AN ANALYSIS OF THE DETERMINANTS OF IMPLEMENTATION OF INFORMATION TECHNOLOGY PROJECTS BY COMMERCIAL BANKS IN KENYA

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An Analysis of the Determinants of Implementation of Information Technology Projects by Commercial Banks in Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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This thesis has been submitted for examination with our approval as the University Supervisors.

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DEDICATION

This thesis is dedicated to my mother Francia Natocho Ginda, who has over the years taught me so much about the complexities of everyday life and the need to always put God first in all endeavours that I undertake. This work is also dedicated to my children Marion, Wilson and Ryan.

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LIST OF ABBREVIATIONS AND ACRONYMS

APM	Agile Project Management
CBK	Central Bank of Kenya
CSP	Critical Success Processes
CCS	Critical Chain Scheduling
CRB	Credit Reference Bureau
CTS	Cheque Truncation System
DTM	Deposit Taking Microfinance
EAPS	East Africa Payment System
EV	Earned Value
FOREX	Foreign Exchange
IMF	International Monetary Fund
IS	Information Systems
IT	Information Technology
ITBRM	Information Technology & Business Relationship Management
JKUAT	Jomo Kenyatta University of Agriculture and Technology
JVs	Joint Ventures
KBA	Kenya Bankers Association
KES	Kenya Shillings
KITS	Kenya Interbank Transaction Switch
KPMG	Klynveld Peat Marwick Goerdeler
MFB	Micro Finance Banks
MRP	Money Remittance Providers
NACOSTI	National Commission for Science, Technology and Innovation

NTCP	Novelty, Technology, Complexity and Pace
PMBOK	Project Management Body of Knowledge
PM	Project Management
PMI	Project Management Institute
PMM	Project Management Methodology
PMO	Project Management Office
PRINCE2	Projects IN Controlled Environments
Q-Q	Quantile - Quantile
RAT	Resource Advantage Theory
RBV	Resource Base View
RDT	Resource Dependence Theory
ROI	Return on Investments
RTGS	Real Time Gross Settlement
SPSS	Statistical Package for Social Sciences
TOC	Theory of constraints
TPM	Traditional Project Management
USA	United States of America
VRIO	Valuable, Rare, Inimitable, Organizational focused
VRIN	Value, Rarity, Inimitability and Non-substitutability

DEFINITION OF TERMS

Project: Is a temporary endeavor undertaken to create a unique product, service or result (PMI, 2013).

Project Management: Is the application of processes, methods, knowledge, skills and experience to achieve project objectives (Cuellar, 2010).

Determinants of Project Implementation: These can be referred to as the perceived and main variables that contribute to projects' success (Beleiu, Crisan & Nistor, 2015).

Executive Commitment: Refers to top management's willingness to champion projects within the organization and allocate the resources required for successful project infusion (Stratman & Roth, 2002).

User Involvement: Is defined as participation in the system development process by representatives of the target user group (PMI, 2013).

Project Team Capability: The ability of people working on projects to deliver outcomes along the most efficient and effective delivery path, motivated mainly by factors relating to characteristics of project members, functions and activities assigned for realization of project objectives (Aubry, 2011).

Project Management Approach: Is a strictly defined combination of logically related methods, processes that determine how best to plan, develop, control and deliver a project throughout the continuous implementation process until successful completion and termination (Ghaffari & Emsley, 2015).

Agile Project Management Methodology: Refers to an iterative, incremental method of managing the design and build activities of engineering, information technology and other business areas that aim to provide new product or service (Collyer, 2016).

Traditional Project Management Methodology:	Is a step-by-step approach to assessing the project through five stages of initiation, planning, execution, monitoring and completion (PMI, 2013).
Project Risk:	An uncertain event or condition, that if it occurs, has a positive or negative effect on a project's objective (Allen, 2015).
Effective Project Implementation:	Is the process that turns strategies and plans into actions in order to accomplish strategic objectives and goals. It is also the correct adoption of a methodology that increases the probability of success of projects carried out in a company (Kerzner, 2013)
Information Technology Projects:	These are endeavours undertaken over a fixed period of time to produce products using information technology (Baccarini, Salm & Love, 2004).

ABSTRACT

Commercial banks in Kenya have been experiencing rapid technological innovations due to the nature of their business, regulatory dynamics, competition and customer expectations. The adoption process continues to be actualized through vibrant information technology projects. However, when Central Bank of Kenya actively started modernizing and standardizing the national payments system, it became apparent that commercial banks had to install robust information technology systems or upgrade existing systems to be in alignment with the new national payments platform. Often times, inability to follow established critical project implementation determinants resulted in delayed or failed projects hence undermining the realization of seamless implementation of IT projects. The general objective of this study was to analyze the determinants of implementation of information technology projects by commercial banks in Kenya. Specifically, this study examined the influence of executive commitment, user involvement, project team capability and project management approach on implementation of information technology projects by commercial banks in Kenya. The study also sought to establish the moderating effect of project risk on the determinants of implementation of IT projects by commercial banks in Kenya. The study adopted a cross-sectional survey design and primary data was collected using questionnaires from 40 licensed and operational commercial banks as at 31st December 2017 since 3 banks were not operational. The target staff compliment was 29,326 members comprising Management, Supervisory and Clerical cadres, derived from CBK annual report. A sample size of 195 members was computed from the target population using a model by Nasiurma. The study adopted stratified and purposive sampling techniques. Pilot study was carried out to check the reliability and validity of the research instrument. Cronbach's coefficient alpha was used to test for reliability while consultations from IT project managers assisted in improving the validity of the questionnaire. Out of 195 questionnaires distributed, 138 questionnaires representing 71% were filled and collected. SPSS version 25 was used to facilitate data analysis. Multiple linear regression analysis was used to produce descriptive and inferential statistics. F-tests were employed to test the significance of the overall model while the significance of each specific variable was tested using T-test. The study showed that all the four project implementation determinants namely executive commitment, user involvement, project team capability and project management approach positively influenced implementation of IT projects. However, executive commitment was found not to have a significant influence on implementation of IT projects. From the study findings, project risk was found not to have a significant moderating effect on the determinants of implementation of information technology projects by commercial banks in Kenya.

More emphasis should therefore be placed on the individual determinants of implementation of IT projects by commercial banks. This study contributes to project management discourse where instead of project managers simply considering individual generic critical success determinants, it is possible to group the success determinants thematically based on multiple-model relationships and also taking cognizance of the nature of the project at hand since not all determinants bear the same results on different projects. The study recommended increased involvement of upper level management in all projects at all stages from initiation, planning, execution, monitoring and control and closure. Also, bank staff ought to embrace continuous improvement facilitated by upper level management and the latter must ensure that there is equitable distribution of training and capacity building opportunities. The study also recommended that commercial banks should embrace meritocracy in their dealings so that only the best staff work on implementation processes of information technology projects hence allowing sustainable stability in the project teams and by extension the workplace. The study suggested that future studies should be carried out to establish why executive commitment was not a significant predictor on implementation of IT projects model yet available literature suggests otherwise. The study also suggested further research to be done using a longitudinal research design to address the span of time used for data collection and lastly further studies suggested using a wide target population.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Project management (PM) has developed into a subject discipline alongside other management functions such as operations, information technology or finance (Mir & Pinnington, 2014) and the research literature in this discipline is growing (Badewi, 2016; Lappe & Spang, 2014). According to Meskendahl (2010), in a competitive business environment, projects play an important role in organizations' strategic management. Projects are vectors for change and for the implementation of strategies and innovations that can bring competitive advantages to companies. Kerzner (2013) noted that the last few decades have been marked by an increased use of project management as a way for organizations to structure themselves to achieve their goals.

Presently, many organizations are increasingly moving towards management through projects, which is sometimes called project-based organizations (Fernandez & Fernandez, 2009; Ahimbisibwe, Cavana & Daellenbach, 2015). This is because according to Mathur, Jugdev and Shing-Fung (2013), projects are said to be 'intensive learning organizational firms' in which companies may achieve success. Project management's abilities to enhance flexibility, remove bureaucracy and make the company more adaptive to change are cited as the major drivers for this paradigm shift (Steinberg, Schiffels & Fügener, 2017).

Project management therefore is the process of making decisions and operationalizing certain strategies and tactics in order to achieve effective project implementation (Khan, Turner & Maqsood, 2013). It is a strategic competency that enables entities to link project outcomes to business goals (PMI, 2013). For organizations running several short-term customer projects, project management is designed to control their resources in a given activity within the constraints of time, cost, acceptable level of performance and good customer relations (Mir *et al.,* 2014).

1.1.1 Determinants of Project Implementation

The process of project implementation, involving the successful development and introduction of projects in the organization, presents an ongoing challenge for managers. The process of project implementation is complex, in most cases requiring simultaneous attention to a wide variety of human, financial, and technical variables (Pinto & Slevin, 1989) as cited by Harrison and Lock (2017). According to Shi (2011), in an organizational environment, projects are the way to implement strategies. Determinants of project implementation can be perceived as the main variables that contribute to projects' success (Beleiu, Crisan & Nistor, 2015) and also as levers that can be operated by project managers to increase chances of obtaining the desired outcomes (Ives, 2005).

A combination of factors determines the success or failure of a project and influencing these factors at the right time makes success more probable (Haughey, 2014). In earlier project management literature, the main focus was on identifying generic determinants that contribute to projects' successful implementation. Within the past few years, authors emphasized on the existence of different success determinants depending on the project type. The struggle to identify the critical success determinants is work in progress, approached by many researchers especially due to the pressure of successful implementation of projects in a dynamic global market and ever-changing business world (Crisan & Borza, 2014), where continuous innovation is a must in order to achieve competitive advantage (Beleiu *et al*., 2015).

When considering the literature more closely, it was also apparent that many studies have grouped these critical success determinants within key themes or categories. However, as concluded by Fortune and White (2011), there is again no broad consensus among researchers and practitioners in categorizing critical success determinants of projects. This issue remains, with recent scholars (Sudhakar, 2012; Sheffield & Lemétayer, 2013; Wan & Wang, 2010; Mohammad & Al-Shargabi, 2011) suggesting alternative frameworks for categorizing these determinants.

According to Meredith, Mantel and Shafer (2017), the factors considered critical for effective implementation of a project are different for different types of projects and industries, while emphasizing that these factors have an important influence on the success of the project and the organization. Based on examination of various journals, 37 distinct critical success determinants have been identified with most frequently cited by about 70 per cent of the publications and 28 determinants cited in over 40 per cent of the publications (Ahimbisibwe *et al.*, 2015). The more frequently cited determinants across the 148 publications tend to be factors related to upper-level management, strategic decision making and organizational culture (Clark & Maggitti, 2012).

Characteristics of the project teams such as dedication, communication, composition and empowerment are also highlighted in over 50 per cent of the publications, as are some factors associated with the project customer or users (Stare, 2011). By drawing on a stakeholder perspective within a project implementation context, though, four key themes emerged within the critical success determinants, each with a separate identity from other categories. These constitute organizational factors, team factors, customer factors and project factors (Shaul & Tauber, 2013). Organizational factors are anchored by executive commitment whose subsets are upper management support, mission and vision, planning and control, leadership, strategic direction and organizational culture.

Team factors as a determinant relates to characteristics of employees from the project organization who form the development team and encompasses their abilities, terms of communication, dedication, expertise and experience (Hashim, Abbas & Hashim, 2013). The third category being customer factors includes aspects specific to users' involvement in the development and eventual use of the project product. The subsets of this determinant include user support, user participation, user training and education and lastly user experience. Project management approach is a determinant too and involves use of project management methodology (PMM) to enhance project effectiveness thus increasing chances of success. As such, PMMs are meant to support project managers in achieving more predictable and effective implementation of projects (Badewi, 2016).

1.1.2 Effective Implementation of Projects

The ultimate purpose of implementing projects is to achieve consistency in project success. Yet, there is no agreed definition of project success, which only further complicates its achievement. The classification of a project as a success or a failure is, to a degree, subjective (Ika, 2015). Müller and Judgev (2012) describe project success as being predominately in the eyes of the beholder meaning one stakeholder may consider a project successful, whereas another stakeholder would consider it a failure. To reduce the subjectivity relating to project success, a common understanding is required. To achieve this, success criteria should be defined in the initiating phase of the project (PMI, 2013). Davis (2014) define success criteria as the measures used to judge the success or failure of a project; these are dependent variables that measure effective implementation of projects.

Project process performance or project management success describes how well the project development process has been undertaken, measuring the extent to which a project is delivered on schedule or time, and within budget and scope (Serrador & Pinto, 2015). On-time and on-budget completion refer to the extent to which a project meets its baseline goals for duration or schedule and cost respectively (Serrador *et al.*, 2015). The second dimension, project product performance, describes the performance of the system delivered to the users (Serrador *et al.*, 2015) and measures the quality of the resulting system.

System quality, however, is a multidimensional and also a multifaceted concept that potentially changes over the project and product life cycle. Based on previous studies that have examined project implementation, using a vendor perspective, measures for assessing the outsourced system quality addresses whether the application developed is reliable; the application developed is easy to use; flexibility of the system is good; the system meets the users' intended functional requirements; the users, the project team and upper-level management are satisfied with the system delivered; and the overall quality of the developed application is high as per stakeholders' expectations (Serrador *et al.*, 2015) .

1.1.3 Global Perspective of Information Technology Projects

The Chaos Report 2015 by Standish Group examined 50,000 projects around the world. The results summarized that 29% of the projects were successful, 52% of the projects were challenged and 19% of the projects belonged to failed category. The study indicated that there was still work to be done around achieving successful outcomes from IT project development (Hastie & Wojewoda, 2015). The results of '2015 Project Management Insight' conducted by Amplitude Research among different industry sectors in USA indicated that one third (1/3) of the projects were not completed on time and also exceeded their approved budget. They concluded that the statistics showed some notable shortcomings and there was significant room for improvement when it came to effective implementation of projects.

Projects are the instruments of choice for technology transfer initiatives by various international development sponsors and their partners. Failures in project implementation seem to be the rule rather than the exception in Africa (Ika, Diallo & Thuiller, 2012). Since the year 2000, project failure rate for World Bank projects in Africa was estimated at 50 per cent (Chauvet, Collier & Duponchel, 2010); while the Independent Evaluation Group discovered 39 per cent of World Bank projects were unsuccessful in 2010 (Ika *et al.*, 2012).

Various organizational and managerial reasons are proffered, including imperfect project design, poor stakeholder management, delays between project identification and start-up, delays during project implementation, cost overruns and coordination failure (Ochara, Kandiri & Johnson, 2014; Ika, 2015; Ahsan & Gunawan, 2010). Matavire, Chigona, Roode, Sewchurran, Davids, Mukudu and Boamah_Abu (2010) identified factors related to IT project leadership weaknesses, task conflicts and institutional fragmentation as contributing factors to project implementation challenges in South Africa. Lungo (2008) plus Sheikh and Bakar (2012), reported on the implementation of health information systems (IS) projects in Tanzania.

A report on the implementation of IT projects in the banking industry worldwide by The Economist (2009) revealed few effective project implementation stories. Most banks expressed disappointment with their new systems, despite the high level of investments made. In spite of the continuous automation of most processes and products and overall high-level investments in new technology, a sizeable amount of bank work still involves use of elaborate paperwork. Very few banks have achieved or are near to achieving paperless banking.

Harris, Levine and Spencer (2011) acknowledge that banks continue to consider technological investments as the key to generating competitive advantage and maintaining the threatened domination of the market for financial services. In Ghana, for example, effective implementation of electronic payment systems in the banking sector has become a significant element in trade and commerce activities. The Central Bank of Ghana set up a company to work with commercial banks to provide a range of technology driven solutions and associated services which support and contribute to the general efficiency of the Ghanaian payments system and to provide affordable and convenient access by residents to banking services (Issahaku, 2012).

Information Technology projects influence the way organizations make their investment decisions since business leaders worldwide have realized that IT can create competitive advantage in the market. However, there are many IT projects around the world that have failed because of lack of guidelines on their management. IT project management is therefore a crucial task as many IT projects fail to achieve their intended results (Palvia, Baqir & Nemati, 2015). When project management best practices are followed, implementation effectiveness of information technology projects increases dramatically (Konstantinou, Morris & Edkins, 2013). Konstantinou *et al.*, (2013) concluded that personnel who follow project management best practices experience dramatic improvement in effective implementation of information technology projects.

Regardless of Konstantinou *et al.'*s (2013) conclusions, effective project implementation is of concern where Creasy and Anantatmula (2013) reported about sub-optimal implementation with healthcare information technology projects that went over budget, ran late and failed to meet functional requirements and delivery of the system. Kerzner (2013) noted that project management involves consolidating project elements based on experience and techniques and helps to accomplish project objectives by organizing project elements and monitoring project tasks.

Project managers are responsible for the proper application of project management techniques (Ngacho & Das, 2014). Neverauskas, Bakinaite and Meiliene (2013) conducted a literature review and discovered disagreement in the project management literature on what constitutes effective implementation of projects. Askland, Ganjendran and Brewer (2013) defined effective project implementation as project delivery that meets stakeholders' requirements on a negotiated date and within the negotiated budget. The Project Management Institute (2013), which is the standard-setting organization for the project management industry, supported Askland *et al.*'s (2013) definition.

Neverauskas *et al*., (2013) take a holistic view of effective project implementation stating that there are four major distinct dimensions: project efficiency, impact on the customer, direct business and organizational success, and preparing for the future. Since the 1960s, researchers have contributed to defining comprehensive factors set to predict effective project implementation but have consistently disagreed on one or more of these factors (Tsiga, Emes & Smith, 2016). Tsiga *et al.,* (2016) indicated that a gap exists in the project management literature and the business literature with respect to the comprehensive factors supporting effective project implementation. Major competency studies undertaken stressed that project management delivery skills were fundamental to success but must be exercised alongside an ability to reflect on experience and the project contexts (Zaval & Wagner, 2011).

1.1.4 Information Technology projects by commercial banks in Kenya

As at 31st December 2017, Kenya's banking sector comprised of the Central Bank of Kenya as the regulatory authority, 43 banking institutions (42 commercial banks and 1 mortgage finance company), 9 representative offices of foreign banks, 13 Microfinance Banks (MFBs), 3 credit reference bureaus (CRBs), 19 Money Remittance Providers (MRPs) and 73 foreign exchange (forex) bureaus. Out of the 43 banking institutions, 40 were privately owned while the Kenya Government had majority ownership in 3 institutions (CBK, 2017).

Out of the 40 privately owned banks, 25 were locally owned (the controlling shareholders were domiciled in Kenya) while 15 were foreign-owned (many having minority shareholding). 24 commercial banks and 1 mortgage financier made up the 25 locally owned institutions. Among the 15 foreign-owned institutions, all commercial banks, 11 were local subsidiaries of foreign banks while 4 were branches of foreign banks. All licensed microfinance banks, credit reference bureaus, forex bureaus and money remittance providers were privately owned (CBK, 2017).

Kenya's commercial banks are classified into three peer groups using a weighted composite index that comprises net assets, customer deposits, capital and reserves, number of deposit accounts and number of loan accounts. A bank with a weighted composite index of 5 per cent and above is classified as a large bank (Tier 1). A medium-size bank (Tier 2) has a weighted composite index of between 1 per cent and 5 per cent while a small bank (Tier 3) has a weighted composite index of less than 1 per cent. For the period ended 31st December 2017, there were 8 large banks with a market share of 65.98 per cent, 11 medium banks with a market share of 26.10 per cent and 21 small banks with a market share of 7.92 per cent (CBK, 2017). In terms of total assets held per tier classification, large banks had assets worth Ksh.2.6 trillion, medium banks had assets worth Kshs.1 trillion while small banks had Kshs.309 billion worth of assets.

The development of a robust financial infrastructure has become a top priority in Kenya's banking sector and the Central Bank of Kenya has been at the forefront in ensuring that efficacious IT systems are developed and maintained to facilitate smooth operations of payment platforms and the stability of the financial markets (CBK, 2017). Commercial banks have been experiencing rapid expansion necessitating technology changes, hence resulting in more product proposition into the market while leveraging on the technology investments which include the automated clearing house, better and versatile core banking systems, self-service online portals, mobile banking, internet banking and other third-party integrated systems including Real Time Gross Settlement, East Africa Payment Systems and Kenya Interbank Transaction Switch (CBK, 2017).

The aforementioned developments have called for apt liaison between commercial banks, the Central Bank of Kenya and Kenya Bankers Association. According to KBA (2014), the banking industry is today operating under high levels of uncertainty and implementation of IT projects is susceptible to all sorts of external influences including unpredictable business environment, cut throat competition, ever growing regulatory requirements, changing constraints and fluctuating resource flows. This clearly shows that if such projects are applied and due steps are not taken to manage them effectively and efficiently, chances of sub-optimal project implementation become rife (KBA, 2014).

According to Kenya Bankers Association (2014), banks failed to meet the March 31st 2014 deadline on the intended switch to chip based Automated Teller Machine (ATM) cards project and faced major challenges in the implementation phase of the project. This meant that many banks still used the pin and stripe cards which were prone to fraudulent manipulations hence occasioning significant losses by commercial banks. The Central Bank of Kenya has been monitoring keenly the developments in the banking sector with a view to managing and improving risk management practices and also ensure that banks install and maintain robust core banking systems that enhance secure interoperability with intermediary systems (CBK, 2017).

1.2 Statement of the Problem

Management of information technology (IT) projects is a challenging task with many projects failing to achieve their intended objectives (Palvia *et al.,* 2015). Many organizations do not critically examine the causes of sub-optimal implementation of projects and this prevents them from learning from their mistakes (Howell, Windahl & Seidel, 2010). Although sub-optimal implementation of IT projects has been widely recognized as the most pressing problem facing IT project management, there is still no clear and accepted definition of effective IT project implementation (Howell *et al.*, 2010).

According to Central Bank of Kenya (2016), there has been increased automation of functions in Kenya's banking sector in the last decade and this has called for individual banks installing robust IT platforms which support stable and efficient conventional banking systems such as Flex cube, Temenos T24, Micro banker, Finacle etc. iMAL system has been widely used for Shariah compliant products. In 2010, Central bank of Kenya in liaison with Kenya Bankers Association initiated the Cheque Truncation Project aimed at shortening the clearance cycle of cheques. All commercial banks were supposed to implement the project by aligning their systems and procuring imaging devices to facilitate the exchange of cheque images in place of physical cheques by 2011. It was not until 2012 that all banks were ready for eventual roll-out of the project.

In 2013, Kenya Bankers Association mooted the Great Migration to EMV Chip Project whose aim was to transit from magnetic stripe cards to chip enabled cards. The implementation uptake went into 2015 when all banks complied. Still in 2013, Central Bank of Kenya in liaison with other Central Banks in East Africa namely Uganda, Tanzania and Rwanda spearheaded the East Africa Payments System Project which was geared towards enabling bank customers across the four countries to transfer funds seamlessly through Real Time Gross Settlement system. It fully became operational in 2016 by all commercial banks after inordinate delays in implementation of the project.

In 2014, Kenya Bankers Association spearheaded the Kenya Interbank Transaction Switch (*Pesalink*) Project which aimed at enabling bank account holders to transfer money between their accounts using mobile phones. At the time of project roll-out in 2017 after several deferments, 26 banks out of 40 were ready to go live. The number of banks joining the platform has since grown to over 30 banks as at June 2019. These examples are a testament to the challenges in implementation of projects being run by both private and public sector (Kabutu, 2013). Previous studies by Kudav and Megha (2013); Sewe (2010); Ikua and Namusonge (2013); Ngugi and Mutai (2014) however, mainly concentrated on factors influencing the growth and failure of information technology projects. This has left a knowledge gap in the key area of appropriate classification and application of thematic determinants of effective implementation of IT projects by commercial banks to forestall cases of delayed implementation of projects. This study therefore sought to examine how executive commitment, user involvement, project team capability and project management approach, moderated by project risk, influenced implementation of IT projects by commercial banks in Kenya.

1.3 Objectives of the Study

This study was guided by general and specific objectives as outlined;

1.3.1 General Objective

The general objective of the study was to analyze the determinants of implementation of information technology projects by commercial banks in Kenya.

1.3.2 Specific Objectives

The specific objectives of the study were;

1. To examine the influence of executive commitment on implementation of information technology projects by commercial banks in Kenya.

2. To determine the influence of user involvement on implementation of information technology projects by commercial banks in Kenya.

3. To establish the influence of project team capability on implementation of information technology projects by commercial banks in Kenya.

4. To examine the influence of project management approach on implementation of information technology projects by commercial banks in Kenya.

5. To determine the moderating effect of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya.

1.4 Research Hypotheses

The study aimed to test the following null hypotheses;

H_{01}: Executive commitment has no significant influence on implementation of information technology projects by commercial banks in Kenya.

H_{02}: User involvement has no significant influence on implementation of information technology projects by commercial banks in Kenya.

H_{03}: Project team capability has no significant influence on implementation of information technology projects by commercial banks in Kenya.

H_{04}: Project management approach has no significant influence on implementation of information technology projects by commercial banks in Kenya.

H_{05}: Project risk has no significant moderating effect on the determinants of implementation of information technology projects by commercial banks in Kenya.

1.5 Significance of the Study

This study is bound to be of benefit to the following stakeholders;

1.5.1 Information Technology Project Managers

The outcome of this research encourages senior information technology project managers in the banking sector to seriously consider how technological advancement and innovation demands for a paradigm shift in the manner in which implementation of projects should be done. The research findings encourage for the adoption of methods that ensure effective implementation of projects at the organizational level. Also, best practices ought to be adopted so that unwarranted delays in implementation of sector-wide projects are avoided. In the same vein, the study contributes to the whole question of how project risk as a moderator variable in the study wherein factors such as complexity of projects, project size, technological uncertainty and specification changes are clearly dissected and reviewed with more light being shed on their moderating effect on the determinants of implementation of information technology projects by commercial banks in Kenya.

1.5.2 Policy Makers

The research significantly contributes towards specific appreciation of the relevant subsets that constitute determinants of implementation of information technology projects by commercial banks and motivation for their acceptance across other types of projects as well as broadening their implementation framework. The results of this research are thus useful in providing relevant project management advice for new projects, guidance for the on-going and established projects and general improvement of the implementation environment of projects and more specifically for information technology projects by commercial banks in Kenya. Policy makers should be in a position to adopt tested and working models with ease since the study findings offer solid building blocks on which adoption and application of project management nuances can be based.

1.5.3 Researchers and Academicians

Researchers and academicians who wish to explore the field of project management with a bias for information technology projects have in this research a foundational basis and substantial knowledge base covered on the subject particularly dealing with determinants of effective implementation of information technology projects across the wide spectrum of sectors but more specifically among Kenya's commercial banks. Although the foundational fundamentals of project management remain universal, it is worth noting that there is always specificity in terms of application based on individual subject sectors and in this case the research focused on information technology projects in the banking sector in Kenya.

1.6 Scope of the study

According to Yin (2017), delimitations are choices made by the researcher which should be mentioned. They describe the boundaries that have been set for the study. The scope of this study was forty-three (43) commercial banks licensed by the Central Bank of Kenya. However, the commercial banks from which the study sample was derived were those in operation by close of business on 31st December 2017 and had also engaged in implementation of industry-wide information technology projects prior to the subject date. Charterhouse Bank was under statutory management whereas Chase Bank and Imperial Bank were under receivership, hence the three banks were excluded from the study. The complete list is provided in Appendix III. The study analyzed the determinants of implementation of information technology projects and more specifically executive commitment, user involvement, project team capability and project management approach constituting the independent variables with project risk being the moderator variable and it was operationalized by technical complexity, technological uncertainty, project criticality and specification changes. Implementation of information technology projects was the dependent variable and was operationalized by on-time completion, within budget, to scope and also projects bearing functional quality. Data collection was conducted in 2018.

1.7 Limitations of the Study

This study adopted a cross-sectional survey design where data was collected at one point in time. In this case, strong conclusions concerning the directions of causality implied in the model could not be clearly drawn and as such, relationships among variables ought to have been interpreted in a more discerning way. The foregoing occasions a deficiency in interpretation of models using multiple regression analysis. Absolute causal inferences can only be drawn when models are tested using longitudinal data. The study analyzed the determinants of implementation of IT projects and it is noteworthy that their influence varied contingent upon the project dynamics obtaining over the period of review.

The target population for the present study was confined to commercial banks where an array of staff cadres who consistently interact with information technology projects were the point of focus. This population is only a very small proportion of the entire population that deals with information technology projects across the different sectors of the economy in Kenya. With such a confined target population, challenges were encountered in terms of applicability or generalizability of the results obtained to other sectors. Future studies with representative groups of people across the sectors would be imperative for the results to be generalized or transferred.

This study also faced challenges in the process of data collection where respondents took so much time filling in the questionnaires and in some cases the exercise took upwards of a couple of weeks. This was due to the busy nature of the banking environment given that there is constant foot traffic throughout the working hours resulting in employees being constantly engaged. Those who filled the questionnaires indicated that they had to find time in the evenings and during the weekend. The researcher had to be patient but persistently followed up and had diplomatic discussions with the respondents which saw 71% of the respondents completing the survey. The response rate achieved is acceptable in social science research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews related literature in the area of implementation of information technology projects. It starts by examining four popular management theories, discussing how these theories can be applied to executing projects. The chapter further reviews the conceptual framework, discussing the independent variables namely; executive commitment, user involvement, project team capability and project management approach; the moderating variable being project risk and the dependent variable being implementation of information technology projects. The empirical literature in IT project implementation is discussed and research gaps identified.

2.2 Theoretical Framework

The study was grounded on theories drawn from general and strategic management but relevant and applied in project management. The theories reviewed in this study include: contingency theory, theory of constraints (TOC), resource-dependence theory (RDT) and the resource-based view framework (RBV) wherein is embedded the resource advantage theory (RAT). These theories were examined to show how each can be integrated into project management more so for effective implementation of IT projects.

2.2.1 Contingency Theory

Contingency theory presents a body of literature that argues that not all projects are the same and therefore they should not all be structured and managed the same way (Howell *et al.*, 2010). The study of contingency theory in project management has gradually emerged during the last two decades with specific frameworks for project management that have been influenced by research from disciplines and fields of study like innovation, organizational theory, management, computer science, product management and engineering (Kureshi, 2013).

The contingency approach assumes that there is more than one way to achieve effectiveness in project organizations (Hanisch & Wald, 2012). Each way has varying effectiveness under all situations, where one way can be more appropriate for a certain situation than another (Aljawder & Davis, 2013; Besner & Hobbs, 2013). Thus, the appropriate match of contingency factors with structural factors will allow for better response to the environment and achieve higher levels of effectiveness (Tolbert & Hall, 2015). Contingency theory suggests that organizational effectiveness depends on how well an organizational structure matches its environment (Wherren, 2013; Cameron, 2015).

Contingency theory has occasioned a paradigm shift in management because it introduces the concept that no one management approach will work for every project type (Howell *et al.,* 2010). Each project that an organization initiates may benefit from the use of a different management approach or a combination of approaches. Many project organizations will adopt one management approach and expect every subsequent project to conform to the requirements of that particular methodology. Different project organizations utilize different management methodologies. Contingency theory allows organizations to work together by de-emphasizing a "one-size-fits-all" mentality for managing projects (Howell *et al.,* 2010).

Howell *et al*., (2010) eloquently posit how contingency theory has developed from classical organizational contingency theory building upon research from innovation (Pak, Carden & Kovach, 2016) and organizational perspectives of projects (Mensah & Gottwald, 2016). Contingency theory similarly argues that the best approach to managing a project depends on the obtaining dynamics and context; that different conditions require different project organizational characteristics and that the effectiveness of the project is related to how well organizational approaches and conditions fit each other (Howell *et al.,* 2010).

According to Kureshi (2013), a contingency approach to project management necessarily investigates the extent of fit or misfit between project characteristics and project management approach. This is consistent with the research examining enduring organizational types drawing on contingency theory that suggests that organizational effectiveness is dependent upon the organization's ability to adapt to the environment and that there is a need for congruence between the environment and structure (Linton & Kask, 2017). Similarly, it has often been suggested that more turbulent environments should be addressed by organic structures because coping with uncertainty is a core problem for complex organizations (Agrawal, 2014).

A lack of this distinction is suggested to be a reason for sub-optimal implementation of projects as well since wrong methodologies and approaches are easily adopted (Jeyakanthan & Jayawardane, 2012). The contingency theory implies that different external conditions require different organizational characteristics and that the effectiveness of an organization is contingent upon the fit between structural and environmental variables (Reddi & Sai, 2013). While these two may have been studied in detail when the organization is viewed as a unit, they have been less investigated in the project context (Mansor, Yahya & Arshad, 2011).

A significant body of research on information technology projects examines project implementation determinants, project implementation and the relationship between the two from a contingency perspective (Jiang, Klein & Chen, 2013; Barki, Rivard & Talbot, 2015; Yetton, Martin, Sharma & Johnston, 2013; Kureshi, 2013; Howell *et al.*, 2010; Jun, Qiuzhen & Qingguo, 2011). These studies have argued for a contingency approach which considers successful project implementation to be dependent on how well the project as a whole is able to deal with uncertainties in the project environment. They have also provided practical evidence that in order to achieve effective project implementation, risk and management strategies need to be tailored to project characteristics and objectives.

Rasnacis and Berzisa (2017) provide evidence that the implementation of the same methodology in two different organizational settings may produce vastly different results. The contingent nature of project success holds that a project management approach or technique that is successful in one project and under certain circumstances might be a failure in a different project or under different circumstances (Erik & Clifford, 2011). Ultimately, this theory proposes that effective organizational performance depends on a complex relationship among environmental characteristics, production technology, internal differentiation, and integration (McManus, 2014).

Chua, Soh and Singh (2011) proposed that the situational view of control dominates project management practice where situational factors determine the appropriate controls to employ. They suggested that effective projects employ a portfolio of controls, which are contingent upon factors related to the project and the organization. Whether to employ an agile or traditional approach also appears to be contingent upon product and organizational factors (Singh, Singh & Sharma, 2015). Contingency theory can help managers and project organizations to achieve project goals and objectives by properly choosing an approach to management of projects or by combining multiple approaches (Joslin & Müller, 2015).

Although there is no widely accepted formal theoretical foundation for project management, one of the most consistent theoretical perspectives used in project management research is contingency theory, where project success is contingent upon a combination of organizational, project, and people-based factors (Joslin *et al.*, 2015; Badewi, 2016; Putra, Ahlan & Kartiwi, 2016). The organization of the critical implementation determinants into four categories for this study represented potentially contingent groups of factors. Contingency theory is important to this study since it asserts that different projects require different management approaches and methodologies all of which are geared towards enhancing effective implementation of information technology projects. Therefore, this is the overriding theory for this study as it explains all the variables in the study.

2.2.2 Theory of Constraints

The theory of constraints (TOC) is primarily concerned with managing uncertainty to minimize resource constraints for multiple projects. The TOC can be used to evaluate obstacles, limitations and similar problems in a project and develop a breakthrough solution (Bisogno, Calabrese, Ghiron & Pacifici, 2017). The TOC is used for developing resources' timelines, for example availability of resources allows project scheduling to the extent that activities using identical resources are scheduled in series (Ghaffari & Emsley, 2015). Leach (2010) argues that more detailed planning or more sophisticated computer programs cannot correct the constraint-based problems (over time, within budget and under scope).

It can be argued that project reality has dynamic variations due to uncertain estimates, dependent events and often scarce resources. Therefore, the organization should focus on project timelines and identify the core constraints that prevent project execution from performing better rather than breaking the process down and improving the efficiency of each step (Bevilacqua, Ciarapica & Giacchetta, 2011). TOC incorporates a sequence of progressive steps for improving the current situation. The objective is to identify the weakest link in the project management plan which is itself regarded as a constraint, exploit the constraint, subordinate all else to the strategy to manage the constraint, elevate the constraint and if all these steps fail, go back to step one (Bisogno *et al*., 2017).

Application of TOC needs supportive organizational policy and resource availability to enhance the project timelines (Leach, 2010). TOC time management technique (also referred to as critical chain scheduling (CCS)) has been extended to allocate resources to project-based organizations that share common resources (Ghaffari *et al*., 2015). This maximizes the number of projects in the organization while maintaining the principles for reducing the duration of individual projects. Ghaffari *et al*., (2015) posited that TOC should be applied initially for project time management, although it can also be used for project risk assessment and cost management.

Moreover, Ghaffari *et al*., (2015) also argue that project timelines are a major constraint in project execution because of the need for positive cash flow, reducing contingency costs of delays and need for scope changes. Therefore, the two key underlying features in using TOC are the availability of key resources, and the ability of organizations to mobilize these resources in a timely manner to meet project schedules and maximize resource utilization. TOC is based on the argument that any manageable process, such as a project, is restricted from achieving its scope by at least one constraint (Bisogno *et al*., 2017; Tulasi & Rao, 2012).

A five-step approach is undertaken to review processes, identify constraints, improve the capacity of the constraint and restructure the rest of the organization (project) around it (Tulasi *et al.*, 2012). Goldratt (1997) as cited by Marquis (2011) applies the TOC to project scheduling – referred to as critical chain scheduling, to reduce project duration and simplify project control. According to Bisogno *et al*., (2017), the critical chain was developed because of the existence of chronic problems that existing methods, approaches and even expensive software have not been able to remove. The key elements of CCS are to focus on critical areas such as critical activities and resources, avoidance of task due dates, milestones and multitasking and insertion of various buffers at strategic points in the project schedule (Bisogno *et al*., 2017; Parker, Parsons & Isharyanto, 2015; Ghaffari *et al*., 2015; Millhiser & Szmerekovsky, 2012).

Parker *et al.*, (2015) consider CCS to be an effective project management strategy which can be deployed to avoid project delays caused by Parkinson's Law which is an adage stating that work expands to fill the time available for its completion, whilst protecting for Murphy's Law which alludes to uncertainty involved in the work. These views are also supported by Ghaffari *et al*., (2015) and Bisogno *et al*., (2017) who highlight that safety reserves are often overestimated in traditional project management approaches, which results in a tendency for project team members to procrastinate.

Whilst empirical studies are lacking, authors continue to cite examples of numerous case studies of effective project implementation where CCS is applied, ranging from private, public and government sectors (Bisogno *et al*., 2017; Millhiser & Szmerekovsky, 2012; Tulasi *et al.*, 2012). Benefits cited include substantial time savings, profitability, customer satisfaction and worker enthusiasm (Millhiser *et al.*, 2012). Nemati, Bhatti, Maqsal, Mansoor and Naveed (2010) in their insight on application of TOC in implementation of projects concluded that typically, the duration of projects was shortened by an amazing 60 per cent from the time originally estimated.

Goldratt (1997) as cited by Marquis (2011) developed a set of tools, formally known as the thinking processes (current reality tree, evaporating cloud, future reality tree, prerequisite tree and transition tree), for analyzing cause and effect relationships. Parker, Nixon and Harrington (2012) explore the theoretical underpinnings of the TOC thinking processes by comparing them with existing classificatory frameworks in project management. Uzun (2015) concludes that the thinking processes share the ontological and epistemological characteristics and assumptions of extant project management methodologies.

Cox, Blackstone and Schleier (2003) as cited by Ahlemann, El Arbi, Kaiser and Heck (2013) show excellent examples of the application of the thinking process tools to operations decisions. Although the thinking processes are very powerful methods of developing generic solutions in project management and other areas, Purba (2016) contends that it is the fundamental concepts of TOC that constitute a theory of project management. Based on the foregoing literature, the theory of constraints therefore explains executive commitment, user involvement, and project team capability whereby important issues dealing with the triple constraints of projects are addressed resulting to reduced delays in schedule and optimal use of resources hence the likelihood of delivering projects on-time, within budget and to scope and quality specifications.

2.2.3 Resource Dependence Theory

Pfeffer and Salancik's (2003) Resource Dependence Theory (RDT) explains interactions between organizations' attempts to reduce reliance upon the external environment for resources, for example, sub-contracting while simultaneously increasing the reliance of other organizations on their own resources like project skills. Control of vital resources is considered to be a source of power in inter-organization and stakeholder relationships, allowing the controller of vital resources to impose economic considerations upon other organizations which are reliant upon access to the resource (DiMaggio, 2013).

Project management research, as a body of work, has been criticized for its focus on the internal dynamics of projects as the key contributors to effective implementation of projects (Tengan, Aigbavboa & Oke, 2018). There has been less focus upon the environmental context and the relative impact upon project outcome (Bartlett, 2018). Given the potential importance of key resources as a source of competitive advantage for projects within an intra-organization and inter-organization environment, RDT may be a useful tool for exploring the nature and methods of competition and collaboration between projects in the context of an environment of scarcity.

The fundamental underpinning concept of Resource Dependence Theory is control of key resources and the political and commercial benefits that these confer upon organizations, whether in their favour or against them in the external environment for access to key resources. Drawing from organizational theory, RDT characterizes the organization as an open system (DiMaggio, 2013) and is based on the premise that all organizations are not autonomous and are constrained by critical dependencies on other organizations for the provision of vital resources (Drees & Heugens, 2013; Pfeffer & Salancik, 2003 as cited in Howell *et al.*, 2010). Within RDT, resources are perceived as a basis of positional power and therefore supremacy and resource dependence are directly linked (Davis & Cobb, 2010).

Davis *et al.,* (2010) note that exchange-based power in RDT was hinged on the parsimonious account that the power of A over B comes from control of resources that B values and that are not available elsewhere. On this account, power and dependence are simply the obverse of each other: B is dependent on A to the degree that A has power over B. Davis *et al.,* (2010) further indicate that power is not zero-sum as A and B can each have power over each other thus making them interdependent. Under RDT, organizations seek to manage their environments and reduce their dependencies, uncertainties and others' power over them by engaging in inter-organizational relations (Deng & Yang, 2015).

Pfeffer and Salancik (2003) as cited in Howell *et al.,* (2010) note that: "Organizations inevitably never manage all external interdependencies, and any actions produce new patterns of dependence and interdependence, which in turn produce inter-organizational as well as intra-organizational power, where such power has some effect on organizational behaviour". Three core ideas of the RDT framework have been identified: first, social context matters; second, organizations having strategies to enhance their autonomy and pursue interests; and third, power being important for understanding both internal and external actions of organizations (Davis *et al.,* 2010)

Pfeffer *et al.,* (2003) as cited in Howell *et al.,* (2010) also suggest the following five actions which firms can take to minimize environmental dependencies: first, mergers and vertical integration; second, joint ventures (JVs) and other inter-organizational relationships; third, shared boards of directors; fourth, political action; and fifth, executive succession. Organizations engage in inter-organizational arrangements to cope with interdependencies, strengthen their legitimacy and restore some degree of control or autonomy over their environments (Davis *et al.,* 2010; Drees *et al.,* 2013). According to Santos and Eisenhardt (2009) as cited in Drees *et al.,* (2013), "implementing such arrangements enable organizations to set their boundaries at the point that maximizes strategic control over crucial external forces."

There is considerable empirical research supporting the rationale that resource dependencies are an antecedent to mergers, alliances, joint ventures and board interlocks (Howell *et al.,* 2010). Hillman, Withers and Collins (2009) as cited in Howell *et al.,* (2010) note that recent research suggests that from the period between 1980 and 2000, there was considerable evidence that firms were engaged in resource-dependence relationships to reduce their overall environmental dependency. Control of key resources and the political and commercial advantages thereof allow a significant impact upon projects during the planning and executing processes (Deng *et al.,* 2015).

Consideration of the control of key resources is important during project planning processes, as schedules, budgets, procurement plans and risk plans will need to be adjusted to allow for procurement of key resources that the project does not already control (Collyer & Warren, 2013). Control of key resources will continue to be an important consideration for risk monitoring during executing processes as other projects or organizations may seek to gain control of a project's key resources for their own projects (Davies, Gann & Douglas, 2014). Accordingly, appropriate mitigation strategies need to be put in place to cover the potential loss of key resources during execution processes and closing.

RDT focuses on external resources and management of environmental dependencies (Howell *et al*., 2010). While the focus of the theory is operational, it still underpins a strategic intent that will support planning at the strategic level and therefore the success of a strategy is in its alignment to operational tactics, and vice versa (Bartlett, 2018). Organizations can improve their success index in implementation of IT projects by applying the RDT to manage internal and external factors which constrain their projects, develop their organizational capabilities, develop their individual project managers' capabilities and partnerships with other firms to strengthen their project management capabilities (Bisogno *et al*., 2017). These constitute the basis for explaining executive commitment and project management approach as variables in this study.

2.2.4 Resource Advantage Theory

Barney's (2001) resource advantage theory as cited by Deng *et al.,* (2015) explains differences in performance between project organizations as being the result of the unique combination of resources possessed by each organization. The theory is a subset of the broader Resource Based View framework of the firm literature. RBV has developed to become one of the key paradigms used within strategic management research to explain the source of sustained advantage over competitors (Deng *et al.,* 2015; Kim & Park, 2013; Kraaijenbrink, Spender & Groen, 2010). Bisogno *et al*., (2017) provide a definition, stating that "the RBV focuses on the use and deployment of resources, the development of resource-based core competencies and the eventual competitive advantage that results from this process."

The RBV framework is commonly adopted to explain how project organizations through their teams can develop and sustain a competitive advantage through the application of a heterogeneous resource base (Davis *et al.,* 2010). There are differences in the literature with regard to which resource characteristics are considered relevant. However, in summary, resources are a source of competitive advantage if they are valuable, scarce, inimitable, non-substitutable, durable, appropriate and organizationally focused (Deng *et al.,* 2015; Jugdev, 2014; Jugdev & Mathur, 2013).

Barney's (2001) VRIO (valuable, rare, inimitable, organizationally focused) framework as cited by Deng *et al.,* (2015) appears to be the most commonly adopted and used in practical terms. Strategic assets are often referred to as "core competencies" (Jugdev, 2014; Jugdev & Mathur, 2013), "organizational capabilities" (Gray & Larson, 2011) or "dynamic capabilities" (Nemati, Bhatti, Maqsal & Mansoor, 2010). Clearly, strategic assets involve complex patterns of interaction and coordination between resources including capital assets and people, processes and knowledge, in order to effectively transform inputs into outputs (Jugdev, 2014).

Jugdev (2014) highlights that strategic assets are more important than individual resources, however, resources are essential in developing strategic assets. Jugdev (2014) also highlights the link between strategic assets and competitive advantage, stating that strategic assets involve a mix of explicit and tacit knowledge that is embedded in a company's unique internal skills, knowledge and resources (Kapsali, 2013). Such strengths are difficult to purchase, let alone copy, so they can contribute to a firm's ability to move beyond competitive convergence toward a competitive advantage or strategic position.

Jugdev and Mathur (2013) argue that intangible, knowledge-based resources are more likely to serve as sources of competitive advantage because they allow firms to incorporate practices into their processes that are valuable, rare, inimitable and organizationally focused. Knowledge-based resources like project teams are especially difficult to imitate due to causal ambiguity, social complexity and associated organization-specificity (Teece, 1998 as cited in Jugdev & Mathur, 2013). The RBV perspective also discusses how organizations should assess their resources and strategic assets and determine which should be developed and which should be de-emphasized (Jugdev, 2014).

Tengan *et al.,* (2018) state that a resource-based approach to strategy is concerned not only with the deployment of existing resources, but also with the development of the firm's resource base. According to Zack (2009), developing a firm's resource base includes having replacement investment to maintain the firm's stock of resources and to supplement resources in order to buttress and extend positions of competitive advantage as well as broaden the firm's strategic opportunity set. Sustaining notable advantage in the face of competition and evolving requirements also requires that firms constantly develop their resource bases. Deng *et al.,* (2015) posit that most of an organization's resources are homogenous and can therefore be relatively easily obtained or duplicated by an organization's competitors, and as such do not provide an advantage when competing against industry peers.

However, Deng *et al.,* (2015) indicated that a sustained competitive advantage is obtained when an organization possesses resources that are heterogeneous and immobile and the resources' heterogeneity and immobility is determined by their value, rarity, inimitability and non-substitutability (VRIN). Resources' potential to deliver a sustainable competitive advantage to the organization is moderated by whether the firm is organized to exploit the advantage offered by ownership of the resources (Barney & Hesterly, 2012). Potential applications of RBV/RAT research in the field of project management have previously been discussed by Killen, Jugdev, Drouin and Petit (2012), however their review was primarily focused upon project management capability being a source of competitive advantage for the project organization.

Howell *et al*., (2010) suggest that RBV framework's focus on integration of these theories may provide new insights into organizational resource endowments and explain how organizations can achieve a competitive advantage by obtaining VRIO resources from the external environment (Howell *et al.,* 2010). To-date, there has been limited discussion of the potential applications of RAT in aiding understanding of the drivers behind project success and failure in environments where projects are competing against each other for critical resources. A project team is a temporary group of individuals requiring various resources; in effect a temporary organization within the wider organization (PMI, 2013).

The unique combination of resources available to this temporary organization can be a source of competitive advantage or disadvantage for a project's successful completion (Barney, 2001). Accordingly, the success of a project is at least partially dependent upon the project team having access to key resources that provide a competitive advantage over other projects within the organization, and more broadly across industry and market. Therefore, the key concept underpinning RAT is the scarcity of resources in the project environment and their impact upon a project's completion. Executive commitment, project team capability and project management approach are consequently explained by the resource advantage theory.

2.3 Contingency Fit Model

From a project management perspective, project implementation determinants are characteristics, conditions, or variables that can have a significant impact on the success of the project when properly sustained, maintained, or managed (Badewi, 2016). Different studies have identified different determinants but there exists a lack of consensus of opinion among researchers on the criteria for judging effective project implementation and the attendant determinants (Panda & Sahu, 2013). The critical success determinants approach has been established and popularized over the last 20 years (Jeston, 2014). When considering the literature on project implementation determinants closely, many studies have grouped the determinants within key themes namely organizational, team, customer and project factors (Müller *et al.*, 2012).

This categorization matches and elaborates on that utilized by others like Nasir and Sahibuddin (2011) who found that people factors seem to dominate the critical determinants. This is not surprising because information technology projects more rarely fail because of technical reasons, despite the fact that people and process problems may manifest technically. It is also likely the project's technical factors can be improved with proper management of people and processes (Aaltonen & Kujala, 2016). This categorization also matches the argument by Sheffield *et al.*, (2013) that in order to achieve effective project implementation, the organization's top management, the project team and users must settle on a development approach that is aligned with the nature of the project and the environment in which it is embedded.

Ascertainment of the appropriate critical project implementation determinants gives project organizations a competitive edge and is the bottom line of success in fulfilling the responsibility of project management organizations (Reddy, Raja, Jigeesh & Kumar, 2013). Chow and Cao (2008) also proposed a research model for candidate critical success determinants for information technology projects and in their model, the candidate determinants were also categorized as organizational, people, process, technical and project factors.

Therefore, drawing on literature of project management, project management practices, objectives of project management, critical success determinants and implementation of projects, this study derived five variables namely executive commitment, user involvement, project team capability, project management approach (independent variables) and project risk (moderating variable) from thematic groups comprising organizational, team, customer and project factors as illustrated in the model;

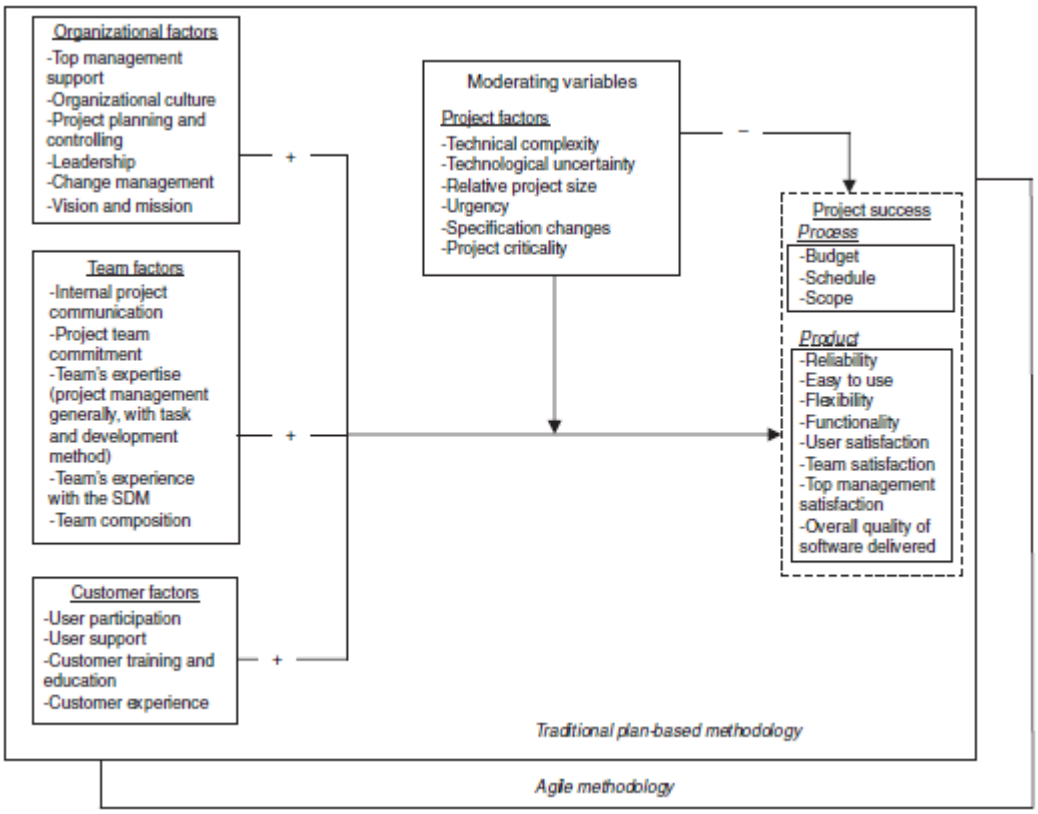

Figure 2.1: A Contingency Fit Model

Source: Ahimbisibwe *et al.*, (2015)

2.4 Conceptual Framework

The objective of this study was to analyze the determinants of implementation of information technology projects by commercial banks in Kenya. The determinants constituting the independent variables were executive commitment, user involvement, project team capability and project management approach and were moderated by project risk all geared towards implementation of information technology projects.

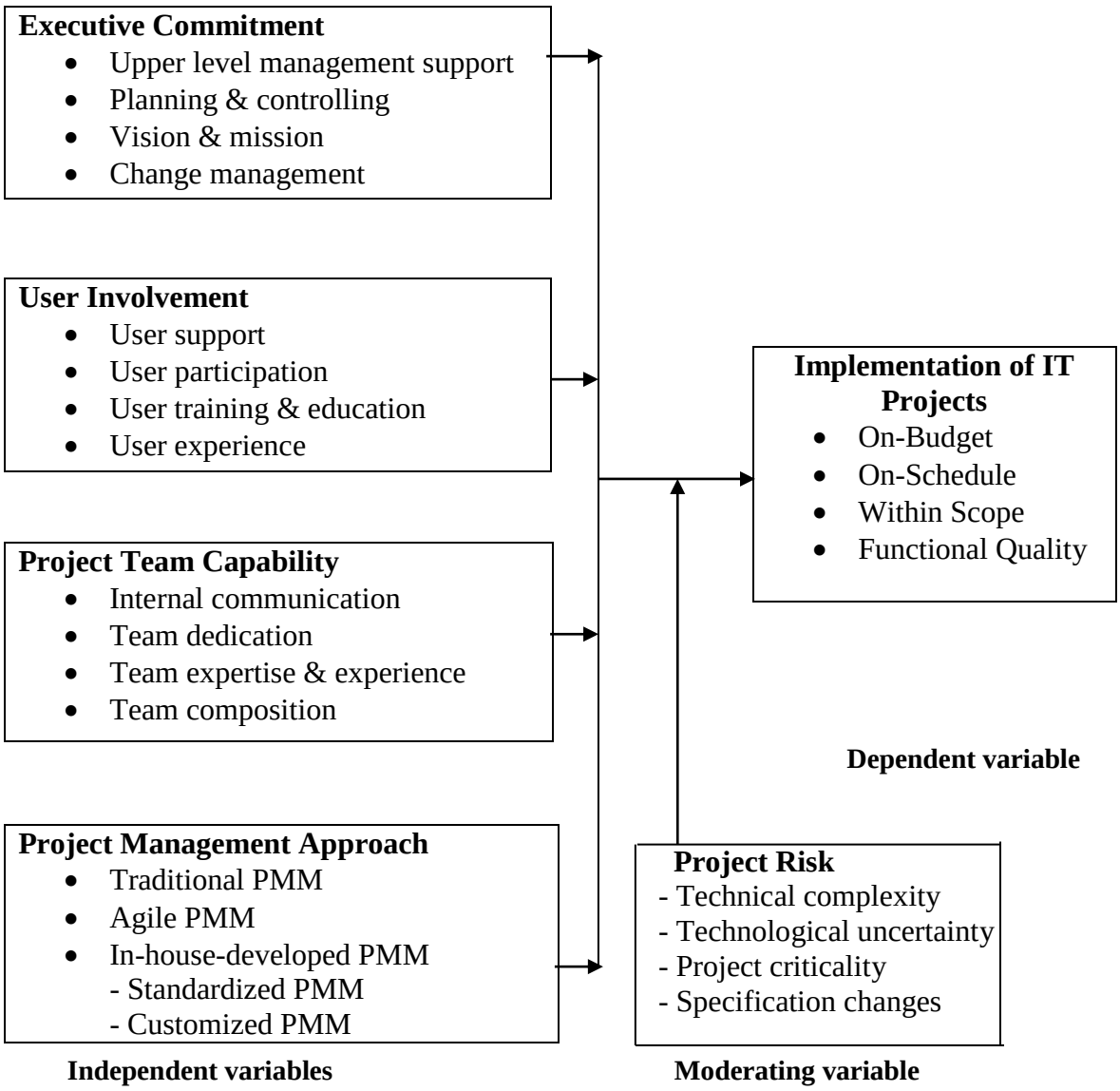

Figure 2.2: Conceptual Framework

2.5 Review of Literature on Variables

2.5.1 Executive Commitment

Executive commitment in this study was derived from general project organizational factors and refers to top level management's willingness to champion projects within the organization and allocate resources for effective implementation of the projects (Kerzner, 2017). Projects are often dominated by parent organizations and as such their management is often influenced by organizational factors. Executive commitment typically centers around upper level management support, organizational culture, project planning and controlling, leadership characteristics, change management and vision and mission.

Since IT projects exist within the broader organization, these factors can greatly impact on the management approach of such projects. Therefore, it can be logically hypothesized that different projects face different parent-imposed constraints and that this yields different project characteristics (Howell *et al.,* 2010). Among all the subsets of executive commitment, upper level management support has been suggested to be the primary factor for effective implementation of information technology projects. This is probably because upper level management support drives and influences other attendant factors (Yunis, Jung & Chen, 2013). Imreh and Raisinghani (2011) and Mansor *et al.*, (2011) also emphasize that no project can be completed successfully unless the project manager secures commitment from the senior management.

Upper level management support is critical for project success (Nyoni & Bonga, 2017). Majority of senior executives perceive that organizational issues are more important for organizational success than technical issues (Doherty, 2014; Luna-Reyes & Gil-Garcia, 2013). Upper level management support has become even more important in projects with the introduction of organizational maturity models, such as capability maturity model, capability maturity model integrated, and organizational project management maturity model (PMI, 2013). Improving the maturity of an organization was found to be highly correlated with project success (Ansari, Farooquie & Gattoufi, 2016).

This implies that for any effective project implementation, there is a necessity for sustained upper level management support to provide resources, authority and influence. Consistently, Dyck and Majchrzak (2012) found that upper level management support has a positive impact on effective implementation of IT projects. Similarly, findings by Yunis *et al.,* (2013) provided support for the hypothesis that upper level management support was a significant predictor of effective project implementation. It is thus clear that there is a positive relationship between upper level management support to projects and effective implementation of IT projects.

While there are many ways in which an organization can support its project managers, it is important to focus on the most effective processes. These are called critical success processes – CSPs (Ahimbisibwe *et al*., 2015). A critical success process is one that most significantly improves project success. Critical upper management support processes that an organization may consider to implement, include developing project procedures, involving the project manager during initiation stage, supporting ongoing project management training programs, establishing a project management office (PMO), developing a supportive project organizational structure, defining clear project success measures and supporting projects in quality management (Zwikael & Smyrk, 2011).

Project planning and controlling refer to the extent to which planning and controlling practices are used in a project. Previous research has demonstrated a positive relationship between planning and effective process implementation (Yetton *et al.,* 2013). Poor planning is likely to be associated with inefficiencies in development and thus, lead to large budget and time variances (Didraga, 2012). Rigorously tracking and monitoring a project according to a project plan can ensure that the final product is delivered within budget and on schedule (Jun *et al.,* 2011). As maintained by Blomquist, Hällgren, Nilsson and Söderholm (2012), planning and plans are intrinsic features of projects. Plans are meant to constitute and guide project team members as they work on realizing whatever project goals that may have been set out for them, bearing in mind that deviation from plans often occasions sub-optimal implementation of projects.

Wan *et al.*, (2010); Sheffield *et al.*, (2013) and Strode, Huff and Tretiakov (2010) found that leadership characteristics positively influence effective implementation of information technology projects. Many argue that more effective leadership would go some way to addressing many of the problems that seem to result in project failures (Mok, Shen & Yang, 2015) thus having some demonstrable impact on efficiencies and costs on a multi-million dollar industry. A relationship-oriented leadership style was found to be effective in information technology projects (Randeree & Ninan, 2011), although the significance of this style was found to be dependent on whether an IT project was involved in a partnership or outsourcing contractual arrangement in another study (Roy, Bernier & Danis, 2010).

Similarly, Wan *et al.*, (2010) indicated that change management characteristics, vision and mission significantly and positively impacted the effective implementation of information technology projects. Separately, Ledimo (2013) defined organizational culture as a pattern of basic assumptions that are invented, discovered, or developed by a given group as it learns to cope with problems of external adaptation and internal assimilation that have worked well enough to be considered compelling and, therefore, to be taught to new members as the correct way to recognize, think and feel in relation to those problems.

Hofstede (2011) defined organizational culture as per the collective programming of the mind that distinguishes the members of one organization from others. Iivari and Iivari (2011) argue that many organizational researches have generalized the concept of organizational culture when in fact they are only referring to particular aspects such as shared values. McLeod and MacDonell's (2011) description is based on solidarity and sociability. Therefore, it is imperative from the literature that executive commitment, derived from the general project organizational factors indeed tend to have a direct positive influence on effective implementation of information technology projects.

2.5.2 User Involvement

Subsets of user involvement adopted from project customer factors are user participation and support, level of user training and education and user experience. User participation and support consist of the behaviours and activities of users in the project organization in relation to product development (Jun *et al.,* 2011). Previous literature reveals that user participation significantly increases the likelihood of effective implementation of information technology projects. Empirical studies by Shahzad and Said (2014); Linton *et al*., (2017) and Sheffield *et al.,* (2013) have provided data to support significant and positive relationship between user participation and support and effective implementation of IT projects. Although it can be argued that user participation tends to increase budget variance by encouraging suggestions for changes to specifications, Yetton *et al.,* (2013) found that user participation can also decrease budget variance by way of managing expectations and promptly resolving probable problems.

Shahzad *et al.,* (2014) found that having strong user involvement contributes to perceived project success in terms of scope but not time, cost and quality. Kawamura and Takano (2014) found that lack of user experience significantly and negatively impacted the quality of work done but not on other success measures. Jun *et al.,* (2011) also found that lack of user experience negatively and significantly affected project performance. This implies that users should have basic experience, training, education and knowledge about their business domain (Mohammad *et al.,* 2011).

Similarly, Jun *et al.,* (2011) demonstrated that resolving potential conflicts early which arise from greater user participation plays a vital role in the perceived system satisfaction of IT project developers and users. Further, users who have an acceptable level of basic education or training in information technology project management can easily explain their requirements and needs in a clear manner. In the same breath, customers who have basic knowledge about their business domain accurately identify their requirements thus saving time, costs and contribution to process and product quality (Murad & Cavana, 2012).

Bendoly (2014) indicated that users who clearly understand the exact problem to be solved in their organization are likely to help in shortening the development time in producing a product. Equally, users who have some basic knowledge about constraints in the hardware and software world can easily make choices and justify their selection of any specific hardware or software. Other scholars have shown that end-user training, experience and education play a positive role in achieving effective project implementation (Jun *et al.*, 2011; Livermore, 2008; Linton *et al*., 2017; Pope-Ruark, 2014).

Kawamura *et al.,* (2014) did not find a statistically significant relationship between user support (willingness) and effective implementation of projects. In contrast, however, Yetton *et al*., (2013) found that user support increases the possibility that the project is completed on time and not redefined or abandoned but can also increase budget variances. Likewise, Linton *et al*., (2017) found a statistically significant and positive relationship between user collaboration and project success. Jun *et al.,* (2011) also found a significant and positive relationship between user support and information technology product performance.

Kawamura *et al.,* (2014) describe user experience as a configuration of users who are very familiar with system development tasks and have a wealth of experience with the activities to be supported by the future applications. Equally, Jun *et al*., (2011) defined users who lacked experience as characterized by not being familiar with the type of applications, did not know what they wanted, did not have a good understanding of the problems they wanted solved and were not familiar with data processing as a work tool. Additionally, Jun *et al*., (2011) argued that user experience and knowledge or understanding of requirements within a specific application area of the development team makes it easy to define complete, unambiguous or consistent requirements, which can lead to information technology project deliverables that can meet the users' needs and decreasing process performance.

On the whole therefore, implementation of information technology projects varies depending on three key user characteristics: cognitive aspect, personality and demographics (Robinson, Austin & Gibb, 2011; Ledimo, 2013; Morwood, Scott & Pitcher, 2008; Love, Mistry & Davis, 2010). It is the combined influence of these three characteristics that is thought to be most influential on implementation of projects, rather than the influence of individual factors (Morwood *et al.*, 2008; Department of Treasury and Finance, 2011). While there is consensus in the literature that there is a relationship between user characteristics and effective project implementation (Morwood *et al.*, 2008; Love *et al.*, 2010; Lee & Yu, 2011), little empirical evidence has been gathered and put forth.

To date, literature has focused on exploring the influence of individual user characteristics on implementation of projects, irrespective of the combined influence of different user characteristics (Morwood *et al*., 2008; Khang & More, 2008); and assessing project implementation, in particular time and cost efficiency, irrespective of user characteristics. The literature does not clearly identify the impact of user characteristics on effective implementation of information technology projects. Further to this, existing research is largely inductive. Information presented in industry publications has been based primarily on the experience of individual project practitioners (Morwood *et al*., 2008).

The findings of these studies cannot be generalized across a range of circumstances, thus limiting the extent to which practitioners can apply the learned lessons to new collaborative projects. The contradictions and uncertainty in the literature has resulted in confusion as to the influence of user characteristics on effective project implementation (Department of Treasury and Finance, 2011; Kelly, 2011). The debate is particularly intensive in relation to the impacts on time and cost efficiency performance (Department of Infrastructure and Transport, 2011).

2.5.3 Project Team Capability

Project team capability is specifically theorized to have a positive impact on effective implementation of information technology projects. Effective implementation of IT projects greatly depends on the project team's communication, empowerment, expertise, experience, dedication and composition (Kappagomtula, 2017). Although these subsets specifically relate to the project teams' capability, some aspects such as empowerment, team composition, size and geographic distribution are also frequently influenced by the parent organization, and the broader corporate culture that is inherited from it (Howell *et al.*, 2010). The foregoing factors and organizational boundaries may all affect the project team's ability to communicate effectively.

Similarly, team communication, dedication, expertise or skill, experience and empowerment determine a teams' ability to quickly comprehend and respond to uncertainties during project implementation, thereby improving the chances of effective project implementation (Cheung, Chan & Kajewski, 2012). Effective implementation of projects is realized under circumstances where there are small teams which are self-organizing, autonomous, composed of best skilled expertise and experienced, highly collaborative and capable project team members (Kozlowski & Bell, 2012).

Project team capability is the ability and willingness by a team to devote energy in an efficient and effective way for best project outcomes hence dedication to a project as expressed in three forms: affective, continuance and normative (Munteanu, 2015). Affective dedication is the team's emotional attachment to the project. Continuance dedication refers to the team's recognition of the benefits of continued association with the project compared to the cost of leaving the project. Normative dedication refers to the team's feeling of obligation to remain in the project. All these three forms affect the team members' willingness to remain with a project and their work-related behavior (Muindi, 2011). Shahzad *et al*., (2014) posited that team members with great motivation positively influenced the perceived success of information technology projects.

Correspondingly, Wan *et al.,* (2010) indicated that there existed significant and positive relationships between project team dedication and effective IT project implementation. This implies that dedicated project team members more often do not have intentions to quit, which saves the project the costs of recruiting and orienting new members in terms of both time and money. Similarly, costs of supervision are mitigated if the project team members are dedicated to their project tasks. Effective implementation of projects is realized if the team is knowledgeable, highly dedicated by way of working full time, representative and empowered (Zwikael *et al.,* 2011).

Internal project communication is defined as the practice that increases information exchange and cohesion among IT project implementation team members. It enhances the levels of information sharing and collaboration between project team members which decreases the amount of team conflict and keeps the team stable. Along similar lines, Jun *et al.,* (2011) confirmed that internal project communication had a significant positive effect on both process and product performance. Similarly, Yetton *et al.,* (2013) demonstrated that project team conflict leads to instability in the team thus resulting in a project being delayed and exceeding budget. This is because IT projects are knowledge-intensive and human-intensive activities that require collaboration between team members with diverse skills and specialties.

Additionally, effective internal project communication creates a feeling of responsibility and attachment between project team members and the project tasks that make the team indebted to the project (Ahimbisibwe *et al.,* 2015). As a result, this creates an atmosphere for individual team members to act without much control and coercion. Under such circumstances, what drives a person to work is the emotional attachment to the project as fostered through communication. This is consistent with Jun *et al.,* (2011); Shahzad *et al.,* (2014) and Linton *et al*., (2017) who indicated that those workers with a positive attitude about project tasks carry out certain role behaviours well beyond the basic minimum levels required of them.

Team members may, for example, not take extra breaks and tend to obey the project rules and regulations even without supervision. Members attend meetings that are not mandatory but are considered important and also keep abreast of changes within the project and elsewhere that affect or are affected by the project and responsibly discuss them with those concerned (Wan *et al.,* 2010). If the organizational culture encourages information sharing freely and collaboration between members with no large power distance, flexible approaches should be used and vice versa (Kawamura *et al.,* 2014).

Other team factors that have also been found to influence effective implementation of projects include team expertise, skills and competences (Linton *et al*., 2017; Shahzad *et al.*, 2014; Orlowski, Blessner, Blackburn & Olson, 2015). Project team's general or specific expertise includes the ability to work with uncertain objectives, ability to work with top management, ability to work effectively as a team, ability to understand human implications of a new system and ability to carry out tasks effectively in technical terms (Kawamura *et al.,* 2014). These are interpersonal, team or technical skills that can be determined early during the formation of the project team.

Although these skills can be addressed from a number of viewpoints, generally, management can communicate early the basic project parameters and guidelines to the project team to allow for skill matching (Turner *et al*., 2009). The building of team's skills can also be conducted by project managers throughout the life cycle which enhances project success (Dwivedi, Wastell & Laumer, 2015). Information technology projects need highly skilled and senior staff at the beginning of the project especially during the project definition phase, and then junior or lower-skilled staff can do the assigned work by following pre-established plans (Nyoni *et al.,* 2017). Orlowski *et al.*, (2015) suggested a principle of using fewer and better people for information technology projects. If project teams are composed of people who have the corresponding required skills and competencies, then the project is likely to be completed on time, within budget, scope and functional quality.

Teamwork in such projects becomes a symbiotic process which leads to much better results that are greater than the integration of individual performances. Thamhain (2011) described effective teams as the ones that produce high quality results and succeed in spite of many difficulties and cultural or philosophical differences. Effective teams have several task-oriented and people-oriented characteristics. Thamhain (2011) debated that the working environment within the project team has a significant impact on effective project implementation and therefore suggests that project managers should exercise significant leadership roles in blending the team.

Sudhakar (2012) posited that the team climate is characterized by interaction between individuals and units. The climate places high value on communication in group settings. It is not just two-way communication that is important, but also communication multi-way, upwards, downwards and laterally. There is less concern than average about power differentials between individuals or units (Prabhakar, 2008). Derakhshanmanesh, Fox and Ebert (2014) bring out the important interpersonal skills required of a project manager that are: communication, team building, coaching, motivating, decision-making, delegating, training, directing, influencing, persuading, negotiating and supporting those involved in the project. Project managers must establish a climate of open communication and maintain effective communication links across organizational interfaces.

In exploration of project team effectiveness, clarifying objectives is a main contributing factor to team success. Clarifying objectives, roles and responsibilities is the main contributing factor and relates closely to management responsibilities in team forming, alignment and communication (Terzakis, 2011). Clarification of objectives is therefore majorly the role of communication among the group. Bogler, Caspi and Roccas (2013) found that communication played a part in the effectiveness and success of a team, therefore contributing to clarifying objectives and maintaining task focus.

2.5.4 Project Management Approach

Project management approaches or methodologies have been developed specifically to help address low success rates using project-related knowledge. Government bodies have helped to establish standards in methodologies and guidelines, with their tools, techniques, processes, and procedures (Joslin & Müller, 2016). While the term project management methodology implies a homogeneous entity, it is instead a heterogeneous collection of practices that vary from organization to organization (Harrington, Voehl, Zlotin & Zusman, 2012). To understand the relationship between methodology and success, the building blocks of a methodology need to be understood as the elements that include processes, tools, techniques, methods, capability profiles, and knowledge areas (Müller, Zhai & Wang, 2017).

Today, many organizations must commit scarce and significant investments to information technology projects. However, most of these projects are not delivered on time or budget and do not give value to the client (PMI, 2013). Didraga (2012) reported that nearly two-thirds of information technology projects do not meet their time and budget goals, and often do not meet their business objectives. Although there are many reasons proposed for the sub-optimal implementation of IT projects, numerous studies argue that such projects are implemented sub-optimally due to inappropriate choice of project management methodologies (Kureshi, 2013; Murad *et al.,* 2012).

Indeed, the existence of several alternative project management methodologies often makes it difficult to determine the best option (Sheffield *et al.,* 2013). It is also likely that users and developers will tend to stick to what they are good at and will therefore favour the project management methodologies with which they have had most experience (Orlowski *et al.*, 2015). As a result, despite the increasing range of available methodology choices, project managers are seen to frequently fail to seriously consider the available alternatives (Howell *et al.,* 2010), potentially narrowly tailoring project categorization systems or using categorization criteria that are not logically linked with overall business objectives.

The literature on project management methodology is divided. There is a positive attitude towards project methodologies and sometimes unrealistic expectations are directed towards them (Lehtonen & Martinsuo, 2006). However, when these methodologies do not produce the expected outcomes, they are replaced by other methodologies and often with those that have other limitations (Brink, 2017). Project methodologies are linked with whether they should be standardized (Badewi, 2016; Špundak, 2014), or customized to the project environment (Joslin *et al.*, 2016). Research has shown that projects where methodologies are used provide more predictable and higher success rates (Lehtonen *et al.*, 2006; Wells, 2012). However, there are still high project failure rates for projects that do use project methodologies (Wells, 2012).

Information technology projects continue to experience sub-optimal implementation even with the existence of an array of communities of methodology practices such as PRINCE2, PMI's Project Management Body Of Knowledge Guidebook and Agile methodologies that promote best practices (Joslin *et al.*, 2015). Whilst the traditional plan-driven development approaches are often regarded as too rigid to fit some environments, some project managers still try to force them to fit projects even where dynamism may be crucial (Howell *et al.*, 2010). This tends to stifle the appropriate effectiveness in implementation of information technology projects.

The traditional approaches rely on what has been described as a linear or sequential life cycle (Vartiak, 2015; PMI, 2013). In the linear or sequential life-cycle, the project is designed to be completed in one unique cycle (Ramesh, Mohan & Cao., 2012). Each stage of the project from analysis to support is executed only once. The project moves from one stage to another sequentially when the predefined milestones or objectives are achieved. At the end of each stage, the deliverable is not the software itself but the documentation that reflects the milestones of the work undertaken. The waterfall model is one of the well-known examples of a linear model.

Project management is composed of different vendor communities of methodology practices, each with a particular set of principles and guidelines. Some practices are extensively developed while others are more *ad hoc* with members who share certain methodological commitments (Osa & Amos, 2014). These vendor communities of methodology practice can be broadly categorized as traditional plan-based and agile. These respective principles and procedures can be used as guidelines for selecting and adapting a methodology that can help to achieve optimal implementation of projects.

Traditional plan-based approaches encompass PRINCE2 (OGC, 2009) and PMBOK (PMI 2013), each with a set of contract-driven methodologies that seek adherence to pre-established plans. On the other hand, there is agile with highly flexible methodologies that seek to embrace the changes and uncertainty that is involved in information technology projects by remaining flexible and adaptive (Ahimbisibwe *et al.*, 2015). According to Mok *et al.,* (2015), agile is generally recommended for not so well-defined projects as it is more geared towards information gathering and human interactions. The role of the project manager is quite diminished because of the team's self-organization and self-management nature. It is a less structured approach and embraces social project management.

Agile approaches are based on an iterative or adaptive life cycle and are designed to accept and embrace change (Sheffield *et al.,* 2013). The iterative life cycle focuses on re-doing the project at each iteration where there is some learning as a result of feedback, and the next iteration might change or adapt what has been done before. Agile methodologies suggest short iterations of less than three months and usually around four weeks (Imreh *et al.,* 2011). Each iteration would cover an entire development life cycle, that is from the requirement specifications of a particular set of functionalities to the testing and release to the client. In the same way there are many types of projects, there also exist several perspectives on how best to apply the agile methods. The banking sector is not an exception and therefore individual commercial banks must choose appropriate project management methodologies when implementing IT projects.

2.5.5 Project Risk

According to the moderation perspective, the fit between the predictor variables and the moderator variable is the primary determinant of the criterion variable (Singh *et al.,* 2015). Researchers usually invoke this perspective when the underlying theory specifies that the impact of the predictor variables varies across different levels of the moderator variable to affect the relationship with the dependent variable (Singh *et al.,* 2015). In this study, fit as moderation is deemed to be the most appropriate for studying project risk.

It is argued that organizational structures or designs enable information processing capabilities that are appropriate to the level of uncertainty challenging each organizational unit (Jun *et al*., 2011). Consequently, as the level of uncertainty facing an organization increases, decision makers must process an increasing amount of information to achieve a given level of performance. This implies that needs of an organization are better satisfied when it is properly designed and the management style is appropriate both to the tasks undertaken and the nature of the work group. General contingency hypothesis supported the view that high-risk information technology projects call for high information processing capacity management approaches (Barki *et al*., (2015).

Similarly, based on this perspective, Jun *et al*., (2011) found that project planning and control fitted low information processing capability approaches while, internal integration and user participation represented the high information processing capability approaches to managing information technology project uncertainty. Technical complexity and technological uncertainty are frequently regarded as independent (Orlowski *et al.,* 2015; Pak *et al*., 2016). However, authors such as Petit (2012) and Hass (2008) consider complexity and uncertainty to be aspects of the same variable. As Howell *et al.,* (2010) argue, project management issues surrounding complexity center upon capacity to understand what is going on, and consequently predict the relationship between inputs and outputs.

Lack of predictability is identical with uncertainty, and thus complexity becomes a factor in uncertainty (Crawford, Hobbs & Turner, 2012). Equally, use of new technologies also increases uncertainty (Howell *et al.,* 2010). Consistent with Nasir *et al.,* (2011) study, Jun *et al.,* (2011) found that the use of unfamiliar technologies can also lead to IT system problems that reduce the performance of the IT product and delay the project. Urgency also constrains uncertainty in a similar fashion to complexity, by restraining the time resource available for understanding because decisions are made on more limited information (Howell *et al.,* 2010). Managers under time pressure also tend to take more vigorous and often more inappropriate measures to handle the situation thereby negatively impacting on effective implementation of projects.

Along similar lines, Jun *et al.,* (2011) found that the absence of client knowledge and understanding of requirements or the absence of development experience and expertise within a specific application area of the development team makes it difficult to define complete, unambiguous or consistent requirements. As a result, this can lead to IT project deliverables that cannot meet the client's needs and decrease process performance. Jiang *et al.,* (2013) also demonstrated that uncertainty is negatively associated with effective project implementation. Some empirical evidence reveals that project size can also affect project implementation (Teller, 2013).

Other variables such as specification changes, inappropriate development methodology and criticality also increase project uncertainty, thereby indirectly affecting project implementation. Specifically, Jun *et al.,* (2011) established that uncertainty had a moderating effect on the relationship between planning and control, internal integration, user participation and project implementation. Therefore, project risk is hypothesized to moderate the relationship between executive commitment, user involvement, project team capability, project management approach and implementation of information technology projects by commercial banks in Kenya.

Other project risk subsets such as technical complexity and technological uncertainty also negatively affect project implementation (Orlowski *et al.*, 2015). The use of unfamiliar technologies can also lead to problems with IT projects that reduce the performance of the products or delay the project for traditional approaches than for agile approaches (Wells, 2012). Similarly, project criticality may demand for a more plan-based approach to ensure that all project specifications are accounted for. In general, such projects are more likely to have lower process performance since extra communication and coordination may be required. Similarly, large project size can also negatively affect effective project implementation, more so for agile projects than traditional projects (Fortune & White, 2011). Thus, generally, the level of project inherent uncertainty or risk associated with the project-specific critical success determinants is also negatively associated with both process and product success.

According to Viitanen and Kingston (2014), the usage of technology promotes efficiency savings including greater volumes handled at greater speeds with fewer resources. Effective introduction of technology is not the only basis for people becoming more motivated but the management process becomes more naturally organized. In any project, stakeholders need to work together (Conway & Lance, 2010). It is very important to have teamwork that can complete successfully all tasks composing the project. Therefore, the aspect of uncertainty plays an important factor that contributes to motivation in project management (Ansari & Bijalwan, 2017).

As indicated in the conceptual framework, executive commitment, user involvement, project team capability and project management approach are predicted to generally have a direct positive influence on effective implementation of information technology projects (Jiang *et al*., 2013). On the other hand, project risk is hypothesized to have a moderating effect between executive commitment, user involvement, project team capability and project management approach and implementation of information technology projects by commercial banks in Kenya.

2.5.6 Implementation of Information Technology Projects

When it comes to implementation of IT projects, organizations use a variety of factors to determine whether or not a project has been implemented effectively. Some determine effective implementation based on the satisfaction of their stakeholders, on-time delivery, budget, delivery of benefits, quality, acceptable return on investments (ROI) and other auxiliary factors (Ritson, Johansen & Osborne, 2012). Leading practice companies determine whether a project has had effective implementation based on whether it achieves benefits that are in line with strategic objectives and establish mechanisms to track progress along the way.

While many projects achieve effective implementation outcomes, it is also a reality that some projects only achieve sub-optimal implementation results. The latter results are linked to internal project issues like missed deadlines and insufficient resources (Ritson *et al.,* 2012). In fact, the top three reasons for sub-optimal implementation of projects are bad estimates and missed deadlines, scope changes and insufficient resources which are all internal project factors (Soja & Soja, 2017). But while such sub-optimal implementation is more frequently correlated to factors internal to a project, the underlying question is; what degree of influence do project managers have over external factors to prevent below par project implementation?

An effective project management function, comprised of people with the right skills and armed with the right techniques, can often minimize the risk of below par project implementation attributed to external factors. For example, a change in company strategy can be detected and remedied early in a project if there is clear alignment between strategy, goals and an implementation plan (Hamid & Soroya, 2017). It is arguable that regardless of whether the risk of sub-optimal project implementation is internal or external to a project, a well-equipped project management function possesses the capabilities to foresee and find a way through the hurdles that may arise during the project life cycle.

The classification of project implementation is to a degree subjective (Hofstede, 2011). Müller and Judgev (2012) describe effective project implementation as predominantly in the eyes of the beholder meaning one stakeholder may consider a project to have been implemented effectively, whereas another stakeholder would consider it as having been done below par. A requisite criterion defining implementation characteristics used to judge between below par and effective project implementation constitute the dependent variable. Project implementation is a multidimensional construct where project stakeholders can select a number of project implementation criteria which they believe are important to pass judgment (Morris, 2012).

For each project, not only should implementation criteria be defined from the beginning of the project, but the relevant implementation factors also need to be identified and incorporated in a timely manner across the project life cycle (Ramesh *et al.*, 2012). Kozlowski *et al.*, (2012) define project management elements as factors of a project, which when influenced increase the likelihood of effective project implementation and they constitute the independent variables that make effective project implementation more likely to be realized.

The selection process for relevant project management methodologies and their elements impacts project implementation. Where the elements have absolutely no impact on the project outcome and are implemented, both management time and cost are wasted (Biesenthal & Wilden, 2014). By relating to the qualitative meaning of Type 1 and Type 2 errors, Biesenthal *et al.*, (2014) suggested that the selection and timing of the implementation for non-relevant implementation factors is called Type 2 error. Accordingly, Type 1 error constitutes the implementation factors that are important but incorrectly implemented. Attention should be given not only to the selection of individual implementation determinants but also to the combination or grouping of related implementation determinants that are contingent on the project life cycle (Besteiro, Pinto & Novaski, 2015).

2.6 Empirical Review

Critical determinants of effective implementation of projects are defined as the key areas where an organization must perform well consistently to achieve its mission (Davis, 2014). Managers implicitly know and consider these key areas when they set goals and as they direct operational activities and tasks that are important to achieving goals. When these key areas of performance are made explicit, they provide a common point of reference for the entire organization (Svejvig & Andersen, 2015). The project management literature in general, and information technology project management literature in particular, has seen a significant number of studies about critical determinants of project implementation (Williams, 2016). Since the 1970's, academics have tried to understand what effective project implementation is and which factors contribute to it (Joslin *et al.*, 2015).

However, its meaning is still not generally agreed upon (Serrador *et al.*, 2015). Effective project implementation is a multidimensional construct that includes both the short-term project management success efficiency and the longer-term achievement of desired results from the project, that is, effectiveness and impact (Mossalam & Arafa, 2016). To achieve a common understanding of what effective project implementation is, it should be measurable and therefore defined in terms of success criteria (Omonyo, 2017).

The understanding of effective project implementation criteria has evolved from the simplistic triple constraints concept, known as the iron triangle (time, scope and cost) to an elaborate metric that encompasses many more success criteria (Serrador *et al.*, 2015; Müller *et al.*, 2012; Pak *et al.*, 2016). Measurement models for effective implementation of projects that are applicable for different types of projects or different aspects of effective implementation of projects were developed for general adoption in the area of project management (Pak *et al.*, 2016; Mok *et al.*, 2015; and Weimar, Plaat, Goudbeek, Visser & Nugroho, 2013).

In regard to top management support, indeed, several authors stipulate that this strategic factor contributes largely to successful implementation of information technology projects (Ofori, 2013). This factor ensures two advantages, the first is the disposition of some leadership, and the second is the access to the available resources (Zouaghi & Laghouag, 2011). Nasir *et al.*, (2011) found that good planning, clear responsibilities and accountability and schedule control have the greatest impact on effective implementation of projects. Khan, Niazi and Ahmad (2011) undertook research on critical determinants of effective project implementation for transformation process. They identified factors such as top management support, clearly defined communication, project champion, efficient process engineering, training and technology as critical for success of transformation of IT projects implementation.

Shah, Bokhari, Hassan, Shah and Shah (2011) carried out studies on six organizations in Hong Kong over a period of 18 months and found that championship, availability of resources and link to organizational objectives were the "meta-success" factors for information systems success supported by senior executives. Frey (2014) identified top management support as a critical success factor for information technology projects. The research identified strategy, facilitation and leadership as top three executive management roles leading to IT project success from project managers' perspective.

Müller and Turner (2010) examined how different types of projects are managed in different ways and explored the domain of traditional contingency theory in the more modern world of projects. Along similar lines, Hwang and Schmidt (2011) also used a meta-analysis to investigate the hypothesized contingency relationship between the level of management support and the degree of interdependency for information technology projects. Their findings revealed that management support has a small effect on implementation success when the task interdependency is low and a medium to large effect when interdependency is high. Likewise, by adopting contingency theory, Ahimbisibwe (2015) established that coordination strategies for information technology projects were contingent upon the degree of task interdependency.

Yetton *et al.,* (2013) in their study found that user support increases project success. Chow *et al.,* (2008) also found that strong user support contributed to the success of agile software development projects. Likewise, Luthra, Garg and Haleem (2016) found a statistically significant and positive relationship between user support and software development project success. Chow *et al.,* (2008) found that involvement of experienced users significantly and positively impacted on project scope but not timeliness, cost or quality. Users who have basic experience about business domain help to identify software development project requirements explicitly.

Studies by Chow *et al.,* (2008); Luthra *et al.,* (2016) and Sheffield *et al.,* (2013) have provided data to support significant and positive relationship between user participation and information technology project success. Yetton *et al.,* (2013) also found that user participation decreases budget variance by managing expectations and quickly resolving potential problems. Similarly, Jun *et al.,* (2011) found that resolving potential conflicts early arising from greater user participation plays a vital role in the perceived system satisfaction of IT project developers and users. Therefore, user participation is an effective way to know and fulfil the needs of the agile users. It may also create user commitment to the IT projects.

AlArafati, Kadir and AlHaderi (2019) in their study assessed the relationship between user participation and the management of change surrounding the development of information technology projects. The study proposed a classification of critical determinants of effective project implementation which were based on a case study in a large organization. User training and upskilling are important as they allow such stakeholders to perfect their knowledge in order to achieve effective implementation of information technology projects outright (Mayer, Van Daalen & Bots, 2018). According to Zouaghi *et al.,* (2011), information technology projects are extremely complex systems that require rigorous training on the part of project teams and users. This kind of training infrastructure requires buy-in and commitment from top down for it to achieve positive results.

Imtiaz, Al-Mudhar, Mirhashemi and Ibrahim (2013) carried out a study on critical success factors of information technology projects. The goal of this study was to review past research on critical success factors relevant to IT projects. The study enlisted 15 factors that were believed to be critical for the success of IT projects based on strong evidence given in their corresponding studies. In the list was project team capability, selecting the right team and training. The findings of the study pointed out that project team capability strongly affects the success of IT projects, selecting the right team has a medium effect in determining the effective implementation of IT projects and that training also has a medium effect in determining the effective implementation of IT projects. In addition, the project team competences should be multidisciplinary by covering technical, managerial and social fields.

Yetton *et al.,* (2013) and Jiang *et al.,* (2013) found that lack of effective internal communication can lead to project team conflict that creates instability in a project team and, thus, result in a project being delayed and be over-budget. Chow *et al.,* (2008) found that dedicated team members positively influenced the perceived effective implementation of IT projects that use agile methodology. Wan *et al.,* (2010) found significant positive relationships between team dedication and IT project success. Yetton *et al.,* (2013) found that project team's expertise reduces team conflicts and creates project team's stability enabling the project to be completed on time. Dezdar and Ainin (2011) found that team's skills contributed to IT project implementation success.

Likewise, Dezdar *et al.,* (2011) found that outsourced information technology projects require balanced cross-functional project teams. The results in the study are also consistent with Betz, Oberweis and Stephan (2014) who found that strategic project stakeholders should be included in project teams for information technology project outsourcing. In case of multi-sourcing, Lacity, Khan, Yan and Willcocks (2012) found that even the number and required knowledge sets of these stakeholders increases. Chow *et al.,* (2008) found that well composed project teams contributed to successful implementation of information technology projects.

Reich, Gemino and Sauer (2014) identified project management methodology as a critical success determinant for information technology projects based on an empirical study. However, the responses received in that empirical study were very few, eight responses to be precise. According to Vartiak (2015), testimonial data gathered from 10,000 project managers indicated that no more than 20 per cent of all projects have the characteristics of traditional projects, but research shows project managers continue to apply the traditional methods to projects for which they are not suited (Sheffield *et al.*, 2013). In contrast, emergent agile methodologies promise increased customer satisfaction with lower defect rates, faster development times for solutions to rapidly changing requirements but are not well understood (Sheffield *et al.,* 2013). Peng and Nunes (2013) found that adopting a project management approach allows focus to always be on results and to be constantly in conformity with programs and budgets that are stipulated.

Despite exhortation to move away from old practices, it has also been cautioned that the new methodologies are not silver bullets that guarantee optimal project implementation (Orlowski *et al.*, 2015). For example, Iivari *et al.*'s (2011) study found that hierarchical organizations were not suitable for the deployment of agile methodologies. Thus, it is not surprising that Mohabuth's (2017) study of 720 information technology projects found that the use of an inappropriate methodology is actually the most critical risk driver for sub-optimal project implementation.

Therefore, matching the project type and the project approach would be expected to enhance chances of effective project implementation. Howell *et al.*, (2010) further suggested that the lack of a decision support tool and theory connecting project types and project methodology discourages project managers from considering alternative methodologies. A survey conducted by Rossiter (2012) identified the common problems in information technology project management. They include poor estimates and plans, lack of quality standards and measures, lack of guidance about decisions, lack of techniques to make progress visible, poor role definition and incorrect success criteria.

The Chaos Report (2015) reviewed 50,000 projects around the world. The results summarized that 29% of the projects were successful, 52% of the projects were challenged and 19% of the projects belonged to failed category. The study indicated that there is still work to be done around achieving successful outcomes from IT project development (Hastie *et al.*, 2015). The results of '2015 Project Management Insight' conducted by Amplitude Research among different industry sectors in the US indicated that one third (1/3) of the projects were not completed on time and also exceeded their approved budget. They concluded that the statistics showed some notable shortcomings and there remained significant room for improvement when it came to achieving effective implementation of projects.

Keeys and Huemann (2017) expressed that technical, human and budgetary factors affect the project implementation process. Their research developed a model of ten critical success factors for project implementation and empirically proved them from a database of 400 projects. The ten critical success factors identified include top management support, project mission, customer involvement, project plan, personnel recruitment, technical tasks, client acceptance, communication, monitoring and feedback and troubleshooting. Top management support, project mission and project schedules or plans were categorized as strategic critical success determinants of project implementation. The rest of the seven factors were categorized as tactical critical success determinants of project implementation.

The Global Construction Survey also confirmed that project sponsors continue to experience project failure (KPMG, 2015). Survey on private organizations showed that 53% suffered one or more underperforming projects in the previous year whereas for energy and natural resources and public-sector respondents the figures were 71% and 90% respectively. Only 31% of all respondents' projects came within 10% of budget in the preceding 3 years. Only 25% of projects came within 10% of their original deadlines in the earlier 3 years (KPMG, 2015).

Sixty percent (60%) of the respondents of the Project and Program Management Survey claimed that the importance of projects for realizing their strategic and operative goals had increased since the previous year (KPMG, 2015). At the same time, the actual success rate of projects did not meet the desired levels. When asked about how many of the projects were delivered on time, with expected quality and realized benefits, only 8% of the respondents stated that their projects fulfilled these criteria. Approximately 31% estimated that 50% to 75% of their projects achieved these criteria, while the majority of the respondents completed only less than half of their projects as planned (KPMG, 2015). These results are similar to an earlier survey report (KPMG, 2013). The number of projects delivered in terms of quality, time and within budget was low even though with high potential for increasing success rates.

Beleiu *et al.,* (2015) did a survey of 418 PMI members in finding the critical factors for achieving effective project implementation. The survey suggested to project managers that they should concentrate on a multi-factor model for critical project implementation determinants and they should also identify the relative importance among the factors. A study done by Pellerin, Pellier, Guillot and Leger (2013) attempted to study the relationship between use of project management software, project performance and project characteristics in Canada. Twenty-one (21) projects were selected from an engineering company and were the focus of the study. Statistical tests were done by Statistical Package for Social Sciences (SPSS) version 25, using project data from the engineering firm. Results from this study showed that less performing projects present significantly low project management software utilization than the other projects.

In Lithuania, Gudiene, Ramelyte and Banaitis (2013) found out that project management experience, project value, project manager's experience, experience of contractor, project size, competence of project team members, clear and realistic goals, decision making prowess, effectiveness of project management, and technical capability of project management team are the most important success factors for construction projects.

Bhoola (2015) identified factors such as clarity of the project mission, top management support and availability of technical resources as those factors that result into high project success rate. Hietajärvi, Aaltonen and Haapasalo (2017) indicated that a well-communicated and convincing project vision makes a strong impact upon perceived effective project implementation. Omonyo (2017) observed that the importance attached to project success criteria and project success rates differ by industry, project complexity, and the age and nationality of the project manager.

Based on secondary research, Faisal and Raza (2016) categorized the critical success determinants of information technology projects implementation in government sector into five categories such as perceived technology factors, organizational factors, collaboration factors, external factors and support factors. Overall, their research identified 42 critical success factors for information technology projects innovation adoption in government sector. These factors include top management support, customer support, user participation, financial ability, decision making, organizational politics, organizational culture and project size.

Nyoni *et al.*, (2017) reviewed 63 publications focusing on critical success determinants of information technology projects. Criticisms were reviewed then their formal systems model was used to solve the problems connected to measuring or discovering the critical success determinants. In total, 81 per cent of the publications included one or more of the following three factors: support from senior management; clear and realistic objectives; and strong and detailed plan kept up to date. Khan, Nicho and Takruri (2016) stated that cooperation, coordination and integration are key success determinants of projects involving multiple buyers and suppliers. Rahman, Haron, Sahibuddin and Harun (2014) did a survey of 142 respondents, in which 14 per cent were information systems and software professionals, to confirm the relationship between organizational structure, organizational roles, project team capabilities, project manager's skills and competencies and effective project implementations.

Alexandrova and Ivanova (2012), attempted to study the critical success factors of project management in Bulgaria. Questionnaires were distributed to 132 project managers and project team members of projects supported by EU programs. There was 98% response rate (129 respondents out of 132). One of the conclusions of this study was that technical competence of the project manager is a critical factor for effective project implementation.

In Kenya, similar studies on determinants of project implementation have been carried out with a wide range of factors being identified. Kabutu (2013) posited that top management support, technology, training and competence, organizational resources and funds management were the success factors of offshore software development and implementation projects in public organizations. Mwai (2012) researched on IT firms in Kenya and concluded that effective project implementation is a matter of perception and a project will most likely be perceived as effectively implemented if it meets its technical performance specifications, meets the project mission, there is satisfaction among key people on the project team and key users.

Wambugu (2012) in a study titled 'Influence of management practices on sustainability of women projects in Kenya,' identified strategy, project team capacity, project communication, monitoring and evaluation and client consultation as the main factors influencing success of Constituency Development Funds (CDF) projects in Nyeri County. Meroka (2011) in a study on 'Critical success factors of industrial and commercial projects in Kenya', concluded that financial viability, general management, market analysis and the quality of project management are the critical determinants of effective project implementation in Kenya. In the study by Rugenyi and Bwisa (2016) titled 'Effects of Triple Constraints on the Management of Projects in Nairobi: The Project Manager's Perspective', the critical determinants of effective implementation of projects espoused were project mission, top management support, project plan, client consultation, trained personnel, technical tasks, client acceptance, monitoring and feedback, and communication and troubleshooting.

2.7 Critique of Existing Literature

Most of the literature and studies done on critical determinants of effective project implementation have been conducted in developed countries and as such there are very few studies on the subject carried out locally and especially those focusing on the banking sector in Kenya. Also, in the foregoing literature, various studies on the factors affecting IT projects growth are well documented but their impact on the overall performance of economies where applicable is largely anecdotal and not explicitly expressed (Simon, Gwaya & Diang'a, 2017). Most of the literature and studies seek to establish the relationship between use of project management software, project performance and project characteristics, in which it is established that less performing projects present significantly low project management software utilization than the other projects.

Most of the studies focused on diverse sectors including manufacturing, healthcare, engineering but few were done in the banking sector. Although such studies may have similar foundational fundamentals on effective project implementation, they may not necessarily be generalizable and therefore be applicable to the local banking sector. In a research on IT firms in Kenya, Mwai (2012) concluded that effective project implementation is a matter of perception and a project will most likely be perceived as successful if it meets its technical performance specifications, meets the project mission, satisfaction among key people on the project team and key users. Although the study is local, it also focuses on other sectors other than the banking sector. Generally, the reviewed literature and studies provide a generic approach to examining the determinants of effective implementation of projects hence occasioning a paucity of research that gauges the collaborative influence of the grouped determinants on effective implementation of IT projects by commercial banks in Kenya. From the literature, the studies seem to be short of meeting the IT projects' needs of Kenya's banking sector which has grown exponentially over time both in terms of advancement in technology and the complexity of the nature of transactions carried out.

2.8 Research Gaps

There is so much literature about determinants of implementation of projects and their application in different industries, however, the same cannot be said to be fully applicable in the banking sector. Literature on projects especially those which are IT related showed that they are implemented better under complex and uncertain environments (White, 2014). In addition, the literature review shows a general use of project management approach by organizations without focused reference to the specific project management approaches and as such there is a problem of matching project types with specific project management approaches (O'Sheedy, Xu & Sankaran, 2010).

Literature is silent on what form of challenges organizations especially banks are likely to face if they do not adopt standardized classification of determinants of effective implementation of projects given that it is a sensitive industry across economies (Tokmak, Turen & Gökmen, 2012). A methodology used is contingent upon the project environment (Kozlowski *et al.*, 2012). Badewi (2016) noted that every project environment has its own unique factors that influence effective project implementation throughout the project life cycle which is why most of the literature uses the concepts of organizational theory as a lens to examining project management phenomena.

Last but not the least, the literature review also indicates that most projects have characteristics ranging from complex to simple depending on the expertise needed to respond to the project needs (Ruparelia, 2010). However, it was noted that there are few studies on such projects and that explains why categorizing the determinants appropriately by identifying their requisite thematic relationships and approach to implementation of projects is key (Wells, 2012). In view of the foregoing, no local studies had classified executive commitment, user involvement, project team capability and project management approach with their attendant subsets as the thematic determinants of implementation of IT projects by commercial banks in Kenya, hence the need for this study.

2.9 Summary

The chapter reviewed theories applied in project management showing how their application to projects had become the order of the day in many organizations because of the attendant benefits, mostly accruing from implementing projects using project methodology. However, some organizations are spoilt for choice between which particular approaches should be followed between traditional project management methodology and the newly emerging principles such as agile. Both approaches can be beneficial because they are suited to different scenarios. The tendency is however for organizations to maintain the status quo because of the fear associated with change even where new methods are more promising.

Also, the literature reviewed pointed to increasing misrepresentation of new project management concepts and piecemeal approaches to their implementation because most managers do not know the importance of matching project type to management approach. This leads to inevitable failures and blame is apportioned on the new methods thus affecting their dissemination. Relying on traditional project management approaches alone in the face of high volatility, unclear goals and solutions is suicidal to organizations. Therefore, the desire to effectively manage projects characterized by a high degree of complexity, unpredictability and uncertainty is the main driver for the emergence of agile project management.

From the literature reviewed, different researchers came up with different findings even when their approach to finding the determinants of effective project implementation in Kenya appeared similar to those in other countries. Many researchers looked at critical success factors of construction projects; others reviewed causes of IT projects failure while others had concentrated on determinants of IT projects growth and yet others looked at project implementation in the public sector. This means that project implementation is an area which requires frequent industry-specific studies in order to establish the right combination of determinants of implementation of IT projects at a particular period of time and this is such a study focusing on Kenya's banking sector.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research plan used in the study. It explains the research philosophy, design, target population, sampling design, data collection instruments, data collection procedures, pilot test, validity and reliability of the research instrument. It also gives a validation of the adopted methodology to make the research findings objective.

3.2 Research Design

3.2.1 Research Philosophy

This study adopted a positivist research philosophy. Positivism is a scientific method that is based on rationality and empiricism with a view to enhancing objectivity. In this paradigm of research, various concepts including formulated objectives and hypotheses are tested (Bryman & Bell, 2015). In positivism paradigm, research works with observable social reality and rationale to get the results of a study. Kiragu (2018) adopted the same philosophy in his study on occupational risks in commercial banks in Kenya.

3.2.2 Research Design

According to Marshall and Rossman (2014), a research design is a general plan for conducting a research study to examine specific testable research questions of interest. Kothari (2014) described a research design as a master plan that specifies the methods and procedures for collecting and analyzing the needed information. This study adopted a cross-sectional survey design because the design is best suited for finding out the prevalence of a phenomenon, situation, problem, attitude or issue, by taking a cross-section of the population as it stands at the time of the study (Kumar, 2014). An underlying aspect of this research design is that all measurements for a sample are obtained at a single point in time using a single questionnaire (Bhattacherjee, 2012).

3.3 Target Population

Mugenda and Mugenda (2012) described a population as the entire group of individuals or items under consideration in any field of inquiry and have a common attribute. It is a group of individuals, items or objects from which a sample of a study can be obtained and to which the results can be inferred (Kombo & Tromp, 2011). According to the Central Bank of Kenya's Annual Supervision Report of 2017, there were forty (40) licensed and operational commercial banks in Kenya which comprised eight (8) large banks, eleven (11) medium banks and twenty-one (21) small banks as shown in Table 3.1 and Appendix III. The same report also indicated that there were 29,326 staff comprising Management, Supervisory and Clerical cadres in the banking sector by close of business on 31st December 2017.

In this study, there were two types of population namely target population and accessible population. Target population refers to the entire group of individuals or objects to which researchers are interested in generalizing their conclusions (Castillo, 2009). The target population was composed of Management staff, Supervisory staff and Clerical staff. The main reason for choosing the aforementioned staff cadres was because they constituted the frequent users of bank systems and therefore were well versed with the nuances of business and information technology in commercial banks.

Accessible population refers to the population in the research to which the researcher can apply their conclusions (Dawson, 2009). The accessible population comprised Heads of IT, Project Managers in charge of IT and Business Relationship Management, Operations Managers, System Authorizers and Data Inputters all of whom could easily be included in the sample on the day of determining the final sample of the study from staff of the licensed and operational commercial banks in Kenya which were forty (40) in number. Central Bank of Kenya is the regulator of commercial banks and mortgage finance institutions hence was used as an authoritative source of information pertaining to commercial banks.

Table 3.1: Commercial Banks' Classification Analysis

Peer Group	No. of Institutions	Weighted Market Share (%)
Large (Tier 1)	**8**	**65.98**
Medium (Tier 2)	**11**	**26.10**
Small (Tier 3)	**21**	**7.92**
Total	**40**	**100**

*Charterhouse Bank under statutory management; Imperial Bank and Chase Bank under receivership.

(**Central Bank of Kenya, 2017**)

3.4 Sampling Frame

According to Hong, Hao and Kumar (2012), a sampling frame is a set of source materials from which a sample is selected. Marshall *et al.*, (2014) defined a sampling frame as a list of the target population from which the sample is selected and that for cross-sectional survey design, a sampling frame usually consists of a finite population. In this study, the sampling frame consisted of forty (40) licensed and operational commercial banks in Kenya by close of business on 31st December 2017. The list was drawn from the Central Bank of Kenya's Annual Supervision Report 2017 which also outlined the grouped number of employees by their cadres in the banking sector. Previous studies where a similar sampling frame was adopted include Wanjiru (2015) and Ngumi (2013).

3.5 Sample and Sampling Technique

3.5.1 Sample size

The term sample refers to a segment of the population selected for research to represent the population as a whole (Chowdhury, 2016). A sample is a portion or part of the population of interest (Lind, Marchal & Wathen, 2012). The rationale of sampling is to have an understanding on some characteristics or attributes of the entire population based on the characteristics of the sample. This study used proportionate stratified sampling where the subjects were chosen such that the existing subgroups in the whole population were more or less reproduced in the sample (Mugenda *et al.*, 2012).

From the sampling frame, there were three strata of classification of employees as Management, Supervisory and Clerical (see Table 3.2), each key classification forming a stratum. Proportionate stratified sampling technique guarantees that each stratum is represented in the sample and is more accurate in reflecting the characteristics of the population. According to Kothari (2014), a population is stratified based on its different features and a sample is picked from each stratum. The sample size was determined using a model by Nasiurma (2000) as shown; -

$n = (Nc_v^2) / (c_v^2 + (N-1)\, e^2)$ where:

n = Sample size

N = Population

c_v = Coefficient of variation (take 0.7).

e = Tolerance at desired level of confidence (take 0.05 at 95% confidence level).

The substituted values in determining the sample size from the target population are;

$n = 29{,}326 * 0.7^2 / (0.7^2 + (29{,}326-1)\, 0.05^2)$

$n = 14{,}369.74 / (0.49 + (29{,}325)\, 0.0025)$

$n = 14{,}369.74 / 73.80$

$n = 195$

Table 3.2: Sample Size

Staff Cadre	Population	Sample	Percentage
Management	10,298	69	35.4
Supervisory	6,188	41	21.1
Clerical	12,840	85	43.5
Total	**29,326**	**195**	**100**

3.5.2 Sampling Technique

A list containing all sampling units is known as sampling frame (Kothari, 2014). The first level of sampling frame for this study was from the list of licensed and operational commercial banks provided by the Central Bank of Kenya by close of business on 31st December 2017 and were forty (40). The second sampling frame consisted of all Heads of IT, PMs in charge of IT & BRM and Operations Managers being Management staff, System Authorizers being Supervisory staff and Data Inputters being Clerical staff. These cadres of staff are the ones who often interact with the various bank systems during the implementation process. Johnson and Kuby (2011) refer to a sampling frame as the technical name for the list of the elements from which the sample is chosen.

This study used purposive sampling procedure to identify sample units. Marshall *et al.*, (2014) states that a purposive sampling, also referred to as a judgment sampling is a type of non-probability sampling. Yang and Miller (2008) define purposive sampling as involving deliberate selection of particular units of the universe for constituting a sample which represents the universe. The method was employed for Heads of IT and PMs in charge of IT & BRM since they could be identified by designation. The same method was used among Operations Managers, System Authorizers and Data Inputters for distribution of the questionnaires, mostly those who had participated in earlier projects. The entry point to each bank was through the Human Capital staff who assisted in distributing the questionnaires to the target respondents. Five (5) questionnaires each were distributed to thirty-eight (38) commercial banks and the remaining five distributed to Dubai Islamic Bank and Mayfair Bank since the two were new in the sector at the time of data collection having been licensed in April 2017 and June 2017 respectively.

3.6 Data Collection Instruments

The study used questionnaires to obtain data for analysis to support or refute hypotheses and to confirm the evidence obtained from the qualitative and quantitative data analysis. Questionnaire is a popular method of collecting data because researchers can gather information fairly easily and the responses are easily coded (Denscombe, 2014). A questionnaire is a research instrument that is used to collect data from a large sample and its objective is to translate the research objectives into specific questions, and answers for each question provide the data for hypothesis testing. A questionnaire has advantages over other instruments including its ability to have information collected from large samples, no opportunity for bias since it is presented in paper form and confidentiality is upheld.

The questionnaire was divided into two sections. Part A was the identification section where the respondents identified themselves, gave their age range, gender, job title and number of years involved in IT projects. Part B asked the respondents to provide information concerning major areas of this study. The questionnaire contained a mixture of closed and open-ended questions. The closed ended questions were aimed at giving precise information which minimized information bias and facilitated data analysis, while the open-ended questions gave respondents the freedom to express themselves.

This study mainly utilized the Likert scale as it is one of the best and most frequently used to measure opinions due to its ease and balance (Zikmund, Babin & Carr, 2010). In order to examine the determinants of implementation of information technology projects by commercial banks, four sub-constructs were used; executive commitment, user involvement, project team capability and project management approach whereas to measure implementation of information technology projects, four sub-constructs were applied; on-time, within-budget, on-scope and functional quality. To measure the moderating role of project risk between independent and dependent variables, four sub-constructs of technical complexity, technological uncertainty, specification changes and project criticality were applied.

3.7 Data Collection Procedure

To ensure that the study complies with all ethical issues pertaining to any research undertaking, permission to conduct the study was obtained from Jomo Kenyatta University of Agriculture & Technology's administration who issued an approval letter for the research and also provided a request letter to banks to participate in the research by filling questionnaires. A research permit was also sought and obtained from National Commission for Science, Technology and Innovation (NACOSTI) and the researcher also wrote a request letter to participating institutions. A full disclosure of all the activities concerning the study was explained to individual banks' management indicating that the study's intention was only for academic purposes. Privacy and confidentiality were observed and the findings of the study submitted specifically to the university.

The respondents were informed of the purpose and nature of the study and that their answering of the questions was voluntary. After receiving the approval to carry out the study, reliability and validity of the instruments was checked by conducting a pilot test amongst a few respondents outside the sample. The test helped in checking the reliability of the questionnaire and how respondents felt about the type of questions contained therein. Necessary adjustments and corrections were then effected on the instrument before embarking on the field study.

The questionnaires were then distributed to the respondents and collected within a reasonable period of time where possible. The questionnaires were self-administered but explanations and guidance were given to the respondents to ensure that relevance was observed when answering questions. Follow up on filling of the questionnaires was done via telephone where necessary. The questionnaires were served to respondents through drop and pick method. The completed questionnaires were physically collected by the researcher since commercial banks strictly uphold the tenet of confidentiality and do not deal with third parties. The researcher personally funded the study.

3.8 Pilot Test

According to Mugenda *et al.,* (2012), pilot testing involves carrying out a preliminary test of data collection tools and procedures so as to identify and eliminate problems, allowing programs to make remedial changes or adjustments before actually collecting data from the target population. Cooper and Schindler (2013) and Creswell (2013) indicated that a pilot test is conducted to identify weaknesses in design and instrumentation and to provide surrogate data for selection of a probability sample. By conducting a pilot test, the researcher ensured that appropriate questions were asked, the right data collected and correct data collection methods used. The questionnaire was tested on 19 members who were part of the target population but not in the sample. This represented about 10% of the sample size which is generally recommended by social scientists (Mugenda *et al.,* 2012). The researcher used purposive sampling in choosing the 19 members for pilot testing from the target population but not purposed for study sample to avoid repeat bias. According to Hugman, Pittaway and Bartolomei (2011), in purposive sampling, the items are selected in such a manner that each of them are rich in information about the parameters that are being studied in the population.

3.8.1 Reliability

According to Drost (2011), reliability is the extent to which a scale produces consistent results if measurements are done repeatedly. This is done by determining the association between the scores realized from diverse administrations of the scale. If the association is high enough then it means the scale yields consistent results thus deemed to be reliable. Internal consistency and reliability among the items of each construct were explored through Cronbach's alpha coefficient (α) (Carmines & Zeller, 2009). All items returned acceptable alpha values including executive commitment's 0.836, user involvement's 0.741, project team capability's 0.740 and project management approach's 0.899, all being above the recommended alpha coefficient of 0.7. After pilot testing, the questionnaire was revised to incorporate the feedback that was gathered from the results' analysis with the purpose of improving the reliability of the instrument.

Cronbach's alpha values range between 0 and 1.0 whereby while 1.0 indicates perfect reliability, the value 0.70 is deemed to be the lower level of acceptability (Tavakol & Sandars, 2014). Cronbach's alpha is a general form of the Kuder – Richardson (KR20) formula which is as follows;

$$\alpha = KR20 = \frac{k\left(S^2 - \sum s^2\right)}{S^2(k-1)}$$

k = number of items in the instrument

S^2 = variance of all scores

s^2 = variance of individual items

3.8.2 Validity

Validity is the degree to which results obtained for the analysis of the data actually represent the phenomena under study and it indicates how precise the data obtained in the study represent the variables of the study (Mugenda *et al.*, 2012). The researcher widely consulted with professionals and experts in the field of IT project management thereby enhancing content and face validity of the instrument. All additional and relevant information that came out of the pre-test was also included to improve the instrument.

3.9 Data Analysis and Presentation

Before processing the responses, the completed questionnaires were cleaned and checked for completeness and consistency. According to Sekaran (2011), data analysis has three basic objectives: getting a feel of the data, test the goodness of the data and test the hypotheses developed for the research. The first objective was achieved by use qualitative techniques such as descriptive statistics and in this case, the response rate, frequency distributions, means and standard deviation for variables that were included in the study.

To achieve the second objective, goodness of data was actualized through enhancing the credibility and reliability of data to be analyzed and was tested using the Cronbach's alpha coefficient. This measured how closely related a set of items are as a group. It was considered to be a measure of scale reliability. Cronbach's alpha is sensitive to the number items in the scale and generally tends to underestimate the internal consistency reliability. Lastly, to test the hypotheses established for the study, appropriate statistical test namely F-test was used.

In this study, both qualitative as well as quantitative methods of data analysis were used to analyze the research variables. Data was edited, coded, classified and summarized into categories. A Likert scale was adopted to provide a measure for qualitative data. The scale helped to minimize subjectivity and to make it possible to use quantitative analysis. The numbers in the scale were arranged such that they indicated the presence or absence of the characteristics to be measured (Mugenda *et al.,* 2012). This mix of tools was necessary because whereas some aspects of the study were qualitative, others were quantitative in nature.

3.9.1 Qualitative Data Analysis

According to Creswell (2013), the process of data analysis involves making sense out of the text and image data. It involves preparing the data for analysis, moving deeper into understanding it, presenting it and making an interpretation of the larger meaning. Under qualitative analysis, the researcher was interested in analyzing information in a systematic way in order to come up with useful conclusions and recommendations. In qualitative studies, the researcher obtains detailed information about the phenomena under review and endeavours to establish patterns, trends and relationships from the information gathered. Before processing the responses, data preparation was done for the completed questionnaires by editing, coding, cleaning and entering the data. The researcher put down notes, keywords and phrases and those which kept recurring were identified and manual themes developed thus forming the basis for codes that were used for analysis.

The code categories were based on the research questions of the study and were entered into a computer program, SPSS version 25 to be precise, with developed pattern codes to group the summaries of data into a smaller number of sets, themes or constructs, and using the program, the researcher analyzed the frequencies of the emerging themes; usually the frequency of appearance of a particular idea was obtained as a measure of content (Khomba & Vermaak, 2012). Data was then processed and resultant information coherently presented, detailing the respondents' perspectives on the different research items which were under review.

3.9.2 Quantitative Data Analysis

Whereas qualitative analysis aims at providing basic information, quantitative analysis goes further to test the theories in the theoretical framework behind the study with the aim of proving or disproving the theories. Descriptive data was analyzed by use of frequencies and central tendencies and was presented in form of tables and pie charts. In this study, inferential consideration started with the analysis of the relationship between independent variables and the dependent variable. Joint influence of the independent variables was carried out then moderation effect of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya was done.

Moderation denotes an interaction effect where introducing a moderating variable alters the direction or magnitude of the relationship between two or more variables. A moderation effect could have an enhancing effect; where increasing the moderator variable, in this case project risk, would increase the effect of the predictor (independent variables) namely executive commitment, user involvement, project team capability and project management approach on the outcome (dependent variable), in this case implementation of IT projects; it may have a buffering effect; where increasing the moderator variable would decrease the effect of the predictor variable on the outcome variable; or it may be antagonistic; where increasing the moderator variable would reverse the effect of the predictor variable on the outcome variable.

According to Bolin (2014), in order to confirm that a third variable is making a moderation effect on the relationship between two variables X and Y, the study should demonstrate that the nature of this association changes as the values of the moderating variable M change. In order to achieve this, multiple regression analysis was used to explore the intensity of the relationship between the individual independent variables and implementation of IT projects as the dependent variable and how that relationship is affected by project risk. Pearson's product moment correlation analysis was used to show the direction of the relationship between the study variables. Simple regression was used in the study to test the stated research hypotheses.

In this study, the quantitative data collected was analyzed by descriptive statistics such as mean, median, standard deviation and proportions using Statistical Package for Social Sciences (SPSS) version 25. Standard multiple regression analysis was used because it provides estimates of net effects and has explanatory power. F-tests were computed for the individual variable coefficients to determine their significance in the model. Null hypothesis was rejected or failed to be rejected based on the p-value obtained and the test was performed at $\alpha = 0.05$ level of significance.

3.9.3 Statistical Measurement Models

According to Mugenda *et al.,* (2012), multiple regression analysis attempts to determine whether a group of variables together predict a given dependent variable and, in this way, attempt to increase the accuracy of the estimate. Multiple regression analysis was carried out to establish the relationship between the independent and dependent variables as prescribed by various scholars (Mendoza, Bischoff & Willy, 2017). Regression is preferred because it has the ability to show whether there is a positive or a negative relationship between independent and dependent variables (Castillo, 2009). In addition, regression would show whether the identified relationship is significant or not. The general single and multiple regression models applied for the study were;

Single Variable:

$Y= \beta_0 + \beta_i X_i + \varepsilon \quad (i=1,2,3,4);$

$Y= \beta_0 + \beta_i X_i + \beta_m M + \varepsilon;$

$Y= \beta_{0+} \beta_i X_i + \beta_m M + \beta_{mi} X_i M + \varepsilon$

Multiple Variables:

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

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

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

Where; Y = Implementation of IT projects

β_0 = Constant

βi = Coefficient for X_i ($i_=$1, 2,3,4)

β_m = Coefficient of Moderator

$\beta_i M$ = Coefficient of Interaction term

X_1 = Executive commitment

X_2 = User involvement

X_3 = Project team capability

X_4 = Project management approach

M = Project risk (moderating variable)

$X_i M$ = Product term/interaction term of the moderating variable with each of the study variables (X_1, X_2, X_3, X_4)

ε = Error term

3.9.4 Variables Definition and Measurement

Table 3.3: Variables Definition

Variables	Hypotheses	Models
Executive commitment	Executive commitment has no significant influence on implementation of IT projects by commercial banks in Kenya.	$Y= \alpha_1+ \beta_1X_1 + \varepsilon$ $Y= \beta_0 + \beta_1X_1+ \beta_mM + \varepsilon$ $Y= \beta_0 + \beta_1X_1 + \beta_mM + \beta_{m1}X_1M + \varepsilon$
User involvement	User involvement has no significant influence on implementation of IT projects by commercial banks in Kenya.	$Y= \alpha_2+\beta_2X_2+ \varepsilon$ $Y= \beta_0 + \beta_2X_2 + \beta_mM + \varepsilon$ $Y= \beta_0 + \beta_2X_2 + \beta_mM + \beta_{m2}X_2M + \varepsilon$
Project team capability	Project team capability has no significant influence on implementation of IT projects by commercial banks in Kenya.	$Y= \alpha_3+\beta_3X_3+ \varepsilon$ $Y= \beta_0 + \beta_3X_3+ \beta_mM + \varepsilon$ $Y= \beta_0 + \beta_3X_3 + \beta_mM + \beta_{m3}X_3M + \varepsilon$
Project management approach	Project management approach has no significant influence on implementation of IT projects by commercial banks in Kenya.	$Y= \alpha_4+\beta_4X_4+ \varepsilon$ $Y= \beta_0 + \beta_4X_4 + \beta_mM + \varepsilon$ $Y= \beta_0 + \beta_4X_4 + \beta_mM + \beta_{m4}X_4M + \varepsilon$
Project risk	Project risk has no significant moderating effect on the determinants of implementation of IT projects by commercial banks in Kenya.	$Y= \alpha_{5+} \beta_1X_1M+ \beta_2X_2M+ \beta_3X_3M+ \beta_4X_4M+ \varepsilon$ $Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4+ \beta_mM + \varepsilon$

Table 3.4: Study Hypotheses

Objective	Hypothesis	Type of Analysis	Interpretation
To examine the influence of executive commitment on implementation of IT projects by commercial banks in Kenya.	H_{01} Executive commitment has no significant influence on implementation of IT projects by commercial banks in Kenya.	Pearson Correlation Linear Regression analysis.	If p-value is < 0.05, reject the null hypothesis.
To determine the influence of user involvement on implementation of IT projects by commercial banks in Kenya.	H_{02} User involvement has no significant influence on implement-ation of IT projects by commercial banks in Kenya.	Pearson Correlation Linear Regression analysis, F-test, t-test.	If p-value is < 0.05, reject the null hypothesis.
To establish the influence of project team capability on implementation of IT projects by commercial banks in Kenya.	H_{03} Project team capability has no significant influe-nce on implementation of IT projects by commercial banks in Kenya.	Pearson Correlation Linear Regression analysis.	If p-value is < 0.05, reject the null hypothesis.
To examine the influence of project management approach on implementation of IT projects by commercial banks in Kenya.	H_{04} Project management approach has no significant influence on implementation of IT projects by commercial banks in Kenya.	Pearson Correlation Linear Regression analysis.	If p-value is < 0.05, reject the null hypothesis.
To determine the moderating effect of project risk on the determinants of implementation of IT projects by commercial banks in Kenya. .	H_{05} Project risk has no significant moderating effect on the determinants of implementation of IT projects by commercial banks in Kenya.	Correlation, Moderated Multiple regression analysis, F-test, t-test.	If p-value is < 0.05, reject the null hypothesis.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The general objective of this research was to analyze the determinants of implementation of information technology projects by commercial banks in Kenya. This was guided by the specific objectives which were to examine the influence of executive commitment, user involvement, project team capability and project management approach on implementation of information technology projects and also establish the moderating effect of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya. This chapter outlines the response rate, assesses the reliability and validity of the research instrument, it indicates the demographics of the respondents, it details both descriptive and inferential statistics and also shows the research findings and discussions.

4.2 General Characteristics of the Study Sample

4.2.1 Response rate

The researcher distributed one hundred and ninety-five (195) questionnaires out of which one hundred and thirty-eight (138) were filled which represented 71% of the total questionnaires distributed. According to Kothari (2014), 50% response rate is considered average, 60% to 70% is considered adequate while anything above 70% is considered to be an excellent response rate. Bell (2014) indicated that for a social science study, anything above 60% response rate is adequate for making significant conclusions. Attaining 71% was therefore an excellent response rate which could be attributed to the data collection procedure employed whereby the researcher personally administered the questionnaires through drop and pick method and made follow up calls to clarify on any queries as well as to prompt the respondents to fill the questionnaires. The personal involvement of the researcher therefore contributed to the high response rate.

4.2.2 Gender distribution

The descriptive statistics of the study indicated that 95 respondents were male representing 68.8% while 43 respondents were female representing 31.2%. The gender distribution conforms to the envisaged requirement by Kenya's constitution that at least one third of either gender should occupy positions of responsibility in constitutional offices but the practice is informally replicated in other areas including workplaces. This implies that more women are now emerging as user support staff and liaison officers with technical skills necessary for effective implementation of IT projects (Eason, 2014). The gender distribution is shown in Table 4.1;

Table 4.1: Gender of respondents

Gender	Frequency	Percentage
Male	95	68.8
Female	43	31.2
Total	**138**	**100**

4.2.3 Age distribution

Table 4.2 indicates that majority of the respondents were aged between 20 and 40 years constituting 79.7% of total respondents. Respondents below 20 years of age were 0.7% whereas those above 40 years constituted 20.3%. The statistics are a confirmation that majority of bank workers are youthful with those above 40 years being continually eased out either by natural attrition or by being incentivized to take voluntary early retirement. Younger staff are perceived to have better technical competencies and pursue change initiatives that come with implementation of new IT projects (Kwahk & Kim, 2008).

Table 4.2: Distribution of age in years

Age Bracket	Under 20	20-30	31-40	Over 40	**Total**
Frequency	1	46	63	28	**138**
Percentage	0.7	33.1	45.3	20.9	**100**

4.2.4 Classification by functional designation

Table 4.3 shows the functional positions held by the respondents in their respective workplaces. There was a near even distribution of respondents amongst Data Inputters (22.4%), Authorizers (26.1%), Operations Managers (26.8%) and IT Managers (19.6%). This is due to their routine involvement in active implementation of IT projects unlike Business Relationship Managers (5.1%) whose role was mostly interfacing IT and business relationship management, advisory and user acceptance testing. The wide array of participants constitutes a critical mass that understands the overall needs of their institutions and can guide in achieving success of IT projects (Jain & Metkewar, 2016).

Table 4.3: Distribution by function

Function	Inputter	Authorizer	Ops Manager	IT Manager	BRM	Total
Frequency	31	36	37	27	7	**138**
Percentage	22.4	26.1	26.8	19.6	5.1	**100**

4.2.5 Classification by bank size

Data for the study was collected across the banking sector which is classified in tiers based on a composite average of asset base, capital base, customer numbers and deposits base. Tier 1 (large banks) are those with a composite average of above 5%, Tier 2 (medium-size banks) have a composite average ranging between 1% to 5%, whereas Tier 3 (small banks) have a composite average of below 1%. From the study findings, 36.7% of the respondents were from Tier 1 banks, 47.5% were from Tier 2 banks and 15.8% were from Tier 3 banks. Low participation from the latter category was mainly due to their being averse to participation in surveys and in several cases, their staff members invoked the tenet of confidentiality to justify their lukewarm participation in the survey. Tier 1 and Tier 2 banks were mostly receptive since they always have open processes and procedures of engagement hence their good participation. It implies that bigger banks have a clear sense of coordination and easily assign responsibilities (Lee & Xia, 2010). Response rate according to Tier classification is outlined in figure 4.1;

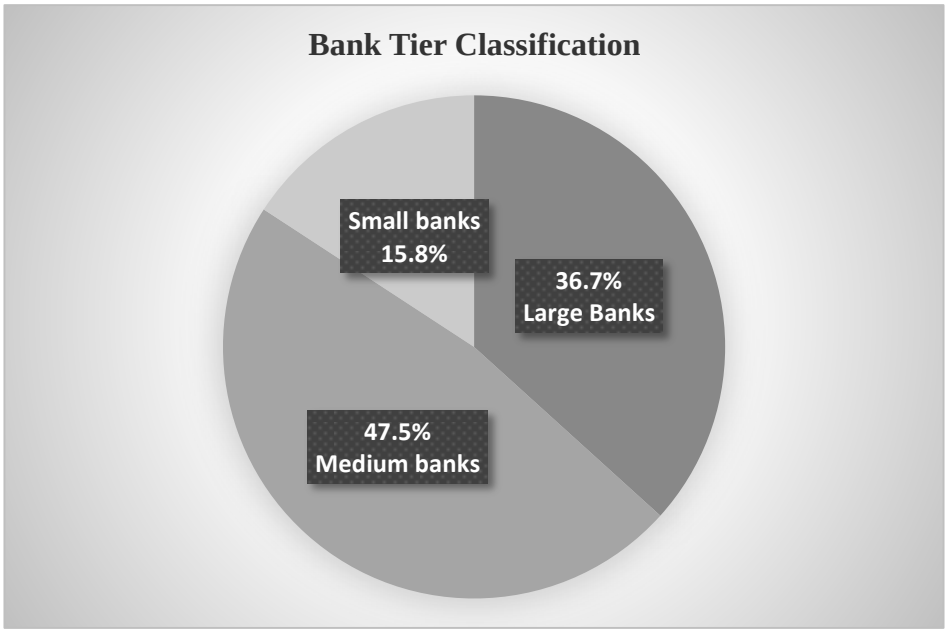

Figure 4.1: Response rate according to banks' tier classification

4.3 Reliability and Validity of the Research Instrument

4.3.1 Reliability Analysis

Cronbach's coefficient alpha was used to determine the internal reliability of the questionnaire employed in this study. The alpha values range between 0 and 1.0 whereby while 1.0 indicates perfect reliability, the value 0.70 is deemed to be the lower level of acceptability (Tavakol *et al.*, 2014). The reliability values for each of the variables are presented in Table 4.4 where it is evident that Cronbach's alpha values for each of the variables were well above the lower limit of acceptability of 0.70. The findings indicated that executive commitment had a coefficient of 0.730, user involvement had a coefficient of 0.777, project team capability had a coefficient of 0.717, project management approach had a coefficient of 0.773, project risk had a coefficient of 0.707 and implementation of information technology projects garnered a coefficient of 0.756. These results therefore indicated that the questionnaire used in this study had a high level of reliability.

Table 4.4: Reliability statistics

Variable	Cronbach's Alpha	Comments
Executive commitment	0.730	Accepted
User involvement	0.777	Accepted
Project team capability	0.717	Accepted
Project management approach	0.773	Accepted
Project risk	0.707	Accepted
Implementation of IT projects	0.756	Accepted

4.3.2 Validity

Validity is the extent to which a test measures what it is supposed to measure (Drost, 2011). Validity is the degree to which the results obtained from the analysis of the data actually represents the phenomenon under study (Mugenda *et al.*, 2012). Face validity was carried out through relevant literature review and peer review, which included use of accepted methods and standards that were adopted in other relevant studies. To ensure content and construct validity, the preliminary questionnaire was pre-tested with a sample of respondents drawn from the relevant cadres of staff who were well versed with information technology projects, but who would eventually not be part of the sample. Also, survey items were extracted from existing project management theory and use of tested instruments where available. A 95% response rate was realized in the pilot data collection and feedback received was incorporated in the final questionnaire hence improving it and was found to be adequate for final data collection.

4.4 Descriptive Statistics

The purpose of this study was to analyze the determinants of implementation of information technology projects by commercial banks in Kenya. This section provides the findings and discussion in the order of the specific objectives of the study which are executive commitment, user involvement, project team capability and project management approach. Frequencies and descriptive statistics are presented first, followed by qualitative analysis then inferential statistics. Questionnaire responses were based on a Likert scale which was aptly coded with numerical values for ease of data analysis. The values assigned were 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, then 5 = strongly agree.

4.4.1 Executive commitment and Implementation of IT projects

A majority of the respondents made up of 64% agreed that upper-level management supported and provided resources for implementation of IT projects. Another 25.9% of the respondents strongly agreed with the aforementioned sentiments thus making a total of 89.9% who were affirmative about the contribution of upper-level management. The same was also confirmed by a high mean score recorded of 4.14. A minority 9.4% of the respondents neither agreed nor disagreed with the position whereas 0.7% strongly disagreed. 89.1% of the respondents opined that planning, monitoring and controlling procedures in their respective banks occasioned efficiency and effectiveness of IT projects. 8% of the respondents neither agreed nor disagreed, 2.2% disagreed and 0.7% strongly disagreed about the contribution of planning, monitoring and controlling.

As indicated by a mean score of 4.06, 82% of the respondents agreed that their banks' leadership exhibited willingness to take measured risks in the course of implementing IT projects. 84.9% were of the view that their banks had a clear vision, mission and objectives for IT projects. 73.9% agreed that there was an organizational culture that promoted flexibility and 77% affirmed that change management was embraced whenever new IT projects were introduced for eventual implementation.

Table 4.5: Executive Commitment and Implementation of IT projects

Executive commitment	SD %	D %	N %	A %	SA %	M*	S.D
Upper level management consistently supports and provides resources for IT projects.	0.7	0.0	9.4	64.0	25.9	4.14	0.632
Planning, monitoring and controlling ensures efficiency.	0.7	2.2	8.0	55.8	33.3	4.19	0.730
Bank leadership always takes measured risks on IT projects.	0.0	2.2	15.8	56.1	25.9	4.06	0.710
There is a clear vision, mission and objectives for IT projects.	0.7	2.9	11.5	55.4	29.5	4.10	0.764
Organizational culture of flexibility on new initiatives by regulators.	1.4	6.5	18.1	47.8	26.1	3.91	0.911
Change management is embraced whenever new IT projects come up.	0.7	5.8	16.5	58.3	18.7	3.88	0.799

n = 138 (SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SA = Strongly Agree) *Mean = (Strongly Disagree = 0 – 1.8; Disagree = 1.8 – 2.6; Neither Agree nor Disagree = 2.6 – 3.4; Agree = 3.4 - 4.2; Strongly Agree = 4.2 – 5.0).

4.4.2 User involvement and Implementation of IT projects

Majority of the respondents consisting of 77.7% agreed that system users were usually involved in new information technology project initiatives, and 15.1% of the 77.7% strongly agreed. 68.9% of the respondents agreed that staff in their banks had requisite experience in dealing with industry-wide IT projects. However, a respectable 30.2% held a contrary opinion regarding experience of bank staff on IT projects with 21.6% being indifferent while 8.6% disagreed. This showed that some banks may indeed be having experienced staff deployed for IT projects while other banks may be lacking such talent.

To ascertain the extent to which system users participated in activities geared towards realizing new IT projects, 65.5% of the respondents were in agreement that users in their respective banks were involved in project implementation while 23.7% were indifferent. The indifferent ones may point to cases where communication regarding involvement may be minimal or non-existent altogether. 10.8% of the respondents disagreed indicating that users are not involved and this could be a pointer that a vast majority of banks do not allow and neither do they encourage free participation of their staff in the implementation process of IT projects.

The level of education and customized training for users on new industry-wide information technology projects was also interrogated. Whereas 60.8% of the respondents were in agreement that indeed education and training were facilitated, 20.1% of the respondents neither agreed nor disagreed with 11.5% disagreeing. The statistics point to a situation where trainings may not have been structured hence this situation made a third of the respondents to hold a contrarian view. Separately, 64.8% of the respondents agreed that system users in their respective banks held consultations with other stakeholders on new IT projects with 77.7% of the respondents agreeing that respective bank users had requisite experience in using industry-wide IT projects.

Table 4.6: User Involvement and Implementation of IT projects

User involvement	SD %	D %	N %	A %	SA %	*M	S.D
System users normally involved in new IT project initiatives.	1.4	7.9	12.9	62.6	15.1	3.82	0.836
Users have requisite end user experience on industry IT projects.	0.0	8.6	21.6	56.1	13.7	3.75	0.799
System users participate in activities for actualizing IT projects.	0.7	10.1	23.7	51.1	14.4	3.68	0.868
Bank staff trained and educated on new industry-wide projects.	0.7	10.8	20.1	48.9	19.4	3.76	0.916
System users hold consultations with relevant IT project stakeholders.	0.0	6.5	28.8	54.0	10.8	3.69	0.750
Bank staff have required expertise in using industry-wide IT projects.	0.0	5.0	17.3	67.6	10.1	3.83	0.670

n = 138 (SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SA = Strongly Agree) *Mean = (Strongly Disagree = 0 – 1.8; Disagree = 1.8 – 2.6; Neither Agree nor Disagree = 2.6 – 3.4; Agree = 3.4 - 4.2; Strongly Agree = 4.2 – 5.0).

4.4.3 Project team capability and Implementation of IT projects

Respondents were asked to give their opinions on whether their project teams embraced internal communication during the life cycle of IT projects and a majority made up of 82% agreed that indeed internal communication was embraced. Further, most of the respondents representing a whopping 89.9% agreed that their project teams were dedicated to the cause of delivering and actualizing the on-going and new IT projects. On whether project teams were adequately skilled in development of new IT projects, 85.6% of the respondents concurred while 12.2% were ambivalent whereas 2.2% disagreed.

Majority of respondents constituting 89.1% agreed that project teams in their respective banks had technical skills and experience to deliver on new IT projects, 10.1% of the respondents neither agreed nor disagreed and a marginal 0.1% of the respondents disagreed. On whether project teams were empowered to carry out their functions without undue interference from stakeholders, 61.8% agreed that indeed project teams were empowered. However, a sizeable number of respondents made up of 30.9% could neither confirm nor disagree with the sentiments. Still on the same subject, 7.2% disagreed and felt that there was always an element of interference.

A question was posed to respondents on whether project teams in their respective banks were composed of talented and multi-disciplinary members to which a majority made up of 82% was in agreement and the same position was further buttressed by the high mean score of 3.99 obtained. However, it is worth noting that 13.7% of the respondents neither agreed nor disagreed with the sentiments. Also, 4.3% were outright in their disagreement about the composition of the project teams. Overall, responses to the question on project team composition were skewed towards general agreement that indeed teams had talented and multi-disciplinary members as attested by a high mean score obtained of 3.99 which according to the mean scoring tool, the score falls under the interval of agree.

Table 4.7: Project Team Capability and Implementation of IT projects

Project team capability	SD %	D %	N %	A %	SA %	*M	S.D
Internal communication among project team usually promoted.	0.0	4.3	13.7	65.5	16.5	3.94	0.689
Project team fully dedicated to endeavours to actualize IT projects.	0.0	0.0	10.1	64.5	25.4	4.15	0.578
Project team adequately skilled in development of new IT projects.	0.0	2.2	12.2	60.4	25.2	4.09	0.675
Project team has technical skills and experience to deliver IT projects.	0.0	0.7	10.1	57.2	31.9	4.20	0.641
Project team empowered to do their work without undue interference.	1.4	5.8	30.9	46.0	15.8	3.69	0.858
Project team composed of talented and multi-disciplinary members.	0.0	4.3	13.7	60.4	21.6	3.99	0.727

n = 138 (SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SA = Strongly Agree) *Mean = (Strongly Disagree = 0 – 1.8; Disagree = 1.8 – 2.6; Neither Agree nor Disagree = 2.6 – 3.4; Agree = 3.4 - 4.2; Strongly Agree = 4.2 – 5.0).

4.4.4 Project management approach and Implementation of IT projects

Respondents were asked whether their respective banks adopted project management methodology in the course of implementation of IT projects. 86.9% answered in the affirmative that indeed their respective banks employed project management methodology. 7.2% neither agreed nor refuted on the question about adoption of project management methodology while 5.8% disagreed indicating that project management methodologies were not adopted. On whether commercial banks embraced processes aligned to agile project management methodology, 74.8% of the respondents were in agreement while 20.9% neither agreed nor disagreed and 4.3% disagreed.

A question was posed seeking to confirm whether banks employed agile project management methodology for their IT projects and 63.3% of the respondents agreed whereas 32.4% were not sure and 4.3% disagreed. 63.3% agreed that their banks employed a documented traditional project management methodology, with 26.6% not being sure. 10.1% of the respondents disagreed meaning their respective banks did not adopt the particular methodology. On the question of whether the respondents' banks adopted in-house developed project management methodology, 67.1% agreed with the sentiments, 23.4% neither agreed nor disagreed while 9.5% of the respondents disagreed.

Respondents were also asked if their banks' approach to IT projects was by use of a standardized project management methodology and 61.9% were in agreement. A sizeable number of respondents made up of 30.9% neither agreed nor disagreed, with 7.2% disagreeing. 54% of the respondents indicated that their banks adopted customized project management methodologies, 40.3% were indifferent whereas 5.7% disagreed. A number of respondents seemed unsure of the project management methodologies used in their respective banks since there are many methodologies and the respondents were not in a position to comfortably delineate the particular methodologies that were in use.

Table 4.8: Project Management Approach and Implementation of IT projects

Project management approach	SD %	D %	N %	A %	SA %	*M	S.D
My bank adopts PMM for IT projects	0.7	5.1	7.2	71	15.9	3.96	0.709
My bank embraces processes aligned to agile PMM.	0.0	4.3	20.9	59.7	15.1	3.86	0.718
My bank adopts agile PMM throughout project lifecycles.	0.0	4.3	32.4	50.4	12.9	3.72	0.742
My bank adopts a documented traditional PMM.	0.7	9.4	26.6	49.6	13.7	3.66	0.856
My bank uses an in-house developed PMM.	0.7	8.8	23.4	54.0	13.1	3.70	0.835
My bank's approach to IT projects is by use of a standardized PMM.	0.7	6.5	30.9	51.1	10.8	3.65	0.788
My bank always uses a customized PMM.	0.7	5.0	40.3	43.9	10.1	3.58	0.771

n = 138 (SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SA = Strongly Agree) *Mean = (Strongly Disagree = 0 – 1.8; Disagree = 1.8 – 2.6; Neither Agree nor Disagree = 2.6 – 3.4; Agree = 3.4 - 4.2; Strongly Agree = 4.2 – 5.0).

4.4.5 Project risk and Implementation of IT projects

The study sought to determine the moderating effect of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya. Among the questions posed to the respondents on the subsets of project risk was whether technical complexity of IT projects had a marked effect on their implementation and 82.6% representing 114 out of 138 respondents concurred. 14.4% neither agreed nor disagreed and only 3.6% disagreed on the effect of technical complexity on project implementation. A majority of respondents, precisely 87% agreed that their banks undertook specification changes during implementation of IT projects. However, 11.5% of the respondents were unsure whereas 1.4% disagreed.

The question regarding whether technological uncertainty affected the implementation process of information technology projects was raised and 79.8% of the respondents answered in the affirmative with 12.9% neither agreeing nor disagreeing and 3.2% of the respondents disagreeing. This question returned a mean score of 3.88. Project criticality having a bearing on the attention given to the implementation process was confirmed by 86.4% of the respondents with 12.2% not being sure whereas a marginal 1.4% of the respondents disagreed that project criticality had any influence on implementation of projects.

Relative project size was a factor that was always considered during the implementation process as was attested by 86.2% representing 119 out of 138 respondents. The factor returned a mean score of 4.06. It is instructive that on the same subject, 10.8% and 3.6% of the respondents were indifferent and disagreed respectively. Urgency with which a project ought to be delivered determined the implementation criteria, and this was confirmed by 84.2% of the respondents but 11.5% representing 16 respondents neither agreed nor disagreed and 4.2% disagreed and averred that urgency of the project may not necessarily be considered when implementing IT projects.

Table 4.9: Project Risk and Implementation of IT projects

Project risk	SD %	D %	N %	A %	SA %	*M	S.D
Technical complexity of IT projects always affect their implementation.	0.7	2.9	14.4	62.6	19.4	3.97	0.722
My bank encourages specification changes during implementation.	0.0	1.4	11.5	66.9	20.1	4.06	0.611
Technological uncertainty usually affects implementation of projects.	0.7	6.5	12.9	63.3	16.5	3.88	0.781
Project criticality usually has a bearing on its implementation.	0.0	1.4	12.2	61.9	24.5	4.09	0.647
My bank regularly works on IT projects based on their relative size.	0.0	3.6	10.8	61.2	24.5	4.06	0.704
Urgency with which a project ought to be delivered affects the criteria for its implementation.	0.7	3.6	11.5	61.2	23.0	4.02	0.747

n = 138 (SD = Strongly Disagree; D = Disagree; N = Neither Agree nor Disagree; A = Agree; SA = Strongly Agree) *Mean = (Strongly Disagree = 0 – 1.8; Disagree = 1.8 – 2.6; Neither Agree nor Disagree = 2.6 – 3.4; Agree = 3.4 - 4.2; Strongly Agree = 4.2 – 5.0).

4.4.6 Aggregation of Independent Variables

With independent variables having met the reliability test, items under each variable were aggregated and the average shown (mean and standard deviation). From the descriptive statistics, executive commitment (X_1) had the highest rating but the second lowest variation in responses (M = 4.0470, S.D = 0.49792). Project team capability (X_3) had the second highest rating but had the lowest variation in responses (M = 4.0091, S.D = 0.45552). User involvement (X_2) had the third highest rating but highest variation in responses (M = 3.7542, S.D = 0.55724). The variable which recorded the lowest rating was project management approach (X_4) but had the second highest variation in responses (M = 3.7297, S.D = 0.50646). From the given scores, project management approach became the worst predictor followed by user involvement. The second-best predictor was project team capability with the best predictor being executive commitment. The aggregation is shown in Table 4.10;

Table 4.10: Summary of Means and Standard Deviations

Variable	Mean	Std. Dev.	Min	Max
Executive commitment – X_1	4.0470	0.49792	2.50	5.00
User involvement – X_2	3.7542	0.55724	2.17	5.00
Project team capability – X_3	4.0091	0.45552	2.80	5.00
Project management approach – X_4	3.7297	0.50646	2.29	5.00

Ranked on scale: (Strongly Disagree = 0 – 1.8; Disagree = 1.8 – 2.6; Neither Agree nor Disagree = 2.6 – 3.4; Agree = 3.4 – 4.2; Strongly Agree = 4.2 – 5.0).

4.4.7 Qualitative Analysis

This study employed both qualitative and quantitative means in obtaining data. Arising from the concept of triangulation, data was obtained from respondents through open and closed ended questions. Methodological triangulation entails combining both quantitative and qualitative data collection methods (Creswell & Creswell, 2017), based on the rationale that a single data collection method is insufficient to provide adequate and accurate research results. A wide array of open-ended questions related to the study objectives were included in the questionnaire and content analysis done by use of SPSS version 25.

Regarding executive commitment, respondents were asked what else could be done by the upper level management to support implementation of information technology projects. Responses were many and varied, where 13% of the respondents indicated that upper level management must ensure that relevant staff executing IT projects should be fully trained to enable them to appreciate the obtaining dynamics concerning IT projects. 8.3% of the respondents suggested that upper level management must have in its ranks qualified and experienced experts who are adept in the dual disciplines of IT and project management to head IT projects.

A cumulative 42.6% of the respondents encouraged upper management to continuously incentivize project teams, promote inter-relationships in banks, benchmark with other excelling commercial banks in implementation of IT projects and constantly engage relevant stakeholders. Another lot of 26.1% of the respondents suggested early planning, leasing of resources including hardware due to rapid changes in technological advancement as contributors to executive commitment likely to facilitate effective implementation of projects. On probing how the management teams of IT projects in respective banks were structured, a majority of 88.7% indicated that teams were lean and project-based hence being a good fit for effective implementation of IT projects. 6% indicated that their banks had a functional structure where project leadership was based on areas of specialization. 5.3% were of the view that their structures were matrix.

Respondents were also asked whether users were fully involved in implementation of IT projects and 77.1% answered in the affirmative adding that requisite training, user acceptance testing and piloting were carried out by users to grow their capacity. On the contrary, 22% of the respondents noted that their involvement was minimal and in some cases none at all. Failure to involve users in IT project implementation can be a recipe for disorder and can ultimately occasion sub-optimal implementation of IT projects. Respondents were asked to state which multifunctional units were responsible for championing the implementation process of IT projects, and 50% indicated that their IT staff in liaison with select operational staff did. 25% indicated that project teams and chosen end users were in charge but another 25% of respondents indicated that it was by teams from Finance and Risk Management departments. Suffice to say that responsible teams were idiosyncratic to individual banks depending on their unique dynamics.

The questionnaire had an open-ended question on how often the respondents held meetings to review their progress in implementation of industry-wide IT projects and 48.9% indicated that meetings were held on an *ad hoc* basis whenever there was need. 28.1%, 17.3% and 5.8% indicated that they held their meetings fortnightly, weekly and daily respectively. This showed that most of the meetings were held on an *ad hoc* basis but also sometimes fortnightly and weekly. The frequency was an indicator that progress reviews were always undertaken and follow up engagements done by banks.

Diverse answers were proffered on the types of trainings that upper management had availed to upskill the respondents' technical competencies. 25% of the respondents confided that training on all emerging industry-wide IT projects was thoroughly done. However, some respondents said they were trained on various technical certifications including Cisco, Windows Suite, System security, Kenya Revenue Authority's I-Tax and Kenya Interbank Transaction Switch or *PesaLink*. Others had training on core banking systems including Micro-banker, Model Bank T24 and Flexcube. On the whole, the survey showed that adequate training opportunities were availed to users and project teams and that served to improve their performance in implementation of IT projects.

To understand if upper level management had deliberate intentions to accomplish future industry-wide IT projects, a question was posed to ascertain whether there were provisions to carry out IT projects with tools and techniques espoused in the strategic blueprints of individual banks. 49% of the respondents confirmed that their banks had expressly provided for continuing and upcoming projects, while 47% averred that their banks accommodated projects as and when they were due. The remaining 4% were not aware of their institutions' working positions. The findings meant that majority of the banks shared their strategic blueprints with project teams which is good for driving the IT projects agenda forward.

The researcher sought to know how project risk affected the implementation process of IT projects and there were diverse responses where 51.6% of the respondents posited that because technology was fast moving and had many secondary risks including uncertainty and criticality, most of the time it occasioned negative repercussions where an ongoing project became overtaken by emerging technologies or attendant risks became overwhelming. Such a situation may force the upper level management and project teams to rework all that they may have hitherto accomplished. 37% of the respondents stated that attendant costs and the length of time taken to internalize new technological concepts negatively affected the implementation process.

To appreciate how banks had been effective in implementing prior IT projects, a sample of four prior projects were chosen and a question posed whether they were delivered on time. The chosen projects were Cheque Truncation System (CTS), Real Time Gross Settlement (RTGS) system, East African Payment System (EAPS) and Kenya Interbank Transaction Switch. CTS and RTGS projects had 85.6% and 92.1% respectively of respondents confirming that the projects were effectively implemented. EAPS and KITS projects had 12% and 32% respectively of respondents confirming that implementation of those projects was effective. This meant that majority of banks were yet to complete the implementation process, with KITS project having been deferred several times for four years before eventually being rolled out in 2017 with 26 out of 40 banks on board.

4.5 Tests of Assumptions

Having explored the independent variables through descriptive statistical analysis, the study sought to establish the relationship between these independent variables with the dependent variable. This meant a bivariate nature of the relationship between the variables had to be established. Correlation analysis was used to evaluate the strength and direction of the relationship among the variables and linear regression used to determine the nature of the relationships. The researcher applied inferential statistics to test the study hypotheses and reject or fail to reject the null hypotheses. At 5% level of significance, the null hypothesis was rejected if the p value was < 0.05.

4.5.1 Normality Tests for Variables

Applied statistical methods are universally used in multidisciplinary research and these methods including correlation, regression, analysis of variance and parametric tests are based on normal distribution. As such, testing of normality is required for most of these statistical procedures based on the normal distribution under the assumption that the population from which the samples are taken is normally distributed (Singh & Masuku, 2014). Normality and other assumptions should be taken seriously for when these assumptions do not hold, it is impossible to draw accurate and reliable conclusions about reality (Ghasemi & Zahediasl, 2012).

With large enough sample sizes (> 30 or 40), the violation of the normality assumption should not cause major problems (Sarkar, 2014). This implies that we can use parametric procedures even when the data are not normally distributed (Behjat, Mahvi & Rahimpour, 2015). Ghasemi, Syedmoradi, Zahediasl and Azizi (2010) posit that the Kolmogorov-Smirnov (K-S) test seems to be the most popular test for normality, but caution that it should not be seriously considered for testing normality owing to its low power and therefore recommend that normality be assessed both visually using instruments like Quantile – Quantile (Q-Q) plots and through other normality tests such as Shapiro-Wilk.

The Shapiro-Wilk test is based on the correlation between data and the corresponding normal scores (Garson, 2012) and provides better power than the K-S test even after the Lilliefors correction (Steinskog, 2007) as cited by Wanjala, Iravo, Odhiambo and Shalle, (2017). Given that H_0 and H_1 are set at $\alpha = 0.05$, the rule is that reject H_0 if the p - value is less than α or else fail to reject H_0;

where;

H_0: The data is normally distributed

H_1: The data is not normally distributed.

Table 4.11: Test of Normality

Test of Normality						
	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Executive commitment	.124	138	.000	.951	138	.000
User involvement	.108	138	.000	.967	138	.002
Project team capability	.131	138	.000	.975	138	.012
Project management approach	.115	138	.000	.972	138	.006
Implementation of IT projects	.138	138	.000	.959	138	.000

a. Lilliefors Significance Correction

Shapiro-Wilk test of normality is highly recommended (Ghasemi *et al.,* 2010). The null hypothesis of the Shapiro-Wilk test is that the population is normally distributed (Singh *et al.,* 2014). Therefore, on the one hand, if the p-value is less than the chosen alpha value, then the null hypothesis is rejected and there is evidence that the data tested are not from a normally distributed population. On the other hand, if the p-value is greater than the chosen alpha level, then we fail to reject the null hypothesis that the data came from a normally distributed population (Sarkar, 2014).

In this study, all independent variables and the dependent variable had p-values of less than 0.05. These were executive commitment (X_1), user involvement (X_2), project team capability (X_3), project management approach (X_4) and implementation of information technology projects (Y). Table 4.11 shows the results of the normality test for all the variables. According to Wasserstein and Lazar (2016), if the test is non-significant ($p < 0.05$), then data is significant ($p > 0.05$), therefore the data is significantly different from normal distribution.

This study therefore rejected their corresponding null hypotheses (H_{01}, H_{02}, H_{03} and H_{04}) respectively and concluded that the data sets for those variables were not normally distributed. However, both Sarkar (2014) and Behjat *et al.,* (2015) agreed that researchers can still use parametric procedures even when the data are not normally distributed. Akin to most statistical significance tests, if the sample size is sufficiently large, this test may detect even trivial departures from the null hypothesis and although there may be some statistically significant effect, it may be too small to be of any practical significance (Dragicevic, 2016). To test the significance of departure from normality, Q-Q plots were done and the results shown in figures 4.2, 4.3, 4.4, 4.5 and 4.6.

4.5.1 (a) Normal Q-Q plot of Executive Commitment

Departure from normality for executive commitment was not so pronounced and the same was confirmed from the approximation of line of fit in Figure 4.2. Data was therefore near to normal distribution and could be used in regression analysis.

Normal Q-Q plot of Executive Commitment

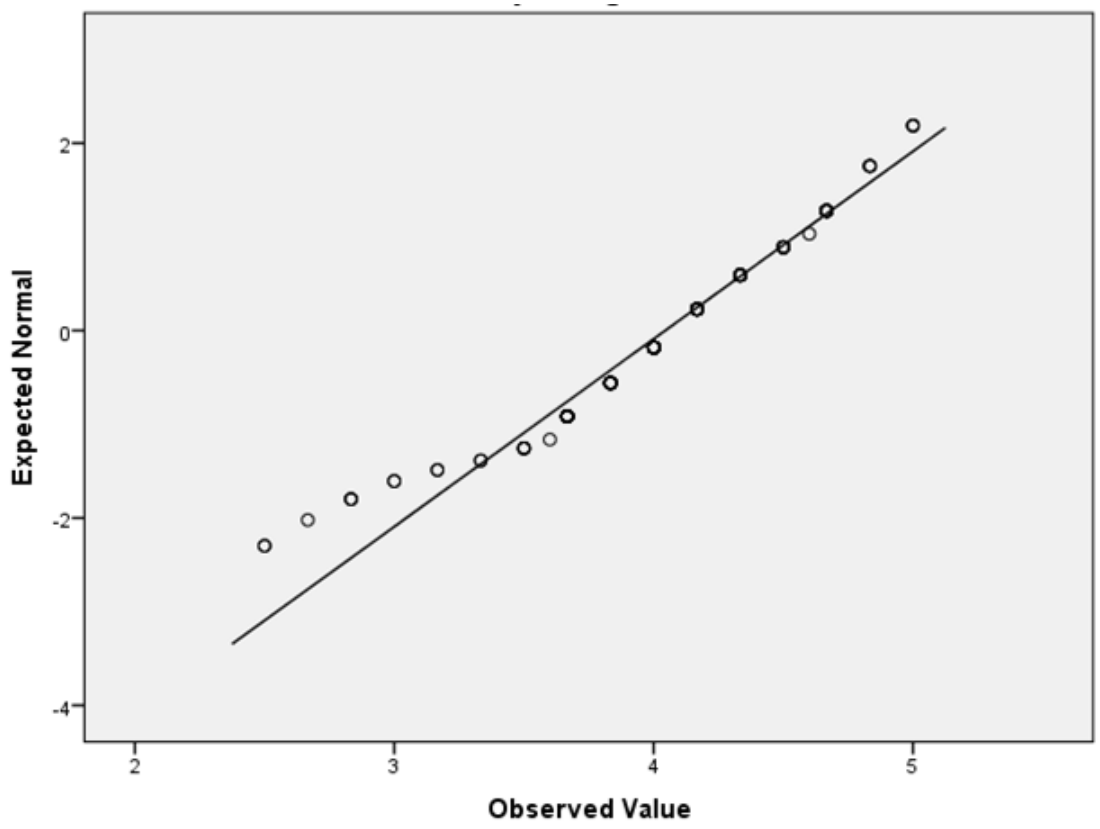

Figure 4.2: Normal Q-Q plot of Executive Commitment

4.5.1 (b) Normal Q-Q plot of User Involvement

For the independent variable user involvement, departure from normality was also not so much as can be seen from the approximation line of fit. This was a confirmation that data was near normal in its distribution and could therefore be used in regression analysis. This is shown in Figure 4.3;

Normal Q-Q plot of User Involvement

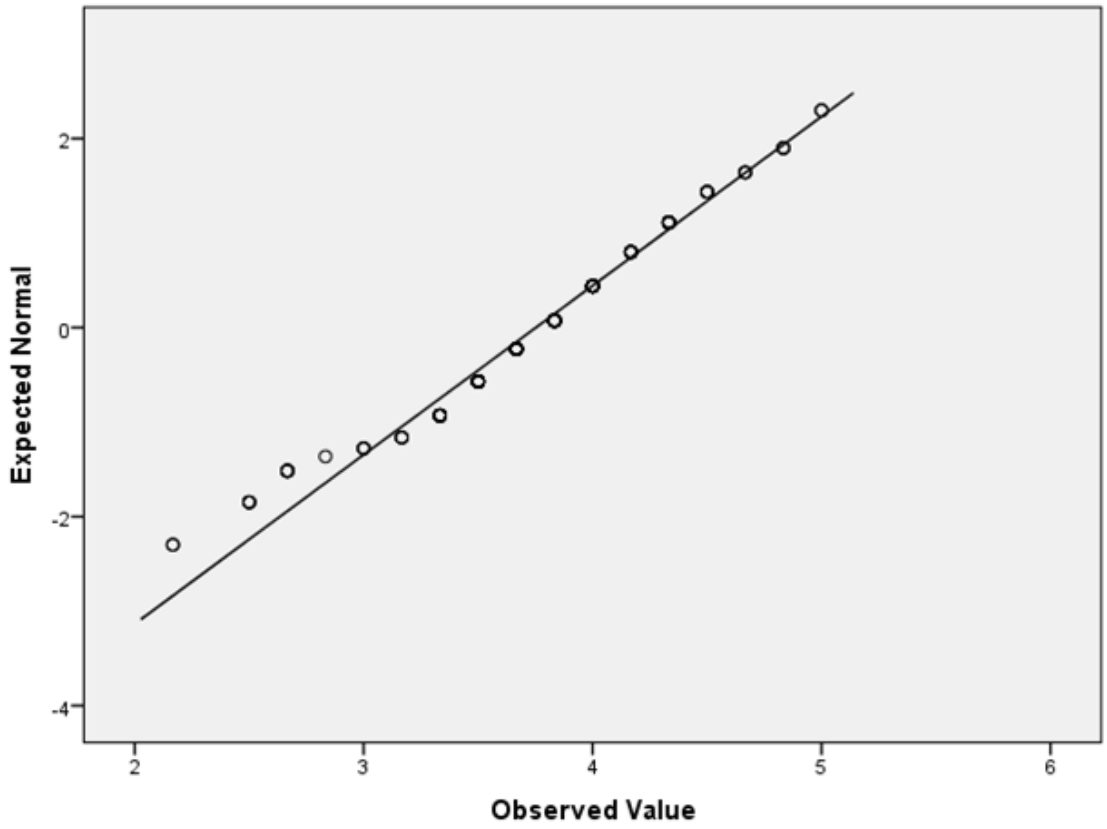

Figure 4.3: Normal Q-Q plot of User Involvement

4.5.1 (c) Normal Q-Q plot of Project Team Capability

The departure from normality for independent variable project team capability was also not very far off the line of approximation of fit. That was a confirmation that the data was almost normally distributed and hence could be used for regression analysis. This is illustrated in Figure 4.4;

Normal Q-Q plot of Project Team Capability

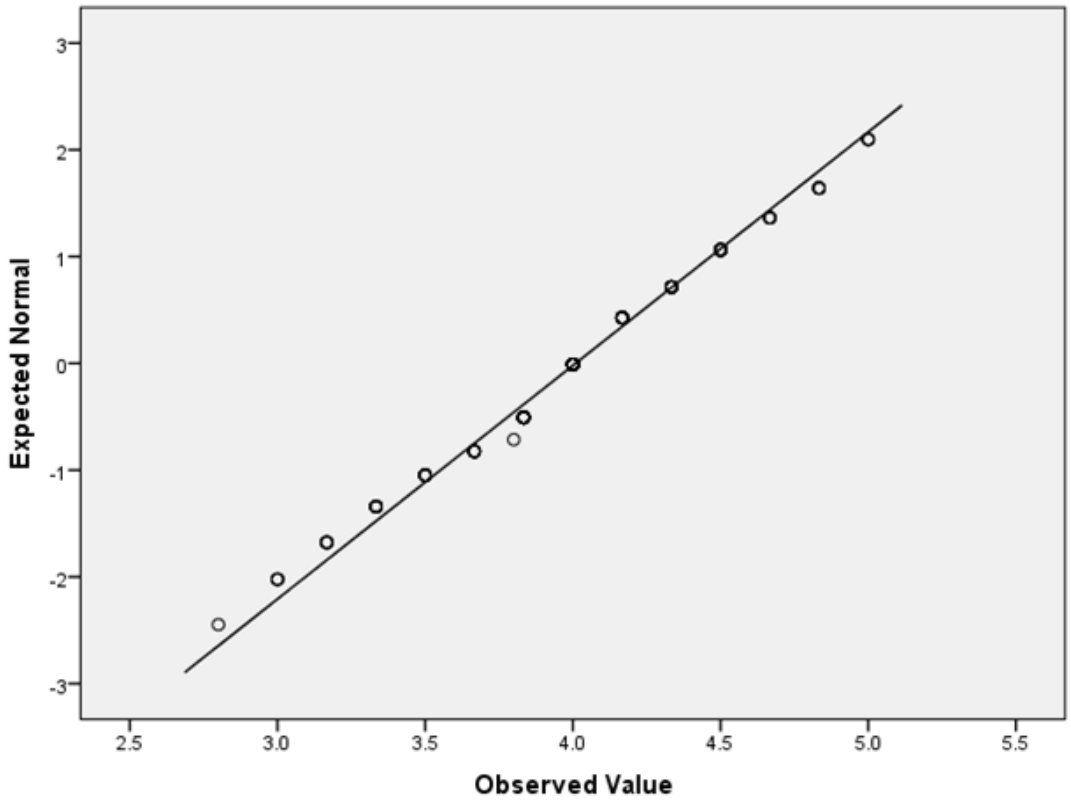

Figure 4.4: Normal Q-Q plot of Project Team Capability

4.5.1 (d) Normal Q-Q plot of Project Management Approach

For the independent variable project management approach, departure from normality was also not so much as shown by the approximated line of fit in Figure 4.5. This confirmed that the data was near normal distribution and could therefore be used in regression analysis.

Normal Q-Q plot of Project Management Approach

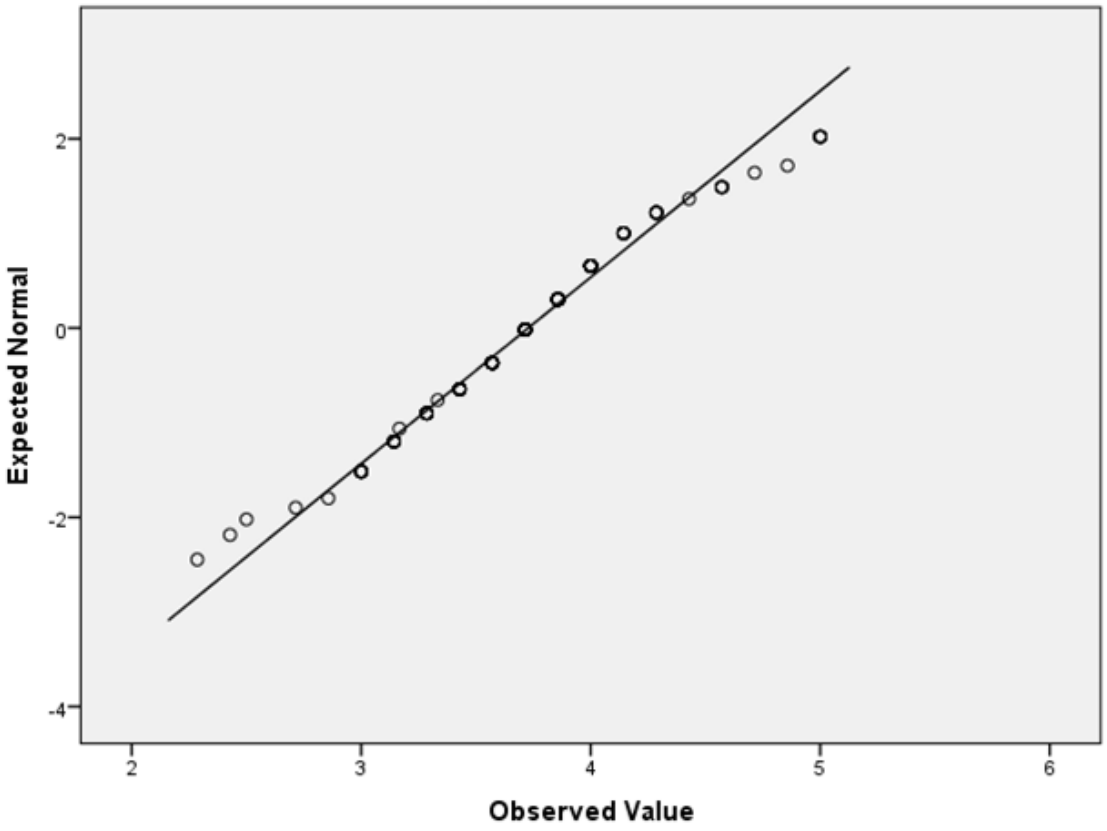

Figure 4.5: Normal Q-Q plot of Project Management Approach

4.5.1 (e) Normal Q-Q plot of Implementation of IT projects (Dependent variable)

Data for the dependent variable, implementation of IT projects, was not far off the approximation line of fit and could therefore be used in regression analysis. This is shown in Figure 4.6;

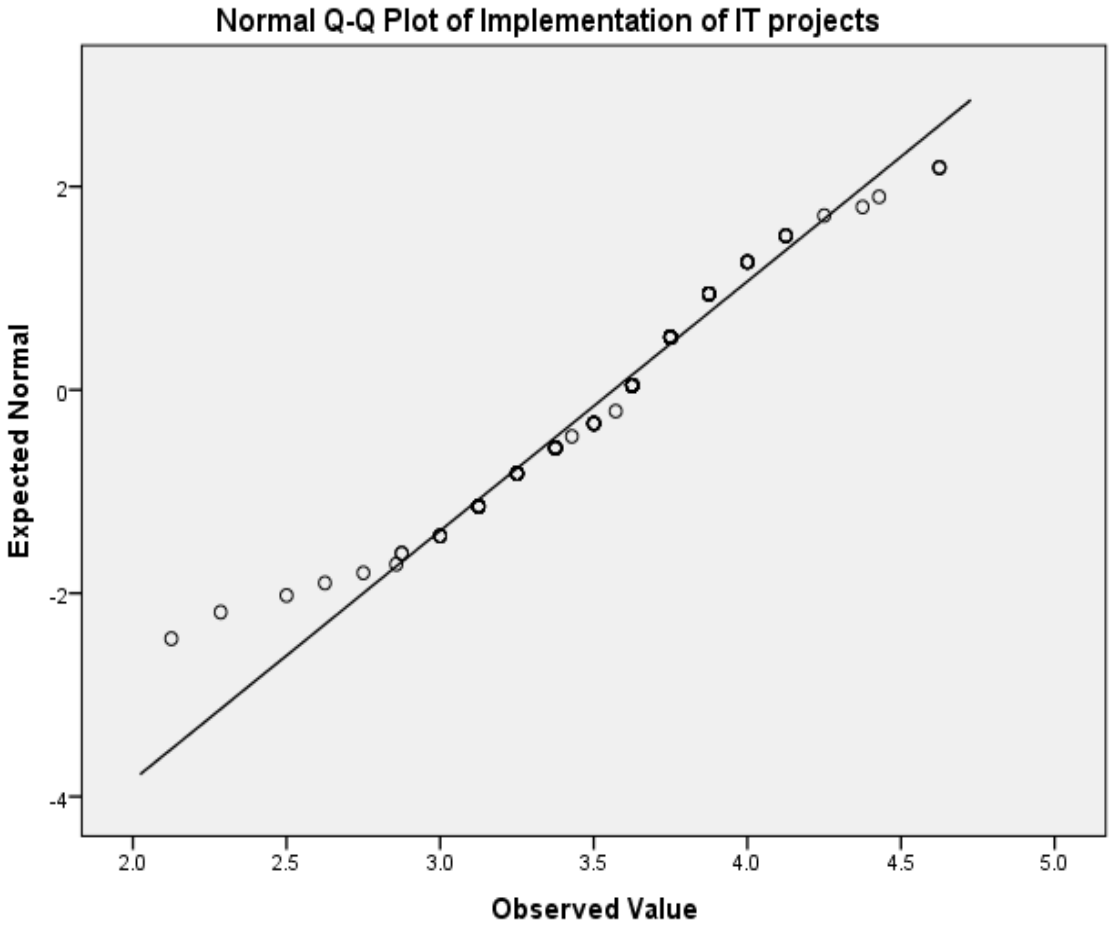

Figure 4.6: Normal Q-Q plot of Implementation of IT projects

4.5.2 Multicollinearity

Multicollinearity is a condition of very high intercorrelations or inter-associations among the independent variables and is therefore a type of disturbance in the data and if present in the data, the statistical inferences made about the data may not be reliable (Olawuwo, Ogunleye, Ojo & Adejumo, 2014). If the degree of correlation between variables is high enough, it can cause problems when you fit the model and interpret the results (Hair, Ringle & Sarstedt, 2011). Multicollinearity therefore describes the existence of strong correlations among predictor variables which results in problems with multiple regression analysis whereby it makes it difficult to easily identify the distinct relationship between each predictor variable and the dependent variable (Kumari, 2008). It occurs when two or more of the explanatory variables overlap and therefore methods of analysis cannot distinguish the explanatory factors from each other or isolate their independent influence (Rahman, 2009). According to Kumari (2008), in the presence of multicollinearity therefore, the estimate of one variable's effect on the dependent variable, while controlling for the other variables tends to be less precise than if predictors were uncorrelated with one another.

Variance Inflation Factors (VIFs) are widely used to detect multicollinearity among predictors in regression models. The variance inflation factor indicates whether a predictor variable has a strong linear relationship with the other predictors in the model. The Variance Inflation Factor (VIF) is 1/Tolerance and it is always greater than or equal to 1 (Yu, Jiang & Land, 2015). There is no formal VIF value for determining presence of multicollinearity. Values of VIF that exceed 10 are often regarded as indicating multicollinearity, but in weaker models values above 2.5 may be a cause for concern (Midi, Sarkar & Rana, 2010). Table 4.17 indicates that executive commitment had a VIF of 1.280 (less than 10), user involvement had a VIF of 1.461 (less than 10), project team capability had a VIF of 1.539 (less than 10) and project management approach had a VIF of 1.498 (less than 10) hence all variables were suitable.

4.5.3 Correlation Analysis for the Linear Relationship between the Study Variables

The researcher ran a correlation matrix to establish if there existed a relationship between the variables. Pearson Product Moment Correlation was used for the correlation analysis, with (r) being used to determine the linear relationship between the study variables. According to Mugenda *et al.,* (2012), the correlation coefficient yields a statistic that ranges between -1.0 (perfect negative correlation) to 1.0 (perfect positive correlation) and it shows the magnitude of the relationship between two variables. How big the correlation coefficient value is points to a stronger association between two variables. A zero value of (r) shows that there is no association between two variables. The correlation coefficients were computed for each pair of the variables and the results shown in the correlation matrix (Table 4.12).

The findings showed that implementation of IT projects had a high correlation with project team capability ($r = .369$, p-value < 0.001). That meant that a positive change in project team capability resulted in effective implementation of IT projects. Also, commercial banks that focused on user involvement in projects recorded improved effectiveness in implementation of IT projects as indicated by a significant correlation value ($r = .360$, p-value < 0.001). The study findings also showed that implementation of IT projects and adoption of project management approach had a relatively significant relationship ($r = .354$, p-value < 0.001). It showed that banks that embraced project management approach achieved effective implementation of IT projects.

Executive commitment showed a weak positive correlation with implementation of IT projects ($r = .148$, p-value $= .084$). Project risk being the moderating variable also showed a weak positive correlation with implementation of IT projects ($r = .136$, p-value $= .112$). The p-values for executive commitment and project risk were above the criteria of $\alpha < 0.05$ and therefore they were not statistically significant. Since all variables returned a positive correlation as shown in Table 4.12, they were therefore subjected to further regression analysis to determine their individual contributions.

Table 4.12: Correlation Analysis Results for Study Variables

		Y	X_1	X_2	X_3	X_4	M
Y	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	138					
X_1	Pearson Correlation	.148	1				
	Sig. (2-tailed)	.084					
	N	138	138				
X_2	Pearson Correlation	.360**	380**	1			
	Sig. (2-tailed)	.000	.000				
	N	138	138	138			
X_3	Pearson Correlation	.369**	.385**	.473**	1		
	Sig. (2-tailed)	.000	.000	.000			
	N	138	138	138	138		
X_4	Pearson Correlation	.354**	.369**	.460**	.502**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	138	138	138	138	138	
M	Pearson Correlation	.136	.156	.205*	.323**	.279**	1
	Sig. (2-tailed)	.112	.067	.016	.000	.001	
	N	138	138	138	138	138	138

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

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

Key: Y = Implementation of IT projects; X_1 = Executive commitment; X_2 = User involvement; X_3 = Project team capability; X_4 = Project management approach; M = Project risk

4.6 Regression Analysis Results

The researcher used multiple regression analysis to determine the linear statistical relationship between the independent, moderating and dependent variables of the study. The null hypotheses of the study were tested using linear regression models. F- test was used to test the validity of the model while (r^2) was used to measure the model's goodness of fit. The regression coefficient was used to describe the results of regression analysis and outline the nature and intensity of the relationships between the study variables.

4.6.1 Influence of Executive Commitment on Implementation of IT projects

To find out the influence of executive commitment (X_1) on implementation of IT projects (Y), a regression model was fitted to the data and it was found not to be statistically significant (F (1, 136) = 3.038, p = .084). The co-efficient of determination (R^2) of .022 was an indicator that executive commitment explained a paltry 2.2% variation in improvement of implementation of IT projects. The adjusted R^2 explained 1.5% variation while the remainder could be explained by other factors not included in the model. R value of .148 indicated a weak positive correlation between executive commitment and implementation of IT projects.

The hypothesis to be tested was **H_{01}**: Executive commitment has no significant influence on implementation of IT projects by commercial banks in Kenya.

The survey results showed that there was a weak positive relationship between executive commitment and implementation of IT projects by commercial banks in Kenya (β_1= .121, t = 1.743, p-value = .084). The regression model fitted to test the relationship was;
$Y = \beta_0 + \beta_1 X_1 + \varepsilon$; where;

Y = Implementation of IT projects, β_0 = Constant, X_1 = Executive commitment,

ε = Error term

The null hypothesis stating that executive commitment has no significant influence on implementation of IT projects by commercial banks in Kenya ($H_{01:}$ $\beta_1 = 0$) was therefore rejected ($\beta_1 = .121$, t = 1.743, p-value < .084) and a conclusion drawn that executive commitment (X_1) has a marginal influence on implementation of information technology projects by commercial banks in Kenya (Y). The resulting regression model was;

$Y = 3.077 + 0.121X_1$

The model equation shows that standardized implementation index of information technology projects will increase by .121 units with one unit increase in the index of executive commitment.

Table 4.13: Regression analysis results on executive commitment and implementation of IT projects

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.148[a]	.022	.015	.40458

a. Predictors: (Constant), Executive Commitment

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.497	1	.497	3.038	.084[b]
	Residual	22.261	136	.164		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects

b. Predictors: (Constant), Executive Commitment

c) Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.077	.282		10.901	.000
Executive - commitment	.121	.069	.148	1.743	.084

a. Dependent Variable: Implementation of IT projects

Pearson product-moment correlation coefficient for executive commitment and implementation of IT projects (r =.148, p-value = .084) was not significant at .05 level of significance. Regression analysis carried out showed that executive commitment had a marginal influence on implementation of information technology projects by commercial banks in Kenya. Effective implementation of information technology projects improved correspondingly by .121 units with every unit increase in the index of executive commitment.

These results on the influence of executive commitment on implementation of information technology projects were consistent with earlier studies by Yunis *et al.,* (2013) who indicated that among all the subsets of executive commitment, upper level management support has been suggested to be the primary determinant for effective implementation of IT projects. This is probably because upper level management support drives and influences other executive commitment subsets. Imreh *et al.,* (2011) and Mansor *et al.,* (2011) also emphasize that no project can be completed successfully unless the project manager secures commitment from the senior management. This implies that for any effective project implementation, there is necessity for sustained upper level management commitment to provide resources, authority and influence. Consistently, Dyck and Majchrzak (2012) found that upper level management commitment has a positive impact on effective implementation of IT projects.

Wan *et al.*, (2010); Sheffield *et al*., (2013) and Strode *et al*., (2010) found that leadership characteristics as a subset of executive commitment positively influenced effective implementation of IT projects. Additionally, Wan *et al*., (2010) indicated that other subsets of executive commitment namely change management characteristics, vision and mission significantly and positively had an impact on implementation of IT projects. Project planning and controlling refers to the extent to which planning and controlling practices are used in a project. Previous research has demonstrated a positive relationship between planning and effective project implementation (Yetton, Martin, Sharma & Johnston, 2013). Poor planning is likely to be associated with inefficiencies in development and, thus, lead to large budget and time variances (Didraga, 2012). Rigorously tracking and monitoring a project according to the work plan can ensure that the final product is delivered within budget and on schedule (Jun *et al*., 2011).

However, the marginal relationship between executive commitment and implementation of IT projects witnessed in this study could also be confirmed from previous studies. Although there is a unanimous agreement in the project management literature regarding the effectiveness of upper level management support, some others underplay its role in projects. Ivens and Pardo (2016) argue that what begins as support easily turns into interference, which is harmful especially in highly innovative environments. Ahmed, Mohamad and Ahmad (2016) found that upper level management support did not really matter in new product innovations.

More other studies found distinct determinants as having the most influence on successful implementation of projects. Wambugu (2012) in a study titled 'Influence of management practices on sustainability of women projects in Kenya,' identified strategy, project team capacity, project communication, monitoring and evaluation and client consultation as factors influencing success of Constituency Development Funds (CDF) projects in Nyeri County. Meroka (2011) concluded that financial viability, management, market analysis and the quality of project management are the critical success factors of industrial and commercial projects in Kenya.

4.6.2 Influence of User Involvement on Implementation of IT Projects

In establishing the influence of user involvement (X_2) on implementation of IT projects (Y), the regression model was found to be significant (F (1, 136) = 20.256, p – value < 0.001), indicating that user involvement was a valid predictor in the model. The coefficient of determination (R^2) value of .130 implied that user involvement independently explained 13% variation in effective implementation of information technology projects. The adjusted R^2 explained 12.3% and therefore the remainder could be explained by other factors not included in the model. The R value of .360 indicated a moderate positive correlation between user involvement and implementation of IT projects. The standard error of .38164 showed the deviation from the line of best fit as captured in Table 4.14.

The hypothesis to be tested was **H_{02}**: User involvement has no significant influence on implementation of information technology projects by commercial banks in Kenya.

The survey results showed that there was a positive relationship between user involvement and implementation of information technology projects by commercial banks in Kenya (β_2 = .263, t = 4.501, p-value < 0.001). The regression model fitted to test the relationship was;

$$\mathbf{Y = \beta_0 + \beta_2 X_2 + \varepsilon.}$$

The null hypothesis **H_{02}:** User involvement has no significant influence on implementation of information technology projects by commercial banks in Kenya was therefore rejected (β_2 = .263, t = 4.501, p-value < 0.001) and a conclusion drawn that user involvement (X_2) moderately influenced implementation of information technology projects (Y).

The model equation was;

$Y = 2.580 + .263X_2$ where; Y = Implementation of IT projects and X_2 = User involvement

The beta coefficient for user involvement was significant (β_2 = .263, t = 4.501, p-value < 0.001), implying that for every single unit increase in the index of user involvement, there is an improvement index of .263 in effectiveness of information technology project implementation as shown in Table 4.14.

Table 4.14: Regression results for the relationship between user involvement and implementation of IT projects.

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.360[a]	.130	.123	.38164

a. Predictors: (Constant), User Involvement

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.950	1	2.950	20.256	.000[b]
	Residual	19.808	136	.146		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects

b. Predictors: (Constant), User Involvement

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.580	.221		11.655	.000
	User - involvement	.263	.058	.360	4.501	.000

a. Dependent Variable: Implementation of IT projects

The findings shown in Table 4.14 confirm that user involvement had a positive influence on implementation of information technology projects (β_2 = .263, t = 4.501, p-value < 0.001). Results from regression analysis showed that user involvement positively influenced implementation of information technology projects in Kenya. Pearson's product-moment correlation coefficient for user involvement and implementation of information technology projects (r = .360, p – value < 0.001) was significant at 0.05 level of significance and indicated that for every unit increase in the index of user involvement, there is a corresponding improvement in effective implementation of IT projects by 0.13 or 13%.

User involvement consists of user participation and support, level of user training and education and user experience. User participation and support consist of the behaviours and activities of users in relation to product development (Jun *et al.,* 2011). This study confirms previous literature which revealed that user participation significantly increases the likelihood of effective implementation of information technology projects. Empirical studies by Shahzad *et al.,* (2014), Linton *et al*., (2017) and Sheffield *et al.,* (2013) provided data to support significant and positive relationship between user participation and support and effective implementation of information technology projects.

Similarly, findings of this study are consistent with Jun *et al.,* (2011) who demonstrated that resolving potential conflicts early arising from greater user participation plays a vital role in the perceived system satisfaction of information technology project developers and users. Further, users who have an acceptable level of basic education or training in information technology project management can easily explain their requirements and needs in a clear form. In the same breath, users who have basic knowledge about their business domain accurately identify their requirements thereby saving time, costs and contribute to process and product quality (Murad *et al.,* 2012).

This study's findings also support earlier findings by Yetton *et al.,* (2013) who established that user support increases the possibility that the project is completed on time and not redefined or abandoned but can also increase budget variances. Equally, Kawamura *et al.,* (2014) describe user experience as a configuration of users who are very familiar with system development tasks and have a wealth of experience on the activities to be supported by the future applications for implementation. Shahzad *et al.,* (2014) found that involvement of experienced users significantly and positively impacted on project scope but not timelines, cost or quality. Users who possess basic experience about their business domain can assist in identifying system development requirements in an explicit manner.

Likewise, this study concurs with Kawamura *et al.,* (2014) who found that lack of user experience significantly and negatively impacted on the quality of work done but no effect to other success measures. Jun *et al.,* (2011) also found that lack of user experience negatively and significantly affected project implementation in terms of both process and product. This implies that the user should of necessity have basic experience, training, education and knowledge about the contemporary business dynamics (Mohammad *et al.,* 2011).

Additionally, Jun *et al.,* (2011) argued that user experience and knowledge or understanding of requirements within a specific application area of the development team makes it easy to define complete, unambiguous or consistent requirements, which can lead to having IT products that can meet the client's needs and decreasing process performance. This study also supports previous scholars who found out that end user training, experience and education play a positive role in project success (Jun *et al.,* 2011; Livermore, 2008; Linton *et al.,* 2017; Pope-Ruark, 2014; Kawamura *et al.,* 2014). Precise understanding of the problem at hand can shorten the development time in producing a product for an information technology project.

4.6.3 Influence of Project Team Capability on Implementation of IT projects

The regression model of project team capability (X_3) and implementation of IT projects (Y) was significant (F (1, 136) = 21.461, p-value < 0.001), implying that project team capability was a valid predictor in the model. Coefficient of determination (R^2) was .136 meaning that project team capability independently explained 13.6% index improvement in implementation of IT projects. The adjusted R^2 was .130 meaning project team capability explained 13% index and the rest could be explained by other factors not included in the model. As shown in table 4.15, the R value of .369 implied a relatively moderate positive correlation between project team capability and implementation of IT projects and the standard error of .38018 indicated the deviation from the line of best fit.

The hypothesis to be tested was **H_{03}**: Project team capability has no significant influence on implementation of information technology projects by commercial banks in Kenya.

The survey results showed that there was a positive relationship between project team capability and implementation of IT projects (β_3 = .329, t = 4.633, p-value < 0.001). In order to test the relationship between the variables, the model fitted was;

$$\mathbf{Y = \beta_0 + \beta_3 X_3 + \varepsilon}$$

The null hypothesis **H_{03}** stating that project team capability has no significant influence on implementation of information technology projects by commercial banks in Kenya was therefore rejected (β_3 = .329, t = 4.633, p-value < 0.001) and a conclusion made that project team capability (X_3) significantly influenced implementation of IT projects (Y). The resulting regression model was;

$$\mathbf{Y = 2.245 + .329 X_3;}$$

where;

Y = Implementation of IT projects and X_3 = Project team capability

From table 4.15, the beta coefficient for project team capability was significant (β_3 = .329, t = 4.633, p-value < 0.001) and implied that for every single unit increase in the index of project team capability, there was a .329 improvement in the index of implementation of IT projects.

Table 4.15: Regression results for the relationship between project team capability and implementation of IT projects

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.369[a]	.136	.130	.38018

a. Predictors: (Constant), Project Team Capability

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.102	1	3.102	21.461	.000[b]
	Residual	19.657	136	.145		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects

b. Predictors: (Constant), Project Team Capability

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.245	.287		7.833	.000
	Project - Team capability	.329	.071	.369	4.633	.000

a. Dependent Variable: Implementation of IT projects

From Table 4.15, the findings confirmed that project team capability positively influenced implementation of information technology projects (β_3 = .329, t = 4.633, p-value < 0.001). Results from regression analysis showed that project team capability had a moderate influence on implementation of information technology projects. The model showed that effectiveness index in implementation of information technology projects would increase by .329 for every unit increase in project team capability index. Pearson product moment correlation coefficient for project team capability and implementation of information technology projects (r = .369, p-value < 0.001) was significant at 0.05 level of significance.

These findings confirm previous studies by Kappagomtula (2017) who noted that project team capability is specifically theorized to have a positive impact on effective implementation of information technology projects. The success of information technology projects greatly depends on the team's communication, team empowerment, expertise and experience, dedication and composition. Similarly, Cheung *et al.,* (2012) confirmed that team communication, dedication, expertise or skill, experience and empowerment determine a team's ability to quickly comprehend and respond to risks, thereby improving the chances of effective project implementation.

Shahzad *et al.,* (2014) found that team members with great motivation positively influenced the perceived success of information technology projects. Correspondingly, Wan *et al.,* (2010) found significant positive relationship between team dedication and IT project management success. This implies that dedicated project team members oftentimes do not have intentions to quit, which saves the project from costs of recruiting and orienting new members in terms of both time and money. Similarly, costs of supervision are mitigated if the project team members are adept at delivering on their project tasks. Jun *et al.,* (2011) found that internal project communication had a significant positive effect on both process and product performance. Similarly, Yetton *et al.,* (2013) demonstrated that project team conflict leads to instability in the team and thus result in a project being delayed and exceeding budget.

4.6.4 Influence of Project Management Approach on Implementation of IT projects

As shown in Table 4.16, the regression model of project management approach (X_4) and implementation of information technology projects was significant (F (1, 136) = 19.451, p-value < 0.001), confirming that project management approach was a valid predictor in the model. The coefficient of determination (R^2) was .125 implying that 12.5% improvement in effective implementation of information technology projects could be explained by project management approach adopted. Adjusted R^2 was .119 meaning 11.9% was explained by project management approach and the rest could be attributed to other factors not captured in the model. R score of .354 indicated a moderate positive correlation between project management approach and implementation of information technology projects. The standard error of .38263 indicated the deviation from the line of best fit.

The hypothesis to be tested was **H_{04}**: Project management approach has no significant influence on implementation of information technology projects by commercial banks in Kenya.

The survey results showed that there was a positive relationship between project management approach and implementation of information technology projects (β_4 = .284, t = 4.410, p-value < 0.001). In order to test the relationship, the regression model fitted was $Y = \boldsymbol{\beta_0 + \beta_4 X_4 + \varepsilon}$;

The null hypothesis $\mathbf{H_{04}}$ stating that project management approach has no significant influence on implementation of information technology projects by commercial banks in Kenya ($H_{04:}$ $\beta_4 = 0$) was therefore rejected (β_4 = .284, t = 4.410, p-value < 0.001) and a conclusion drawn that indeed project management approach (X_4) influences implementation of IT projects (Y). The resulting regression model was;

$$\mathbf{Y = 2.506 + .284X_4;}$$

where; Y = Implementation of IT projects and X_4 = Project management approach

The beta coefficient for project management approach was significant (β_4 = .284, t = 4.410, p-value < 0.001), implying that for every one unit varying in the index of project management approach, there was a .284 index improvement in effectiveness of implementation of IT projects.

Table 4.16: Regression results for the relationship between project management approach and implementation of IT projects

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.354[a]	.125	.119	.38263

a. Predictors: (Constant), Project Management Approach

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.848	1	2.848	19.451	.000[b]
	Residual	19.911	136	.146		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects

b. Predictors: (Constant), Project Management Approach

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.506	.242		10.349	.000
	Project-Management Approach	.284	.064	.354	4.410	.000

a. Dependent Variable: Implementation of IT projects

The findings of the survey revealed that project management approach positively influenced implementation of information technology projects (β_4 = .284, t = 4.410, p-value < 0.001). Results from regression analysis showed that project management approach had a moderate influence on implementation of information technology projects. The model showed that there was a .284 units improvement in effectiveness index of implementation of information technology projects. Pearson's product moment correlation coefficient for project management approach and implementation of information technology projects (r = .354, p-value < 0.001) was significant at 0.05 level of significance.

This study's findings confirm that project management is a well-recognized discipline and the principal vehicle used by a majority of the world's leading organizations to deliver their work. Regardless of the industry, sector or project size, utilizing appropriate project management approach is widely believed to enhance the probability of completing projects on time, within budget and to deliver the product to the satisfaction of all stakeholders (Pope-Ruark, 2014; Chepkoech & Waiganjo, 2015). However, this condition only applies if the project manager appreciates the nature of the project and is able to reshape and scale it to fit the project specifications (Rasnacis *et al.*, 2017).

Similarly, this study's findings concur with Mohabuth's (2017) study of 720 information technology projects that found that the use of an inappropriate methodology is actually the most critical risk driver for sub-optimal project implementation. Therefore, matching the project type and information technology project approach would be expected to enhance chances of effective implementation of information technology projects by commercial banks. Špundak (2014) researched on the issue of introducing agile methods to traditional environments and noted that larger organizations contained some unique management challenges. Larman and Vodde (2013) demonstrated that it is possible to use an agile approach on a large scale though, and that it is more a style of working than a prescribed set of procedures.

Separately, according to a survey on Project Management carried out by KPMG (2013), overall results showed that 41 percent of respondents said that their project managers always used specific project management methodologies. However, a comparison between use of a methodology and project outcomes gave a striking correlation whereby 90 percent of organizations that consistently delivered projects successfully would always or often use a project management methodology and this is in consonance with this study's findings that indeed the type of project management approach adopted contributes to effectiveness in implementation of IT projects.

4.6.5 Joint Influence of Independent Variables on Implementation of IT projects

Multiple regression was carried out where all the variables were aggregated to assess their collinearity with implementation of IT projects. A multiple regression model was fitted to the data and it was found to be statistically significant ($F(4,133) = 8.564$, p-value < 0.001). The four variables' R^2 was .205 meaning that they jointly explained 20.5% variation in effective implementation of information technology projects.

The hypothesis to be tested was that the joint determinants of implementation of projects have no significant influence on implementation of information technology projects by commercial banks in Kenya. To test the hypothesis, the following model was fitted;

$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon;}$ where;

Y = Implementation of IT projects X_1 = Executive commitment

X_2 = User involvement X_3 = Project team capability

X_4 = Project management approach

ε = Error term (referring to other factors not captured in the study but had influence).

The regression model fitted was given by;

$$\mathbf{Y = 1.96 - 0.064X_1 + 0.151X_2 + 0.187X_3 + 0.146X_4}$$

Under joint influence of factors, the null hypothesis stated that determinants of implementation of projects have no significant influence on implementation of information technology projects by commercial banks in Kenya. Regression analysis results revealed that executive commitment had a negative and insignificant relationship with implementation of information technology projects ($H_{01}: \beta_1 \neq 0$), since t= -.898, p-value = .371). We therefore fail to reject the null hypothesis and conclude that executive commitment (X_1) has no significant influence on implementation of information technology projects (Y).

User involvement had a positive and significant effect on implementation of information technology projects (H_{02}: $\beta_2 = 0$), since t = 2.210, p-value =.029). We therefore reject the null hypothesis and conclude that user involvement (X_2) has a significant influence on implementation of information technology projects (Y). It means a unit increase in user involvement causes 0.151 improvement in implementation of information technology projects when all the other variables are held constant.

Project team capability had a positive and significant effect on implementation of information technology projects (H_{03}: $\beta_3 = 0$), since t = 2.190, p-value =.030). We reject the null hypothesis and conclude that project team capability (X_3) has a significant influence on implementation of IT projects (Y). It means a unit increase in project team capability causes 0.187 improvement in implementation of information technology projects when all the other variables are held constant.

Project management approach had a positive but insignificant effect on implementation of information technology projects (H_{04}: $\beta_4 = 0$), since t = 1.926, p-value =.056). We fail to reject the null hypothesis and conclude that project management approach (X_4) has no significant influence on implementation of information technology projects (Y). It means a unit varying in project management approach causes 0.146 improvement in implementation of information technology projects.

In the model equation, the significant terms were the constant (t = 5.913, p<0.001), user involvement (t = 2.210, p = 0.029) and project team capability (t = 2.190, p = 0.030). Therefore, the model equation implies that for one unit increase in the index of user involvement, effective implementation of IT projects improves by an index of .151 when all the other variables are held constant. Effective implementation of IT projects will improve by an index of 0.187 with a unit increase in the index of project team capability, holding other variables constant and lastly, for one unit increase in the index of project management approach, there is a corresponding improvement in implementation of IT projects by an index of 0.146, holding other variables constant.

Table 4.17: Regression results for joint relationship model summary

a) Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.453[a]	.205	.181	.36888

a. Predictors: (Constant), Project Management Approach, Executive Commitment, User Involvement, Project Team Capability

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.661	4	1.165	8.564	.000[b]
	Residual	18.097	133	.136		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects b. Predictors: (Constant), Project Management Approach, Executive Commitment, User Involvement, Project Team Capability

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.963	.332		5.913	.000		
	X_1	-.064	.071	-.079	-.898	.371	.781	1.280
	X_2	.151	.068	.207	2.210	.029	.684	1.461
	X_3	.187	.086	.210	2.190	.030	.650	1.539
	X_4	.146	.076	.182	1.926	.056	.667	1.498

a. Dependent Variable: Implementation of IT projects

X_1 = Executive Commitment, X_2 = User Involvement, X_3 = Project Team Capability, X_4 = Project Management Approach, Y = Implementation of IT projects

4.6.6 Moderating effect of project risk on the determinants of implementation of IT projects.

A moderator variable, denoted as M, is a third variable that affects the strength of the relationship between the dependent variable (Y) and an independent variable (X). According to Aguinis (2004), the strength and form of relationship between two variables may depend on the value of the moderating variable. A moderator is a variable that modifies the form or strength of the relationship between an independent and a dependent variable. In correlation studies, the moderating variable is defined as a third variable denoted M, which affects the correlation between two variables X and Y. Hayes (2013) noted that a statistically significant moderating variable can amplify or weaken the correlation between X and Y. The moderating variable is technically another predictor variable and therefore multiple regression analysis is run to determine the effect of the variable.

This study sought to establish the moderating effect of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya. The researcher used multiple regression analysis to test the influence of the moderator variable on the independent and dependent variables. In order to test for the moderation effect, each of the study variables was analyzed separately, then with the moderating variable as a predictor and also jointly with the interaction term.

Project risk was operationalized by technical complexity, technological uncertainty, project size, specification changes and project criticality. On the other hand, determinants of implementation of projects were qualified by executive commitment, user involvement, project team capability and project management approach. The hypothesis to be tested was $\mathbf{H_{05}}$: Project risk has no significant moderating effect on the determinants of implementation of information technology projects by commercial banks in Kenya.

4.6.7 Moderating effect of project risk between executive commitment and implementation of IT projects.

Regression analysis was carried out to confirm whether project risk had a moderating effect between executive commitment and implementation of information technology projects. The study hypothesized that;

$H_{05(a1)}$: Project risk has no significant moderating effect between executive commitment and implementation of information technology projects by commercial banks in Kenya.

The following models were fitted to test the hypothesis;

Model 1: $Y= \beta_0+ \beta_1X_1 + \varepsilon$

Model 2: $Y= \beta_0 + \beta_1X_1+ \beta_MM + \varepsilon$

Model 3: $Y= \beta_0 + \beta_1X_1 + \beta_MM + \beta_1X_1M + \varepsilon$

To test for the moderation relationship, the standard models were fitted hierarchically. The simple regression model had project risk added as a predictor and finally the model was added with both executive commitment, project risk and the interaction term. Table 4.18(a) shows that the three models were not statistically significant ($p>0.001|$ in all cases). The coefficient of determination (R^2) for the first model was .022 implying that executive commitment contributed a paltry 2.2% to the variation in improvement of implementation of IT projects.

Similarly, adding project risk to the first model did not contribute significantly to the model improvement (F Change = 1.796, p = 0.182). This implied that the moderator had no predictive role when executive commitment was held constant. On adding the interaction term to the second model, the improvement was again not significant (F Change = 0.015, p = 0.902). This implied that project risk does not have a significant moderating effect between executive commitment and implementation of information technology projects.

Table 4.18: Moderating effect of project risk between executive commitment and Implementation of IT projects.

a) Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.148[a]	.022	.015	.40458	.022	3.038	1	136	.084
2	.186[b]	.035	.020	.40340	.013	1.796	1	135	.182
3	.187[c]	.035	.013	.40488	.000	.015	1	134	.902

a. Predictors: (Constant), Executive Commitment,

b. Predictors: (Constant), Executive Commitment, Project Risk

c. Predictors: (Constant), Executive Commitment, Project Risk, Executive Commitment*Project Risk

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.497	1	.497	3.038	.084[b]
	Residual	22.261	136	.164		
	Total	22.758	137			
2	Regression	.789	2	.395	2.426	.092[c]
	Residual	21.969	135	.163		
	Total	22.758	137			
3	Regression	.792	3	.264	1.610	.190[d]
	Residual	21.966	134	.164		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects

b. Predictors: (Constant), Executive Commitment

c. Predictors: (Constant), Executive Commitment, Project Risk

d. Predictors: (Constant), Executive Commitment, Project Risk, Executive Commitment*Project Risk

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.534	.039		91.316	.000		
	X_1	.121	.069	.148	1.743	.084	1.000	1.000
2	(Constant)	3.506	.044		80.054	.000		
	X_1	.105	.070	.129	1.505	.135	.973	1.028
	M	.105	.078	.115	1.340	.182	.973	1.028
3	(Constant)	3.507	.044		79.522	.000		
	X_1	.101	.078	124	1.288	.200	.780	1.282
	M	.101	.083	.111	1.216	.226	.862	1.160
	X_1M	.015	.123	.013	.123	.902	.692	1.446

a. Dependent Variable: Implementation of IT projects

X_1 = Executive Commitment, X_5 = Project Risk, X_1M = Interaction term

Beta value for executive commitment in the first model (β = .121, t = 1.743, p-value = .084) implied that executive commitment contributed an index of 0.121 to effectiveness in implementation of information technology projects. In the second model, project risk was combined with executive commitment. The beta value reduced marginally from (β = .121, t = 1.743, p-value = .084) to (β = .105, t =1.505, p-value = .135) and therefore not statistically significant. The beta value for project risk was (β = .105, t = 1.340, p-value = .182) and as such this study reached a conclusion that project risk was not a predictor in the model. In the third model, the interaction term (X_1*M) was introduced and with it the beta value for executive commitment plummeted further (β = .101, t = 1.288, p-value = .200) as was that of project risk (β = .101, t = 1.216, p-value = .226). The interaction term's (X_1*M) beta value marginally reduced to (β = .015, t = .123, p-value = .902) and was not significant.

These findings consequently confirmed the position that project risk did not have a moderating effect between executive commitment and implementation of information technology projects by commercial banks in Kenya. Project risk is theorized to have an effect on the success of project performance and implementation. The subsets of project risk identified from the literature were technical complexity, technological uncertainty, project size, urgency, project criticality and specification changes. Although some of the subsets of project risk can emerge during the course of project implementation, most of them are project-specific characteristics that initially exist in a project itself (Howell *et al*., 2010). The beta coefficient of the independent variable, followed by the combined independent variable and moderating variable then lastly for the interaction term kept deteriorating hence confirming findings by Jun *et al.,* (2011) who established that technical complexity adversely and negatively affected information technology project performance and implementation in terms of both process and product performance from the vendor perceptive.

Yetton *et al.,* (2013) in their study found that larger projects are likely to be characterized by high complexity and high levels of task interdependence which increase project failure. The findings are also in line with other empirical findings that large project size increases project risk (Teller, 2013; Jun *et al.*, 2011, Turner & Zolin, 2012). Jun *et al.,* (2011) postulated that other variables such as specification changes, inappropriate development approaches and criticality also increase project uncertainty, thereby indirectly affecting successful implementation of projects.

The findings of this study however contradict with those of a study by Jun *et al.,* (2011) who specifically established that project uncertainty as a subset of project risk had a moderating effect on the relationship between planning, control and internal integration and project implementation. It is worth noting that planning and control are subsets of executive commitment as is the case with internal integration as per the classification of this study.

4.6.8 Moderating effect of project risk between user involvement and implementation of IT projects.

Regression analysis was carried out to confirm whether project risk had a moderating effect between user involvement and implementation of information technology projects by commercial banks in Kenya. The hypothesis to be tested was;

$H_{05(a2)}$: Project risk has no significant moderating effect between user involvement and implementation of information technology projects by commercial banks in Kenya.

The following models were fitted to test the hypothesis;

Model 1: $\mathbf{Y = \beta_0 + \beta_2 X_2 + \varepsilon}$

Model 2: $\mathbf{Y = \beta_0 + \beta_2 X_2 + \beta_M M + \varepsilon}$

Model 3: $\mathbf{Y = \beta_0 + \beta_2 X_2 + \beta_M M + \beta_2 X_2 M + \varepsilon}$

The first model was statistically significant (p-value = 0.000) but the second and third models were not significant (p-value = 0.446 and p-value = 0.840) respectively, Table 4.19 (a) refers. The coefficient of determination (R^2) for the first model was .130, implying that user involvement on its own contributed 13% to the variation in successful implementation of IT projects. On adding project risk to the first model as a predictor, it did not contribute significantly to model improvement as R^2 increased marginally to .133. That meant user involvement with project risk could only explain 13.3% of successful implementation in IT projects (F Change = .585, p-value = .446). This implied that the moderator had no predictive role when user involvement was held constant. With the addition of the interaction term (X_2*M) to the model, the improvement was again not significant (F Change = .041, p-value = .840). This meant that project risk does not have a significant moderating effect between user involvement and implementation of IT projects. The model equations are;

Model 1: $\mathbf{Y = 3.505 + .263 X_2}$

Model 2: $\mathbf{Y = 3.490 + .253 X_2 + .057 M}$

Model 3: $\mathbf{Y = 3.492 + .244 X_2 + .047 M + .028 X_2 M}$

Table 4.19: Moderating effect of project risk between user involvement and implementation of IT projects.

a) Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.360[a]	.130	.123	.38164	.130	20.256	1	136	.000
2	.365[b]	.133	.121	.38222	.004	.585	1	135	.446
3	.366[c]	.134	.114	.38359	.000	.041	1	135	.840

a. Predictors: (Constant), User Involvement

b. Predictors: (Constant), User Involvement, Project Risk

c. Predictors: (Constant), User Involvement, Project Risk, User Involvement *Project Risk

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.950	1	2.950	20.256	.000[b]
	Residual	19.808	136	.146		
	Total	22.758	137			
2	Regression	3.036	2	1.518	10.389	.000[c]
	Residual	19.723	135	.146		
	Total	22.758	137			
3	Regression	3.042	3	1.014	6.891	.000[d]
	Residual	19.717	134	.147		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects

b. Predictors: (Constant), User Involvement

c. Predictors: (Constant), User Involvement, Project Risk

d. Predictors: (Constant), User Involvement, Project Risk, User Involvement*Project Risk

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.505	.035		99.788	.000		
	X_2	.263	.058	.360	4.501	.000	1.000	1.000
2	(Constant)	3.490	.040		86.536	.000		
	X_2	.253	.060	.347	4.230	.000	.955	1.047
	M	.057	.075	.063	.765	.446	.955	1.047
3	(Constant)	3.492	.042		83.953	.000		
	X_2	.244	.076	.334	3.207	.002	.596	1.677
	M	.047	.092	.051	.509	.611	.643	1.556
	X_2M	.028	.139	.025	.202	.840	.420	2.379

a. Dependent Variable: Implementation of IT projects

X_2 = User Involvement M = Project Risk X_2M = Interaction term

Evidence from running multiple regression on the data confirmed that project risk does not have a significant moderating effect between user involvement and implementation of information technology projects by commercial banks in Kenya. The findings are different from those espoused by Liu and Wang (2014) who found out that requirements instability had a negative effect on project implementation. Similarly, Liu *et al.*, (2014) found out that too much user specification changes may have a negative effect on project success and in particular, variations in delivery time, scope and budget. Project managers must therefore understand the potential trade-offs between pronounced and low specification changes. Also, contrary to this study's findings, Jun *et al.*, (2011) found that project risk subsets like technical complexity had a negative moderating effect on the relationship between user participation and project implementation especially for software development projects.

However, this research's findings are consistent with the views of Jun *et al.,* (2011) and Yetton *et al.,* (2013) who found that user participation tends to increase budget variance by encouraging suggestions for changes to specifications. The findings also mirror the empirical findings of Liu *et al.,* (2014) that increased interaction between users and the project team does not necessarily lead to a project that converges well. Contrary to this research findings, Jun *et al.,* (2011) established that uncertainty had a moderating effect on the relationship between user participation and project implementation whereby in the presence of elevated technological uncertainty, user support becomes a key cog in realizing project success and therefore by extension, project risk moderates the relationship between project customer factors and successful project implementation.

4.6.9 Moderating effect of project risk between project team capability and implementation of IT projects.

Regression analysis was performed to confirm whether project risk had a moderating effect between project team capability and implementation of information technology projects by commercial banks in Kenya. The hypothesis to be tested was;

$H_{05(a3)}$: Project risk has no significant moderating effect between project team capability and implementation of information technology projects by commercial banks in Kenya. The following models were fitted to test the hypothesis;

Model 1: $\mathbf{Y = \beta_0 + \beta_3 X_3 + \varepsilon}$

Model 2: $\mathbf{Y = \beta_0 + \beta_3 X_3 + \beta_M M + \varepsilon}$

Model 3: $\mathbf{Y = \beta_0 + \beta_3 X_3 + \beta_M M + \beta_3 X_3 M + \varepsilon}$

The first model was statistically significant ($p < 0.001$) but the second and third models were not statistically significant ($p = 0.836$ and $p = 0.186$) respectively, refer to Table 4.20 (a). The co-efficient of determination (R^2) for the first model was .136, implying that project team capability on its own contributed 13.6% to the variation in effective implementation of IT projects by commercial banks in Kenya.

However, adding project risk to the first model did not contribute significantly to model improvement as R^2 increased marginally to .137, implying that project team capability with project risk could only explain 13.7% of successful implementation in IT projects (F Change = .043, p-value = .836).

The slight change implied that the moderator had no predictive role when project team capability was held constant. With the addition of the interaction term (X_3*M) to the above model, the improvement was again not significant (F Change = 1.766, p-value = .186). This meant that project risk does not have a significant moderating effect between project team capability and implementation of IT projects. The model equations are;

Model 1: $\mathbf{Y = 3.467 + .329X_3}$

Model 2: $\mathbf{Y = 3.464 + .324X_3 + .016M}$

Model 3: $\mathbf{Y = 3.466 + .280X_3 - .036M + .172X_3M}$

Table 4.20: Moderating effect of project risk between project team capability and Implementation of IT projects.

a) Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.369[a]	.136	.130	.38018	.136	21.461	1	136	.000
2	.370[b]	.137	.124	.38152	.000	.043	1	135	.836
3	.384[c]	.148	.129	.38044	.011	1.766	1	134	.186

a. Predictors: (Constant), Project Team Capability

b. Predictors: (Constant), Project Team Capability, Project risk

c. Predictors: (Constant), Project Team Capability, Project Risk, Project Team Capability*Project Risk

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.102	1	3.102	21.461	.000[b]
	Residual	19.657	136	.145		
	Total	22.758	137			
2	Regression	3.108	2	1.554	10.676	.000[c]
	Residual	19.650	135	.146		
	Total	22.758	137			
3	Regression	3.364	3	1.121	7.747	.000[d]
	Residual	19.395	134	.145		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects

b. Predictors: (Constant), Project Team Capability

c. Predictors: (Constant), Project Team Capability, Project Risk

d. Predictors: (Constant), Project Team Capability, Project Risk, Project Team Capability*Project Risk

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.467	.039		89.865	.000		
	X_3	.329	.071	.369	4.633	.000	1.000	1.000
2	(Constant)	3.464	.042		82.633	.000		
	X_3	.324	.075	.363	4.297	.000	.894	1.119
	M	.016	.077	.018	.208	.836	.894	1.119
3	(Constant)	3.466	.042		82.859	.000		
	X_3	.280	.082	.314	3.404	.001	.748	1.337
	M	-.036	.086	-.039	-.414	.679	.711	1.406
	X_3M	.172	.129	.137	1.329	.186	.599	1.669

a. Dependent Variable: Implementation of IT projects

The survey results showed that there was a positive relationship between project team capability and implementation of information technology projects by commercial banks in Kenya. Beta value for project team capability in the first model (β = .329, t = 4.633, p-value = .000) implied that project team capability contributed .329 units to implementation index of information technology projects. In the second model, project risk was combined with project team capability. The beta value reduced from (β = .329, t = 4.633, p-value = .000) to (β = .324, t = 4.297, p-value = .000) hence statistically significant. The beta value for project risk was (β = .016, t = .208, p-value = .836) and therefore a conclusion was reached that project risk was not a predictor in the model.

In the third model, the interaction term (X_3*M) was introduced and with it the beta value for project team capability again reduced (β = .280, t = 3.404, p-value = .001). The beta value for project risk reduced to (β = -.036, t = -.414, p-value = .679). The interaction term's (X_3*M) beta value was (β = .172, t = .1.329, p-value = .186). These findings confirmed that project risk did not have a moderating effect between project team capability and implementation of information technology projects by commercial banks in Kenya.

The findings are consistent with studies by Nasir *et al.,* (2011) and Jun *et al.,* (2011) who found that the use of unfamiliar technologies can also lead to information technology system problems that reduce the implementation and eventual performance of the system product and occasion undue delays in implementation of projects. Urgency also constrains uncertainty in a similar fashion to complexity, by restraining the time resource available for understanding because decisions are made on much limited information (Howell *et al.,* 2010). Managers under time pressure also tend to take more vigorous and often more inappropriate measures in handling the obtaining situations thereby negatively impacting on effective implementation of information technology projects.

In the same vein, according to Orlowski *et al.*, (2015), other subsets of project risk such as technical complexity and technological uncertainty also negatively affect project implementation. Similarly, project criticality may demand a more plan-based approach to ensure that all project specifications are accounted for. In general, such projects are more likely to have lower process performance since extra communication and coordination may be required. Jun *et al.*, (2011) found that the absence of client knowledge and understanding of requirements or the absence of development experience and expertise within a specific application area of the development team makes it difficult to define complete, unambiguous or consistent requirements. As a result, this can lead to a system product that cannot meet the client's needs and decrease process performance.

Similarly, large project size can also negatively affect effective project implementation, more so for current projects than traditional projects (Nyoni *et al.*, 2017). Thus, generally, the level of project inherent uncertainty or risk associated with the project-specific critical success factors is also negatively associated with both process and product success. Yetton *et al.*, (2013) found that larger projects are likely to be characterized by high complexity and high levels of task interdependence which increase project failure. The findings are also in line with other empirical evidence that large project size increases project risk (Teller, 2013; Jun *et al.*, 2011; Turner & Zolin, 2012).

However, contrary to the subject study's findings, Jun *et al.*, (2011) established that uncertainty had a significant moderating effect on the relationship between planning and control, internal integration and user participation and project performance and therefore project risk moderates between project team capability and successful implementation of information technology projects.

4.6.10 Moderating effect of project risk between project management approach and implementation of IT projects.

Regression analysis was performed to confirm whether project risk had a moderating effect between project management approach and implementation of IT projects by commercial banks in Kenya. The hypothesis to be tested was;

$H_{05(a4)}$: Project risk has no significant moderating effect between project management approach and implementation of information technology projects by commercial banks in Kenya. The following models were fitted to test the hypothesis;

Model 1: $\mathbf{Y = \beta_0 + \beta_4 X_4 + \varepsilon}$

Model 2: $\mathbf{Y = \beta_0 + \beta_4 X_4 + \beta_M M + \varepsilon}$

Model 3: $\mathbf{Y = \beta_0 + \beta_4 X_4 + \beta_M M + \beta_4 X_4 M + \varepsilon}$

The first model was statistically significant ($p < 0.001$) but the second and third models were not significant ($p = 0.658$ and $p = 0.385$) respectively, refer to Table 4.21(a). The co-efficient of determination (R^2) for the first model was .125, implying that project management approach on its own accounted for 12.5% to the variation in effective implementation of IT projects. However, adding project risk to the first model did not contribute significantly to model improvement as R^2 increased marginally to .126, implying that project management approach with project risk could only explain 12.6% of successful implementation in IT projects (F Change = .197, p-value = .658). This implied that the moderator had no predictive role when project management approach was held constant. With the addition of the interaction term (X_4*M) to the model, the improvement was again not significant (F Change = .759, p-value = .385). This meant that project risk does not significantly moderate between project management approach and implementation of IT projects. The model equations are;

Model 1: $\mathbf{Y = 3.501 + .284X_4}$

Model 2: $\mathbf{Y = 3.492 + .275X_4 + .034M}$

Model 3: $\mathbf{Y = 3.491 + .242X_4 + .020M + .099X_4M}$

Table 4.21: Moderating effect of project risk between project management approach and Implementation of IT projects.

a) Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.354[a]	.125	.119	.38263	.125	19.451	1	136	.000
2	.356[b]	.126	.113	.38376	.001	.197	1	135	.658
3	.362[c]	.131	.112	.38410	.005	.759	1	134	.385

a. Predictors: (Constant), Project Management Approach

b. Predictors: (Constant), Project Management Approach, Project Risk

c. Predictors: (Constant), Project Management Approach, Project Risk, Project Management Approach*Project Risk

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.848	1	2.848	19.451	.000[b]
	Residual	19.911	136	.146		
	Total	22.758	137			
2	Regression	2.877	2	1.438	9.766	.000[c]
	Residual	19.882	135	.147		
	Total	22.758	137			
3	Regression	2.989	3	.996	6.752	.000[d]
	Residual	19.770	134	.148		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects

b. Predictors: (Constant), Project Management Approach

c. Predictors: (Constant), Project Management Approach, Project Risk

d. Predictors: (Constant), Project Management Approach, Project Risk, Project Management Approach*Project Risk

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.501	.036		98.094	.000		
	X_4	.284	.064	.354	4.410	.000	1.000	1.000
2	(Constant)	3.492	.040		86.405	.000		
	X_4	.275	.067	.343	4.083	.000	.917	1.090
	M	.034	.077	.037	.444	.658	.917	1.090
3	(Constant)	3.491	.040		86.217	.000		
	X_4	.242	.077	.302	3.125	.002	.695	1.438
	M	.020	.078	.022	.257	.797	.879	1.137
	X_4M	.099	.113	.085	.871	.385	.681	1.468

a. Dependent Variable: Implementation of IT projects

X_4 = Project management approach M = Project risk X_4M = Interaction term

Beta value for project management approach in model one (β = .284, t = 4.410, p-value = .000) implied that project management approach contributed .284 units to effectiveness in implementation of information technology projects. In the second model, project risk was combined with project management approach and the beta value reduced marginally to (β = .275, t = 4.083, p-value = .000) and therefore was statistically significant. The beta value for project risk was (β = .034, t = .444, p-value = .658) hence a conclusion was reached for this study that project risk was not a predictor in the model. In the third model, the interaction term (X_4*M) was introduced and with it the beta value for project management approach plummeted further (β = .242, t = 3.125, p-value = .002) and the same was the case for project risk (β = .020, t = .257, p-value = .797). The interaction term's (X_4*M) beta value was scored at a paltry (β = .099, t = .871, p-value = .385).

The findings confirmed that project risk did not have a moderating effect between project management approach and implementation of IT projects by commercial banks in Kenya. This study confirms the divergent positions held by various experts whereby literature is split on whether project management methodologies directly contribute to goals (Tsiga *et al.,* 2016; Nyoni *et al.*, 2017) or to the perceived appropriateness of project management (Joslin *et al.,* 2015). In some cases, there exists positive attitudes toward project management approach, and in other cases, unrealistic expectations are directed toward project management approach (Joslin *et al.,* 2015).

However, if the chosen project management approach does not produce the expected results, they are replaced with yet another approach and often those having other limitations (Wells, 2012). Sometimes a particular project management approach does not seem to fit in complex project environments; however, when they are customized, they tend to be too complex to be maintained and the organization may switch from an overly formal and rigid control to chaotic freedom (Joslin *et al.,* 2015).

This research confirms the findings by Bilau, Ajagbe, Kigbu and Sholanke (2015) who gave an interesting notion that project management methodologies are being infected with pathogens especially in the tools and systems employed that impact project success. This implies that, irrespective of configuration, when the tools and systems used in a methodology are infected with pathogens, the methodology never achieves its intended purpose of supporting project success. Wells (2012) found that project management methodologies vary in completeness and appropriateness from organization to organization as some are considered inadequate for certain types of projects. White and Fortune (2002) as cited by Joslin and Müller (2015) using a survey on project management practices, reported that very few methods, tools, and techniques were used; and for the ones that were used, almost 50% of the respondents reported drawbacks to the way these were deployed. Fortune and White (2011) stated that 27% of respondents experienced limitations with in-house PMMs and 57% of respondents experienced limitations with other PMMs.

Every project environment has its own unique set of factors that influence a project and its resources throughout the project life cycle which is why many papers use the concepts of organizational theory as a lens to examine project management phenomena (Crawford *et al.,* 2012). This by extension infers that it is possible for there to exist project risk but without necessarily having a significant moderating effect between project management methodologies and implementation of information technology projects.

Results in this study are consistent with previous studies that have demonstrated that different candidate project management methodologies have a statistically significant impact on successful implementation of projects under different dynamics of project risk. Subsets of project risk such as technical complexity and technological uncertainty can also negatively affect effective implementation of projects (Ahimbisibwe *et al.*, 2015). Jun *et al.,* (2011) posited that the use of unfamiliar technologies can also lead to problems in information technology projects that reduce the performance of the information technology product or delay the project for traditional approaches than for agile approaches.

Other subsets of project risk such as specification changes, inappropriate development methodology and criticality also increase project uncertainty, thereby indirectly affecting eventual effective implementation of projects (Teller, 2013). Similarly, project criticality may demand a more plan-based approach to ensure that all project specifications are accounted for in their entirety. In general, such projects are more likely to have lower process implementation and performance success since extra communication and coordination may be required. Similarly, large project sizes can also negatively affect the overall project implementation and performance, and such cases are prevalent more so for agile projects than for traditional projects.

4.7 The Joint Moderation Effect

4.7.1 Joint moderation effect of project risk on the determinants of implementation of IT projects.

In this section, regression analysis was run to validate whether project risk had a moderating effect on the determinants of implementation of information technology projects. The hypothesis to be tested was;

$H_{05(b)}$: Project risk has no significant moderating effect on the determinants of implementation of information technology projects by commercial banks in Kenya.

The following models were fitted to test the hypothesis;

Model 1: $Y= \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \varepsilon$

Model 2: $Y= \beta_0 + \beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \beta_MM + \varepsilon$

Model 3: $Y= \beta_0 + \beta_1X_1+ \beta_MM + \beta_1MX_1+ \beta_2X_2+ \beta_MM + \beta_2MX_2+ \beta_3X_3+ \beta_MM + \beta_3MX_3+ \beta_4X_4+ \beta_MM + \beta_4MX_4+ \varepsilon$

The first model was statistically significant ($p < 0.001$) but the second and third models were not significant ($p = .828$ and $p = .926$) respectively, see Table 4.22 (a). The coefficient of determination (R^2) for model one was .205 implying that determinants of implementation of projects on their own accounted for 20.5% variation in effective implementation of IT projects. However, adding project risk to model one did not contribute significantly to model improvement as the coefficient of determination (R^2) remained static at .205 (F Change = .047, p-value = .828). This implied that the moderator had no predictive role when determinants of implementation of projects were held constant. On adding the interaction term to the above model, the improvement was still not significant (F Change .222, p-value = .926). This meant that project risk did not have significant moderating effect on the determinants of implementation of information technology projects by commercial banks in Kenya.

Table 4.22: Regression results for the joint overall model.

a) Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.453[a]	.205	.181	.36888	.205	8.564	4	133	.000
2	.453[b]	.205	.175	.37021	.000	.047	1	132	.828
3	.459[c]	.211	.155	.37465	.005	.222	4	128	.926

a. Predictors: (Constant), X_4, X_1, X_2, X_3

b. Predictors: (Constant), X_4, X_1, X_2, X_3, Project risk

c. Predictors: (Constant), X_4, X_1, X_2, X_3, Project risk, X_1*Project risk, X_4*Project risk, X_3*Project risk, X_2*Project risk

b) ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	4.661	4	1.165	8.564	.000[b]
	Residual	18.097	133	.136		
	Total	22.758	137			
2	Regression	4.667	5	.933	6.811	.000[c]
	Residual	18.091	132	.137		
	Total	22.758	137			
3	Regression	4.792	9	.532	3.793	.000[d]
	Residual	17.967	128	.140		
	Total	22.758	137			

a. Dependent Variable: Implementation of IT projects (Y)

b. Predictors: (Constant), X_4, X_1, X_2, X_3

c. Predictors: (Constant), X_4, X_1, X_2, X_3, Project risk

d. Predictors: (Constant), X_4, X_1, X_2, X_3, M, X_1* M, X_4*M, X_3* M, X_2* M

c) Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.458	.039		89.632	.000		
	X_1	-.064	.071	-.079	-.898	.371	.781	1.280
	X_2	.151	.068	.207	2.210	.029	.684	1.461
	X_3	.187	.086	.210	2.190	.030	.650	1.539
	X_4	.146	.076	.182	1.926	.056	.667	1.498
2	(Constant)	3.461	.042		83.371	.000		
	X_1	-.064	.072	-.078	-.893	.373	.781	1.280
	X_2	.151	.068	.207	2.207	.029	.684	1.462
	X_3	.191	.088	.214	2.182	.031	.625	1.600
	X_4	.149	.077	.185	1.931	.056	.655	1.526
	M	-.016	.076	-.018	-.217	.828	.873	1.146
3	(Constant)	3.457	.044		79.017	.000		
	X_1	-.052	.088	-.064	-.587	.558	.527	1.897
	X_2	.155	.087	.212	1.776	.078	.432	2.316
	X_3	.174	.101	.195	1.726	.087	.484	2.066
	X_4	.126	.095	.157	1.322	.189	.440	2.273
	M	-.031	.096	-.034	-.324	.746	.559	1.790
	X_1M	-.012	.144	-.010	-.080	.936	.430	2.324
	X_2M	-.048	.166	-.043	-.288	.774	.281	3.562
	X_3M	.089	.185	.071	.482	.630	.283	3.539
	X_4M	.062	.147	.054	.422	.674	.384	2.606

a. Dependent Variable: Implementation of IT projects

X_1 = Executive Commitment, X_2 = User Involvement, X_3 = Project Team Capability X_4 = Project Management Approach, X_iM = Interaction Term.

4.7.2 Discussion on the joint overall model

This study sought to analyze the determinants of implementation of information technology projects by commercial banks in Kenya. In the study, a thorough literature review from secondary sources including books, journals and conference proceedings was done and critical determinants of project implementation aggregated based on their relationships, semantics flow and dependencies between the individual subsets to form single determinants. The determinants were categorized as executive commitment, user involvement, project team capability and project management approach. Further analysis showed that these determinants were predictors of implementation of projects.

This study supports early research by Belassi and Tukel (1996) and cited by Prabhakar (2008) who categorized factors affecting project performance as factors related to project, organization, project managers, team members and external environment. Pinto and Slevin (1989) and cited by Prabhakar (2008) did a survey of 418 PMI members in finding the critical determinants of project implementation. Based on the extensive literature review of 17 research papers, Aldayel, Aldayel and Al-Mudimigh (2011) identified 23 critical determinants of successful implementation of Enterprise Resource Planning (ERP) projects. Kostromina and Bordovskaia (2013) suggested to project managers that they should concentrate on multi-factor model for critical determinants of project success and they should also identify the relative importance amongst the factors.

Rahman *et al.,* (2014) did a survey of 142 respondents, in which 14 percent were from the information systems and software profession, to study the relationship between organizational structure, organizational roles, capabilities, project manager's skills and competencies and successful implementation of projects. In this study, 37.6 percent of the respondents said that projectized organizational structure is most conducive to project success. Chaveesuk and Hongsuwan (2017) posited that user participation and team skills were the factors which determine project implementation success or failure. Khan *et al.,* (2016) stated that cooperation, coordination and integration are determinants of successful implementation of projects involving multiple buyers and suppliers.

Also, this study corroborates findings by Wells (2012) who identified clear goals or objectives, support from senior management and adequate resources including funding as top three most critical determinants of successful implementation of projects based on a survey of 995 project managers in the United Kingdom. A total of 60 percent of the projects surveyed were IT projects. Afande (2013) identified project management methodology as a critical determinant for successful implementation of IT projects based on an empirical study. To further buttress this study's findings, based on secondary research, Kamal (2009) categorized the critical determinants of successful IT innovation, adoption and implementation in the government sector into five categories namely perceived technology factors, organizational factors, collaboration factors, external factors and support factors. Overall, he identified 42 critical factors including top management support, customer support, user participation, financial, decision making, organizational politics, organizational culture and size.

This study also sought to determine the moderating role of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya in which it was concluded that the moderator had no significant moderating effect. Technical complexity and project uncertainty are frequently regarded as independent factors (Orlowski, *et al.*, 2015; Pak *et al*., 2016). However, authors such as Petit (2012) and Hass (2008) consider complexity and uncertainty to be aspects of the same variable. As Howell *et al.,* (2010) argue, the project management issues surrounding complexity center upon capacity to understand what is going on, and consequently predict the relationship between inputs and outputs. Lack of predictability is identical with uncertainty, and thus complexity becomes a factor in uncertainty (Howell *et al*., 2010). Equally, use of new technologies also increases uncertainty (Howell *et al.*, 2010). Some empirical evidence reveals that project size can also affect project performance (Teller, 2013). However, contrary to this study's findings, Jun *et al*., (2011) established that uncertainty as a subset of project risk had a moderating effect on user commitment, user involvement, project team capability, project management methodologies and successful implementation of projects.

Table 4.23: Summary of Hypotheses Tested

S/No.	Hypothesis	Decision
H_{01}	Executive commitment has no significant influence on implementation of IT projects by commercial banks in Kenya.	Reject H_{01}
H_{02}	User involvement has no significant influence on implementation of IT projects by commercial banks in Kenya.	Reject H_{02}
H_{03}	Project team capability has no significant influence on implementation of IT projects by commercial banks in Kenya.	Reject H_{03}
H_{04}	Project management approach has no significant influence on implementation of IT projects by commercial banks in Kenya.	Reject H_{04}
$H_{05\ (a1)}$	Project risk has no significant moderating effect between executive commitment and implementation of IT projects.	Fail to reject $H_{05\ (a1)}$
$H_{05\ (a2)}$	Project risk has no significant moderating effect between user involvement and implementation of IT projects.	Fail to reject $H_{05\ (a2)}$
$H_{05\ (a3)}$	Project risk has no significant moderating effect between project team capability and implementation of IT projects.	Fail to reject $H_{05\ (a3)}$
$H_{05\ (a4)}$	Project risk has no significant moderating effect between project management approach and implementation of IT projects.	Fail to reject $H_{05\ (a4)}$
$H_{05\ (b)}$	Project risk has no significant moderating effect on the determinants of implementation of IT projects by commercial banks in Kenya.	Fail to reject $H_{05\ (b)}$

Table 4.24: Summary of Moderating Effect Results

Hypothesis	Variables	F-Change	P-value	Decision
$H_{05\ (a1)}$	Project risk (M)* Executive commitment & implementation of IT projects.	.015	.902	Fail to reject H_0
$H_{05\ (a2)}$	Project risk (M)* User involvement & implementation of IT projects.	.041	.840	Fail to reject H_0
$H_{05\ (a3)}$	Project risk (M)* Project team capability & implementation of IT projects.	1.766	.186	Fail to reject H_0
$H_{05\ (a4)}$	Project risk (M)* Project management approach & implementation of IT projects.	.759	.385	Fail to reject H_0
$H_{05\ (b)}$	Project risk (M)* Determinants of implementation of IT projects by commercial banks in Kenya.	.222	.926	Fail to reject H_0

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the key findings as guided by the specific objectives of the study, the conclusions reached based on the information gathered and policy recommendations for practice as well as suggestions for further research.

5.2 Summary of major findings

The overall objective of this study was to analyze the determinants of implementation of information technology projects by commercial banks in Kenya. Specifically, the study aimed to examine the influence of executive commitment, to determine the influence of user involvement, to establish the influence of project team capability, to examine the influence of project management approach on implementation of information technology projects and finally to determine the moderating effect of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya.

5.2.1: To examine the influence of executive commitment on implementation of information technology projects by commercial banks in Kenya.

The first specific objective of the study was to examine the influence of executive commitment on implementation of information technology projects by commercial banks in Kenya. The study established that the influence of executive commitment on implementation of information technology projects by commercial banks in Kenya was not significant. However, the role played by executive commitment in enhancing effective implementation of IT projects cannot be gainsaid. Banking sector dynamics have over time shown that strategy, facilitation and leadership are the three most fundamental contributing elements to upper level management's role as a subset of executive commitment.

This study also found out that just like executive commitment was not significant in influencing effective implementation of information technology projects, the moderating variable being project risk was also not a significant moderator between executive commitment and implementation of information technology projects by commercial banks in Kenya. From the study, planning and control of all project activities must be embedded in designated hierarchical levels of the project organization thereby achieving rigorous tracking and monitoring of the projects' progress.

The project organization's overall culture, and in particular risk-taking attitudes as characterized by collegiality among staff in the project environment and their general teamwork, flexibility and mutual participation were found to encourage social interaction within the project environment. Flexible leadership style inculcates adaptive behaviour amongst the project team hence allowing a conducive working environment. Change management characteristics, vision and mission are significant subsets that have a bearing on executive commitment. Environments in which information technology projects take place tend to be highly volatile and therefore adoption to quick changes must be well ingrained in project staff.

5.2.2: To determine the influence of user involvement on implementation of information technology projects by commercial banks in Kenya.

The study determined that user involvement had a significant influence on implementation of information technology projects by commercial banks in Kenya. This confirms the important role that users play in the implementation process of information technology projects by commercial banks in Kenya. The findings showed that multifaceted characteristics of users can be enhanced over time in order to become substantive players in commercial banks' information technology projects. User involvement is an amalgamation of critical characteristics of users in the project organization and include users' mutual support, co-operation, experience and participation.

The criticality of these characteristics in adding impetus and value to the implementation process of IT projects was confirmed by findings in this study and also by earlier conducted studies. Users who have basic experience about their business domain help to explicitly identify information technology projects' development requirements. The study sought to determine the influence of user involvement on implementation of information technology projects, as an important and critical success determinant. The study also established that project risk as a moderating variable was not a significant moderator between user involvement and implementation of information technology projects by commercial banks in Kenya.

5.2.3: To establish the influence of project team capability on implementation of information technology projects by commercial banks in Kenya.

The third specific objective of the study was to establish the influence of project team capability on implementation of information technology projects by commercial banks in Kenya. This study found out that project team capability had a significant influence on implementation of information technology projects by commercial banks in Kenya. The study reaffirms the long-held existence of there being a relationship between project team characteristics and implementation of information technology projects.

These results confirm that capable project team members have an inner feeling of loyalty and responsibility to the project. This occasions a working environment where less supervision is required hence allowing for cost savings. Similarly, dedicated project team members oftentimes do not harbour intentions of quitting and this saves commercial banks from costs of recruitment and orientation of new members in terms of both time and money. In the same breath, the study established that project risk as a moderator variable did not have a significant moderating effect between project team capability and implementation of information technology projects by commercial banks in Kenya.

5.2.4: To examine the influence of project management approach on implementation of information technology projects by commercial banks in Kenya.

The fourth specific objective of the study was to examine the influence of project management approach on implementation of information technology projects by commercial banks in Kenya. The study found out that there was a significant influence of project management approach on implementation of information technology projects by commercial banks in Kenya. The research showed that the project management approach adopted is specifically developed to address particular needs of the project environment. A well thought out analysis of requisite output, service, product or system is identified from the outset for information technology projects.

The project organization then focuses on having a new project management approach introduced or improvement on an earlier one done. An inventory is then kept of the documentation and processes adopted to ensure that future developments can be done easily. As such, institutions that decide to develop their own customized project management approach or adopt an international standard will have different starting points insofar as documentation will be concerned.

This study also established that project risk did not have a significant moderating effect between project management approach and implementation of information technology projects by commercial banks in Kenya. Several researchers in their prior studies show that it is not just the use of a project management approach that leads to project success; it is the experience of using the particular project management approach and the ability to tailor it to the context of a subject project that links it to project success. Project managers with their project teams must fully understand and have the requisite experience to know which project management approach subsets are to be applied on diverse projects. The findings of this study provide new insight on the subject of applicable project management methodologies.

5.2.5: To determine the moderating effect of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya.

This study sought to assess the moderating effect of project risk between determinants of implementation of projects and implementation of information technology projects by commercial banks in Kenya. While some prior studies confirmed that there was a moderating effect of project risk between some subsets of executive commitment and implementation of information technology projects, this study found contrary results where project risk was found not to be a valid predictor in the model and did not significantly moderate between executive commitment and implementation of information technology projects by commercial banks in Kenya. The study showed that, for all new projects, it is imperative that project organizations continuously monitor the possible effects of project risk.

Based on the findings of this study, project risk did not have a predictive role in the model and further regression analysis confirmed that project risk did not have a significant moderating effect between user involvement and implementation of information technology projects by commercial banks in Kenya. Some previous studies recorded different findings whereby in one of the studies, it was found that a subset of project risk namely technical complexity had a negative moderating effect between user involvement and participation and implementation of information technology projects. In the context of this study, subsets of project risk included technical complexity, technological uncertainty, project criticality and specification changes. In line with this study's findings, other prior studies found that an application's complexity did not significantly impact on project effectiveness in terms of the quality of work done, meeting schedules, operational efficiency and operational speed and meeting budgets.

Findings from this study revealed that there was a positive relationship between project team capability and implementation of information technology projects by commercial banks in Kenya. However, adding project risk to the model as the moderator did not contribute significantly to model improvement hence concluding that project risk did not have a predictive role when project team capability was held constant. With the addition of the interaction term, improvement to the model was again not significant implying that project risk did not have a significant moderating effect between project team capability and implementation of information technology projects by commercial banks in Kenya.

This study's findings confirmed that when combined with other determinants, project management approach was not significant in influencing the implementation of information technology projects by commercial banks in Kenya. Further, addition of project risk did not significantly improve the model implying that project risk did not have a predictive role when project management approach was held constant. On adding the interaction term to the model, the improvement was similarly not significant hence the conclusion that project risk did not have a significant moderating effect between project management approach and implementation of information technology projects by commercial banks in Kenya.

The fifth specific objective of this study was to determine the moderating effect of project risk on the determinants of implementation of information technology projects by commercial banks in Kenya. This study's findings showed that project risk as a moderator variable did not have a significant moderating effect on the determinants of implementation of information technology projects, in this case being the independent variables which were executive commitment, user involvement, project team capability and project management approach and the dependent variable which was implementation of information technology projects by commercial banks in Kenya.

5.3 Conclusions of the study

This study's findings showed that each of the four project implementation determinants namely executive commitment, user involvement, project team capability and project management approach individually influenced implementation of information technology projects by commercial banks in Kenya. However, executive commitment showed a weak relationship when tested against implementation of information technology projects. Project team capability had the greatest influence on implementation of IT projects, followed by user involvement then project management approach. Although executive commitment exhibited marginal influence on implementation of IT projects, its importance cannot be gainsaid.

Upper level management support as a subset of executive commitment is critical in providing resources, giving direction and overall leadership to the project. Based on this research, it came out that pronounced planning and controlling by parent organizations in the project environment may sometimes be misconstrued for interference given that projects usually have their own complete administrative structures. Where the parent organization does not give clear-cut objectives and realistic goals, it may result in having disenchanted and disenfranchised project staff who struggle to deliver on their mandates. Cumulatively, this research concludes that executive commitment had a marginal influence on implementation of IT projects by commercial banks in Kenya.

Based on the findings of this study, user involvement was found to have a positive influence having recorded the second highest contribution to effective implementation of IT projects by commercial banks in Kenya. The study concludes that user support and involvement are critical in realizing the envisaged results of successfully implementing IT projects, since acceptance testing before eventual roll-out is facilitated by users who interact with the new systems. From the research findings, it was apparent that training and education did not receive due attention from commercial banks as most users and project team members indicated not to have had capacity building trainings hence lacking requisite experience thus hampering seamless roll-out of new IT projects.

This study concludes that project team capability as a determinant of implementation of projects positively influences implementation of information technology projects by commercial banks in Kenya. In this study, the determinant returned the highest contribution to effective implementation of information technology projects by commercial banks in Kenya. Project team capability subsets especially internal communication makes or breaks the project organization and by extension envisaged projects. The study shows that structured communication amongst project team members and other stakeholders to the project is a key implementation contributor. Capable project teams having balanced composition with the right expertise and experience are the gem that bring success to implementation of information technology projects.

Project team capability is specifically about dynamics of project teams that are generally theorized to contribute positively to the impact of successful implementation of information technology projects. These subsets include project team's communication, team empowerment, expertise and experience, and composition. On the whole, these project team capability subsets determine a team's ability to quickly comprehend and respond to issues concerning the information technology projects being undertaken.

This study's findings also mean that with a correct mix and composition of multidisciplinary skill sets among the project team members, there is a high likelihood that information technology projects would be implemented on time, within envisaged budgets and to the required quality specifications. The findings point to a situation where best workers in various segments of the project organization are of necessity included as part of the implementation teams of emerging projects as they contribute innovative ideas and enhance creativity in project teams. Also, structured and continuous communication among project team members brings about tranquility in the work environment hence promoting high levels of productivity by project teams.

This study concludes that there was a positive relationship between project management approach and implementation of information technology projects. In this study, project management approach had the third highest contribution to effective implementation of information technology projects. Project management approach constitute structured processes that projects ought to follow as they go through the project life-cycle stages. The various approaches come in different forms, with some being traditional whereby a project must strictly follow a step by step approach from beginning to completion; with other methodologies being flexible so that project steps may be repeatable until required results are obtained before progressing; yet other methodologies are internally developed based on the project's unique dynamics and operating environment. The latter methodologies are idiosyncratic to an individual bank's unique characteristics and therefore customized to the bank's needs.

This study concluded that determinants of implementation of IT projects individually positively influenced implementation of information technology projects by commercial banks in Kenya. However, their joint influence revealed slightly different results, with executive commitment having a positive but not significant influence on implementation of IT projects, same as project management approach. User involvement and project team capability had positive and significant influence on implementation of information technology projects by commercial banks in Kenya. The study shows that as much as the two determinants of implementation of projects may not have had a significant influence, they still had a positive relationship with implementation of IT projects.

This study concluded that project risk had no significant moderating effect on the determinants of implementation of information technology projects by commercial banks in Kenya. The implication of this is that irrespective of how technically complex a project may be, however critical a project may be, however uncertain the project environment may be, as long as the hypothesized determinants are well deployed then project organizations would still achieve effective implementation of their information technology projects.

Similarly, the findings show that IT projects can still be successfully implemented even if there are uncertainties in projects like unfamiliar technologies being used. Experienced and capable project teams with the support of upper level management may just have to adapt to the obtaining technologies through structured capacity building and on the job training. With good communication in the project setting, specification changes ought to be permissible to a certain level otherwise it can lead to frequent conflicts and unnecessary changes to the envisaged project results. It is noteworthy that if properly managed, successful implementation of information technology projects can still be delivered in spite of project risk.

5.4 Recommendations

The recommendations are based on findings on the objectives of the study.

5.4.1 Managerial Implications

The study established that user involvement, project team capability and project management approach had significant influence on implementation of information technology projects by commercial banks in Kenya. The study also showed that executive commitment was not significant in influencing implementation of information technology projects by commercial banks in Kenya but suffice to say that the variable had a positive relationship with implementation of IT projects by commercial banks in Kenya.

Commercial banks' upper level management should continuously provide support to information technology projects in terms of required resources and also offer leadership that is geared towards realizing the banks' overall vision and mission. There ought to be flexibility in planning of information technology projects so that projects' administrative structures are allowed the latitude to make crucial decisions but in consultation with the upper level management. Additionally, respective banks should put in place control mechanisms that track the progress of current IT projects to ensure that they are on course and able to meet the banking sector regulator's timescales.

It is therefore incumbent upon the upper level management in the respective commercial banks to proactively formulate and draw up attainable vision and mission for institution-specific and industry-wide information technology projects, and also provide overall leadership and support for the projects, inculcate an organizational culture that aligns project members to selflessness and flexibility which ultimately enhances positive outcomes for implementation of information technology projects.

It is also important for banks to ensure that staff members especially users and the project team embrace change management so that on-going information technology projects can be implemented without undue resistance. Commercial banks must therefore inculcate a culture of taking calculated risks and flexibility during implementation of IT projects. Banks should engage staff members with the right mental attitude and whose interpersonal skills would incline them towards supporting bank initiatives including IT projects. Staff must be encouraged to be actively involved in on-going IT projects as such involvement would serve to improve their experience on such projects' implementation. In the same breath, structured training and education must be offered equitably to staff members.

Users' attitudes ought to be supportive and inviting to ensure successful implementation of IT projects. All users and developers must pay attention to each other through relevant interpersonal approaches to ensure successful implementation and delivery of IT projects. It is noteworthy that users should continuously participate in the implementation process of IT projects and give relevant feedback that enables the upper level management to have a common understanding of the obtaining situation in the project environment. However, the upper level management must consciously appreciate the potential trade-offs between extensive users' involvement and extremely detached and limited user participation especially at the initial stages of the implementation process of IT projects and therefore optimal involvement by users guarantees good tidings for effective implementation of projects.

Banks should have incentive schemes so that when staff members deliver on certain projects within the constraints of time, budget and scope, then they ought to be rewarded and commended for a job well done. Such small actions would motivate users and other bank staff so much so that when new industry-wide IT projects are due to be rolled out, it would just be a matter of aligning structures and beginning the implementation process. Project teams are the nexus around which the whole implementation process of IT projects in commercial banks revolve. Banks must ensure that internal communication amongst project team members and other project stakeholders is continuous and deliberate to ensure that positive energy is spread throughout the project environment.

Banks should have capable staff enlisted as project team members because such staff exhibit loyalty and ownership to on-going projects. Such staff members bring stability to the implementation process as they are looked upon by other bank staff. It is also important for banks to encourage professionalism in their staff cadres by appreciating and rewarding expertise and experience. Project teams must be properly constituted with equitable distribution across demographics. Meritocracy in project teams must therefore be institutionalized by commercial banks for better results in implementing IT projects.

Banks cannot afford to engage in haphazard implementation of IT projects as that can only lead to failure. It is paramount for banks to assess and choose a suitable process by which IT projects need to be delivered. The choice should be contingent upon the type of project to be rolled-out and bank specific dynamics including the bank's wherewithal in terms of finance and human resources. Banks should choose between the rigid traditional approaches and newer agile approaches that seem flexible and attractive but the latter are not silver bullets nor are they applicable to all sorts of projects. Depending on an individual bank's capacity, they can build their own customized internal methodologies to facilitate implementation of IT projects. It is therefore incumbent upon individual banks to appraise their unique environments, resources and nature of IT projects at hand to choose the appropriate methodologies to use.

From the study findings, individual determinants had a positive influence on implementation of IT projects but with varied significance levels. However, when the determinants were employed jointly, project team capability, user involvement and project management approach stood out as having more contribution to effective implementation of information technology projects. Banks must therefore ensure that project teams, users and requisite processes are fully embraced and continuously improved to ensure that projects are successfully implemented. However, executive commitment whose subsets include upper level management support and overall leadership cannot be sidestepped and therefore banks must always endeavour to have defined project management cadres within their organizational structures. Also, banks should ensure that comprehensible goals and objectives are communicated clearly and continuously to users and project teams for ease of internalization and execution.

Although this study's findings concluded that project risk did not have a significant moderating effect on the determinants of implementation of information technology projects, it is recommended that commercial banks should continue keeping an eye on aspects such as technical complexity of projects for purposes of being in a position to bring on board relevant skill sets that would suffice for the tasks at hand. Where new technologies pose a cloud of uncertainty to new projects, banks must mitigate this by roping in external consultants and specialists who can navigate around the new technologies and also build the capacity of local staff. Time critical projects must be given priority to forestall cases where whereas the regulator (Central Bank of Kenya) or the banks' umbrella body (Kenya Bankers Association) may be ready to roll out new innovations, some banks may strive to be ready while others take time before being ready and that occasions a situation where such innovations are deferred for inordinate time periods. The Kenya Interbank Transaction Switch (*PesaLink*) whose implementation was deferred more than five times in a period of over three years before eventual roll-out in 2017 is a case in point.

5.4.2 Recommendations for Policy and Practice

This study was mainly underpinned by the contingency theory together with the theory of constraints, resource dependence theory and resource advantage theory. The findings from the study showed that determinants of implementation of projects were positive and significant except for executive commitment which was positive but not significant. Since all the determinants were positively related to implementation of projects, it implied that they contributed to implementation of IT projects by commercial banks in Kenya. Based on these findings, the study made the following specific policy recommendations:

The study recommends that commercial banks' management teams be involved in all projects at all stages of the projects' lifecycle. It should be made policy for multi-disciplinary teams to drive the leadership agenda throughout the projects' life-cycle. Additionally, external assistance can be sought through facilitative meetings with consultants having diverse skill sets and backgrounds especially where bank specific IT projects such as core banking systems are to be implemented. Because user involvement forms a key plank in contribution to effective implementation of IT projects, it is recommended that a policy framework be put in place to guide system users in enhancing their competencies and adeptness in the use of new and emerging IT systems. There should also be motivation and incentives for super achievers as the gesture inculcates a sense of competitiveness in the different cadres of users.

Similarly, making it a policy requirement to onboard only competent project team members and enhancing user involvement must be the guiding principles in the banking sector. In a nutshell, having ample resources, vision and mission, change management, dedicated users and project management approach without an experienced project team with requisite skills and expertise may just amount to naught. Also, because project risk was found not to significantly moderate between determinants of implementation of projects and implementation of IT projects, banks must treat each IT project as distinct and avoid an approach of one-size-fits-all in implementation of projects.

5.4.3 Contribution to Existing Body of Knowledge

This study contributes to the contingency theory in the area of project management. The theory posits that different projects should be managed and structured differently depending on their unique dynamics. The theory seeks to appreciate why some IT projects succeed, some get challenged whereby certain project objectives are overrun and also why some others totally fail. This study contributes to the discourse by reviewing these factors and detailing how effective implementation of projects may be realized and improved through employing variations in applicable critical success factors contingent to the different projects and obtaining dynamics.

This study also reviewed extensive literature and classified the critical success factors that had subtle inter-relationships under thematic areas to constitute grouped determinants of implementation of information technology projects. Thematic areas that contextually apply to our local Kenyan situation were used. In most previous studies, individual factors were considered separately and generally assumed to contribute to overall project success. This amalgamation of related factors based on the local Kenyan context forms a basis and offers a useful stepping stone for future research engagements in the area of project management and more so for information technology projects.

The hypothesized determinants of implementation of projects as captured in this study are relevant to all project types. Putting these factors under several umbrella thematic classifications has been made as simple as possible so that all and sundry amongst practitioners in the discipline of project management can easily identify and allocate the factors accordingly depending on the unique dynamics of subject projects. In as much as this study applied some measures as developed for other contexts of projects, efforts were made to ensure that the factors chosen fit well within the area of enhancing successful implementation of projects, and most especially information technology projects by commercial banks in the local Kenyan context.

5.5 Areas for Further Research

The general objective of this study was to analyze the determinants of implementation of information technology projects by commercial banks in Kenya, namely executive commitment, user involvement, project team capability and project management approach, and their influence on implementation of IT projects by commercial banks in Kenya. The relationship was moderated by project risk. From the findings, executive commitment did not significantly influence implementation of IT projects despite the evidence in theoretical literature suggesting that executive commitment led to project success. Future studies could proceed to investigate why executive commitment did not influence implementation of projects as hypothesized in the existing literature.

This study adopted a cross-sectional survey design where data was collected at one point in time but the projects under review had been implemented at diverse time periods. In such cases, strong conclusions concerning the directions of causality implied in the model may not be properly drawn and therefore relationships among variables required to be interpreted in a more discerning way. The foregoing causes a deficiency in interpretation of models using multiple regression analysis. It will be useful therefore, for future research to examine the determinants of implementation of such projects using longitudinal research design where data is gathered for the same projects repeatedly over a period of time so as to re-evaluate directions of causality among the study variables.

The target population for the present study was confined to commercial banks where staff cadres who consistently interact with IT projects were the point of focus. This population is a very small proportion of the entire population that deals with IT projects across the different sectors of the economy in Kenya. With such a confined target population, challenges were encountered in terms of applicability or generalizability of the results obtained to other sectors. A target population with representative groups of people across the different sectors would be imperative. Therefore, future research studies with a more representative population would suffice to ensure that appropriate generalization and application of the study findings is possible.

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APPENDICES

Appendix I: Letter of Introduction

Patrick Dan Mukhongo,

P.O BOX 86984-80100,

Mombasa.

Dear Respondent,

RE: REQUEST FOR COLLECTION OF DATA

I am a doctoral student at Jomo Kenyatta University of Agriculture and Technology. I request the assistance of your organization to volunteer filling data collection questionnaires to be used in undertaking my research study titled, *"An Analysis of the Determinants of Implementation of Information Technology projects by Commercial Banks in Kenya".* This research project is a requirement for the **award of a PhD in Project Management of Jomo Kenyatta University of Agriculture & Technology.**

Please take a few minutes to complete this questionnaire. Your specific answers will be completely anonymous. Your views together with those of others will form an important basis of my study. The information generated using this questionnaire will be treated with confidentiality and will not be in any way used against the respondent nor the institution. The information obtained will be used purely for the intended academic purposes.

Yours faithfully,

Patrick Dan Mukhongo

E-mail: pmukhongo45@gmail.com

Mobile: +254722 672588/ +254732 672588

Appendix 1I: Research Questionnaire

An Analysis of the Determinants of Implementation of Information Technology projects by Commercial Banks in Kenya.

Please fill this questionnaire openly and honestly. Confidentiality will be strictly adhered to and there will be no mention of your personal name nor your bank. Kindly provide the following information as required;

Section A: Background Information

1.1 Please indicate your position in the bank……..

1.2 Please indicate your gender; Male ☐ Female ☐

1.3 Please select your age range; Under 20 yrs ☐ 20 – 30 yrs ☐

30 – 40 yrs ☐ Over 40 yrs ☐

1.4 What is your job experience in IT projects? ……. years

1.5 How would you classify your bank based on asset base, customer numbers and deposits?

Large bank ☐ Medium bank ☐ Small bank ☐

*Please indicate how much you agree or disagree with the following statements by ticking **ONE** answer in the appropriate box. Scale of 1-Strongly Disagree and 5-Strongly Agree*

Section B: Executive Commitment.

1. Executive Commitment	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
1.1 My bank's upper level management consistently supports and provides resources for projects.					
1.2 Planning, monitoring and controlling procedures at my bank have constantly ensured efficiency and effectiveness in implementation of projects.					
1.3 My bank's leadership always exhibits a character of willingness to take measured risks in implementation of projects.					
1.4 My bank consistently gives clear vision, mission and objectives for projects.					
1.5 My bank has an organizational culture of flexibility when participating in initiatives by the industry regulators.					
1.6 My bank always embraces change management whenever new projects come up for implementation.					

1.7 What else can the upper level management do in order for IT projects to be delivered within the triple-constraints of time, cost and scope?

1.8 Choose the management structure used in your bank for the various IT projects

Functional ☐ Project-based ☐ Matrix ☐ None ☐

*Please indicate how much you agree or disagree with the following statements by ticking **ONE** answer in the appropriate box. Scale of 1-Strongly Disagree and 5-Strongly Agree*

Section C: User Involvement

2. User Involvement	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
2.1 System users in my bank are normally involved in new project initiatives.					
2.2 My bank staff have requisite end-user experience on industry-wide system related projects.					
2.3 System users in my bank always participate in project activities aimed at actualizing new projects.					
2.4 My bank staff are adequately trained and educated on new industry-wide projects.					
2.5 My bank's system users usually hold consultations with relevant stakeholders on new projects.					
2.6 My bank staff have the required competence in using industry-wide projects.					

2.7 'Users in my bank are usually engaged in the process of new systems implementation by expressing their opinion on how the system should operate and also carry out user acceptance testing'. Comment on the statement from your bank's experience ……

2.8 Which multi-functional units in your bank ensure that the process of putting together of new industry-wide IT projects is achieved?.....

*Please indicate how much you agree or disagree with the following statements by ticking **ONE** answer in the appropriate box. Scale of 1-Strongly Disagree and 5-Strongly Agree*

Section D: Project Team Capability.

3. Project Team Capability	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
3.1 In my bank, internal communication amongst the project team is always promoted throughout projects' life cycles.					
3.2 My bank's project team is fully dedicated in their endeavour to actualize new projects.					
3.3 My bank's project team is adequately skilled in system development of projects.					
3.4 My bank's project team has technical skills and experience to deliver new projects.					
3.5 The project team in my bank is empowered to do their work without undue interference from stakeholders.					
3.6 The project team in my bank is composed of talented and multi-disciplinary members.					

3.7 How often do you hold review meetings to assess the progress of industry-wide IT projects?

☐ Daily ☐ Weekly ☐ Fortnightly ☐ *Ad hoc*

3.8 List any specific training(s) that your bank has facilitated to up-skill your technical competency?.....

*Please indicate how much you agree or disagree with the following statements by ticking **ONE** answer in the appropriate box. Scale of 1-Strongly Disagree and 5-Strongly Agree*

Section E: Project Management Approach.

4. Project Management Approach	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
4.1 My bank usually adopts project management methodology in implementation of projects.					
4.2 My bank always embraces processes aligned to agile project management methodology.					
4.3 My bank adopts agile project management methodology throughout projects' lifecycles.					
4.4 My bank usually adopts a documented traditional project management methodology.					
4.5 My bank uses an in-house developed project management methodology.					
4.6 My bank's approach to projects is by use of a standardized project management methodology.					
4.7 My bank always uses a customized project management methodology.					

4.8 Please comment if all industry-wide IT projects are carried out using tools and techniques espoused in your bank's IT strategic focus……

*Provide the following information by ticking **ONE** answer in the appropriate box that you believe best describes the interplay between variables. Scale 1-Strongly Disagree and 5- Strongly Agree.*

Section F: Moderating effect of project risk on the determinants of implementation of IT projects by my bank.

5. Project Risk	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
5.1 Technical complexity has a marked effect on implementation of projects.					
5.2 Specification changes usually affects implementation of projects.					
5.3 Technological uncertainty usually affects project implementation.					
5.4 Project criticality has a strong bearing on project implementation.					
5.5 Relative project size affects to a large extent project implementation.					
5.6 Urgency with which a project ought to be delivered greatly affects project implementation.					

5.7 Briefly state how project risk poses a challenge to the determinants of implementation process of Information Technology projects in your bank.

……..
……..

*Please indicate how much you agree or disagree with the following statements by ticking **ONE** answer in the appropriate box. Scale of 1-Strongly Disagree and 5-Strongly Agree*

Section G: Implementation of Information Technology projects by Commercial Banks in Kenya.

6. Implementation of IT projects by Commercial Banks in Kenya	**Strongly Disagree**	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**
6.1 IT projects in my bank are delivered on time and within the allocated budget.					
6.2 Project scope and goals do not change unnecessarily during the project life cycle.					
6.3 In my bank, project outputs usually satisfy key stakeholders.					
6.4 Industry-wide systems, both for inland and outward-bound transactions are reliable in my bank.					
6.5 Overall quality of systems delivered by my bank is good.					
6.6 The various industry wide systems are easy to use in my bank.					
6.7 Functionality of systems in my bank is as per the service level agreements by the industry regulator.					

6.8 Choose which among the following industry-wide IT systems was delivered on time by your bank?

☐ Cheque Truncation System (CTS) ☐ Real Time Gross Settlement System

☐ East African Payment Systems ☐ Kenya Interbank Transfer System

Respondent's Signature …….

Date …….

Thank you for taking time to complete the questionnaire.

Appendix III: List of Commercial banks that participated in the study

1. Kenya Commercial Bank	28. Spire Bank Ltd
2. Equity Bank	29. Credit Bank Ltd
3. Co-operative Bank of Kenya Ltd	30. Transnational Bank Ltd
4. Barclays Bank of Kenya Ltd	31. M Oriental Commercial Bank Ltd
5. Standard Chartered Bank (K) Ltd	32. Paramount Bank Ltd
6. Diamond Trust Bank (K) Ltd	33. UBA Kenya Ltd
7. Commercial Bank of Africa Ltd	34. Middle East Bank (K) Ltd
8. Stanbic Bank (K) Ltd	35. Victoria Commercial Bank Ltd
9. NIC Bank Ltd	36. Development Bank of Kenya Ltd
10. I&M Bank Ltd	37. SBM Bank Kenya Ltd
11. National Bank of Kenya Ltd	38. HFC Ltd
12. Citibank N.A Kenya	39. Dubai Islamic Bank
13. Bank of Baroda (K) Ltd	40. Mayfair Bank Ltd
14. Family Bank Ltd	
15. Prime Bank Ltd	
16. Bank of Africa (K) Ltd	
17. Bank of India	
18. Ecobank Kenya Ltd	
19. Guaranty Trust Bank Ltd	
20. Gulf African Bank Ltd	
21. African Banking Corporation Ltd	
22. Sidian Bank Ltd	
23. Habib Bank A.G Zurich	
24. Jamii Bora Bank Ltd	
25. First Community Bank Ltd	
26. Guardian Bank Ltd	
27. Consolidated Bank of Kenya Ltd	

Appendix IV: Research Permit

THIS IS TO CERTIFY THAT:
MR. PATRICK DAN MUKHONGO
of JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY, 0-80100 MOMBASA,has been permitted to conduct research in *Nairobi County*

on the topic: *DETERMINANTS OF IMPLEMENTATION OF INFORMATION TECHNOLOGY PROJECTS BY COMMERCIAL BANKS IN KENYA.*

for the period ending:
9th April,2019

.....
Applicant's Signature

Permit No : NACOSTI/P/18/91753/22138
Date Of Issue : 10th April,2018
Fee Recieved :Ksh 2000

.....
for Director General
National Commission for Science, Technology & Innovation

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