

**SUSTAINABILITY OF INFORMATION AND COMMUNICATION TECHNOLOGY
PROJECTS IN PUBLIC ORGANISATIONS IN KENYA; A CASE OF KENYA
REVENUE AUTHORITY**

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DECLARATION

This research project is my original work and has not been presented for a degree in any other University. No part of this research project may be reproduced without the prior written permission of the author and/or Kenyatta University.

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DEDICATION

This project is dedicated to my dear family. I am indeed indebted for the invaluable support and encouragement during the course of my studies Thank you for your tolerance and support.

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I wish to thank The Almighty God for giving me the gift of life to write this work. I wish to express my gratitude to my supervisor; Dr. Rosemary for her professional guidance and motivation that enabled me to compile this project. I wish to extend my gratitude to my classmates whose presence offered me psychological motivation and the need to learn more.

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ABBREVIATION AND ACRONYMS

GOK	: Government of Kenya
ICT	: Information and Communications Technology
IS	: Information System
IT	: Information Technology
ITMS	: Integrated Tax Management System
ITIL	: Information Technology Infrastructure Library
MDG	: Millennium Development Goals
PIN	: Personal Identification Number
PMBO	: Program Management and Business Office
KRA	: Kenya Revenue Authority
UN	: United Nation
UNDP	: United Nations Development Programme
SPSS	: Statistics Packages for Social Sciences

OPERATIONAL DEFINITION OF TERMS

ICT Infrastructure	Is the physical equipment/hardware and software that enables a network to function.
Information Communications Technologies	Includes technologies both traditional for example radio, television, print, video and newer technologies for example internet virtual reality, distance education, mobile phones etc. that are intended to fulfill information processing and communication.
Infrastructure Facilities	A set of interconnected structural elements that provide framework that supports an entire structure of development. Include buildings, laboratories and electrical connections.
Financial Resources	All the money, either liquid or solid that is needed to meet all the expenses that are geared towards seeing ICT projects become a reality.
Management Support	Refers to the administration's effort in assisting in successful planning, implementation and sustainability of ICT projects.
Sustainability	A systemic concept, relating to the continuity of technical, Business and economic aspects of an ICT project after its implementation. It is how well the Project survives post deployment.
Training and skills	Refers to human capacity in terms of acquired and technical knowledge required for a successful undertaking of particular task.

ABSTRACT

The emergence of Information and communication technologies (ICTs), and e-Government, has made it possible to improve efficiency and effectiveness of internal administration within government and to re-locate government service from government offices to locations closer to the citizens. However, in its effort to have ICT systems that make these services available to citizens, most of the system projects have not been sustainable as the systems do not last or achieve the objective they were intended to over time. It is for this reason that this study was carried out, to investigate the sustainability of Information and Communication Technology Projects in Kenya Revenue Authority. The specific objectives of this study were to find out the effect of financial resources, ICT Infrastructure, Management Support, Skills and Stakeholder Participation on Sustainability of ICT projects in Kenya Revenue Authority. This study employed descriptive survey research design. The target population consisted of all the 1,496 employees in the 5 major ICT projects in KRA. Research instruments used were questionnaires with both open-ended and structured questions. The data collected was analyzed using descriptive and inferential statistical approaches. The collected data was analyzed using Statistical Package for Social Sciences (SPSS). Multiple regression analysis was carried out to determine the relationship between independent and dependent variables. This study concluded that sustainability of the ICT projects was dependent on the improvement of ICT infrastructure by allocation of more financial resources towards purchase of ICT equipment, involvement of all project stakeholders during implementation, as well as allocation of more resources towards skills enhancement for the staff. From this study, it was found out that insufficiency of financial resources has had negative effects on sustainability of ICT project in KRA. Also, that ICT infrastructure has been an influence in the sustainability of the said ICT projects in the KRA to the negative deviation. On the idea of management support, this study concluded that the management has not done enough in ICT projects sustainability and this has limited its success. Based on the findings of this study, it is recommended, enough financial resources should be set aside in the ICT sector to allow proper training and acquisition of efficient ICT infrastructure in order to increase the integration and sustainability of ICT projects in the KRA. This study also recommended that the management support should heavily take up the ICT initiative, have better perception towards ICT and start campaigning for the ICT strategy initiatives integration in KRA.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The nature of project management has taken a paradigm shift from the earlier one in the sense that it has ceased to be dominated by the construction industry but now is applicable in all organizations (Tembo, 2003). It has also advanced and become more specialized branch of management in its own right. As a result, the nature of projects has to change taking into focus the project management cycle that include: proper design, planning, effective implementation, monitoring and evaluation and the sustainability as well (Norton & Bryan, 2005).

The emergence of information and communication technologies (ICTs), and e-Government, has made it possible to improve efficiency and effectiveness of internal administration within government and to re-locate government service from government offices to locations closer to the citizens. The use of technology to improve the success of projects in order for the taxpayers to get value for taxes they pay has come to attract increasing attention in developed and developing countries (Dowe, 2008). Governments worldwide have increasingly been demanding substantially more effective use of modern technology systems for the delivery of services to citizens. Developed countries are called so because of successfully executing projects that enhance service delivery to the populace. Such projects as observed by Dowe, (2008) include registration of persons, issuance of business permits and efficient tax administration among other essential services.

In his book relating to the role of ICT and diffusion of technology in today's business world, Andreas (2011) argues that the ongoing diffusion of new Information Communication

Technology and e-business technologies among firms is a current example of the dynamics of technological change and economic development. On the conceptual level, there exists a clear link between the adoption of new e-business technologies and firm's performance. To confront the demands of changing business environments, tax authority across the world- both in the developed countries, least developed countries and developing countries- are increasingly turning their attention to particular ICT system.

According to Hill & Jones (2010), the introduction of ICT such as integrated tax management systems (ITMS) has improved taxation administration efficiency in rendering services to taxpayers. Tax administration authorities are using the system to deliver a wide range of value added products and services to taxpayers (Kloppenburger & Laning, 2012). Successful development of ITMS is not guaranteed as failure can occur at various stages of Integrated Tax Management System development. Implementation is the final critical stage, and if not properly managed the entire efforts of Integrated Tax Management System development may fail and the system will not be effective.

In the USA for example, after the government's realization of the greater number of immigrants who were repatriating huge sums of money to their country without having them taxed, the government introduced an integrated tax management information system that was being implemented at all the states and local authorities of this most developed continent in the world (Smithenry, 2010). In the years 1986 to 2001, the USA government was on toes towards investing up to 54 Percent of its income in ICT for education, health, security, food production and control of uncounted for funds. This for example led to the country being rated as one of the most advanced technological economy in 1995 to 2001 compared to other G8 countries.

However, their study found out that unlike China, USA and India have been faced by many challenges therefore affecting the sustainability of their ICT projects in managing their revenue systems. In India for example, between the years 2003 and 2009 factors like deficiency of ICT experts, limited ICT budgets allocations, poor innovations, high cost of imported technology, poor projects planning and management strategies, political rivalries, cultural differences and views, poor ICT infrastructure and many more for a long time hindered fully the sustainability of ICT for taxation process. In the USA, factors like poor tendering processes of ICT, poor perceptions about imported ICT especially that from China, global markets rivalry, terrorism, criminal acts like hacking and many more have for a long time up to present influenced the sustainability of ICT projects in their integrated tax systems. While the benefits of ICT in government cannot be disputed, there are several concerns about its success as well as the strategies to be adopted in sustainability of systems in various countries.

Kenyan government has embarked on adopting the use of Technology in Projects since the year 2003. The projects are administered through respective government bodies and ministries. Kenya Revenue Authority (KRA) is one such a Public Sector that has invested heavily in the use of Information and Communication Technology which have been undertaken from time to time over the years with an aim of achieving specific intentions and or satisfying/bridging identified needs in the society. The nature of projects has also changed where some projects have been technology intensive.

Research done in 10 ministries in Kenya in 2003 to 2010 has shown that the implementation of information systems in organizations requires a focus on contextual variables such as organization power relations and organizations culture (Opoku Mensah, 2011). Implementation of ICT strategies by the Kenya revenue sector just like with other strategies in the country has

challenges. According to Owuor (2011), improving information services implementation continues to rank highly among the major issues facing management of user oriented IT services in public organizations. This is as a result of issues like budget constraints, resistance to change among internal and external stakeholders, poor planning, lack of skills and knowledge as well as technology penetration within an organization. Other factors include lack of communication and involvement by staff, lack of requisite infrastructure like power, networks and content, duplication of technology platform and overcapacity in organization data centers. Access to mobile networks in telecommunication and use of broadband internet are central to the long-term economic development strategies in firms.

In order to meet its challenging role of tax collection and administration, KRA has always embarked on modernization projects, one of which involves automation (Revenue Reforms in Kenya: Experience and Lessons, 2010). Some of these automation projects include online application of Personal Identification Number (PIN), online Integrated Tax Management System (ITMS), and online PIN Checker among others. These initiatives are not only resource intensive but also critical in service delivery. Kenya Revenue Authority has a Project Management and Business Analysis Office (PMBO), which is mandated to oversee the formation, development and implementation of projects in the Authority.

1.1.1. The Concept of Project Sustainability

Project sustainability denotes the ability of a project to maintain its services, operations and benefits during its projected life time (Langran, 2002). Project sustainability aims at creating and launching a project capable of continuing to generate benefits after donor input has been withdrawn (United Nations, 2002). Efforts to develop a sustainable project should be integrated from the onset of project design (Sneddon, 2000). Project sustainability is dissected into various

sustainability dimensions and this includes institutional stability, continuous flow of benefits, equitable distribution and sharing of project benefits, active community participation, continued operation and maintenance of project structure and maintenance of environmental stability.

The concept of sustainability was first employed in relation to natural resources and how they should be used. Sustainability has been viewed as a broad set of concepts which should serve to guide research in all of its facets. It is not a set of technologies (Graham, 1991). It has been defined as the ability to maintain a given flow over time from the base upon which that flow depends, and as primarily an issue of intergenerational equity (Norgaard, 1992). It involves calculation of the balance between present and future use of a resource or set of resources, as well as debate over the valuation of resources in relation to different uses.

Over the years, the concept of project sustainability has varied widely and broadened in scope. According to IFAD strategic Framework 2007 – 2010 (IFAD, 2007), project sustainability ensures that institutions supported through projects and the benefits realized are maintained and continue after the end of the project. Also, according to IFAD's office of Evaluation, sustainability entails determining whether the results of a project will be sustained in the medium or even long term without continued external assistance.

1.1.2 Information and Communication Technology Projects in the Public Sector

Information and Communication Technology (ICT) is the branch of engineering that deals with the use of computers. Computers are used to store, retrieve and transmit information. The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications are its main fields.

ICT projects are those projects that are fully dependent on Information Technology platform for their development and implementation. Given the deviation from the traditional or manual based projects such as construction, IT based projects are faced with various challenges which have always influenced its outcome to be successful or otherwise.

Public organizations in Kenya have over the last three decades embraced strategic management practices through initiatives such as Structural Adjustment Programmes (SAP), Millennium Development Goals (MDGs) and Vision 2030 that have put the ICT strategy as enabler of competitive advantage (Department of Science Information Technology, 2012). According to the Kenya's National ICT policy (2006), the government endeavors to reduce waste and project failure and stimulate growth. It also aspires to create a common ICT infrastructure for government agencies, use ICT to deliver change and strengthen ICT governance. The ICT policy has since been strengthened by the launch of the National ICT Master plan 2017(2012) which whose pillars include use of ICT to enhance public value and quality of life, put focus on the development of ICT businesses, strengthening ICT as a driver of industry and creating an integrated ICT infrastructure and info-structure.

According to a bulletin from the website of the Kenya ICT board, E-government applications apply the judicious use of ICT to enable governments to improve their internal systems, deliver services more efficiently and effectively and make information more accessible to the citizens. This has made such public sector to heavily invest in IT based projects. For instance, KRA has since 2003 initiated a lot of Reform and Modernization Projects which are all IT based (KRA Tax Reforms and Modernization, 2009). Some of these IT based projects the Authority has invested in are Simba, ITMS, Online Services, Vehicle Monitoring System (VMS) among others. The intention of these projects has been to enhance efficiency in service delivery and to enable

KRA live to its vision of being the leading revenue authority in the world respected for professionalism, integrity and fairness’.

1.1.3 Project Success Criteria

In their 2006 annual publication on IT project performance in the US, the Standish Group reported that only 34 Percent of projects had been delivered on time and on budget. On his website www.martinbauer.com, Bauer (2010) referring to this same report cautions that in order for project managers to avoid the chances of their IT projects failing then the wise move is to establish upfront what success means to the client for each of their projects. Ajam (2013) adds to this argument by alluding to the fact that it is quite difficult to assess the success of a project at project closure since most of the project’s intended benefits will not be realized until a few months later. He concludes that it is the client organization’s responsibility to measure project success at a point in time where they can meaningfully assess its outcome and determine if they realized the intended benefits as opposed to demanding it of the project manager immediately the project is completed.

De Wit et al (1988) distinguish between project success (measured against the overall objectives of the project) and project management success (measured against the widespread and traditional measures of performance against cost, time and quality). Munns and Bjeirmi (1996) also support this definition citing the example of a construction project where the project manager’s success would be measured immediately the construction is finished based on whether the housing units were completed on time, within budget and according to the technical plans whereas the project’s success which would be of overall benefit to the sanctioning company for instance profitability in terms of mortgaged sale or rental income from the housing units would only be measured once all the housing units have been sold or rental income supersedes the construction

costs. The benefits of the project and thus measurement of project success could even be extended over 10-50 years, depending on the anticipated buildings life and thus measurement of the project's success would also take a similarly long time.

After reviewing the works of Baker, Murphy and Fisher, Mwai (2012) concluded that project success is a matter of perception and a project will most likely be perceived to be an overall success if; “the project meets the technical performance specifications and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people on the project team and key users or clientele of the project effort”. There is also a general agreement that although schedule and budget performance alone are considered inadequate as measures of project success, they are still important components of the overall construct.

Quality is more often than not intertwined with issues of technical performance, specifications, and achievement of functional objectives and it is achievement against these criteria that will be most subject to variation in perception by multiple project stakeholders says his publication. Following years of extensive project management exposure and after interacting with a myriad of clients in diverse project environments, Bauer (2010) came up with a list of critical success criterion from his clients; “Have satisfied stakeholders, Meet the project's objectives/requirements, Meet an agreed budget, Deliver on time, Add value to the client organization, Meet the client's quality requirements and achieve an acceptable sense of professional satisfaction for the project team”. It is these aspects of a project's outcome that shall be referenced in this entire study as constituting project success.

1.1.4 Kenya Revenue Authority

Kenya Revenue Authority (KRA) is the tax collection agency of Kenya. It was formed on July 1, 1995 through an act of Parliament to enhance tax collection on behalf of the Government of Kenya. It collects a number of taxes and duties, including: value added tax, income tax and customs. Since KRA's inception, revenue collection has increased dramatically (KRA, Fourth Corporate Plan, 2009), enabling the government to provide much needed services to its citizenry like free primary education and Health Services to all. Over 90 Percent of annual national budget funding comes from local taxes collected by the KRA (Institute of Economic Affairs, 2006).

In the recent past, it has been observed that the PMBO unit has been involved much on ICT based projects which have had various outcomes with varying impact on the Authority 's resources and plans.

1.2 Statement of the Problem

A successfully managed project must be sustainable in the long run. To enhance ICT project sustainability, a rigorous sustainability analysis is needed at the time of formulation of a project. It is expected that such an analysis which is to be followed up by development of a sustainability strategy will assist in incorporating the elements of sustainability, right at the design stage of a project (Reh, 2013).

The sustainability of ICT strategy in public corporations just like any other organization remains challenging (Kundishora, 2012). Kenya Revenue Authority is one such organization that relies heavily on ICT and the related ICT strategy in order to deliver on its core responsibility of collecting revenue on behalf of the Government of Kenya (GOK, 2012). The need to identify the challenges facing public organizations like KRA in the sustainability of the ICT and measures of mitigating them, warrant the need to carry out this study. ICT projects have been noted by a

number of researchers to be facing several performance challenges including failure in US, Europe, Australia and other parts of the globe. Previous studies from the year 2000 capture ICT project failures to be between 70% to 86% resulting in massive wastage of resources (British Computer Society, 2004; Mueller-Jacobs & Tuckwell, 2012).

Kenya faces sustainability and performance challenges, despite the remarkable growth of ICT sector coupled by opportunities created by government strategies on ICT. Performance of ICT projects has still remained a challenge experienced with projects being run by both private and public sector. According to Kabutu (2013) software development and implementation is a major challenge in Kenya due to high failure rate in public sector.

Public institutions in Kenya have a mandate to deliver services to the citizens as contained in the Service Charter developed by the Office of the Prime Minister. This has made such institutions to heavily invest in ICT based projects. Over the last 10 years, KRA initiated a lot of Reform and Modernization Projects which are all ICT based (KRA Tax Reforms and Modernization, 2009). Some of these ICT based projects the Authority has invested in are Simba, ITMS, Online Services, Vehicle Monitoring System (VMS), I-Tax Management System among others. The intention of these projects has been to enhance efficiency in service delivery and to enable KRA live to its vision of being the leading revenue authority in the world respected for professionalism, integrity and fairness, However, according to customer satisfaction survey done by PriceWaterHouseCoopers (PWC) in 2011 on Taxpayers' satisfaction with KRA's service delivery, 41 Percent of those surveyed felt that KRA needs to do more to satisfy the needs of taxpayers in Kenya. Furthermore, a study was done on the effects brought about by automation of these systems, a case of I- Tax Management System and it was discovered that although a number agreed that automation had benefits in simplifying the tax filing, the system was not

always accessible and efficient as expected to be (Wasao, 2014) It was from this background that this study sought to investigate the factors that affect sustainability of ICT based projects in public sector, with a particular focus being on Kenya Revenue Authority.

1.3 Research Objectives

1.3.1 General Objective

The general objective of this study was to investigate the factors that affect the sustainability of Information and Communication Technology Projects in Public Organizations in Kenya with a particular focus on Kenya Revenue Authority.

1.3.2 Specific Objectives

The specific objectives of the study were: -

- i. To find out the effect of financial resources on sustainability of ICT projects in Kenya Revenue Authority.
- ii. To investigate the effect of ICT infrastructure on sustainability of ICT projects in Kenya Revenue Authority.
- iii. To determine the extent to which management support influences sustainability of ICT projects in Kenya Revenue Authority.
- iv. To establish the effect of Training and skills on sustainability of ICT projects in Kenya Revenue Authority.
- v. To determine the effect of stakeholder participation on sustainability of ICT projects in Kenya Revenue Authority.

1.4 Research Questions

This study aimed to answer the following questions: -

- i. What is the effect of financial resources on sustainability of ICT projects in Kenya Revenue Authority?
- ii. What is the effect of Infrastructure on sustainability of ICT projects in Kenya Revenue Authority?
- iii. To what extent does management support influence sustainability of ICT projects in Kenya Revenue Authority?
- iv. How does Training and skills affect sustainability of ICT projects in Kenya Revenue Authority?
- v. How does stakeholder participation influence sustainability of ICT projects in Kenya Revenue Authority?

1.5 Significance of the Study

This study provided valuable lessons on approaches necessary in ensuring a successful outcome of ICT Projects.

The findings from the study will be useful to the Government to both current and future automation initiatives that the Government will endeavor to implement. It will also help the government know how much to Budget to assign to Public corporations such as KRA, so as to ensure sustainable systems are implemented. The findings gives an insight to other public corporations on kind of policies that should be deployed by the public institutions in Kenya to ensure that the ICT projects they endeavor to undertake end up to be beneficial as intended, such as a focus on boosting staff skills by training. This study records the insights that can be adopted by the management so as to influence progress of ICT projects through their lifecycle which is

among the factors that affect its sustainability. The general public will benefit from this study, they are users of the system as well and therefore it will serve as a source of information for them to understand the effect of various factors on sustainability.

1.6 Scope of the Study

This study focused on the public Sector in Kenya. It was limited to the Kenya Revenue Authority which is a public Sector Organization. Kenya Revenue Authority has stations country wide and it has approximately four thousand six hundred employees. The Authority has embarked on the reform and modernization projects aimed at efficient service delivery. This study was limited to Five major ICT based projects that were deployed within last 10 years; Simba, ITMS, Online Services, Vehicle Monitoring System (VMS) and I-Tax Management System which cuts across all 7 departments of KRA which includes customer service, domestic taxes, road transport, human resources, administration, finance and ICT. The topical focus of the study was sustainability of information and communication technology projects in public organizations in Kenya with a specific focus on Kenya Revenue authority.

1.7 Limitation of the Study

This study was constrained by a number of factors. Some of the information that this study sought was been considered by KRA as confidential and sensitive and therefore, some members of staff and management were not keen on filling the questionnaires This study used questionnaires with both closed and open ended questions to collect data. Closed ended questions have the disadvantage of limiting the responses whereby the respondent is compelled to answer questions according to the provided questions. However, to mitigate this limitation, it was ensured that the questions were well thought out and comprehensive enough to cover all important aspects of this study's objectives. This study sample was drawn from very busy

executive team members and scheduling appropriate timings was a challenge; in some instances, the researcher had to keep rescheduling the meeting and frequent follow up on premise to ensure that the questionnaires were filled. However, this study eventually managed to obtain information from the key decision makers of KRA through the sample size that was representative.

1.7 Organization of the Study

This study is organized into five chapters. Chapter one covers the background of this study. It covers the research problem as well as the objectives, significance, scope, assumptions and limitations of this study. The second chapter is an overview of the literature review. It presents theoretical underpinnings and the selected empirical studies. Several paradigms that complement the theories and how they enhance the conceptualization have been presented. This chapter also presents a summary of knowledge gaps and the conceptual framework as a result of emerging issues related to the sustainability of ICT projects.

Chapter three discusses the research methodology which covers the research design, population of this study's sampling design and data collection methods. The chapter has elaborated the measurement tests, data analysis techniques and analytical models that address the objectives.

Chapter four gives the research findings such as the nature of the research, the number of those who responded and discussions on how each finding affected sustainability of ICT projects as given by the respondents. This chapter details the analysis methods that were employed and the analysis data based on every objective of the research.

Chapter five provides a summary of the research problem that this study was addressing, the purpose for this study, the research design that was deployed, details on the target population that

was used during the research, analysis and presentation of the findings, then a conclusion from the data that was collected is done, here, the research reports what every specific objective achieved and general conclusion. Lastly, a recommendation from the findings has been documented in this chapter, this is information that can benefit KRA and any other Public institution, as drawn from the data that was collected and analyzed during the research. This chapter also gives a suggestion to other researchers on kind of study of further study that can be explored.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature review. The review of literature focuses on the sustainability of Information Communication Technology Projects in Public Sector. Section one deals with theoretical review, section two discusses the empirical review, section three deals with conceptual framework and finally section five deals with summary of gaps to be filled.

2.2 Theoretical Review

2.2.1 Kurt Lewin's 3 Step Change Theory

Kurt Lewin (1951) conceived of change as modification of those forces keeping a system's behavior stable. Specifically, those striving to maintain the status quo and those pushing for change. To change a state, one can increase those forces pushing for change, decrease those forces maintaining the current state or apply some combination of both. Lewin suggested that decreasing those forces maintaining the status quo produces less tension and resistance than increasing forces of change and consequently is a more effective change strategy. Lewin viewed this change process as consisting of the following three steps: (i) Unfreezing – this step usually involves reducing those forces maintaining the organization's behaviors at its present level. Driving forces facilitate change because they push employees in the desired direction whereas restraining forces hinder change because they push employees in the opposite direction. These forces must be analyzed and managed which is where Lewin's model can help shift the balance in the direction of the planned change and help organizations transition from one ICT system to the next one with minimal

disruption to their business operations. Action research proceeds in a spiral of steps each of which is composed of a circle of planning, action and fact-finding about the results of the action (Burke, Lake & Paine, 2009).

(ii) Moving- this step shifts the behavior of the organization, department or individual to a new level; (iii) Refreezing – this step stabilizes the organization at a new state of equilibrium (Cummings & Worley, 2009). The re freeze stage is the final stage of Lewin’s change model and comes at the end of the project when all the ICT project products have been delivered and are ready for use by the staff members or end users. The stage involves crystallizing and the adaptation of ownership of the new processes or way of doing things by all the employees. The organization may revert to former ways of doing things at this point unless the changes are reinforced through freezing and again the project leadership must play a key role at this stage or else all the benefits that had been intended when initiating the project may not be realized due to poor or total lack of use of the project’s end products by the employees/ end users. According to Bullock and Batten (1985), phases of planned change draw on the discipline of project management. This approach consists of four phases. Exploration phase involves verifying the need for change and acquiring any specific resources necessary for the change to go ahead. A diagnosis is completed and actions are sequenced in a change plan. The plan is signed off by management before moving into action phase. Actions are completed according to plan with feedback mechanisms that allow some re-planning if things go off track. Integration phase is started once the change plan has been fully actioned. It involves aligning the change with other areas in the organization and formalizing them in some way via established mechanisms such as policies, rewards, and company updates (Cameron & Green, 2012).

2.2.2 The Stakeholder Theory

Project sustainability, which is the dependent variable in this study, is anchored on the stakeholder theory (Freeman, 1984). In the 1980s, sustainability is viewed as belonging to the shareholders only. The shareholder theory, which uses shareholder return, is used to measure sustainability. The stakeholder theory is a theory of organizational management of stakeholders. Stakeholders are groups or individuals who benefit from or who are harmed by, and whose rights are violated or respected by organizational actions (Freeman, 1984). They are therefore groups of people or individuals who are crucial for the success of organizations and they can affect or are affected by the actions of organizations. The theory suggests that the purpose of a business is to create as much value as possible for stakeholders. In order to succeed and be sustainable over time therefore, executives must keep the interest of all the stakeholders important to the organization aligned and going in the same direction, particularly how the stakeholders are significant towards the sustainability of ICT projects at the KRA.

2.2.3 Dynamic Capabilities Theory

The dynamic capability theory explains how organizational responsiveness and innovativeness through ICT become timely, rapid and flexible in dynamic markets. Based on a review and synthesis of the literature, a dynamic capability is the organization's potential to systematically solve problems formed by its propensity to sense opportunities and threats, make timely and market-oriented decisions and to change its resource base (Barreto, 2010; Di Stefano, Peteraf & Verona, 2010). Easter by-Smith, Lyles and Peteraf (2009) concluded that dynamic capabilities are higher-level capabilities, which enable 'knowledge gathering and sharing, continual updating of the operational processes, interaction with the environment and application of suitable ICT projects. This ICT projects according to the theory may be driven by management fads such as

culture change, business process engineering, empowerment, total quality, dramatic changes within the environment, declining organizational performance, or even both.

2.2.4 Collective action theory and institutional theories

First published by Mancur Olson, collective action theory seeks to explain what causes continuity of projects and ventures (Anesi, 2009). The theory suggests that a project that meets a common need will instinctively bring people together leading to project sustainability (Mazibuko, 2007). This theory however falls short since sustainability is much more complex than a project just meeting a common need.

Institutional theory was developed by Nelson Phillips, who asserts that institutionalization, which is the process of institution formation, is the backbone to sustainable development (Schneiberg and Soule, 2005). Institutions are the building units of any society and they shape human interaction as well as provide structure to everyday life. Institutions can be seen as a collection of specific behaviors and support structures that simplify or make possible the accomplishment of a task. Institutions make it possible for desirable set of actions to be realized more frequently and with repetition, these actions take root as norms (Green, Li & Nohria, 2009). People at this point cease doing things because there are rules that call them to but because it's the norm (Scott, 1991). In their work, Edward and Hulme (1992) summarized the theory by saying "One clear conclusion is that institution building is the critical task facing all Non-Governmental Organizations in their search for sustainable development" (Edwards & Hulme, 1992). The stability of institutions depends a lot on their fit with culture and values of the subjects as well as the benefits that it presents to the people (Schneiberg and Soule, 2005). This theory was adopted for this study since the process of institutionalization is multi-faceted and goes beyond looking at sustainability being a factor of a project simply meeting a common need.

2.3 Empirical Review

This section details reference to literature that has been done by various scholars before, regarding a similar area of study. It considers the specific objectives of this study and details what other scholars have to say that is relevant to the research.

2.3.1 Financial Resources and sustainability

Siroret al. (2010), ICT ideas diffusion and integration just like any other business undertaking in the world, whether developed or developing countries need efficient capital to function efficiently and grow. Increasing the ICT business' volume and services requires additional capital. Funding is needed to cater for meetings and feasibility studies, purchase of necessary facilities like the quality computers, hiring the required personnel for the new technology, installing and erecting new/relevant ICT enabling structures etc.

Carvalho (2013) argue that The Global Report on the Costs of ICT 2013 indicates that the total money spent on ICT worldwide has been most recently estimated as US \$3.5 trillion, and is currently growing at 5 Percent p.a. This has been doubling every 15 years. ICT costs, as percentage of corporate revenue, have grown 50 Percent since 2002, putting a strain on ICT budgets. Today, when looking at companies' ICT budgets, 75 Percent are recurrent costs, used to "keep the lights on" in the ICT department, and 25 Percent are cost of new initiatives for technology development. The World Bank (2010) reports that the average ICT budget has the following breakdown: 31 Percent personnel costs(internal), 29 Percent software costs (external/purchasing category), 26 Percent hardware costs(external/purchasing category), and, 14 Percent costs of external service providers(external/services). The recent reports therefore indicate that both the developed and developing countries are heavily investing in ICT as the major economic driving force.

According to Thompson & Arthur (2012), ICT for development in both the e-Governments and education across the developing countries in Asia like Indonesia, Malaysia, Pakistani and Thailand and Less developed countries in Africa like Angola, Lesotho, Botswana and Namibia in 2009, financial resources is a key determinant of ICT projects adoption, implementation and use in the various sectors of the economy for accelerated economic development and realization of the MDGs of ICT development for easy services delivery by 2015. According to him, planning and deployment of ICTs in today suffers from several major problems, for example, budgets only consider the immediate costs and seldom, if ever, consider the long-term costs of purchasing, deploying and maintaining ICTs. For example, costs for replacements, disposal or even operating costs for refresher training, maintenance and technical support are often ignored. The sum of all this costs is called the TCO (Total Cost of Ownership) that is a challenge by 72 Percent globally in developing countries, 91 Percent in LFCs and 25 Percent in developed countries.

In his comparative study on the challenges facing revenue collection and independence of mind from donors' dependence to self-sufficient/sustainable self-funding in China, Zajac and Westphal (2012) argued that, the country's first target was to come up with strategies that aimed at collecting at least a half US dollar from the about 500,123 million population that was active daily in the non-formal employment world between 1997 and 2009. The major way and strategy that was employed to come up with this way of revenue collection was the idea of adoption of the new technology that was developed by the Japanese and later on modify it to fit to the people of china. One year after 1998, China had achieved 72 Percent of its technology related projects implemented that were applied in collecting tax. The World Bank (2012) showed that China didn't only overspend in importing new technology importation but faced financial crisis in

implementing the whole process since the process required trained ICT experts(majority of whom were sent to USA for integrated financial management and revenue collection), the process with it came new challenges of developing new structures like specific computerized systems of tax collection that never dependent on the formerly existing structures like the LAN and many more. However, China has been able to stand the minor challenges of some budgetary constraints and today it is the leading ICT exporter in the world and the number one fastest developing economy that has been loaning other countries in the world (Huiru, 2014).

Wafula (2012) argues that the same is not evident in developing countries, largely because the cost barriers to supplying ICT hardware, software and connectivity are very high thus posing a challenge. In developed countries, there is a growing realization of what in 1996 Oberlin called the ‘financial mythology of information technology’ which he described as follows: ‘While the per unit price of information technology is declining rapidly, the total cost of owning and maintaining systems is steadily rising, the falling prices mislead many to expect cost savings that will never materialize’ (Bernelot, 2013). This was largely because of consistent underestimation of the management, technical support, curriculum development and training expenditure that is essential to ensure sustainable ICT access and use in any sector of the economy. Given global enthusiasm for applying ICT in e-Governments, e-Learning, e-Medicare and many more, it is essential to put in place appropriate costing, financing and planning processes to aid budget allocation decisions. This therefore flows down to the parastatals like those in charge of revenue collection.

In developing countries that have to deal with constrained budgets, financial allocations to ICT must properly take into account the full costs of sustainable ICT systems as well as address the

challenge of providing ICT on an equitable basis. The management and the government must investigate costs related to ICT so that key strategic questions around effectiveness, efficiency and sustainability can be better understood. Such an understanding is particularly important, given that sometimes wildly extravagant claims are made for ICT and its impact on revenue collection processes (World Bank, 2012).

In his study for example on the role of ICT in financial management and revenue collection in Malaysia, Nigeria, Ethiopia and Kenya, Davidson (2011) argues that Malaysia has been growing at a rate of 4.6 GPA against its counterparts like Nigeria and Kenya that were far ahead in their GPAs in the late 1970s and early 1980s. According to him, the country for example in 2009 spent approximately €337 million for erecting new structures that integrated new technology that was imported from Japan with the aim of streamlining its National Revenue Collection Authority.

This has been missing in the African countries for long like Kenya, Ethiopia, Nigeria and many more that have been lacking enough financial resources in their budgets to invest in such importations. A study by Malburg (2010) show that in Nigeria the impact of cost in ICT projects is considered a 21st century challenge by both the local and national government. Williams (2010) researched on ICT in education and revenue management in sub Saharan Africa and looked at countries like Ghana, Nigeria and many more, whereby the idea of financial resources were not left out.

2.3.2 Information Communication Technology Infrastructure and sustainability

The Information Technology Infrastructure Library is a set of practices for IT service management (ITSM) that focuses on aligning ICT services with the needs of business. In its current form (known as ITILv3 and ITIL 2011 edition), ITIL is published in a series of five core publications, each of which covers an ITSM lifecycle stage (Bernelot, 2013).

Chen & Thurmaier (2011) define infrastructure in ICT as the computer and communication hardware, software, databases, people, structures and policies supporting an enterprise's information management functions. The World Bank Institute report of 2009, indicates that the backbone of ICT projects in revenue collection in the world ties itself to infrastructural facilities that range from hard infrastructure like: computer laboratories, computers, electricity and computer hardware, to software infrastructure like local internet connection and computer software. Davidow & Uttal (2010) carried a survey report about ICT projects in education, financial management and e-migration management in most countries in six African countries in 2008/2009 that included Kenya, DRC, Angola, Eritria, Nigeria and Morocco. The report shows that 4 of the 6 countries surveyed have, or are in the process of, liberalizing their telecommunications policies to enable more competition and diversity of service providers in the industry by trying to subsidized or eliminate the barriers tied to ICT infrastructure like frequent electrical power interruptions, poor network signals etc. The report continues to show that poor policies in the African countries have been a challenge whereby they have been having the effect of lowering the cost of access to information and telecommunication infrastructure, leading to the costs of connectivity being unaffordable for most parastatals and institutions.

Furthermore, a study by Grant (2010) on the common East Africa taxing system shows that the project is challenged specifically in Tanzania due to the fact that there is a difference in the level of ICT infrastructure between the country's towns and other town of the neighboring countries like Kenya, Uganda, Burundi and Rwanda. This study generalizes the ICT infrastructure challenge in East Africa by saying that, there are huge gaps between urban and rural areas in terms of access to ICT infrastructure. Access to a reliable supply of electricity in Towns like

Tabora (KRA Terminus after Isibania Border), Arusha, Shinyanga and many more is a general problem but is particularly severe in rural areas because of the difficulty of connecting to national electrical grids. A similar study by Mutakha (2011) shows that the county governments will be faced with a major problem of developing ICT that will help them be self-sufficient in revenue collection and projects execution. Quoting counties from North Eastern parts of Kenya for example, he argues that there is a general lack of human resource capacity to provide ICT training and equipment servicing, and there is also a lag between the availability of ICT infrastructure and the ability of developing a general standard ICT infrastructure that is reliable.

Sigey (2010) argues that, the role of electricity in ICT projects implementation in KRA is a challenge that if overlooked can kill up to 57 Percent expectations of the ICT strategy implementation by the parastatal. He further suggested that the parameters to be looked into when accessing the ICT readiness for an institution include; infrastructural availability like electricity, access to infrastructure, manpower availability, policy and regulatory framework. In Kenya, one of the major cited hindrances to ICT integration and use in parastatals like the KRA, KPLC, KPC and many more is lack of electrical power (Kenya Revenue Authority, 2010).

A report by the World Bank (2013) shows that almost 35 Percent of KRA branches up to date are still not yet connected to continuous electricity flow. Those that have connected grids like the Mombasa bureau are served with electricity that is faced with regular power black outs causing effects of delayed performance, extra expenses of repairs when machines are electrocuted/short/destroyed due to power over supply, extra sources of power sourcing like generators that are expensive to maintain and many more. Kenya being a developing country, the government has not been able to connect all parts of the country to the national electricity grid.

2.3.3 Management Support and sustainability

Recent research on the role of top management in ICT projects failure in Kenya and SA that interviewed 1867 respondents, Heeks (2011) shows that, 100 Percent respondents agreed that it is vital for senior management to be supportive to a project and to provide the necessary resources to carry it out. However, inappropriate ICT knowledge, lack of familiarity, and background among the top management who were selected and decided on the project with the target technologies will cause inaccurate decision and eventually contribute to the project's failure. This study continued to show that the managers are the chief accounting officers in their parastatal branches and therefore are concerned in allocating budgets to various activities including implementation of ICT projects. According Siror (2010), implementation of ICT projects in any revenue collection point would be successful when branches leaders/managers supports, learns, provide up to-date infrastructure, adequate professional development and support staff during its implementation.

Revenue administration leaders and managers have the responsibility of bringing harmony whenever a new technology is adopted, identifying gaps, giving direction, identifying and providing resources besides implementing the various laid down policies and projects. According to Graham & Waema (2014), a good and focused leadership gives a sense of direction to the employees of an organization through clear cut policies, well defined mission, vision and well directed course of action. It also encourages all the employees in an organization thus challenging them to take new creative and innovative chores that will always bring an increment of revenue in any organization.

Chelimo (2010) on the role of technology in energy regulations shows that the responsibility of supervising and implementing ICT programs in the government sector remains in the hands of management. In the study for example, she cited that application of ICT in electricity bills collection at first faced acute opposition from the management, whereby the top managers especially those in the main offices in Nairobi were opposing the idea as they felt that it could deny them the chances of influencing the power rates, it could reduce the number of employees (some of whom have been their close relatives and friends), could deny them the powers of control and in many cases could require extra spending by hiring expertise or training the available ones on ICT issues.

More research by Kloppenburg & Laning (2012) support the idea that leadership behavior determines success or failure of parastatals plans to implement ICT in their activities. Therefore, parastatal managers' behaviors are important in implementation of ICT. According to Strickland, Thompson and Gamble (2004), leadership behavior of managers has a positive role in determining the process of ICT implementation in various sectors across the world. A positive behavior towards ICT would set clear visions and good conditions for its implementation. In Parastatals like KRA for example, positive behavior towards ICT would manifest itself by the way the managers use ICT and encouraging others to use it.

2.3.4 Training and skills and sustainability

Research has identified that “people management drives project success more than technical issues do”. Despite this finding however, there exists only a small body of research that examines the people side of project management (Kloppenburger & Opfer, 2002). According to Archibald (1976), the successful project manager should have the following skills and

competencies: flexibility and adaptability, preference for significant initiative and leadership, aggressiveness, confidence, persuasiveness, verbal fluency, ambition, activity, forcefulness, effectiveness as a communicator and integrator, broad scope of personal interests, poise, enthusiasm, imagination, spontaneity, able to balance technical solutions with time, cost, and human factors, well organized and disciplined, a generalist rather than a specialist, able and willing to devote most of his or her time to planning and controlling, able to identify problems and willing to make decisions.

According to Turner and Müller (2005), although the project success literature has traditionally ignored the project manager (and his or her competence, personality, or leadership style) as a project success factor, much has still been written on the subject of the project manager. “They reviewed literature from a myriad of authors and derived the following conclusions :that the project manager’s competence is related to his or her success as a project manager; that different project leadership styles are appropriate at each stage of the project life cycle; that specific leadership styles are appropriate for multi-cultural projects; that project managers have a leadership role in creating an effective working environment for the project team; that project managers prefer task-oriented to people-oriented leadership styles and that the project manager’s leadership style influences his or her perception of success in different situations.

2.3.5 Stakeholder Participation

For many years, stakeholder Participation has been considered vital for efficiency and effectiveness of ICT projects. ICT projects tend to be more effective and sustainable when they adopt a participatory approach. Stakeholder participation help projects meet their targets within planned budget and enhance sustainability of ICT projects management. Active stakeholder

participation in various project`s activities is recommended to enhance their positive impact to the citizens. Developing countries tend to adopt stakeholder participation initiatives as they help in creating a sense of ownership, settle internal differences, increase technical knowledge and management experiences of the beneficiaries of ICT projects (Khan, 2004). Decades of implementation of development projects have proved that top down approaches to development don`t work (Hodgkin, 1994). The top down participation of the beneficiaries usually adopted by central governments has been challenged in the past as the government planning mechanism view beneficiary participation as a process of drawing people in to project implementation after all project decisions have been made (Mulwa, 2008). In this way people are seen as resource potential that the authorities want to mobilize and this usually includes involuntary material and financial contribution towards these public projects. Genuine stakeholder participation does not focus on participation in implementation or even in project design but rather has to start with the community identifying their needs. This ideology has been utilized a lot in the recent past where community based groups initiate development projects assisted by external entities. This has enabled the people identify their own goals and define how to attain them. This is an approach that places control and ownership squarely on the hands of the beneficiaries (Tango International, 2009).

2.3.6 Project Sustainability

According to Brundtland (1987), a project is sustainable if it effectively meets the needs of present population without jeopardizing the ability of the future generations to meet their needs (Keeyes, 2012). Before the work by Brundtland commission, sustainability of a project was seen as the ability of a project to maintain healthy economic records once the initial financial input has been stopped (Deland, 2009). Bagheri and Hjorth (2007) viewed a sustainable project as one

whose short term outputs are highly valued by the stakeholders such that they are willing to sacrifice and commit resources to the maintenance of the project to ensure it produces outputs in the long term. With the integration of all these concepts, a holistic look at sustainability can take into account multiple indicators that can be monitored to ensure project sustainability. In this study, sustainability will be henceforth defined as the ability of a project to continue fulfilling the desired needs in the community on the long term even after external support has been withdrawn. The sustainability of community development projects has been an important concern in developing countries (Panda, 2007). Sustainability of a project ensures that the benefits from a project are felt for extended periods of time that can justify the economic and social input invested in to the project (Hayward & Neuberger, 2010). Unfortunately, sustainability development concepts and principles are not taken much seriously in development projects (Gareis, Huemann, & Weninger, 2010). In the corporate sector, sustainability is a very important concept that is taken seriously because of the need to meet company and also customers' needs (Heap, 1998). There is however little guidelines on sustainable project management and also the role of the project team in ensuring project sustainability (Silvius & Schipper, 2010).

Ebner and Baumgartner (2010) in their work note that a project acquires sustainability if it is managed by a system that has the long term capacity to mobilize resources sufficiently. These 10 resources come in the form of technology, finances, manpower, information and raw materials (Ebner and Baumgartner, 2010). There are three key indicators that can be used to monitor project sustainability; these factors include project benefits, systemic indicators and social development indicators (Silvius & Schipper, 2010). From these indicators, it is possible to derive factors that affect the sustainability of community development projects. These factors can be classified into factors associated with project design and implementation, organizational factors

and environmental factors (Silvius & Schipper, 2010). It is paramount for the project team to take into considerations these indicators during the planning and design phases of community development projects if sustainability is to be achieved.

2.4 Summary of Literature Review

Whereas various scholars and researchers have come up with multiple factors affecting project sustainability, no single person or research can claim to have exhausted all the factors affecting project sustainability. Furthermore, even where researchers have primarily focused their studies in the area of IS/IT, no researches have produced the same project sustainability factors and even where the same researcher conducted the exact same study in different time periods they have consistently come up with different project sustainability factors. This goes to show the complexity of the subject and it will thus be foolhardy for this study to state that the conclusions drawn are exhaustive.

Most of the quoted researchers have approached the subject from within the project management teams of the studied projects by collecting primary data from the project managers themselves. All the indicators/ determinants of project sustainability in these past studies have therefore emanated from only one party within the entire project organization which would in a way be biased reporting since the project manager will always see themselves as the better person within the project and blame everyone and everything else for project sustainability but themselves. This research study seeks to bridge the gap to identify the overall perception of on sustainability of ICT projects within Kenya Revenue Authority.

2.5 Conceptual Framework

Conceptual framework is a presentation on how the independent and dependent variables are related. It therefore, specifies the working definition of a variable and enables a simple explanation of the flow of theoretical framework used by the study (Mugenda & Mugenda, 2003). In this study, the independent variables were financial resources, ICT infrastructure, management support and knowledge and skills while the dependent variable will be project sustainability.

Independent Variables

Dependent Variable

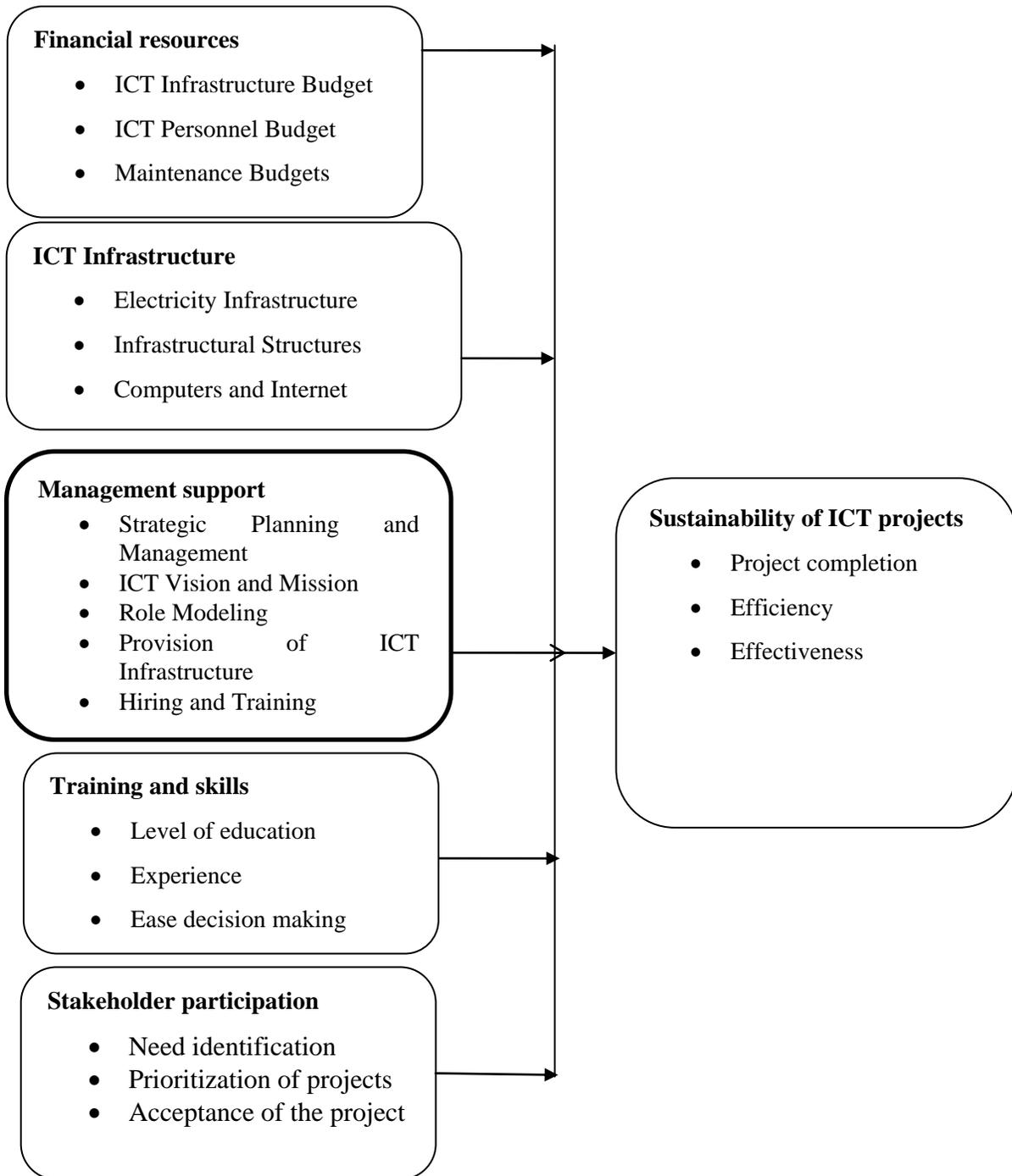


Figure 2.1 Conceptual Framework

Source: Author (2016)

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the methodology that was used to conduct this study, focusing on research design, study location, target population, sampling procedures and sample size, research instruments, questionnaires, pilot study, reliability, validity, data collection procedure and methods of data analysis.

3.2. Research Design

This study employed the use of a descriptive survey research design. Research design refers to the procedures selected by a researcher for studying a particular set of questions or hypothesis; this includes this study's choice of quantitative or qualitative methodology, and how, if at all, causal relationships between variables or phenomena are to be explored (Orodho, 2009).

Descriptive design allows the researcher to gather information, summarize, present and interpret data (Zikmund, 2000). Indeed, descriptive design is preferred because the questions raised in the study require collecting data through administration of questionnaires to the respondents. The Surveys are always favored for such a research that focuses on a group of people since they are capable of obtaining information from large samples of the population. Equally, surveys require minimal involvement to develop and administer and are quite easy for making generalizations (Mugenda and Mugenda, 2003).

Descriptive design allows the data to be gathered, summarized, presented and interpreted and interpreted. Descriptive method involves measurement, classification, comparison and

interpretation of data while the survey method is suitable as it is used in gathering data from a relatively large number of cases at a particular time.

3.3 Target Population

Target population is a set of people or objects that the study wants to use to draw the results from (Borg and Gall, 1989). In this study, the target population consisted of Five Main ICT projects; Simba, ITMS, Online Services, Vehicle Monitoring System (VMS), I-Tax Management System that are used by all the 1,496 employees in the seven major Departments in KRA; These include customs service, domestic taxes, road transport, human resources, administration, finance and IC. It is from these Departments that the respondents were drawn as distributed in Table 3.1

Table 3.1: Respondents

Departments	Total Employees	Percentage
Customs service	456	30.48 Percent
Domestic taxes	364	24.33 Percent
Road transport	81	5.41 Percent
Human resources	43	2.87 Percent
Administration	100	6.68 Percent
Finance	42	2.81 Percent
ICT	410	27.41 Percent
Total	1,496	100 Percent

Source, KRA, (2016)

3.4 Sample Size and Sampling Procedure

Stratified random sampling was used to divide the projects into different project categories i.e. customs service, domestic taxes, road transport, human resources, administration, finance and ICT. Simple random sampling was used to select a sample from the various strata's representing to represent the entire population because the sample population is heterogeneous (Kothari, 2001). Mugenda & Mugenda (2003) advocate for 10-30% of target population as representative sample with a population of less than 1000 and 1-10% for populations over 1000. This gave a total of 150 respondents.

Table 3.2: Sample Size

Departments	Employees	Percentage	Sample Size
Customs service	456	10 Percent	46
domestic taxes	364	10 Percent	36
road transport	81	10 Percent	8
human resources	43	10 Percent	4
Administration	100	10 Percent	10
Finance	42	10 Percent	4
ICT	410	10 Percent	41
Total	1,496	10 Percent	150

Source, KRA, (2016)

3.5 Data Collection Instruments

Research instrument used was a questionnaire that had both open-ended and structured questions. This instrument was preferred because of its effectiveness in generating the required response. It was economical to use in terms of time and money. The open-ended questions were appropriate in this study as they permitted a greater depth of response especially as this study was descriptive in nature and thus this type of questions allowed the respondents to give their feelings, background, hidden motivation, interests and decisions (Mugenda & Mugenda (2003).

The respondents also had adequate time to give well thought answers and large samples could be made use of and thus the results could be made more dependable and reliable (Kothari,2004).

The data collection procedure that was preferred was self-administration of the questionnaires.

3.5.1 Validity of Research Instrument

The Pilot testing was done to determine validity of the data collection instrument. According to Paton (2001) validity is quality attributed to proposition or measures of the degree to which they conform to establish knowledge or truth. It refers to the extent to which an instrument asks the right questions in terms of accuracy. Mugenda and Mugenda (1999) define validity as the accuracy and meaningfulness of inferences which are based on research results. A pilot test was carried out using a random sample of 10 respondents who were excluded from the real study. Content validity which was employed by this study is a measure of the degree to which data collected using a particular instrument represents a specific domain or content of a particular concept. After piloting, the questionnaire was adjusted accordingly to meet the desired purpose. Expert opinion was requested to comment on the representativeness and suitability of questions and give suggestions of corrections to be made to the structure of the research tools, this was received from the supervisors in the department of management science.

3.5.2 Reliability of Research Instrument

According to Powell, (2004) reliability is always contingent on the degree of uniformity of the given characteristics in the population. This implies that the more heterogeneous the population is in regard to the variable in question, the more reliable the instrument is likely to be. Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals and by using uniform testing procedures. In order to test the reliability of the instruments, internal consistency techniques were applied using Cronbach's Alpha. The alpha

value ranges between 0 and 1 with reliability increasing with the increase in value. Coefficient of 0.6-0.7 is a commonly accepted rule of thumb that indicates acceptable reliability and 0.8 or higher indicated good reliability (Mugenda, 2008). Therefore 0.7 was adopted as a cutoff point.

3.6 Data Analysis and Presentation

According to Orodho (2003), data analysis is the process of systematically searching and arranging filed notes, data and other materials obtained from the field with the aim of increasing one's own understanding and to enable one to present them to others. This study collected both qualitative and quantitative data through the questionnaires. After collecting the questionnaires, they were checked for completeness, consistency and uniformity. Data clean-up followed this process involved editing, coding and tabulation in order to detect anomalies in the responses and assign specific numerical values to the responses for further analysis. Both inferential and descriptive methods were used. Tools used for analysis were MS Excel and Statistical Package for Social Sciences (SPSS). Descriptive statistics was used to describe the data with interpretation in percentages; frequencies mean score and standard deviation. Closed ended questions were analyzed through percentages to depict weight given to each item, the open ended questions were analyzed through content analysis to depict the main themes from the responses while likert type questions through mean scores. Analysis for variance (ANOVA) and Multiple Regression Analysis was used to determine the relationship between the variables. The findings were presented using tables and graphs for further analysis and to facilitate comparison. This generated quantitative reports through tabulations, percentages, and measure of central tendency.

3.6.1 Regression Model

The data was analyzed using the following regression equation to find out the relationship between variables.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$$

Y- Is the dependent variable (Sustainability of projects);

β_0 - the constant; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ - are regression coefficients or change induced in Y by each X variable;

X_1 - Financial resources;

X_2 - ICT infrastructure;

X_3 - Stakeholder Participation;

X_4 - Training and skills;

X_5 - Management Support

e - error term.

This study used the regression coefficients to test the magnitude of the relationship between variables. This study applied f and t-significance from ANOVA to establish the significances of such relationship. ANOVA was used as it compares group means by analyzing comparisons of variance estimates; that is, whether or not the means of several groups are all equal. This helped in establishing whether there is a significant relationship between the dependent and independent variables, hence the significance of the regression model.

Correlation coefficient values ranging between -1 and 1 which measures the degree to which two variables are linearly related with the higher magnitude indicating higher degree of association between two variables. Cohen (1988) observed that that a correlation coefficient of magnitude 0.3–0.5 shows a medium linear dependence between two variables while 0.5 to 1.0 shows a strong linear dependence. According to Rohlf and Sokals' (1995) critical values for the correlation coefficient, is 0.576 at 0.05 error margin. Qualitative data was analyzed using content analysis where variables were arranged thematically.

3.7 Ethical Considerations

An authorization letter was acquired from Kenyatta University with which Permission was sought from The National Commission for Science, Technology and Innovation and permit awarded (see Appendix III). This was presented to the Deputy Commissioner, Kenya Revenue Authority. The respondents were assured of confidentiality of the data collected and used codes instead of names as identification of participants. Voluntary participation and consent of respondents was also sought. The respondents were informed that they can withdraw from this study if they wish to do so without any consequences.

CHAPTER FOUR

DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter contains findings, discussions and presentation of findings that this study targeted. The aim was investigating sustainability of ICT projects in KRA. General information of the respondents and discussion of data based on the objectives is given. Pie charts, Graphs and frequency distribution tables were used in presenting data where interpretations and conclusions were made.

4.2 Response Rate

Detailed questionnaires were designed and distributed to investigate the sustainability of Information and Communication Technology Projects in Kenya Revenue Authority. To make the analysis more comprehensive a total of 150 questionnaires were distributed out of which 117 were filled and returned which is a response rate of 78.18 Percent. The response rate was considered satisfactory for this study as in table 4.1 below.

Table 4.1: Response Rate

Respondents	Questionnaire Distributed	Questionnaire Returned	Response Rate
	150	117	78.18 Percent

Source: Research data, (2016)

This response rate was good and representative and conforms to Mugenda and Mugenda (2003) stipulation that a response rate of 50 Percent is adequate for analysis and reporting; a rate of 60 Percent is good and a response rate of 70 Percent and over is excellent. The questionnaires that

were not returned were due to the respondents not available to fill them in at that time and with persistence follow-ups there were no positive responses from them. The response rate demonstrates a willingness of the respondents to participate in this study. Table 4.1 shows the number of questionnaires distributed and the number of questionnaires returned from the respondents including their percentage response rate.

4.3 Reliability Analysis

The results of the item analysis conducted to determine the reliability of the summated scores calculated for the various factor categories are reported in this section. The Item analysis was conducted for all items (statements) in the questionnaire that were summated into scores for the 5 factor categories. For each factor Cronbach's coefficient α was calculated and a factor analysis specifying a one factor model was conducted. Tests for the internal reliability of the factors in each category were conducted by determining their Cronbach's coefficient α value.

Table 4.2: Reliability Analysis

Variable	Cronbach's Alpha
financial resources	.83
ICT infrastructure	.80
Stakeholder Participation	.89
Training and skills	.77
Management Support	.82
Combined α value	.82

Source: Research data, (2016)

Cronbach's α value for all factor categories were $> .70$, which is regarded as adequate proof of internal consistency. The Combined Cronbach's α values was at $.82$. It should be noted that Cronbach's α values of 0.50 to 0.70 are acceptable while that greater than $.70$ stipulates high reliability according to Mohsen (2011).

4.4 Demographic Characteristics of Respondents

The results on demographic characteristics of the respondents were investigated in the first section of the questionnaire. Socio demographic characteristics of the respondents included gender, age bracket, level of education and work experience. These variables indicate the proportions of the respondents who were interested in this study.

4.4.1 Age

The level of employee performance may vary with the age of the respondents. In order to avoid biasness, this study had to investigate the composition of the respondents in terms of age brackets to understand their familiarity with the sustainability of ICT projects. This study thus posed a question requesting the respondents to indicate their age brackets. Figure 4.1 shows the results of the findings on the age brackets of the respondents.

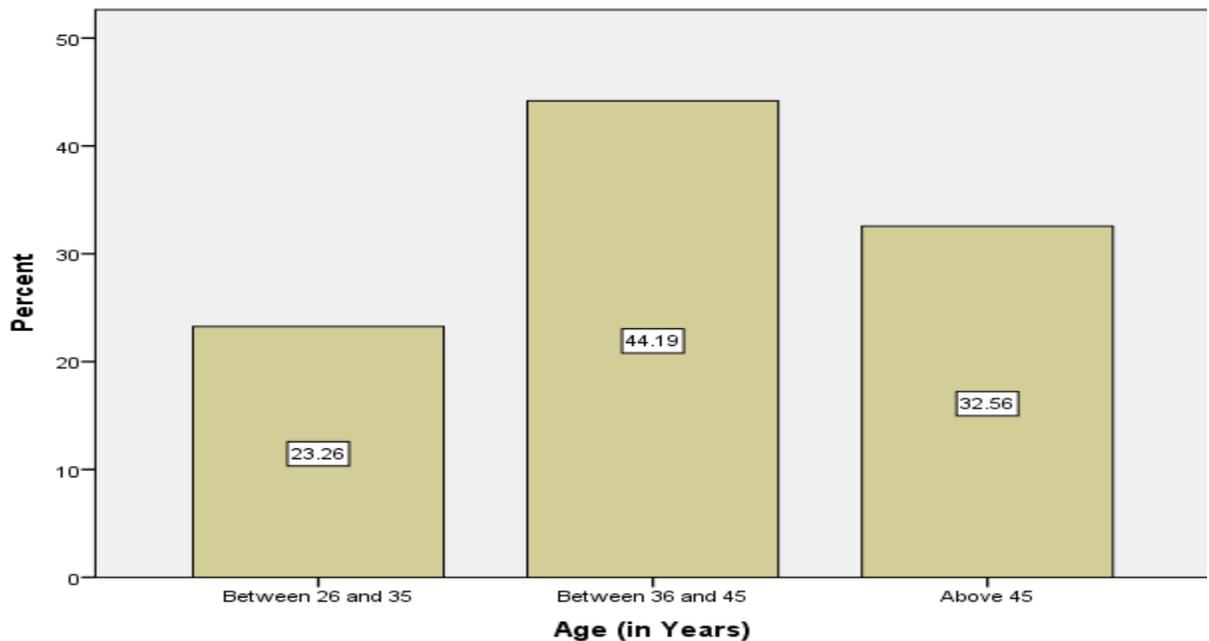


Figure 4.1: Respondents Age

Source: Research data, (2016)

From the findings, 44.19 Percent of the respondents were aged between 36 and 45 years followed by 32.56 Percent who were above 45 years while 23.26 Percent of them indicated that they were between 26 and 35 years. It was clear that none of the respondents was aged below 25 years of age. This implies that most respondents have been in the organization for a considerable time hence possessing the right information regarding sustainability of ICT projects.

4.4.2 Gender

Gender balance has been a great emphasis in most public-sector firms. This study found it necessary to find out the number of male versus the females for purpose of knowing the gender that mostly interacts with the ICT system, for purpose of balancing out the findings for it to be a

comprehensive representation of the entire corporation. It was found paramount to determine the respondents' gender in order to ascertain whether there was gender parity in the positions indicated by the respondents. According to the analysis it was evident that majority of the respondents were male which represented (55.81 Percent) while (44.19 Percent) were female. This is in line with literature from Acker (2006) who observed that gender equality was a very important trait since it can be used to improve performance of all the staff involved. He argued that it fosters teamwork and also creates a sense of unity and the aspect of working together for a common goal with every individual effort whether male or female being important to the attainment of the overall objectives. A gender responsive firm provides a conducive working environment where a staff/manager is supposed to interact with other colleagues of the opposite gender in pursuit of excellence and achievement of set targets.

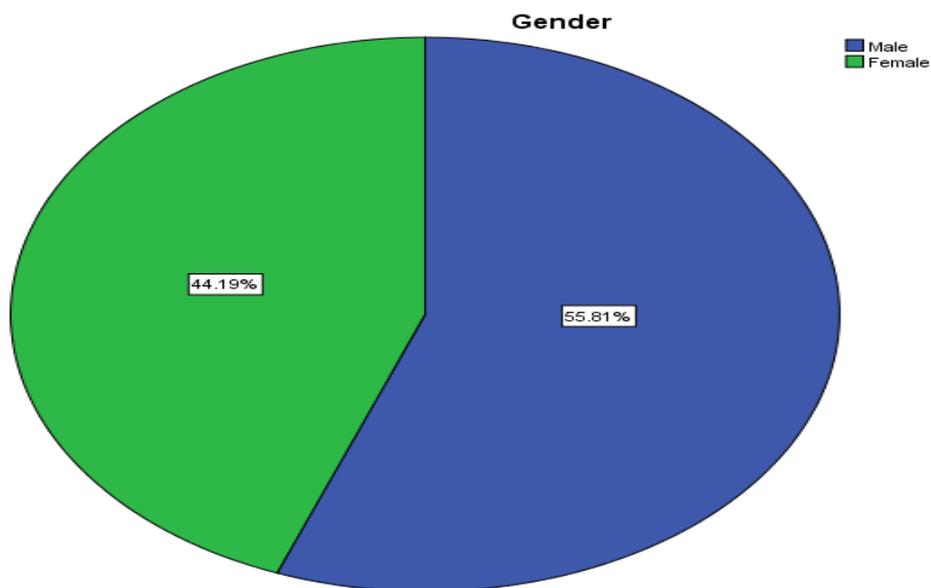


Figure 4.2 Gender

Source: Research data, (2016)

The findings showed that the KRA had both male and female members. The findings imply that the views expressed in these findings are gender balanced and can be taken as representative of the opinions of both genders as regards to the sustainability of ICT projects.

4.4.3 Work Experience

This was incorporated in the research instrument to establish if respondents had much experience in interaction with the ICT projects within the authority and the level of day to day interaction with them.

The length of service/working in an organization determines the extent to which one is aware of the issues sought by this study. In the wake of technological advancements and globalization, there are likely to be many changes in institutional and operating environment that the respondents should know when responding to the issues sought by this study. Establish of the length of time that the respondents had been working in KRA was done. The results on this question are presented in figure 4.4.

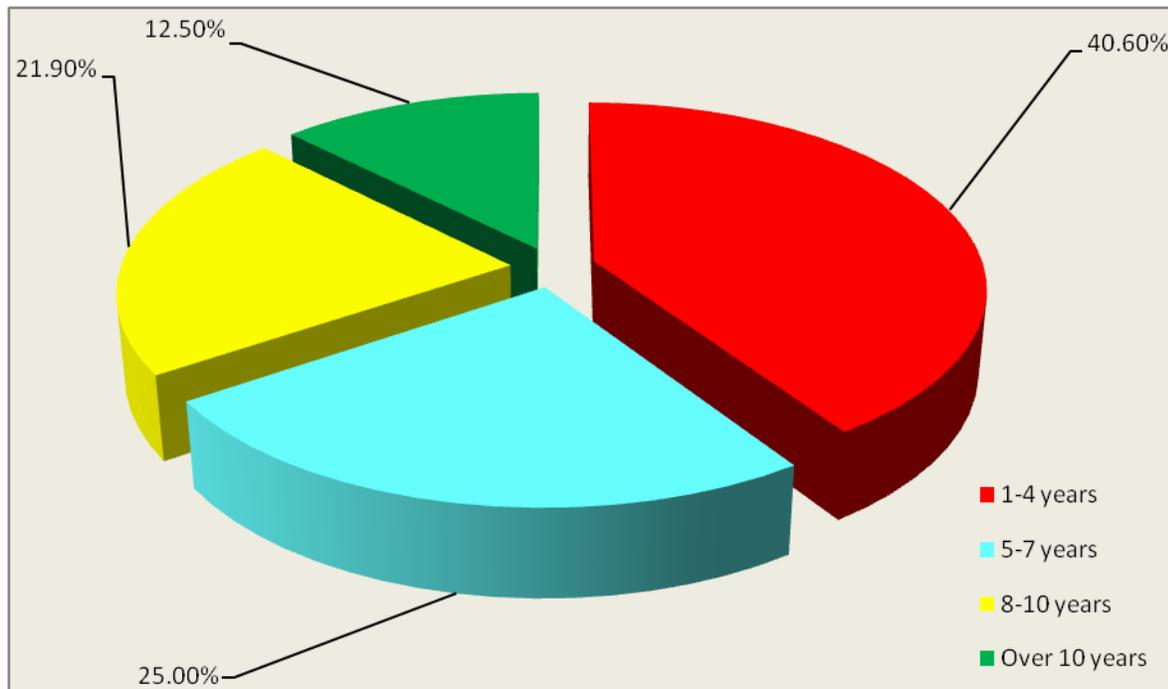


Figure 4.4: Length of Time Worked

Source: Research data, (2016)

40.60 Percent of the respondents indicated that they had an experience of 1 - 4 years in the organizations, 25.0 Percent of them had worked in the organization for a period of 5 - 7 years, 21.90 Percent of them had a working experience of 8-10 years, while 12.50 Percent of the respondents indicated that they had an experience of more than 10 years in the organization. This shows that majority respondents had enough work experience in organizations to respond effectively. Most of the respondents had worked in the organization for long period hence they understood the sustainability of ICT projects in the organization.

4.4.4 Level of Education

This study sought to find out the level of skills and training, for purpose of establishing if respondents will comprehend the information that what sought by this study.

The results revealed that 58 percent of the respondents had acquired a Bachelor’s or undergraduate degrees, while 42 percent had acquired post graduate level of education as their highest level of education. It was further established that none of the respondents had college education. These results imply that majority of the respondents had at least an undergraduate degree and hence understood the information sought by this study. The findings further imply that all the respondents were academically qualified and also familiar with their duties and could dispense them effectively in terms of professional work ability and performance.

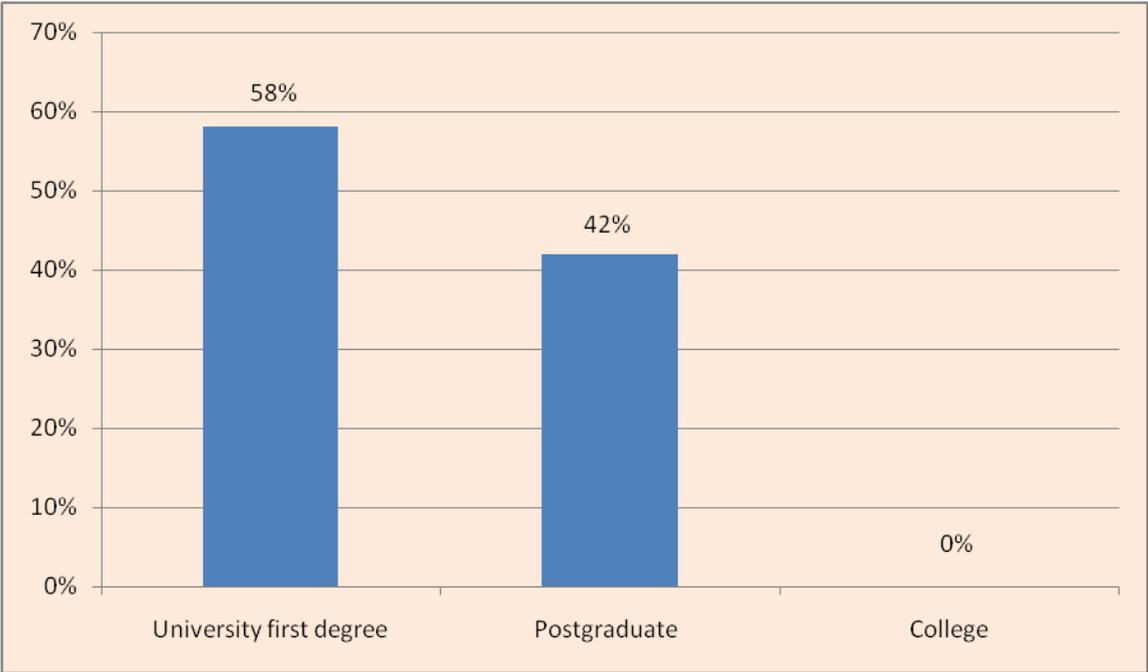


Figure 4.3: Level of Education

Source: Research data, (2016)

4.5 Results on Descriptive Statistics

4.5.1 Financial Resources and ICT Projects Sustainability

Respondents were asked whether they supported the idea that there was an influence posed by

Financial resources in ICT projects Sustainability by KRA and the following were the findings

Table 4.3 Financial Resources

Response	Frequency	Percentage
YES	108	92.31
NO	9	7.69
Total	117	100

Source: Research data, (2016)

From the responses, 108 of the respondents who represented 92.3 Percent felt that financial resources as a factor influenced the Sustainability of the ICT Projects at the KRA while the remaining 9 felt that this has no influence representing 7.69 Percent. When asked to support their reasoning in the above answers, respondents who made 108 in numbers argued that finances were central in hiring qualified personnel, buying the required computers and general success of the project while the remaining argued that minus proper leadership, the funds could go into a waste as the projects were prone to fail.

The respondents were asked in a Likert scale of 1-5, where: Not at all =1, Little extent =2, Moderate extent=3, Great extent =4, Very great extent =5, to indicate the extent to which the following factors have been an influence in ICT programmes Sustainability in KRA and the responses were as follows:

Table.4.4 Degree of Support of Financial Resources Influence

Statement	Mean	Standard Deviation
Limited ICT Infrastructure Budget	4.231	.956
Constrained ICT Personnel Budget	3.982	.986
Constrained Maintenance Budgets	3.453	.989
Average mean score	3.889	.977

Source: Research data, (2016)

From the responses, respondents represented by a mean of 4.231 felt that limited ICT infrastructure budget influence the sustainability of ICT projects, those who felt that constrained ICT personnel budget influenced ICT sustainability are represented by a mean of 3.982 with those who felt that constrained maintenance budgets influenced ICT sustainability are represented by a mean of 3.453. The overall mean was 3.889 which indicated that financial resources as a factor influence ICT sustainability to a large extent.

The responses confirmed that financial resources were crucial in sustaining ICT projects. For example, Siror, et al. (2010), ICT ideas diffusion and integration just like any other business undertaking in the world, whether developed or developing countries need efficient capital to function efficiently and grow. Increasing the ICT business' volume and services requires additional capital. Funding is needed to cater for meetings and feasibility studies, purchase of

necessary facilities like the quality computers and accessories, hiring the required personnel for the new technology, installing and erecting new/relevant ICT enabling structures etc.

Carvalho, (2013) for example argue that The Global Report on the Costs of ICT 2013 indicates that the total money spent on ICT worldwide has been most recently estimated as US \$3.5 trillion, and is currently growing at 5 Percent p.a. This has been doubling every 15 years. IT costs, as a percentage of corporate revenue, have grown 50 Percent since 2002, putting a strain on ICT budgets and organizational budgets as a whole. Today, when looking at companies' IT budgets, 75 Percent are recurrent costs, used to "keep the lights on" in the ICT department, and 25 Percent are cost of new initiatives for technology development. The World Bank (2010) reports that the average ICT budget has the following breakdown: 31 Percent personnel costs (internal), 29 Percent software costs (external/purchasing category), 26 Percent hardware costs (external/purchasing category), and, 14 Percent costs of external service providers (external/services). The recent reports therefore indicate that both the developed and developing countries are heavily investing in ICT as the major economic driving force.

4.5.2 Infrastructural Facilities' Influence on ICT projects Sustainability

Respondents were asked whether they thought that ICT enabling infrastructure has been a Factor influencing the sustainability of the ICT strategy in the KRA and the responses were as follows:

Table 4.5 Infrastructural Facilities

Response	Frequency	Percentage
YES	63	53.85
NO	36	30.78
NOT SURE	18	15.37
Total	117	100

Source: Research data, (2016)

From the response, 53.85 Percent of the respondents felt that the infrastructure as a factor has an influence in the sustainability of ICT projects while the remaining 30.78 Percent and 15.37 Percent went for no and not sure respectively as per the responses from the field. When asked randomly to support their reasoning from the above, 71 Percent of the respondents said that infrastructure is the back bone where the ICT projects rides on while the remaining argued that as much as ICT infrastructure had an influence in ICT projects sustainability, a few can be achieved minus combining other factors like leadership and finances.

Respondents were also asked whether they agreed with the following factors in relation to infrastructural facilities and sustainability of ICT programmes in KRA using a scale of 1-5 where 1= strongly disagree; 2 = Disagree; 3 =Not sure; 4 =Agree; 5 = strongly agree and the following responses were arrived at as shown in the table:

Table 4.6 Degree of Infrastructural Facilities Rating

Statement	Mean	Standard Deviation
Electricity Infrastructure has been a major factor in ICT projects implementation	4.321	.654
Infrastructural Structures have been a limiting factor in ICT adoption by KRA	4.673	.634
Computers and Internet supply have been a factor in ICT adoption	4.234	.723
Average mean score	4.409	.670

Source: Research data, (2016)

The idea that Electricity infrastructure has been a major factor in ICT sustainability showed that a mean of 4.321, Infrastructural Structures have been a limiting factor in ICT adoption by KRA had a mean of 4.673 with computers and Internet supply have been a factor in ICT adoption having a mean of 4.234. The average mean score was 4.409 which is a strong indication that infrastructural facilities as a factor greatly influence ICT projects sustainability in KRA.

It was confirmed from the findings that ICT infrastructure influenced ICT projects sustainability to high extent. Machuki K'Obonyo (2011) for example shows that almost 54 Percent of the

major government run parastatals in Kenya are lacking a well-defined ICT laboratory for separate activities. In KRA for example, computers range from common computers that are shared among 3 employees- for the cases of Mombasa and Eldoret bureau, and one for the individuals who share common operations, that is only protected by a pass word and placed at the employee's desk; making it hard for one to come up with creativity and focused production to the company. The lack of a separate computer for each individual worker, lack of computer laboratories for separated operations and low numbers of computer application programmes as opposed to paper work limits the creativity of the employees and to a great extent a good number of them shy away from such working environments; making the ICT strategy sustainability a challenge.

4.5.3 Management Support Influence in ICT Projects Sustainability

The respondents were asked to give their position in relation to what extent they thought management support influenced ICT programmes adoption in Kenya's KRA.

Table 4.7 Influence of management support

Rating	Frequency	Percentage
Not at all	4	3.08
Little extent	9	7.69
Moderate extent	12	10.80
Great extent	39	32.32
Very great extent	56	48.11
Total	117	100

Source: Research data, (2016)

From the responses, not at all, attracted 4 respondents; little extent, attracted 9 respondents;12 attracted moderate extent, 39 went for great extent, while the remaining 56 went for very great extent. This implies that management support has a great influence on ICT projects sustainability. This study sought to seek the extent to which the respondents rated the influence of management support in relation to ICT projects implementation on a scale and the responses below arrived at: A scale of 1-5 was used where **1= strongly disagree; 2 = Disagree; 3 =Not sure; 4=Agree; 5 = strongly agree.**

Table 4.8: Rating of management support

Statement	Mean	Standard Deviation
Strategic ICT Planning and Management is missing in KRA's management.	3.452	.542
ICT Vision and Mission has not been fully adopted by KRA.	2.456	.562
Role Modeling in ICT has not been achieved by managers.	2.341	.652
Provision of ICT Infrastructure has been a challenge from managers.	3.421	.789
Hiring and Training of ICT experts and personnel has been given a raw deal by the administration.	2.657	.732
Average Mean Score	2.865	.655

Source: Research data, (2016)

This study's findings indicated that the statement that role modeling in ICT has not been achieved by managers had the lowest mean of 2.341 with the statement that strategic ICT Planning and Management is missing in KRA's management having the highest mean of 3.452. The average overall mean was 2.865 indicating that respondents had contradictory views on the statements posed concerning management support and ICT projects sustainability.

The role of management as an influence on the sustainability of ICT projects was found to be significant. From the literature for example, in his recent research on the role of top management in ICT projects failure in Kenya and SA that interviewed 1867 respondents, Heeks (2011) shows that, from the interviews, 100 Percent respondents agreed that it is vital for senior management to be supportive to a project and to provide the necessary resources to carry it out. However, inappropriate ICT knowledge, lack of familiarity, and background among the top management who were selected and decided on the project with the target technologies will cause inaccurate decision and eventually contribute to the project's failure.

4.5.4 Stakeholder participation and ICT projects sustainability

This study further determined if the stakeholder participation in the project process influenced ICT projects sustainability. The findings were as indicated in the figure 4.4

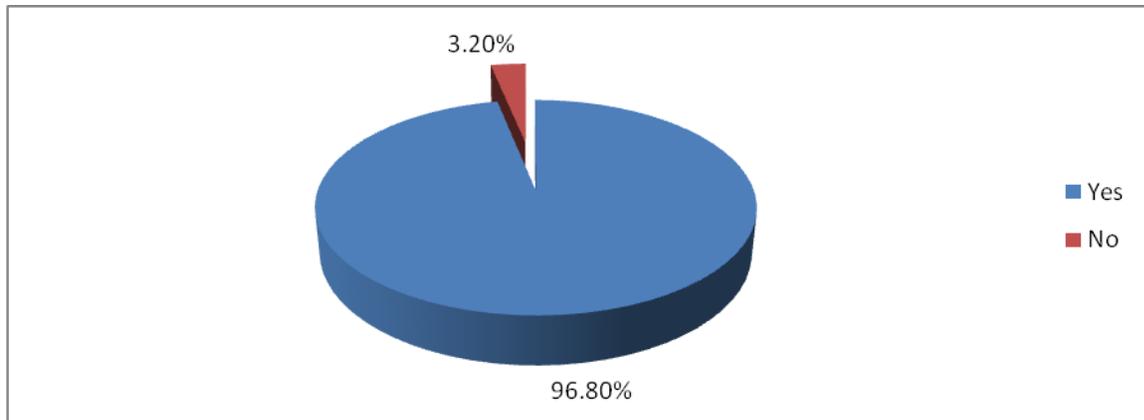


Figure 4.5: Stakeholder participation

Source: Research data, (2016)

The findings of this study indicated that majority (96.80 Percent) of the respondents indicated that the stakeholder participation influences ICT projects sustainability. 3.20 Percent of the respondents however indicted that the stakeholder participation do not influence ICT projects sustainability. The respondents further indicated that the stakeholder is involved in the project process through participation in financial management, monitoring and evaluation, governance and operations and management. This study concurs with IRC (2003) that stakeholder Participation (CP) has been considered vital for efficiency and effectiveness of the ICT projects.

This study further determined the extent of stakeholder participation in the outlined ICT project activities. The findings were as indicated in Table 4.9.

Table 4.9: Extent of stakeholder participation

	Mean	Standard deviation
ICT Project Activity	2.67	1.047
Selection and prioritizing of ICT projects	2.71	0.734
Location of ICT projects	2.99	1.301
Follow up/monitoring of ICT projects	2.83	0.802
Management of ICT project funds	2.55	0.934

Source: Research data, (2016)

The findings of this study indicated that majority of the respondents indicated that they moderately participated in the ICT project activity as indicated by a mean of 2.67, with selection and prioritizing of ICT projects registering a mean of 2.71. They also indicated that they participated in the locations of the ICT projects as indicated by a mean of 2.99, with follow up/monitoring of ICT projects registering a mean of 2.83 and lastly they moderately participated in management of funds as indicated by a mean of 2.55. Stakeholder participation in budgeting process strengthens and broadens partnerships and also creates spaces for mutual learning. (Baiocchi, 2005) illustrated that participatory budgeting process produce actual welfare effects by improving the effectiveness of public investments, emphasizing a pro-poor orientation and reducing possibilities for „pork-barrel politics“ and other forms of clientelistic policy-making processes. Transparency is a vital ingredient for building trust and maintaining the commitment of individual members of projects.

4.5.5 Training and Skills Influence in ICT Projects Sustainability

The respondents were asked to give their opinion as to whether training and skills had an influence on sustainability of ICT projects in KRA. Out of the total respondents, 73.5 percent felt that Training and Skills had an influence on sustainability of ICT projects in KRA. 26.5 percent felt that Training and Skills did not have an influence.

Table 4.10 Influence of Training and skills

Response	Frequency	Percentage
YES	86	73.5
NO	31	26.5
Total	117	100

Source: Research data, (2016)

Respondents who responded to YES Training and Skills had an influence on Sustainability of ICT projects in KRA, were further asked to break down their responses to the extent of influence.

Table 4.11 Rating of Training and Skills on Sustainability

Rating	Frequency	Percentage
Very low extent	1	1.16
Low Extent	3	3.49
Neutral	5	5.81
Great extent	34	39.53
Very great extent	43	50
Total	86	100

Source: Research data, (2016)

Out of the respondents who agreed that Training and skills has an influence on Sustainability of ICT projects: To a very low extent attracted 1 respondent, Low extent attracted 3 respondents, Neutral attracted 5, great extent, 34 and for Very great extent were 43.

Lee-Kelley et al. (2003) set out to find out the effect of skills and training on Project Sustainability. In His study, He found it vital that the various players in a project need to be knowledgeable in their area of responsibility in the project, this cuts across the management to the end users, A gap in skills from any stakeholder might affect a project’s sustainability.

4.6 ICT Project Sustainability at KRA

The respondents were also expected to rate the following statement as they relate to ICT projects sustainability. The findings are as shown in the table 4.12 below.

Statement	Mean	SD
There has been high rate of the sustainable ICT projects in KRA	3.302	1.202
ALL ICT projects in KRA were well planned, executed and thus sustained in the long run	3.485	1.447
The management in KRA have fully supported ICT projects thus high level of sustainability	4.197	1.210
Sustainability of ICT projects has be easily achieved in KRA	4.098	1.156

The results from the table 4.12 above show that there has been no high arte of sustainability of ICT projects at KRA, the mean value of 3.303 and a standard deviation of 1.202 indicates that the sustainability has only been average but not to the expectation. The results also indicate that

the management of KRA supported the ICT projects and hence high sustainability. however this applies to a few projects that had full support from management.

In the same vein, on whether all ICT projects at KRA were well planned, executed and thus sustained, the respondents confirmed that this was not the case as various factors affected the execution and sustainability.

4.7 Results of Inferential Analysis

Inferential analysis was used to establish the relationship between the independent variables and the dependent variable. Inferential statistics analysis aimed to reach conclusions that extend beyond the immediate data alone between the independent variables in this study. The independent variables in this study included financial resources, ICT infrastructure, management support, training and skills and stakeholder participation while the dependent variable being sustainability of ICT projects.

4.7.1 Regression Analysis

Regression model is used here to describe how the mean of the dependent variable changes with changing conditions. Regression Analysis was carried out for focus on financial resources, ICT infrastructure, management support, training and skills and stakeholder participation and sustainability of ICT projects. To test for the relationship that the independent variables have on sustainability of ICT projects, a multiple regression analysis was done.

Table 4.13 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.787 ^a	.625	.609	147.57954

- a. Predictors: (Constant), financial resources, ICT infrastructure, management support, training and skills and stakeholder participation
- b. Dependent Variable: Sustainability of ICT projects

The five independent variables that were studied explain 60.9 Percent of the sustainability of ICT projects as represented by the adjusted R square. This therefore means that other factors not studied in this research contribute 39.1 Percent of the sustainability of ICT projects. This implies that these variables are significant therefore need to be considered in any effort to boost sustainability of ICT projects in Kenya.

Table 4.14 ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	324285.245	4	81071.311	3.722	.012 ^b
Residual	827629.406	38	21779.721		
Total	1151914.651	42			

Source: Research data, (2016)

- a. Dependent Variable: Sustainability of ICT projects
- b. Predictors: (Constant), financial resources, ICT infrastructure, management support, training and skills and stakeholder participation

The significance value is 0.012 which is less than 0.05 thus the model is statistically significant in predicting how financial resources, ICT infrastructure, management support, training and

skills and stakeholder participation influence the sustainability of ICT projects in KRA in Kenya. The F critical at 5 Percent level of significance was 3.722. This shows that the overall model was significant. This study ran the procedure of obtaining the coefficients, and the results were as shown on the table 4.15.

Table 4.15 Coefficient Results

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error			
1	(Constant)	1492.193	120.754		12.357	.000
	Financial resources	5.431	28.403	.040	.191	.049
	ICT infrastructure	49.041	25.553	.420	1.919	.032
	Stakeholder Participation	79.373	68.789	.682	1.154	.036
	Training and skills	69.224	69.389	-.597	-.998	.025
	Management Support	4.431	8.403	.040	.291	.039

a. Dependent Variable: sustainability of ICT projects

Source: Research data, (2016)

As per the SPSS generated table above, the equation ($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon$) becomes:

$$Y = 1492.193 + 5.431X_1 + 49.041X_2 + 79.373X_3 + 69.224X_4 + 4.431X_5 + \epsilon$$

According to the regression equation established, constant at zero sustainability of ICT projects was 1492.193 meaning this is the value when all the stated independent variables have zero influence to sustainability. A unit increase in financial resources will lead to a 5.4 percent

increase on sustainability of ICT projects. The p-value of 0.049 which is less than 0.05 indicates that financial resources are a statistically significant determinant of project sustainability.

A unit increase in ICT infrastructure will lead to a 49 percent increase in sustainability of ICT projects, according to Grant (2010), the success of any systems is highly dependent on availability of infrastructure. This value was found statistically significant factor affecting Project sustainability, with a p-value of 0.032. the results from this are in line with those of Carvalho, (2013) who argues that The Global Report on the Costs of ICT 2013 indicates that the total money spent on ICT worldwide has been most recently estimated as US \$3.5 trillion, and is currently growing at 5 Percent p.a. This has been doubling every 15 years. IT costs, as a percentage of corporate revenue, have grown 50 Percent since 2002, putting a strain on ICT budgets and organizational budgets as a whole.

Stakeholder participation was found to be the highest factor affecting sustainability of ICT projects; a unit increase in Stakeholder Participation will lead to a 79.4 percent increase in sustainability of ICT projects with a p-value of 0.036 which indicates that it is a statistically significant determinant of project Sustainability. Heeks (2011) agrees that it is vital for senior management to be supportive to a project and to provide the necessary resources to carry it out. However, inappropriate ICT knowledge, lack of familiarity, and background among the top management who were selected and decided on the project with the target technologies will cause inaccurate decision and eventually contribute to the project's failure.

A unit increase on management support will lead to 4.43 percent increase in sustainability of ICT projects. This study concurs with IRC (2003) that stakeholder Participation (CP) has been

considered vital for efficiency and effectiveness of the ICT projects. This variable has a p-value of 0.039 and therefore statistically significant factor affecting Sustainability.

A unit increase in training and skills will lead to a 69.2 percent increase in sustainability of ICT projects. The p-value of 0.025 which is less than 0.05 indicates that Training and skills is a statistically significant determinant of project sustainability. Jim mullins (2004) agrees that training and skills is one of the major factors that will contribute to 50 percent probability of success of a project.

4.7.2 Correlation Analysis

Pearson correlation was used to measure the degree of association between variables under consideration that is; independent variables and the dependent variables. Pearson correlation coefficients range from -1 to +1. Negative values indicate negative correlation and positive values indicates positive correlation where Pearson coefficient < 0.3 indicates weak correlation, Pearson coefficient $0.3 < r < 0.5$ indicates moderate correlation and Pearson coefficient > 0.5 indicates strong correlation.

Table 4.16 Correlation Coefficients

		Financial resources	ICT infrastructure	Management support	Training and skills	Stakeholder participation	Sustainability of ICT projects
Financial resources	Pearson Correlation	1	.723**	.539**	.577**	.577**	.367*
	Sig. (2-tailed)		.000	.000	.000	.000	.016
	N	117	117	117	117	117	117
ICT infrastructure	Pearson Correlation	.723**	1	.625**	.621**	.621**	.504**
	Sig. (2-tailed)	.000		.000	.000	.000	.001
	N	117	117	117	117	117	117
Management support	Pearson Correlation	.539**	.625**	1	.971**	.971**	.387*
	Sig. (2-tailed)	.000	.000		.000	.000	.010
	N	117	117	117	117	117	117
Training and skills	Pearson Correlation	.577**	.621**	.971**	1	.621**	.349*
	Sig. (2-tailed)	.000	.000	.000		.000	.022
	N	117	117	117	117	117	117
Stakeholder participation	Pearson Correlation	.539**	.625**	.971**	.971**	1	.387*
	Sig. (2-tailed)	.000	.000		.000	.000	.010
	N	117	117	117	117	117	117
Sustainability of ICT projects	Pearson Correlation	.367*	.504**	.387*	.349*	.508**	1
	Sig. (2-tailed)	.016	.001	.010	.022	.001	.000
	N	117	117	117	117	117	117
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Source: Research data, (2016)

The analysis above shows that Stakeholder participation has the strongest positive influence on ICT projects sustainability (Pearson correlation coefficient =.508) and $P < 0.05$ implying that the relationship is statistically significant. In addition, ICT infrastructure, management support, financial resources, and training and skills are positively correlated to sustainability of ICT projects (Pearson correlation coefficient =.504, .387, .367 and .349 respectively and $P < 0.05$ implying statistically significant relationships. The correlation matrix implies that the independent variables are very crucial determinants of ICT projects sustainability as shown by their strong and positive relationship with the dependent variable.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of this study's findings, discussions and recommendations of this study. This chapter also contains suggestions of related studies that may be carried out in the future.

5.2 Summary of findings

Kenyan government embarked on adopting the use of Technology in Projects since the year 2003. The projects were administered through respective government bodies and ministries. Kenya Revenue Authority (KRA) is one such a Public Sector that has invested heavily in the use of Information and Communication Technology which have been undertaken from time to time over the years with an aim of achieving efficiency to the taxpayer. However, these ICT projects have been faced with challenges that have affected their sustainability.

The purpose of this study was to investigate sustainability of Information Communication Technology projects in Kenya Revenue Authority by investigating the factors that affect the sustainability of these projects within KRA. The Objectives of this study were: To find out the effect of financial resources on sustainability of ICT projects in Kenya Revenue Authority, to investigate the effect of ICT infrastructure on sustainability of ICT projects in Kenya Revenue Authority, to determine the extent to which management support influences sustainability of IT projects in Kenya Revenue Authority, to establish the effect of Training and skills on sustainability of ICT projects in Kenya Revenue Authority, and to determine the effect of

stakeholder participation on sustainability of ICT projects in Kenya Revenue Authority. A descriptive research design was employed and target population of 1496 employees that cut across all major Departments was used as a representative sample size of ten percent which was used to draw the respondents. Questionnaires with both closed and open ended questions were used as the data collection instrument then the data was presented using both qualitative and quantitative techniques, and also analyzed by employing both inferential and descriptive statistics.

From an analysis and review of the research data and additional data gathered through questionnaires filled, the objectives of this study were reviewed against the data from respondents.

5.2.1 The effect of financial resources on sustainability of ICT projects.

Availability of financial resources was found to be crucial in sustaining ICT projects from the planning phase, implementation and support. Implementation, support, marketing and training costs need to be available for ICT projects to be sustainable.

5.2.2 The effect of ICT infrastructure on Sustainability of ICT projects.

ICT infrastructure was found to be vital to support the technology side of ICT projects, which allow proper running of the systems and its availability, which greatly contributes to its sustainability.

5.2.3 The extent to which management support affects sustainability of ICT projects.

The effect was found significant as they are the key decision makers in terms of supporting a project in various aspects such as negotiation of a budget, marketing and enforcement of proper usability and hence sustainability of a project. The study sought to establish the effect of Training and Skills on Sustainability of ICT projects. Training and Skills was found to be vital at

all levels from management level, to the ICT staff who implement the project and support it post deployment, as well as the end users who interact with the systems on a daily basis.

5.2.4 The effect of Stakeholder involvement on Sustainability of ICT projects.

Stakeholder involvement was found to significantly affect the sustainability of ICT projects, with the greatest effect. It came out clearly that stakeholders need to be involved from the onset of the project, so that all requirements of a project that impact to its sustainability are captured.

5.2.5 Inferential and descriptive findings

The inferential statistical results imply that these variables are significant therefore need to be considered in any effort to boost sustainability of ICT projects in Kenya. A unit increase in ICT infrastructure will lead to a 49 percent increase in sustainability of ICT projects, according to Grant (2010), the success of any systems is highly dependent on availability of infrastructure. This value was found statistically significant factor affecting Project sustainability, with a p-value of 0.032. Stakeholder participation was found to be the highest factor affecting sustainability of ICT projects; a unit increase in Stakeholder Participation will lead to a 79.4 percent increase in sustainability of ICT projects with a p-value of 0.036 which indicates that it is a statistically significant determinant of project Sustainability. Pearson correlation was used to measure the degree of association between variables under consideration that is; independent variables and the dependent variables. The analysis above shows that Stakeholder participation has the strongest positive influence on ICT projects sustainability (Pearson correlation coefficient =.508) and $P < 0.05$ implying that the relationship is statistically significant. In addition, ICT infrastructure, management support, financial resources, and training and skills are positively correlated to sustainability of ICT projects (Pearson correlation coefficient =.504, .387, .367 and .349 respectively and $P < 0.05$ implying statistically significant relationships.

5.3 Conclusion

From the information gotten from the field and the values computed in chapter four, this study concludes that: stakeholder's participation in KRA affects sustainability as their requirements and expectations are not captured comprehensively thus this has limited the rate of success of ICT projects. Training and skills is a significant factor on Sustainability of ICT Projects and lack of it will affect survival of a project in the long run. Insufficiency of financial resources has influenced sustainability of ICT project in KRA, for projects to be successful even post deployment, a long-term budget must be allocated to ensure sustainability of the project.

The study found that ICT infrastructure has been an influence in the sustainability of the said ICT projects in the KRA, as efficiency and survival of the ICT projects which are deployed in the ICT infrastructure, depends on if enough infrastructure has been provisioned to ensure business continuity and service availability.

Finally, management support also contributes to sustainability of ICT projects as they are the gap between technology and business, to negotiate any support that the project may need.

5.4 Recommendations

This study Recommended that all stakeholders to be involved at every stage of the ICT projects, to ensure that after rollout of the projects, they achieve the intended purpose. These stakeholders include all users of the system, from the tax payers to the internal staff, as well as the Government of Kenya, to understand what the project entails and therefore offer any support required. This is with reference to the findings, where a huge percentage of those interviewed agreed that stakeholder participation had an influence on ICT project sustainability.

Based on the findings that an increase in ICT infrastructure support will increase ICT projects Sustainability, it was recommended that the ICT infrastructure such as Servers, Networking and Data Storage should be of good capacity, electricity be sourced and alternative sources of power be put in place, by the ICT department, which is headed by the Deputy Commissioner –ICT.

On the basis of management support, the management should come up with measures aimed at building equipped laboratories, increasing the number and capacity of computers and finally connect them with unlimited internet.

This study also recommended that the management should heavily take up the ICT initiative, have better perception towards ICT and start campaigning for the ICT strategy initiatives integration in KRA. It was recommended that Training of all personnel at different levels involved in the ICT projects, either on managerial, operations or technical level be done during various phases of the ICT projects to ensure Sustainability. This is supported by finding from the study; that most of those interviewed agreed that increase in training will cause an increase on sustainability.

Based on the findings of this study, many of the respondents agreed to a great extent that financial resources contributed to sustainability of financial resources it was recommended that more financial resources be set aside by the government to be invested in ensuring quality systems. The KRA management should increase the allocation to ICT department in order to increase the integration and sustainability of ICT projects in the KRA.

Finally, this study recommended that the organizational structure needs to be framed in a way that well stated ICT policies are developed, stated, attached to rewards and seen as an integral part in the parastatals rules. Also, laws being broken in relation to ICT, penalties should be attached.

5.5 Suggestions for Further Research

This study was carried out in KRA and it was recommended that a similar study can be done in other public organizations in the country to capture any other factors that affect sustainability of ICT projects that might have not been captured in this study. Another study can also be done to focus on the role of organizational structure in the success of the ICT strategy in KRA. Finally, a research can be done to investigate the socio-economic factors influencing the sustainability of ICT projects in KRA or any other public institution in the country.

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APPENDIX I: Research Questionnaire

Dear respondent,

I am a postgraduate student at Kenyatta University pursuing a Master in Business Administration Project Management option. As a partial fulfillment of the course, I am conducting a study on Sustainability of ICT projects in public institutions, a case of Kenya Revenue Authority. For this reason, I would kindly appreciate if you would spare a few minutes of your time to fill in the questionnaire to the best of your knowledge.

Kindly respond to the questionnaire by ticking (√) in the appropriate box or by filling the spaces provided. The information provided will be highly appreciated and treated with utmost confidentiality and only used for the sole purpose of this study which is academic.

Thank you in advance.

Yours faithfully,

Sarah Mutua

D53/CTY/PT/25868/2013

Kenyatta University

Section A: Basic Information

1. Your gender: Male Female

2. Your age bracket

20-30yrs 31 - 40 Years 41 - 50 years 51 - 60 years Over- 61 years

3. Highest education level?

Diploma/certificate Bachelors' degree Postgraduate degree others
specify.....

4. Working Experience.

a) Less than 5 years () b) 5-10 years c) 10-20 years () d) 21 years and above ()

Section B: Financial Resources

5. Do you support the idea that there is an influence posed by financial resources in ICT projects sustainability by KRA?

Yes () No ()

6. Support your answer in 5 above by giving reasons with relevant examples

.....
.....
.....

7. In a Likert scale of 1-5, where: Not at all =1, Little extent =2, Moderate extent=3, Great extent =4, Very great extent =5, indicate the extent to which the following factors have been a an

Influence to ICT programmes sustainability in KRA

No	Factor	1	2	3	4	5
1.	Limited ICT Infrastructure Budget.					
2.	Constrained ICT Personnel Budget.					
3.	Constrained Maintenance Budgets.					

Section C: ICT Infrastructural Facilities

8. Do you think that ICT enabling infrastructure has been a factor in sustainability of ICT Projects in KRA?

Yes () No () Not sure ()

9. Briefly give reasons for your answer in 8 above

.....

.....

.....

10. How do you agree with the following factors in relation to ICT infrastructural facilities and Sustainability of ICT programmes in KRA? Use a scale of 1-5 where 1= strongly disagree; 2 = Disagree; 3 =Not sure; 4 =Agree; 5 = strongly agree.

No	Factor	1	2	3	4	5
1.	Electricity Infrastructure has been a major challenge to ICT sustainability.					
2.	Infrastructural Structures have been a limiting factor in ICT sustainability by KRA.					
3.	Computers and Internet supply have been a challenge in ICT sustainability.					

Section C: Management support

11. To what extent do you think management has been a factor in the ICT programmes sustainability in Kenya's KRA?

Very great extent [] Great extent [] Moderate extent [] little extent [] Not at all []

12. To what extent do you agree or disagree with the following statements? Use a scale of 1-5 where 1= strongly disagree; 2 = Disagree; 3 =Not sure; 4 =Agree; 5 = strongly agree.

No	Statement	1	2	3	4	5
1.	Strategic ICT Planning& Management is missing in KRA's management.					
2.	ICT Vision & Mission has not been fully adopted by KRA.					
3.	Role Modeling in ICT has not been achieved by managers.					
4.	Provision of ICT Infrastructure has been a challenge from managers.					
5.	Hiring and Training of ICT experts and personnel has been given a low deal by the management.					

Section E: Training and Skills

13. In your opinion, do you think there is sufficient skills to support sustainability of ICT projects in KRA?

Yes () No ()

14. If yes, to what extent?

Very great extent ()

Great extent ()

Neutral ()

To a low extent ()

To a very low extent ()

15. To you think training and skills influence the sustainability of ICT projects in KRA?

Yes () No ()

Explain your answer above

.....

.....

.....

16. In your opinion, does the following parameters present challenges to sustainability of ICT projects in KRA

No	Statement	1	2	3	4	5
1.	Induction training of staff					
2.	Refresher training					
3.	Taxpayer education/clinic					
4.	Job experiences					

Section F: Stakeholder involvement

17. Is the stakeholders involved in the project process?

Yes

No

18. In your opinion how is the stakeholder involved in the project process?

19. Kindly tick your rate of satisfaction with the extent of stakeholder involvement in the following project activities:

	Satisfied	Fairly Satisfied	Dissatisfied
Project Activity			
Selection and prioritizing of projects			
Location of projects			
Follow up/monitoring of projects			
Management of project			

SECTION G: SUSTAINABILITY

20. To what extent do you agree on the following statement as they relate to ICT projects sustainability? Rate, 1 to strongly disagree while 5 to strongly agree. Please tick appropriately

Statement	1	2	3	4	5
There has been high rate of the sustainable ICT projects in KRA					
ALL ICT projects in KRA were well planned, executed and thus sustained in the long run					

The management in KRA have fully supported ICT projects thus high level of sustainability					
Sustainability of ICT projects has be easily achieved in KRA					

THANK YOU FOR YOUR PARTICIPATION

APPENDIX II: Approval of Research Proposal



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

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NAIROBI, KENYA
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Internal Memo

FROM: Dean, Graduate School

DATE: 29th June, 2016

TO: Sarah Mumo Mutua
C/o Management Science Dept.

REF: D53/CTY/PT/25868/2013

SUBJECT: APPROVAL OF RESEARCH PROPOSAL
=====

We acknowledge receipt of your revised Research Proposal as per our recommendations raised by the Graduate School Board of 8th June, 2016.

You may now proceed with your Data Collection, subject to clearance with Director General, National Commission for Science, Technology and Innovation.

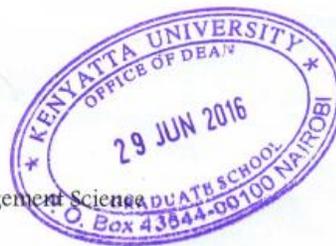
As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

EDWIN OBUNGU
FOR: DEAN, GRADUATE SCHOOL

c.c. Chairman, Department of Management Science

Supervisors:



APPENDIX III: Research Permit



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

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Ref: No. NACOSTI/P/16/67868/13585

Date:

16th September, 2016

Sarah Mumo Mutua
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on "*Sustainability of Information and Communication projects in public sector organizations in Kenya: A case of Kenya Revenue Authority,*" I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **14th September, 2017**.

You are advised to report to the **Commissioner General, Kenya Revenue Authority, the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.


BONIFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The Commissioner General
Kenya Revenue Authority.