the study. However the internet was also used to gather any relevant information for the study.

3.4.1 Data Collection Procedures

In order to accurately get the information, the researcher personally administered the questionnaires to the respondents.

3.4.2 Data Collection Instruments

It refers to the techniques to be used to collect data from the respondents. The researcher used structured questionnaire to gather primary data from the respondents.

3.4.3 Reliability Test

According to Mugenda and Mugenda (2003) reliability is the degree to which a research instrument can yield consistent results after repeated trials. The rule of the thumb suggests that 5% to 10% of the target sample should constitute the pilot test (Cooper and Schilder, 2011; Creswell, 2003; Gall and Borg (2007).Reliability of the structured questionnaire will tested through a pilot study in which the questionnaire was pretested to a sample group similar to the actual sample at Kimute Sacco and 9 respondents participated. The pilot test sample was within the recommendation, this was essential to ensure that any deficiencies in the questionnaire were corrected before issuing out the final questionnaires.

3.4.4 Validity Test

To ensure validity of the research instrument used in collecting data the researcher submitted the questionnaire to the supervisor who checked for validity and assessed the relevance of the questions and the content of the study. Cronbach alpha was used to measure its internal consistency.

3.5 Data Analysis

The completed questionnaires were edited for completeness and consistency; the data was then coded and analyzed using multivariate regression. The model was specified as below:-

$Y=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\varepsilon$

Where:-

Y- Adoption of e-banking

X_1- Technological factors

X_2- Security factors

X_3- Cost factors

ε-Error term

3.6 Data Presentation

The data collected was analyzed and presented in frequency percentages (%) and tables.

3.7 Demographic Output

This chapter discusses the response rate, background information, reliability analysis and validity test, representation of respondents in gender and age and Length of service with the SACCO. Results were presented in tables.

3.7.1: Response Rate

The researcher issued out 82 questionnaires to the respondents. All the 82 questionnaires were dully filled and returned. From table 3.1 below it is evident that the response rate of 100% questionnaires was analyzed and sufficient to give the findings adequate credence and reliability. The adequate response rate as recommended by Babbie (2004) indicated 50% as acceptable to analyse, 60% as good and 70% as very good.

Table 3.1 Response Rate

Categories	Respondents	Percentage
Responded	82	100
Total	82	100

Source: Field 2019

3.7.2: Reliability Analysis

The study sought to determine the reliability of the research instruments pilot study results for Research Instruments**.** The results are as shown in Table 3.2. The results of the reliability test produced overall Cronbach Alpha correlation coefficient value of the variable ranging between 0.794 and 0.823. The closer the Cronbach alpha coefficient is to 1, the higher the internal consistency reliability (Mugenda, 2003), all the instruments met the threshold therefore the instruments were reliable.

Table 3.2: Cronbach Alpha for Reliability Assessments

Variables	Number of items	Cronbach Alpha Values
Technological factors	9	0.823
Security factors	9	0.794
Cost factors	9	0.812

Source: Field 2019

3.7.3: Validity Test

Validity of the research instrument used to collect data by the researcher was tested by submitting the questionnaire to the supervisor who checked for validity and assessed the relevance of the questions and the content of the study.

3.7.4: Demographic Representation of Respondents

The study collected information regarding general characteristics of the respondents and the SACCOs they work for. The information was grouped in terms of their gender, age, the length of service in their SACCO.

3.7.4.1: Gender Distribution

Table 3.3 Gender Distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	45	54.9	54.9	54.9
	Female	37	45.1	45.1	100.0
	Total	82	100.0	100.0	

Source: Field 2019

From the table 3.3 above, the respondents are accounted for as Male respondents 54.9% and females 45.1%.The study revealed that the majority of the staff are male as compared to the female, however one third gender rule provided for in Kenyan constitution was well implemented by SACCOs.

3.7.4.2: Age Distribution

Table 3.4 Age Distribution

Age Bracket		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below Age 25	44	53.7	53.7	53.7
	Age 25-35	21	25.6	25.6	79.3
	Age 35-45	7	8.5	8.5	87.8
	Age 46 and above	10	12.2	12.2	100.0
	Total	82	100.0	100.0	

Source: Field 2019

From the table 3.4 above, the study established that the age of respondents differs greatly. The study established that respondents with below 25 years dominate by 53.7% relative to 25.6% respondents who are 25-35 years and also 12.2% respondents are 46 years and above while 8.5% are between 35-45years. This implies that most SACCOs have majority of younger workforce than older workforce and therefore better succession plan.

3.8: Length of service with the SACCO

Table 3.5 Length of service with the SACCO

Length of Service		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-1 Year	35	42.7	42.7	42.7
	1-5 Years	25	30.5	30.5	73.2
	6-10 Years	17	20.7	20.7	93.9
	Above 10 Years	5	6.1	6.1	100.0
	Total	82	100.0	100.0	

Source: Field 2019

The study collected information regarding the respondent's length of service in the respective SACCOs they work for. From table 3.5 it is clear that majority of respondents have served for 0-1 year with the SACCO at 42.7% of the population. Followed closely by those between 1-5 years at 30.5 % of the population and those with 6-10years at 20.7%, however it is evident that minority of the respondents at only 5% have served above 10 years with the SACCO.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter discusses the descriptive and inferential findings. Primary data was collected and analyzed using both quantitative and descriptive statistics tools which include percentages, mean, and standard deviation. Quantitative data was coded and the data was entered in SPSS for analysis. Data analysis refers to the process of breaking complex information into smaller elements that can be easily clarified and understood (Kothari, 2008).The study furthermore used inferential analysis applying Pearson moment correlation and regression analysis. Regression analysis was used to establish the relationship between each independent variable and the dependent variable. The results were presented in the form of statistical tables. The analysed data was arranged under themes that reflect the research objectives. The main objective of this study was to determine the effect of business operational factors on adoption of e-banking by the SACCOs in Kisumu County, Kenya. The specific objectives were to investigate the association between technological factors, security factors and cost factors and adoption of e-banking by SACCOs and to investigate the effect of technological factors, security factors and cost factors on adoption of e-banking by SACCOs.

4.1: Descriptive Findings of the Study Variables

This section illustrates descriptive findings and discussions relative to the objective that sought to investigate the association between technological factors, security factors and cost factors and adoption of e-banking by SACCOs. The findings are presented in the form of mean and standard deviations. The responses are in line with a 5 point Likert scale where 5Very great extent (VGE), 4great extent (GE), 3moderate extent (ME), 2little extent (LE), and 1Not at all (N) respectively.

4.1.1: Technological factors

Table 3.6Descriptive Statistic for technological factors

	N	Min	Max	Mean	Std. Deviation
System failure	82	1	5	4	0.92930
Processing error	82	1	5	4	0.97977
Software defects	82	1	5	4	0.91097
Inadequate recovery capabilities	82	1	5	4	0.94121
Power failure	82	1	5	4	0.95266
Lack of internet connectivity	82	1	5	4	0.84655
Lack of infrastructure	82	1	5	4	0.84691
Average				**4**	**0.91534**

Source: Field 2019

The findings are shown in Table 3.6. As per the table the respondents strongly agreed to a great extent that that all the technological factors namely System failure(mean = 4; std dev = 0.92930),Processing error (mean = 4; std dev = 0.97977),Software defects (mean = 4; std dev = 0.91097)had a positive effect on the adoption of e-banking. The study further indicated that Inadequate recovery capabilities(mean = 4; std dev = 0.94121), Power failure (mean = 4; std dev = 0.95266), Lack of internet connectivity (mean = 4; std dev = 0.84655) and Lack of infrastructure(mean = 4; std dev = 0.84691) also had a positive effect on the adoption of e-banking. The mean score was 4 which show that most of the respondents agreed that technological factors influence the adoption of e-banking by SACCOs in Kisumu County positively. The responses resulted to a standard deviation of 0.91534 indicating that they were concentrated within the mean within one standard deviation.

The findings of this study are consistent with those of a study by Langat (2012) which concluded that technologies provide SACCOs with networking and innovative opportunities to strengthen

their niche and competitive advantages. Basweti et al (2013) and Mang'ana et al (2015) found out that technology is used as part of business strategy for expansion and revenue increase, enhancing the speed, accuracy efficiency, handling huge volumes of data and as a core competence use to outwit rivals in the business industry .Okiro and Ndungu (2003) concluded that technology is the force behind the transformation of financial institutions mobile and internet banking in Kenya. Nkonge G.M**&**. Kahonge A.M (2018) found out that technology enables customers transact business with ease, reduces operation costs, leads to growth of organizations' revenue and market share, and organization's size influences technology, however they noted that Top management does not fully support technological innovation decision making.

4.1.2: Security factors

Table 3.7Descriptive Statistic for Security factors

	N	**Min**	**Max**	**Mean**	**Std. Deviation**
Control weaknesses	82	1	5	3	1.29931
Security shortcomings	82	1	5	3	1.02071
Malicious attacks	82	1	5	3	0.94894
Hacking incidents	82	1	5	3	0.87704
Average				**3**	**1.0365**

Source: Field 2019

The study also analyzed the views of respondents in respect to Security factors and adoption of e-banking by SACCOs in Kisumu County, Kenya. In Table 3.7 the finding indicates that the respondent agreed to a moderate extent (mean = 3; std dev = 1.29931) with the statement that Control weaknesses has enhanced efficiency on adoption of e-banking. Respondent also agreed that Security shortcomings (mean = 3; std dev = 1.02071) has had a positive effect of increasing efficiency on adoption of e-banking. The study further indicates that respondents concurred that Malicious attacks (mean = 3; std dev = 0.94894) and Hacking incidents (mean = 3; std dev =

0.87704).The mean score was 3 which show that most of the respondents agreed that security factors influence the adoption of e-banking by SACCOs in Kisumu County positively. The responses resulted to a standard deviation of 1.0365 indicating that they were concentrated within the mean within one standard deviation.

The findings of this study are consistent with those of a study by Mahmood S. and Feroz S.**(**2006) who found systems security alongside understanding customers, organizational flexibility, availability of resources, , established brand name, having multiple integrated channels, e-channel specific marketing, systems integration, systematic change management to be most critical for success in e-banking, However they noted that support from top management and good customer services are necessary for their achievement. The study differs from that by Wai-Ching Poon (2008) who found privacy and security to be the major sources of customer dissatisfaction and preferred accessibility, convenience, design and content as sources of satisfaction. Kiragu et al (2013) found that fraud risk is a global problem. Moga et al (2012) differed with the study and found out that whether or not the measures are effective in mitigating banking consumers security concerns it is yet uncharted and still needed to be investigated and mitigating measures taken. The findings by Nkonge G.M and Kahonge A.M (2018) differs from this study they found that there are no effective laws to fight cybercrime and that Tech-savvy SACCOs are more favorable to customers than non-Tech-savvy SACCOs.

The findings implies that when a SACCO institute better control weaknesses, strong security controls, address malicious attacks and hacking incidents on adoption of e-banking they achieve high efficiency in their operations.

4.1.3: Cost factors

Table 3.8Descriptive Statistic for Cost factors

	N	Min	Max	Mean	Std. Deviation
Legal requirements	82	1	5	4	0.98677
High implementation costs	82	1	5	3	1.05409
Average				**3.5**	**1.02043**

Source: Field 2019

The study further inquired on the influence of Cost factors on the adoption of e-banking by SACCOs in Kisumu County, Kenya. The results are presented in Table 3.8. The finding reveal that the respondents admitted (mean = 4; std dev = 0.98677) that Legal requirements has positively affected the adoption of e-banking by SACCOs in Kisumu County, Kenya. Respondent were also in agreement that High implementation costs (mean = 3; std dev = 1.05409) greatly affect the adoption of e-banking by SACCOs in Kisumu County, Kenya. The mean score was 3.5 which show that most of the respondents agreed that cost factors influence the adoption of e-banking by SACCOs in Kisumu County positively. The responses resulted to a standard deviation of 1.02043 indicating that they were concentrated within the mean within one standard deviation. The findings differs with that of Nkonge G.M and Kahonge A.M (2018) who found out that SACCOs do not allocate resource slack on technological acquisitions and Akuku et al (2017) found out that the costs of acquiring, adopting, creating human resource capacity with technologies pose a great challenge for small firms. The findings however concur with those of Neufeld et al. (2007) who found that cost of the technology plays a crucial role in determining technology implementation success and failure.

4.1.4: Adoption of e-banking

Table 3.9 Descriptive Statistic for Adoption of e-banking

	N	Min	Max	Mean	Std. Deviation
Technological factors affect adoption of e-banking	82	1	5	5	0.554
Security factors affect adoption of e-banking	82	1	5	4	0.501
Cost factors affect adoption of e-banking	82	1	5	4	0.570
Average				**4.3**	**0.542**

Source: Field 2019

The study sought to determine the respondent's level of agreement with effect of business operational factors on the adoption of e-banking by SACCOs Kisumu County, Kenya. Table 3.9

indicates that the majority of the respondents agree that technological factors (mean = 5; std dev = 0.554) affect adoption of e-banking. Respondent were also in agreement that adoption of e-banking is affected by security factors (mean = 4; std dev = 0.501). The findings further indicates cost factors (mean = 4; std dev = 0.570) also affect adoption of e-banking. These findings indicate that the variables are positively associated with the adoption of e-banking by SACCOs Kisumu County, Kenya where increment in the independent variables(technological factors, security factors, cost factors) would result to increase in the dependent variable (adoption of e-banking).The mean score was 4.3 which show that most of the respondents agreed that technological factors, security factors and cost factors influence the adoption of e-banking by SACCOs in Kisumu County positively. The responses resulted to a standard deviation of 0.542 indicating that they were concentrated within the mean within one standard deviation.

4.2: Correlation Analysis

A correlation analysis of the independent variables of Technological factors, Security factors, Cost factors and Adoption of e-banking by SACCOs yielded the results in the table below:-

Table 3.10Correlations between independent and dependent variables

Correlations

		Technological factors	Security factors	Cost factors	Adoption of e-banking
Technological factors	Pearson Correlation	1			
	Sig. (2-tailed)				
Security factors	Pearson Correlation	.037	1		
	Sig. (2-tailed)	.000			
Cost factors	Pearson Correlation	.095	.972	1	
	Sig. (2-tailed)	.000	.000		
Adoption of e-banking	Pearson Correlation	0.82	0.37	0.31	1
	Sig. (2-tailed)	.000	.000	.000	

N=82

Correlation is significant at the 0.05 level (2-tailed)

The results of the correlation analysis presented in Table 3.10. The study revealed that the relationship between technological factors and adoption of e-banking of SACCOs in Kisumu County was positive and statistically significant ($r=0.82$, $p=.000<0.05$). This implies that technological factors enhanced the efficiency of a SACCOs on adoption of e-banking. The results agree with the findings of (Maiyo, 2013; Sonja, 2010; Basweti et al, 2013) that technological factors has impacted positively on the operations and the activities rendered and boosted the performances of firms

The relationship between security factors and adoption of e-banking by SACCOs in Kisumu County was examined. The results of correlation analysis are presented in Table 3.10. The Table shows that the correlation between security factors and adoption of e-banking is positive, and statistically significant ($r=0.37$, $p=.000<0.05$). This indicates that the effort to control weaknesses that address security gaps enhance security features and increase trust on adoption of e-banking. The relationship between Cost factors and adoption of e-banking by SACCOs in Kisumu County was examined. The results of correlation analysis are presented in Table 3.10. The Table indicates that the correlation between Cost factors and adoption of e-banking is positive, moderately weak but statistically significant ($r=0.31$, $p=.000<0.05$). This implies that Cost factors can contribute positively to the cost control by SACCOs on adoption of e-banking. The findings also concur with the previous studies by (Daniel, 1999; Lee et al., 2005; Muthini, 2013) that confirmed security factors had a significant effect and are an important predictor of e-banking adoption.

The results of the correlation analysis presented in Table 3.10 also revealed that the relationship between technological factors and Cost factors was positive and statistically significant ($r=0.95$, $p=0.000<0.05$), technological factors and security factors($r=0.37$,$p=0.000<0.05$) was positive and statistically significant and technological factors and Cost factors($r=0.137$,$p=0.000<0.05$) was positive and statistically significant. The findings confirm the results of the study by Misati et al (2010) and Mabrouk and Mamogholi (2010) who studied e-banking as a factor used to achieve high profitability.

Technological factors enable SACCOs to provide a range of services to their members thus SACCOs should embrace technology factors and the security features commensurate with the services provided and also consider both legal and implementation costs which have financial implications to their operations to increase their incomes and achieve customer satisfaction.

4.3 Regression Analysis

In order to test the relationship between independent variables(technological factors, security factors and cost factors) on the dependent variable(adoption of e-banking), multiple linear regression analysis was conducted using statistical package for social sciences(SPSS).The output include; Model summary, coefficient of determination

Table 3.11: Model Summary for Technological factors and adoption of e-banking

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.737[a]	.544	.518	.239

a. Predictors: (Constant), Technological factors

b. Dependent variable: Adoption of e-banking

Source: Field 2019

Table 3.11 provides the model summary of the relationship between the predictor variable, technological factor and adoption of e-banking. The results show thatR^2=0.544, i.e. 54.4% variation in that Adoption of e-banking can be explained by the model's predictor however the balance of 45.6% variation which is unexplained is attributed to other considerations not factored in the regression model. The findings show that the variables have a positive relationship where R=0.737, i.e. 73.3% indicating a significant relationship between technological factors and adoption of e-banking. The findings concur with findings of by Mang'ana et al (2015) who studied the extent to which SACCOs have invested in IT to Achieve Sustainable Competitive Advantage over Their Rivals: results depicted satisfaction of members with the role of Information technology in enhancement of sustainable competitive advantage edge.

Table 3.12: ANOVA for Technological factors and adoption of e-banking

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.163	1	2.041	2.373	.059
Within Groups	66.081	81	8.58		
Total	74.244	82			

Source: Field 2019

Table 3.12 presents the analysis of variance (ANOVA) on the influence Technological factors on adoption of e-banking. The results indicate that the model is statistically significant in explaining

the impact of business operational factors and Adoption of e-banking in SACCOs in Kisumu County, Kenya. The results indicate that the combined effect of Technological factors is statistically significant in explaining variations in adoption of e-banking at a level of significance of 0.05 and fail to accept the null hypothesis and conclude that business operational factors have a positive influence on adoption of e-banking

Table 3.13: Regression Coefficients[a]

Model	**Unstandardized Coefficients**		**Standardizd Coefficients**	**t**	**Sig.**
1	B	Std. Error	Beta		
(Constant)	.181	.416		0.192	.000
Technological factors	.469	.100	.383	4.69	.033

Dependent variable: Adoption of e-banking: Source: Field 2019

The regression model of the above model was $\mathbf{Y = \beta_0 + \beta_1 X_1 + \varepsilon}$

Substituting the coefficient in the model,

$\mathbf{Y = 1.181 + 0.469 X_1}$ **……Equation 4.1**

Where y is the Adoption of e-banking, $\boldsymbol{\beta_0}$, is the y-intercept (a constant), $\boldsymbol{\beta_1}$ is the regression co-efficient to be determined. Technological factors $\mathbf{X_1}$ and $\boldsymbol{\varepsilon}$ = is the error term Size. Expressed as follows:

Adoption of e-banking=1.181+0.469Technological factors

According to table 3.13 above this model found that taking all the technological factors variables value at zero, the adoption of e-banking by the SACCOs in Kisumu County, Kenya will be 1.181. The regression coefficient for technological factors (0.469) was statistically significant

(t=4.69, p=0.033<0.05), which indicates that a unit increase in technological factors will result to an increase of 0.469 units in adoption of e-banking.

The results imply that the relationship between technological factors and adoption of e-banking was statistically significant at 0.05 level of significance. When all independent variables security factors were taken together (t=0.192; p=0.000<0.05), they constituted a strong and significant relationship with the dependent variable(adoption of e-banking) hence showing that they affected adoption of e-banking by SACCOs in Kisumu County, Kenya.

Managers should embrace Information technology in their day-to-day running of their activities for a competitive advantage otherwise their competitors will claim a bigger share of their market and shrink their incomes. Technology enables provision of diversified products and services which guarantee the SACCOs a steady sustainable stream of income.

Table 3.14: Model Summary for Security factors and adoption of e-banking

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
2	.927[a]	.859	.838	.15904

a. Predictors: (Constant) Security factors

b. Dependent variable: Adoption of e-banking

Source: Field 2019

Table 3.14provides the model summary of the relationship between the predictor variable, security factor and adoption of e-banking. The results show that R^2=0.859, i.e. 85.9% variation in that Adoption of e-banking can be explained by the model's predictor however the balance of 14.1% variation which is unexplained is attributed to other considerations not factored in the regression model. The findings show that the variables have a positive relationship where R=0.927, i.e. 92.7% indicating a significant relationship between security factors and adoption of e-banking. The findings agree with those of Kiragu et al (2013) technology adoption and occupational fraud risk: empirical evidence from commercial banks in Kenya**.**

Table 3.15: ANOVA for Security factors and adoption of e-banking

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.075	1	.519	.553	.697
Within Groups	72.169	81	.937		
Total	74.244	82			

Source: Field 2019

Table 3.15 presents the analysis of variance (ANOVA) on the influence business operational factors on adoption of e-banking. The results indicate that the model is statistically significant in explaining the impact of business operational factors and Adoption of e-banking in SACCOs in Kisumu County, Kenya. The results indicate that the combined effect of business operational factors is statistically significant in explaining variations of e-banking at a level of significance of 0.05 and fail to accept the null hypothesis and conclude that business operational factors have a positive influence on adoption of e-banking. The study findings are in agreement with those of (Okiro and Ndungu 2003, Mulima, (2012),Loudon and Bitta 1993, Polatogho and Ekin, (2011) who found significant relationship between security risk and adoption of e-banking.

Table 3.16: Regression Coefficients[a]

Model	**Unstandardized Coefficients**		**Standardizd Coefficients**	**t**	**Sig.**
2	B	Std. Error	Beta		
(Constant)	1.870	.419		4.463	.000
Security factors	.671	.125	.699	4.334	.000

Dependent variable: Adoption of e-banking.

Source: Field 2019

The regression model of the above model was $Y= \beta_0 + \beta_2 X_2 + \varepsilon$

Substituting the coefficient in the model:

$Y = 1.870 + 0.671X_2$ ……Equation 4.2

Where y is the Adoption of e-banking, β_0, is the y-intercept (a constant), β_2 is the regression co-efficient to be determined. Technological factors X_2 and ε = is the error term Size. Expressed as follows:

Adoption of e-banking=1.870+0.671Security factors

According to table 3.16 above this model found that taking all the technological factors variables value at zero, the adoption of e-banking by the SACCOs in Kisumu County, Kenya will be 1.870. The regression coefficient for technological factors (0.671) was statistically significant ($t=4.334$, $p=0.000<0.05$), which indicates that a unit increase in security factors will result to an increase of 0.671 units in adoption of e-banking.

The results imply the relationship between security factors and adoption of e-banking was statistically significant at 0.05 level of significance. When all independent variables security factors were taken together ($t=4.463$; $p=0.000<0.05$), they constituted a strong and significant relationship with the dependent variable (adoption of e-banking) hence showing that they affected adoption of e-banking by SACCOs in Kisumu County, Kenya.

These findings above concur with the results by Wairi, 2011who did a study on factors influencing the adoption of agent banking innovation among commercial banks in Kenya and found that inadequate physical or electronic security, frauds and errors lead to operational risk and Muthini 2013 who studied challenges facing commercial banks in Kenya due to adoption of e-banking in a case study of standard chartered bank in Ruaraka Nairobi found that technology and found that security and cost affect the adoption of e-banking.

Relevant customer protection against risks of fraud, loss of privacy, and loss of service is needed for establishing trust among consumers as trust and customer confidence is the single most necessary ingredient for successful adoption of e- banking since deals with many first time customers with low financial literacy level, agent banking requires that adequate measures for customer protection and awareness. SACCOs should therefore incorporate technology with security features for customer satisfaction and efficiency. SACCOs should constantly upgrade e-banking technology, adequately put in place application and general control mechanism beside training staff.

Table 3.17: Model Summary for Cost factors and adoption of e-banking

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
3	.972[a]	.944	.356	0.7728

a. Predictors: (Constant), Cost factors.

b. Dependent variable: Adoption of e-banking

Source: Field 2019

Table 3.17provides the model summary of the relationship between the predictor variable, cost factors and adoption of e-banking. The results show that R^2=0.944, i.e. 94.4% variation in that Adoption of e-banking can be explained by the model's predictor however the balance of 5.6% variation which is unexplained is attributed to other considerations not factored in the regression model. The findings show that the variables have a positive relationship where R=0.972, i.e. 97.2% indicating a significant relationship between cost factors and adoption of e-banking. Findings concur with those of the study by Ching and Ellis, (2004) and Gupta, (1988).

Table 3.18: ANOVA for Cost factors and adoption of e-banking

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.744	1	.686	.739	.568
Within Groups	71.500	81	.929		
Total	74.244	82			

Source: Field 2019

Table 3.18 presents the analysis of variance (ANOVA) on the influence business operational factors on adoption of e-banking. The results indicate that the model is statistically significant in

explaining the impact of business operational factors and Adoption of e-banking in SACCOs in Kisumu County, Kenya. The results indicate that the combined effect of business operational factors is statistically significant in explaining variations in adoption of e-banking at a level of significance of 0.05 and fail to accept the null hypothesis and conclude that business operational factors have a positive influence on adoption of e-banking. The Findings concur with those of Neufeld et al. (2007) who found that cost of the technology plays a crucial role in determining technology implementation success and failure and were statistically and positively significant in adoption of e-banking.

Table 3.19: Regression Coefficients[a]

Model	**Unstandardized Coefficients**		**Standardizd Coefficients**	**t**	**Sig.**
3	B	Std. Error	Beta		
(Constant)	1.872	.492		5.820	.000
Cost factors	.435	.100	.621	1.648	.004

a. Dependent variable: Adoption of e-banking

Source: Field 2019

The regression model of the above model was $Y= \beta_0 + \beta_3 X_3 + \varepsilon$

Substituting the coefficient in the model:

$Y= 1.872 + 0.435X_3$ ……Equation 4.3

Where y is the Adoption of e-banking, $\boldsymbol{\beta_0}$, is the y-intercept (a constant), $\boldsymbol{\beta_3}$ is the regression co-efficient to be determined. Cost factors $\mathbf{X_3}$ and $\boldsymbol{\varepsilon}$ = is the error term Size. Expressed as follows:

Adoption of e-banking=1.872+0.435Cost factors

According to table 3.17 above this model found that taking all the technological factors variables value at zero, the adoption of e-banking by the SACCOs in Kisumu County, Kenya will be

1.872. The regression coefficient for technological factors (0.671) was statistically significant (t=1.648, p=0.004<0.05), which indicates that a unit increase in security factors will result to an increase of 0.435 units in adoption of e-banking.

The results imply that the relationship between cost factors and adoption of e-banking was statistically significant at 0.05 level of significance. When all independent variables cost factors were taken together (t=5.820; p=0.000<0.05), they constituted a strong and significant relationship with the dependent variable(adoption of e-banking) hence showing that they affected adoption of e-banking by SACCOs in Kisumu County, Kenya.

The findings in table 3.17, 3.18 and 3.19 concur with the study by Akuku et al (2017) who explored the relationship between the perceived cost of technology and the rate of adoption based on a study of small engineering firms in Kisumu city and found that perceived cost of technology (p=0.001) significantly influenced technology adoption behavior. SACCOs should comply with legal requirements and have cost effective strategies to overcome the risks

Table 3.20: Model Summary for Business operational factors and Adoption of e-banking

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
4	.699[a]	.489	.479	7.14817

a. Predictors: (Constant), Technological factors, Security factors, Cost factors.

b. Dependent variable: Adoption of e-banking

Source: Field 2019

The results in Table 3.20 show that the value of R^2=0.489 indicating that variation of 48.9% in adoption of e-banking by the SACCOs in Kisumu County, Kenya can be explained by the model's predictor however the balance of 51.1% variation which is unexplained is attributed to other considerations not factored in the regression model. The findings show that the variables have a positive relationship where R=0.699, i.e. 69.9% indicating a significant relationship between security factors and adoption of e-banking. The findings are in agreement with those of Langat, (2012), Basweti et al, (2013) and Majjugo, (2019).

Table 3.21: ANOVA –Business operational factors and Adoption of e-banking

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.806	4	1.403	1.073	.347
Within Groups	103.304	77	1.308		
Total	106.110	81			

Source: Field 2019

Table 3.21 presents the analysis of variance (ANOVA) on the influence business operational factors on adoption of e-banking. The results indicate that the model is statistically significant in explaining the impact of business operational factors and Adoption of e-banking in SACCOs in Kisumu County, Kenya. The results indicate that the combined effect of business operational factors is statistically significant in explaining variations in adoption of e-banking at a level of significance of 0.05 and fail to accept the null hypothesis and conclude that business operational factors have a positive influence on adoption of e-banking. The findings are in agreement with those of Mahmood S. & Feroz S., (2006) and Kolodinsky et al, (2004).

Table 3.22: Regression Coefficients[a]

Model	Unstandardized Coefficients		Standardizd Coefficients	t	Sig.
4	B	Std. Error	Beta		
(Constant)	2.892	.489		5.910	.000
Technological factors	.211	.128	.181	1.646	.014
Security factors	.128	.206	.134	1.615	.014
Cost factors	.124	.169	.155	1.720	.017

a. Dependent Variable: Adoption of e-banking

Source: Field 2019

The regression model of the study was $\mathbf{Y= \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon}$

Substituting the coefficient in the model,

$\mathbf{Y= 2.892 + 0.211X_1 + 0.128X_2 + 0.124X_3}$**……Equation 4.4**

Where y is the Adoption of e-banking, $\mathbf{\beta_0}$, is the y-intercept (a constant), $\mathbf{\beta_1}$, $\mathbf{\beta_2}$, and $\mathbf{\beta_3}$ are the regression co-efficient to be determined. Technological factors$\mathbf{X_1}$,Security factors$\mathbf{X_2}$,Cost factors$\mathbf{X_3}$and $\boldsymbol{\varepsilon}$ = is the error term Size. Expressed as follows:

Adoption of e-banking=2.892+0.211Technological factors+0.128Security factors+0.124Cost factors

According to table 4.13 above this model found that taking all the independent variables value at zero, the adoption of e-banking by the SACCOs in Kisumu County, Kenya will be 2.892. The regression coefficient for technological factors (0.211) was statistically significant (t=1.646, p=0.014<0.05), which indicates that a unit increase in technological factors will result to an

increase of 0.211 units in adoption of e-banking. The regression coefficient for security factors (0.128) was statistically significant (t=1.615,p=0.014<0.05), this indicates that a unit increase in security factors will result to an increase of 0.128 units in adoption of e-banking by SACCOs in Kisumu County, Kenya. The regression coefficient for cost factors (0.124) was also statistically significant (t=1.720, p=0.017<0.05), which indicates that a unit increase in cost factors will result to an increase of 0.124 units in adoption of e-banking by SACCOs in Kisumu County, Kenya.

The results imply that the null hypotheses $Ho_1$and$Ho_1$was rejected since the relationship between business operational factors and adoption of e-banking was statistically significant at 0.05level of significance. When all independent variables (technological factors, security factors and cost factors) were taken together (t=5.910; p=0.000<0.05), they constituted a strong and significant relationship with the dependent variable(adoption of e-banking) hence showing that they affected adoption of e-banking by SACCOs in Kisumu County, Kenya. The findings are in agreement with those of Wai-ching poon, (2008).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a summary of the findings, conclusions, recommendations, limitations and suggestions for further research on the effect of business operational factors and adoption of e-banking by SACCOs in Kisumu County, Kenya.

5.1 Summary of the Findings

5.1.1: Effect of Technological factors and adoption of e-banking

The findings of the study revealed that technological factors positively affect the adoption e-banking by SACCOs in Kisumu County, Kenya with majority of the respondents agreeing to a great extent as exhibited by their respective average mean of 4 for system failure, software defects and power failure, Lack of internet connectivity, lack of infrastructure and also to a moderate extent by processing errors and inadequate recovery capabilities.

5.1.2: Effect of Security factors and Adoption of e-banking

Security factors also affect adoption of e- banking positively to a very great extent as indicated by their average mean of 4 for Security shortcomings, Control weaknesses and malicious attacks and hacking incidents. These findings confirm the study findings by (Muthini, 2013) who posited that the security concerns of users and potential users towards the security and privacy of e-banking transactions and confidentiality regarding the processing of personal information

5.1.3: Effect of Cost factors and Adoption of e-banking

The Findings reveal that with a mean of (4.00) legal requirements affect adoption of e-banking by SACCOs in Kisumu county, Kenya to a very great extent as indicated by majority of the respondents, however high implementation costs with a mean of (3.33) moderately affect adoption of e-banking by SACCOs in Kisumu County, Kenya.

5.1.4: The overall effect of the variables

The study findings also indicate that business operational factors positively affect the adoption of e-banking by SACCOs in Kisumu County, Kenya. This means that understanding the effect of business operational factors by SACCOs can help them adopt e-banking.

5.2: Conclusion of the study

From the findings the study makes the following conclusions; That business operational factors (technological factors, security factors, cost factors) affect the adoption e-banking by SACCOs in Kisumu County, Kenya; Technological factors such as system failure, software defect, power failure, Lack of internet connectivity, lack of infrastructure, processing errors and inadequate recovery capabilities, therefore limit the adoption of e-banking by SACCOs in Kisumu county and the services offered to their members. Security factors such as the possibility that members personal information will be disclosed either inside or outside the SACCO has made SACCOs fear losing their members 'and members' fear of adopting e-banking as a result of security shortcomings, Control weaknesses, malicious attacks and hacking incidents. Cost factors such as legal requirements and cost of implementations also affect the adoption of e-banking by SACCOs in Kisumu County, Kenya. Strict legal requirements by the regulatory bodies and government agencies hinder the adoption of e-banking due to the many strings attached. Likewise the high costs of implementation on acquisition and maintenance have made it impossible for SACCOs in Kisumu County, Kenya to adopt e-banking.

5.3: Recommendations

The study makes the following recommendations;

In order to address technological factors the SACCOs in Kisumu County, Kenya should address technological complexity to enhance adoption of e-banking, this will make it easy to be used by the SACCOs and their members to maximize relative advantage; The SACCOs in Kisumu County, Kenya should also source for open software Compatible with their needs which can deliver the best results. The SACCOs in Kisumu County, Kenya should also address lack of trustworthiness by providing secure platform for their e-banking transactions, this will help them

improve their Image and attract more members to use e-banking services. Legal costs, implementation and post implementation costs should be considered on a cost-benefit perspective inorder to enhance the adoption of e-banking. The recommendations will help SACCOs in Kisumu County, Kenya to achieve efficiency, control costs and customer satisfaction on adoption of e-banking.

5.4: Limitations of the study

The study sought to determine the effect of business operational factors on adoption of e-banking by the SACCOs in Kisumu County, Kenya. The time and money available for the research was quite short and scarce respectively therefore the research confined to Kisumu County.

5.5: Suggestion for further study

Further and similar research can be carried out for SACCOs in other counties and sectors in order to confirm the findings of this study and also other business operational factors that may influence the adoption of e-banking by SACCOs should be considered.

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Mohammad Abukhzam School of the Built Environment, University of Salford, Maxwell Building, The Crescent, Salford, M5 4WT, UK m.abukhzam@pgr.salford.ac.ukAngela Lee School of the Built Environment, University of Salford, Maxwell Building, The Crescent, Salford, M5 4WT, UK a.lee@salford.ac.uk

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APPENDICES

APPENDIX 1

List of SACCOs licensed by SASRA to operate in Kisumu County

1. Agro –Chem Sacco society limited
2. Harambee Sacco society limited
3. Imarisha Sacco society limited
4. Jumuika Sacco society limited
5. Kite Sacco society limited
6. Koru Sacco society limited
7. Metropolitan national Sacco society limited
8. Mwalimu National Sacco society limited
9. Ukulima Sacco society limited
10. Unaitas Sacco society limited
11. Nacico Sacco society limited
12. Kimute Sacco society limited
13. Sijeca Sacco society limited

Source: SASRA SACCO supervision report 2018.

APPENDIX II

Letter of Introduction

Robert Okoth Nyawara
Maseno University
Private Bag, Maseno

To the Chief Executive Officer,

_____SACCO

Dear Sir/Madam,

RE: REQUEST FOR DATA

I am a Master of Business Administration (Accounting) student at Maseno University conducting a research on business operational factors on adoption of e-banking by SACCOs in Kisumu County, Kenya. Your organization has been identified and selected for the study.

The purpose of this letter is to request you for permission to interview you and your employees using the questionnaires attached. The information obtained shall be treated with confidentially and shall be used for purposes of this research only.

Yours faithfully,

Robert Okoth Nyawara
Mobile: 0732660700

APPENDIX III

PART 1: PERSONAL INFORMATION

1. What is your gender?

Female □ Male □

2. What is your age bracket?

Below 25 years □ 25-35years □

35-45 years □ 46 and above □

3. For how long have you served in this Sacco?

Less than one year □ 1-5 years □

6-10 years □ more than 10 years □

PART 2: THE FACTORS AFFECTING ADOPTION OF E BANKING.

Note: Please indicate your answer using the following 5-points scale where;

5= very great extent (VGE)

4= great extent (GE)

3= moderate extent (ME)

2= little extent (LE)

1= Not at all (N)

PART 2(A): TECHNOLOGICAL FACTORS

In your opinion rate the following statements on technological factors.

	VGE(5)	GE(4)	ME(3)	LE(2)	N(1)
To what extent does the System failure associate with adoption of e banking					
To what extent does the Processing error associate with adoption of e banking					
To what extent doe the Software defects associate the with adoption of e banking					
To what extent does the Inadequate recovery capabilities associate with adoption of e banking					
To what extent does the Power failure associate with adoption of e banking					
To what extent does the Lack of internet connectivity associate with adoption of e banking					
To what extent does the Lack of infrastructure associate with adoption of e banking					

PART 2 (B): SECURITY FACTORS

In your opinion rate the following statements on security factors.

	VGE(5)	GE(4)	ME(3)	LE(2)	N(1)
To what extent does the Control weaknesses associate with adoption of e banking					
To what extent does the Security shortcomings associate with adoption of e banking					
To what extent does the Malicious attacks associate with adoption of e banking					
To what extent does the Hacking incidents associate with adoption of e banking					

PART 2 (C):COST FACTORS

In your opinion rate the following statements on cost factors.

	VGE(5)	GE(4)	ME(3)	LE(2)	N(1)
To what extent does the Cost factors associate with legal requirements					
To what extent does the Cost factors associate with high implementation cost					

PART 2 (D): ADOPTION OF E-BANKING

In your opinion rate the following statement on adoption of e-banking.

	VGE(5)	GE(4)	ME(3)	LE(2)	N(1)
To what extent does the Technological factors affect adoption of e-banking					
To what extent does the Security factors affect adoption of e-banking					
To what extent does the Cost factors affect adoption of e-banking					