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**An Assessment Tool for ICT Stakeholder Integration and Infrastructure  
Performance Improvement: Case Kenya**



**Doctor of Philosophy**

**June 2021**

**An Assessment Tool for ICT Stakeholder integration and Infrastructure  
Performance Improvement: Case Kenya**

**Diana Kageha Ominde (052515)**

**Submitted in total fulfillment of the requirements for the Degree of Doctor of  
Philosophy in Business Management at Strathmore University**



**Strathmore University Business School**

**Strathmore University**

**Nairobi, Kenya**

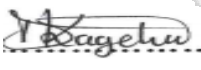
**June 2021**

## Declaration and Approval page

I declare that this is my original work and has not been submitted or approved for any award of degree in this or any other University. To the best of my knowledge the content used in this thesis, especially from other researchers' work has been acknowledge in form of referencing where applicable.

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### Approval

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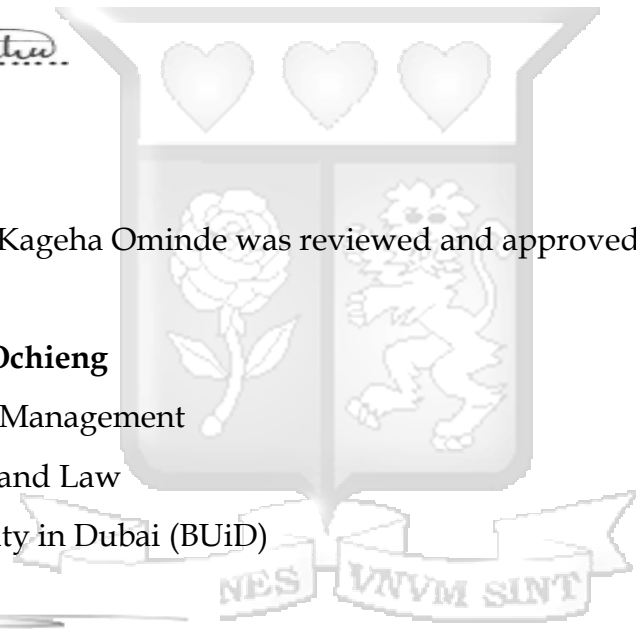
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Strathmore University

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Date: **1<sup>st</sup> June 2021**



## Abstract

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The poor performance of infrastructural projects in the country has been partly attributed to the lack of an evaluation framework for these projects, especially in terms of the stakeholder management model, and need to look into how the projects can achieve their optimal success formed the research problem of the study. This was to be pursued through the development of an assessment tool for stakeholder integration and infrastructure performance improvement in the ICT sector. The specific objectives of the research study were to establish the complexity of project delivery and propose improvements to policy makers and senior project practitioners in the ICT sector in Kenya. Moreover, the study was keen to identify key stakeholder integration determinants that can be used by policy makers and senior project practitioners to enhance ICT infrastructure project planning in Kenya. Additionally, the study focused on identifying some of the key performance metrics that are specific, measurable and relevant to the achievement of stakeholder integration and ICT infrastructure planning in Kenya. In addition, the study was keen to assess how infrastructure policy makers and senior project practitioners can prioritise and ensure there is a holistic end-to-end commitment to realise the defined benefits of ICT infrastructure projects in Kenya. Finally, the research proposed an assessment tool that comprises stakeholder integration, project complexity and performance metric determinants, which can be used to enhance the delivery of ICT projects in Kenya. The study adopted mixed methods research design, specifically, exploratory sequential design to examine how ICT project practitioners and policy makers can improve ICT project delivery. A total of 500 participants formed a target sample for the quantitative method; 290 participants responded and 286 of the filled-in questionnaires were found to be useful for the analysis. For the qualitative method, 47 participants were interviewed, and the data was analysed through NVivo. The number of participants was considered adequate with regards to the context of the study and the realisation of the objectives, which aimed to propose an assessment tool for ICT project delivery in Kenya.

Data analysis comprised descriptive statistics, a reliability test, a correlation test and principal component analysis. Validity and reliability were attained through the assessment of the plausibility of variables in relation to the existing knowledge on integration of stakeholders, project complexity and key performance metrics within the context of delivery of ICT projects. The assessment tool was verified through focus discussions with participants. Research rigour was achieved through verification and validation of the methodology coherence and data analysis. The findings of the study suggest that ICT performance be measured against the achievement of stakeholder integration and realisation of benefits. Commitment to project objectives, competence of key stakeholders, alignment of stakeholder skills, understanding of core project processes and addressing stakeholder needs and expectations were found to be key to stakeholder integration. Through theory elaboration, the study structured the sequence relations of project management and stakeholder management constructs that could be used to assess and optimise the delivery of ICT infrastructure projects. The findings gave the novelty of the research study to be viewed from two perspectives:

- The research study findings intended to streamline the delivery of ICT projects in Kenya as a way of enhancing the performance of these projects. The development of an assessment tool for the evaluation of stakeholders delivering ICT projects in Kenya is likely to be an important step in addressing the missing link between theory and practice. ICT project practitioners now have an assessment tool on which they will be able to base their project delivery model as a way of enhancing the outcome of their project.
- From a policy viewpoint, the research study findings are likely to form part of the appraisal models that the government apply in monitoring the progress of ICT stakeholder integration. As already noted, the final outcome of the research was the proposal of an assessment tool that can be used by infrastructure policy makers and senior project practitioners in Kenya to ensure a mind-set of accountability and a structured approach to ICT project planning and stakeholder integration.

**Keywords:** Information communication technology (ICT), Key performance metrics, Stakeholder integration, Benefit realisation, Project complexity.



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## List of abbreviations

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**AI-** Artificial intelligence

**CAK-** Communications authority of Kenya

**CCK-** Communication commission of Kenya

**FGD-** Focused group discussion

**GDP-** Gross domestic product

**GSM-** Global system for mobile communications

**ICT-** Information communication technology

**ICTA-** Information and commission technology authority

**KENET-** Kenya education network trust

**KNBS-** Kenya national bureau of standards

**KPI-** Key performance indicators

**KPM-** Key performance metrics

**NACOSTI-** National commission for science, technology and innovation

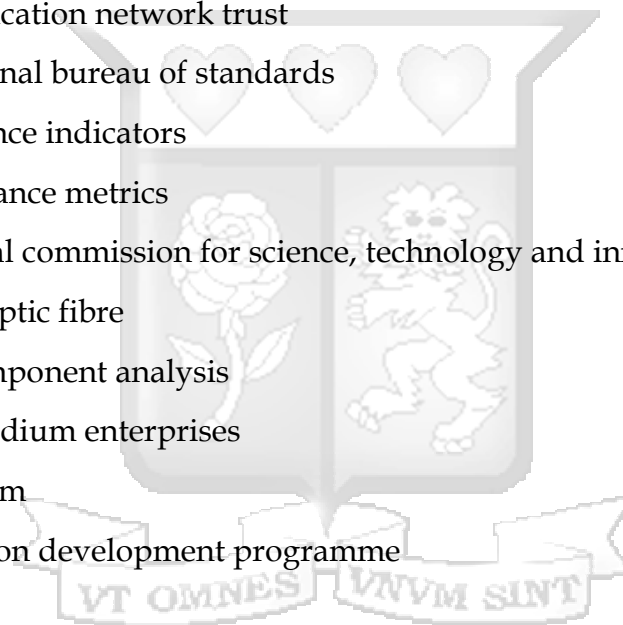
**NOFBI-** National Optic fibre

**PCA-** Principal Component analysis

**SME-** Small and medium enterprises

**UK-** United Kingdom

**UNDP-** United nation development programme

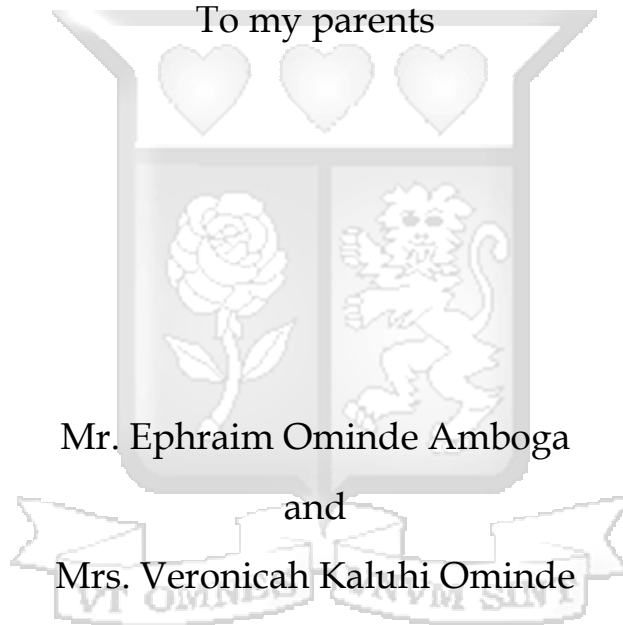


## Dedication

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This thesis is dedicated.

To my parents



Mr. Ephraim Ominde Amboga

and

Mrs. Veronicah Kaluhi Ominde

## Acknowledgements

---

Many wonderful people have contributed towards the successful completion of this research journey.

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## List of published publications

---

### Referred Conference

- **Ominde, D.**, Ochieng, E.G. and Omwenga, V. (2020). Refitting stakeholder integration strategies. Case ICT projects in Kenya. *EURAM Conference*. December 4-6, at Trinity College, Dublin, Ireland, ISSN 2466-7498 and ISBN 978-2-9602195-2-4 Available from: [https://s3.amazonaws.com/amz.xcdsystem.com/15B4DBD5-FFD1-D393-oF4517B218EA66B2\\_abstract\\_File9278/1173\\_Paper\\_0114042934.pdf](https://s3.amazonaws.com/amz.xcdsystem.com/15B4DBD5-FFD1-D393-oF4517B218EA66B2_abstract_File9278/1173_Paper_0114042934.pdf)

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- **Ominde, D.**, Ochieng, E.G. and Omwenga, V. (2020). Enhancing delivery of Information Technology Projects through stakeholder sense-making. *International Journal of Business Process Integration and Management*, **10**(1), pp. 1-16. Available from: <https://www.inderscience.com/info/inarticle.php?artid=113116>
- **Ominde, D.**, Ochieng, E.G. and Omwenga, V. (2021). Optimising ICT infrastructure performance in developing countries. Kenyan viewpoint. *Technological Forecasting and Social Change*. Vol. 169 (120844-in press). Available from: <https://www.sciencedirect.com/science/article/abs/pii/S0040162521002766>

### Book chapters

- **Ominde, D.** and Ochieng, E.G. (2020). Managing multi-partner collaborations on major infrastructure projects in' Ochieng, E.G., Zoufa, T. and Badi, S., *Routledge Handbook of Planning and Management of Global Strategic Infrastructure Projects*. Oxon, UK: Routledge Taylor and Francis Group, pg. 155-170. ISBN 9780367477486. Available from: <https://www.routledge.com/Routledge-Handbook-of-Planning-and-Management-of-Global-Strategic-Infrastructure/Ochieng-Zuofa-Badi/p/book/9780367477486>
- Ochieng, E.G. and **Ominde, D.** (2020). The role of operations and maintenance in infrastructure management in' Ochieng, E.G., Zoufa, T. and Badi, S., *Routledge Handbook of Planning and Management of Global Strategic Infrastructure Projects*. Oxon, UK: Routledge Taylor and Francis Group, pg.221-247. ISBN 9780367477486. Available from: <https://www.routledge.com/Routledge-Handbook-of-Planning-and-Management-of-Global-Strategic-Infrastructure/Ochieng-Zuofa-Badi/p/book/9780367477486>

# Chapter One: Introduction

---

## 1.1 Introduction

This chapter sets the scene for the thesis and appraises the concept of stakeholder integration in project management. Moreover, the chapter provides a synopsis of the research problem, theoretical gaps in the research area, and the research aim, objectives and novelty.

## 1.2 Background to research

Kenya relies on ICT as one of the critical drivers of economic growth (Outa *et al.*, 2006). The development of the ICT sector in the country is considered an impetus to the general economy of the country. In fact, the country has been leveraging its ICT growth as the springboard for growth in other sectors of the economy, and the envisaged economic blueprint of Kenya Vision 2030 lists the ICT sector as one of the principal pillars of its growth (Outa *et al.*, 2006). What this means is that the ICT sector is the pillar onto which all the other sectors of the country's economy lean. A review of the country's economic growth prospects affirm that all sectors of the economy have sought to embrace ICT as the basic fabric on which their growth can be woven (Otieno, 2008). With the weight of the economic progression of the country resting on its shoulders, there are implications for the ICT sector in general; this calls for a more rational view of the implementation of various projects in the ICT sector in Kenya. Considering the Kenyan government had initiated massive infrastructural developments to lay the foundations for harnessing ICT as a potent economic development tool, there is a need to streamline the operations within the ICT sector and chief amongst this was the operationalisation of an assessment tool to evaluate the level of ICT stakeholder integration and the infrastructure performance improvement required in the ICT sector.

Project benefits realisation management is an aspect of stakeholder management that is essential in enhancing the quality of project outcomes (Dupont & Eskerod, 2016). As suggested by Simon (2003), it is prudent that a well-framed model of handling project benefits realisation is developed in order to ensure that stakeholder expectations are well managed in the project. When discussing project benefits realisation management, the study was keen on identifying some of the key strategies of stakeholder integration that could be applied in managing benefits realisation on ICT projects in the country. Monitoring and evaluation of project performance is essential if project outcomes are to be optimised. The identification of key performance metrics for projects is an essential aspect of project delivery (Grasberg & Buitrago, 2002). As an aspect of project monitoring and evaluation models, it is important to develop the right evaluation procedures, where the right metrics of performance for the project have been incorporated. The project performance indicators are key in assessing the trajectory of the projects during the implementation phase of these projects (Balta *et al.*, 2015). Within the context of ICT projects, these indicators are meant to drive the decision-making process in the project in the sense that upon evaluation of the trends and directions of these projects, the project implementation teams are able to assess the direction and make the right decisions regarding the project delivery strategies that are being employed in the project.

From the reviewed literature, it was established that the ICT sector in Kenya lacks a comprehensive stakeholder assessment tool that could be used to guide the implementation of projects in the sector (Gwaya *et al.*, 2014). The manner in which ICT projects in the country have been executed in the past shows that there is an urgent need to conceptualise an ICT project management scaffold to optimise project outcomes (Mburu, 2017). Indeed, an evaluation of the implementation of ICT projects in Kenya revealed that the country requires the development of a structured approach in handling its ICT projects (Gichoya, 2005). The execution gaps witnessed in the various stages of the implementation of ICT projects in the country point to a wider need for the development

of an assessment tool to improve outcomes. Moreover, a practical operational model is required in a bid to evaluate the progression of these projects and further aid the improvement of benefits realisation.

### **1.2.1 Stakeholder integration and project performance**

Developing an effective stakeholder integration framework in any project is fundamental if the objectives and goals of the project are to be realised (Sanchez, 2015). Thiry (2016) suggests that stakeholder integration in the execution of projects aids in the maximisation of the methods through which all project definitions, together with approval, are collected. In essence, project definitions and approval further aid in the identification of the expectations and needs of the stakeholders in the project. The conceptualisation of a stakeholder integration model in any project must consider the fact that in any project implementation phase, there needs to be an inventory of the expectations of various stakeholders in the project. Developing an effective stakeholder assessment tool must thus take into consideration the fact that each of the needs of the various clusters of project implementers has to be taken care of if the project is to achieve its objectives. As stated by Schwalbe (2015), the concept of stakeholder integration in projects entails the establishment of an effective and optimal work environment and equally advocates for the incorporation of teamwork.

From a generic perspective, stakeholder integration, as a concept in project management and implementation, is viewed as a progressive process through which the institutional stakeholders are all brought on board throughout the implementation of the specific project (Plaza-Beda *et al.*, 2009). From the perspective of communication, the concept of stakeholder integration in project management thus entails the adoption of communication in the management of the specific project – considering that stakeholder integration involves the knowledge of a number of stakeholders involved in the project – and establishes ways to engage stakeholders in the project execution while the goals of the project are pursued. One therefore gets the sense that the performance of any project

is deeply dependent on the level of stakeholder integration undertaken during the project implementation phase. Muller (2017) opines that regardless of the methods that have been utilised in the implementation of any project, if the stakeholder integration model adopted in the project is not adequate, the project outcome will be inherently unsatisfactory. The project goals are directly affected if an inadequate stakeholder integration model is adopted (Chung *et al.*, 2009). Such is the importance of stakeholder integration, as a principle of stakeholder management, in the implementation of any project. It is thus imperative that any ICT project, regardless of its nature or complexity, develops the right stakeholder management matrix, which places emphasis on the stakeholder integration model that is to be adopted throughout the project's lifecycle.

Bygstad and Lanestedt (2009) identified a number of metrics for evaluating the performance of projects and established that the level of stakeholder management forms a very important project performance parameter that cannot be ignored. In essence, this means that stakeholder management occupies a central place in project evaluation and assessment, and this is in consideration of the fact that stakeholder integration is a component of stakeholder management. Current best practices in project management and implementation have further identified stakeholder management as the link between project input and project output (Heugens *et al.*, 2002). This essentially means that the realisation of the objectives of any project depends on the rationality of the methods that have been employed in the management of the stakeholders in the project; stakeholder integration is at the heart of stakeholder management.

It could therefore be suggested that the performance of any project, irrespective of the nature of the project, is intertwined with the stakeholder management practices that have been developed in the project, of which stakeholder integration occupies a central part. The research study attempts to give a more complete discussion as to the nexus between project team performance and stakeholder integration. This is based on Crawford's (2014)

assertions that the stakeholder management template within any project implementation schedule plays a crucial role in the advancement of the project's aims and objectives. But before attempting to explore the nexus between project stakeholder integration as a stakeholder management tool and project infrastructure performance through the development of an assessment tool, the study gives an overview of project management within the Kenyan context and assesses the significance of the proposed stakeholder assessment tool based on the current project delivery model in Kenya.


### **1.2.2 Project complexity**

ICT projects are often described as very complex, based on the idea that they entail the integration of both hardware and software. Nevertheless, some of the factors that make ICT projects complex have not been widely understood in the case of Kenyan ICT projects. Some global research focusing on the implications of project complexity during the project implementation phase has been undertaken to establish some of these factors. Muller *et al.* (2011), for instance, indicates that one of the emergent themes in the discussion of project complexities in the ICT sector has been largely based on the question of managing stakeholder expectations in these projects and developing an operational model from which the various expectations can adequately be addressed without having any impact on project progress.

A number of factors have been proposed as some of the major project complexity variables in ICT projects. Bradley (2010) identifies inherent complexity as one of the major factors in project complexity. The rigidity of sequence, uncertainty, organisational complexity as well as stakeholder management practices have emerged as key issues in project complexities in the project implementation schema. Indeed, the extent of stakeholder management as a key issue in project complexity is discussed by Muller *et al.* (2011), who note that the relationship between the project parties is a critical determinant of the complexity of these projects.

Within the context of ICT projects in Kenya, the manner in which the interpersonal relationships between the stakeholders in the projects is managed defines the level of complexity of these projects. In essence, projects that have a non-defined stakeholder management model are considered to be very complex, since these projects do not have a well-defined stakeholder management model. Nonetheless, extant literature on the Kenyan project management framework have failed to give a detailed discussion of project complexity in ICT projects and have not established the extent to which the Kenyan ICT project management and delivery ecosystem experiences project complexity.

### **1.2.3 Project benefits realisation**



Muller *et al.* (2011) describe the project benefits realisation process as the derivation of value from the project. It entails the extraction of the desired project values from the project itself. As discussed by Bradley (2010), a benefits realisation plan within any project could be applied to the definition of the anticipated project benefits and aid in defining the success criteria for the stakeholders in the project. In order to understand the project benefits realisation process, it is prudent to evaluate the concept of value in projects, especially within the larger context of stakeholder engagement in projects. The concept of value within the stakeholder engagement model entails the realisation of the stakeholders' expectations of the project. It essentially means that every stakeholder in the project expects some form of return from the project. For every type of project stakeholder, there are expectations or objectives that the stakeholders anticipate from the project. The project benefits realisation process thus entails the progress of the project processes in order to ensure that the expectations of the various stakeholders in the project are realised.

Project benefits realisation management has generated a lot of discussion in the realms of stakeholder management. Current research trends suggest that it is important to manage the expectations of the stakeholders within the project. In this research, the concept of

project benefits realisation management is discussed within the larger context of stakeholder integration. As discussed by Muller *et al.* (2011), the justification for focusing on benefits realisation management in projects is primarily associated with ensuring that stakeholder expectations are managed within the project (Derby & Zwikael, 2012). Looking at the Kenyan context and the management of ICT projects, there is no well-defined model of benefits realisation within the scope of stakeholder integration. In this study, by proposing an assessment tool for integrating stakeholders in ICT infrastructure projects, the expectations of the stakeholders in the project are well articulated. The project stakeholder integration model adopted in the project can thus be said to be an important aspect of project benefits realisation.

### **1.3 Theoretical gaps in the research**

The current research trends in terms of stakeholder management have not adequately focused on ICT infrastructure projects in Kenya. Indeed, no stakeholder management frameworks have been documented within the Kenyan ICT context. A review of the discussions on the current state of project delivery in the country in the ICT industry suggested that there is no stakeholder management theory relevant to addressing some of the challenges in the delivery of ICT projects. In terms of theory, a stakeholder integration model has not yet been conceived in the Kenyan ICT project delivery context. Within the contexts of project complexity, project benefits realisation and project key performance metrics, there is a significant theoretical gap that needs to be addressed to enhance the outcomes of these projects. It was on these assertions that this research study sought to propose an assessment tool for evaluating stakeholder integration in these projects within the Kenyan ICT project delivery model.

#### **1.4 Research problem**

As established from the reviewed literature, major infrastructural developments in Kenya were found not to effectively yield the anticipated outcome in terms of return on investment (Gwaya *et al.*, 2014). From a project management perspective, one could suggest that the implementation of these projects does not really yield the desired or anticipated outcomes. This therefore means that these projects do not get to cross over the threshold into optimal performance. While there have been concerted efforts made by the government and other non-state actors to develop a way in which the anticipated return on investment for major infrastructural projects is facilitated, without a comprehensive format to evaluate the performance of these infrastructural projects, there are bound to be issues with the sustainability of these projects. The poor performance of infrastructural projects in the country has been partly attributed to the lack of an evaluation framework for these projects, especially in terms of the stakeholder management model. It is established that a framework for monitoring the infrastructural projects is necessary if the performance of these projects is to be enhanced, and this could possibly be achieved through a stakeholder integration assessment tool.

The development of a stakeholder assessment tool is critical in assessing the progress of any project and developing relevant strategies to steer the project towards its objectives. Mertens and Wilson (2018) highlighted this when appraising key performance indicators in projects along with the need to have a template to quantitatively and qualitatively define these key performance indicators. Basically, there is a sense in which project progression throughout the project lifecycle has to be measured against the planned objectives (Mertens & Wilson, 2018). Within the Kenyan context, one could cautiously argue that there seems to be no rubric developed for the assessment of ICT projects, especially in terms of stakeholder integration and the performance of ICT project delivery. Consequently, it could be suggested that the implementers of these projects

have not presented a conclusive and comprehensive report on the manner in which ICT projects in Kenya can be improved.

There is evidence that the delivery of ICT projects in Kenya has been shrouded in a lot of inefficiencies (Kessy *et al.*, 2006). This means that the performance of these projects has not met the established threshold of success that they are required to reach. Furthermore, while there are no elaborate documented inventories in the public domain regarding the performance of ICT projects in Kenya, there are a number of indicators to the effect that the majority of these projects have not been managed well at various stages of the project implementation cycle. Several instances of delay in terms of the project timelines have been noted, with the stakeholders in the projects trading blame games over the delayed timelines (Crawford, 2014). The establishment of a proper project schedule and restriction of the implementation of the project to within the established timeline have been lacking and a big problem in the implementation and delivery of ICT projects in Kenya. In fact, a significant number of the ICT projects have experienced cost inflation owing to the extended project timelines – an issue that required an urgent address by the project stakeholders (Kipsoi *et al.*, 2006).

As well as the issues of scheduling, project delivery in Kenya has equally been noted as having issues with quality – a fact that was noted in the study of Kituyi-Kwake and Adigun (2008). Compromise on the integrity of the process has also been noted in a number of these projects, which is an issue that needs to be addressed. Some of these completed projects have failed the tests of quality, thus compromising their own objectives and putting into question the integrity of the whole process. Moreover, there have been issues of stakeholder engagement and management – a fact that has been highlighted by several authors as one of the greatest contributors to the problem of poor project delivery in the country. Kipsoi *et al.* (2006) suggest that the question of project sustainability, an issue that is considered a salient problem in the delivery of ICT projects,

is traceable to the poor stakeholder management models that were adopted by the majority of these projects.

In relation to the gaps in the implementation of ICT projects in Kenya, this research study proposes the development of a tool for the assessment of the performance of the ICT projects, in order to be able to identify project weaknesses and propose relevant improvements. Specifically, the research study proposes a tool that focuses on the integration of stakeholders delivering ICT projects in Kenya. Looking at the defined problems bedeviling ICT project performance in Kenya, the conception of a tool of assessment is proposed to track the performance of these projects based on a number of project performance metrics (Sandberg & Alvesson 2011). In order to develop a tool for the integration of stakeholders in ICT infrastructure projects, it is equally important to have an overview of the level of complexity of these projects in the country. The level of complexity of ICT projects in the country gives an important insight into the extent to which stakeholder integration, or rather management, has been undertaken in the country. It was noted that there has been no study undertaken to evaluate the complexity of stakeholder management in the Kenyan ICT sector. Therefore, the proposal of a tool that could be used to enhance the integration of the stakeholders in these projects includes the assessment of the current state of stakeholder inclusion in the projects.

According to Kerzner (2017), project benefits realisation management entails the management of the expectations of the stakeholders in the project. What this means is that the anticipated objectives of the research are managed in order to ensure that the project expectations are not impaired even amidst the progression of the project. As an aspect of project stakeholder management, the study aims to address the methods that are applied in the project progress to manage the expectations of the stakeholders. As an aspect of project benefits realisation, stakeholder integration seeks to intersect all the

expectations of the stakeholders at a point, developing a framework for managing these expectations to ensure that they do not affect the general progress of the project.

## **1.5 Research aim**

The overarching aim of the proposed research is to examine how the integration of stakeholders delivering ICT projects in Kenya could be improved. The research proposes an assessment tool that could be used by policy makers and senior ICT project practitioners to improve the integration of stakeholders delivering ICT projects and promote a mind-set of accountability and a structured approach to ICT project planning, delivery and stakeholder integration in Kenya. The assessment tool comprises key stakeholder integration determinants and key performance metrics.

### **1.5.1 Research objectives**

The specific objectives developed to achieve the aim of the research are to:

1. Establish the complexity of project delivery and propose improvements to policy makers and senior project practitioners working on ICT infrastructure projects in Kenya.
2. Identify and examine the nature of key stakeholder integration determinants that can be used by policy makers and senior project practitioners to enhance ICT infrastructure project planning in Kenya.
3. Identify key performance metrics that are specific, measurable and relevant to the achievement of stakeholder integration and ICT infrastructure planning in Kenya.
4. Assess how infrastructure policy makers and senior project practitioners could prioritise and ensure there a holistic end-to-end commitment to realise the defined benefits of ICT infrastructure in Kenya; and
5. Propose and validate an assessment tool for ICT infrastructure projects that could be used by infrastructure policy makers and senior project practitioners in Kenya.

### 1.5.2 Research questions

The research questions are as follows:

1. What project complexity enhancements can be used by infrastructure policy makers and senior project practitioners to improve Kenyan ICT projects?
2. What impact does a good stakeholder integration plan have on ICT projects in Kenya?
3. Are current performance metrics being used by ICT infrastructure policy makers and senior project practitioners in Kenya specific, measurable and relevant to ICT infrastructure planning and stakeholder integration?
4. Have infrastructure policy makers and senior project practitioners in Kenya prioritised and ensured there is a holistic end-to-end commitment to realise the defined benefits with assignment ownership and responsibility for adding value through an ICT infrastructure planning realisation process?
5. What is the most effective form of assessment tool that could be used by infrastructure policy makers and senior project practitioners in Kenya to promote a mind-set of accountability and a structured approach to ICT project planning, delivery and stakeholder integration?

### 1.6 Scope of the study

The research covers both government-funded and privately funded ICT projects. The aim is to gain an in-depth understanding of the manner in which these two sets of projects have been implemented in the country and of any arising stakeholder integration and planning issues that the public and private stakeholders had faced. The research study specifically reviews the scale of the Kenyan ICT project delivery challenges with specific interest in both the government-funded and the privately facilitated projects. Additionally, the research reviews stakeholder engagement practices in Kenya. In this regard, the research explores the ways in which the stakeholder strategies, together with the appraisal approaches, were effectively used in the improvement of ICT project delivery in Kenya. In this regard, various stakeholders in the selected projects to be

studied are discussed in detail and their input towards the improvement of these projects is also evaluated. In the context of stakeholder theory, the study limits itself to proposing an assessment tool for ICT stakeholder integration and infrastructure project performance improvement.

### **1.7 Justification of research**

The novelty of the research study lies in the following two facets:

- The theoretical foundation of this research study is traceable to stakeholder management theory. In this regard, this research aims to streamline the project delivery of ICT projects in Kenya as a way of enhancing the performance of these projects. The development of an assessment tool for the evaluation of stakeholders delivering ICT projects in Kenya is likely to be an important step in addressing the missing link between theory and practice. ICT project practitioners would then have a well-thought-out, validated assessment tool by which they could benchmark the ICT projects being delivered in Kenya.
- From a policy and practitioner viewpoint, this study offers an appraisal model that the government could use to monitor the progress of ICT stakeholder integration. As already intimated, the final outcome of this research is to propose and validate an assessment tool that could be used by infrastructure policy makers and senior project practitioners in Kenya to ensure a mind-set of accountability and a structured approach to ICT project planning, delivery and stakeholder integration. The inferences made in this study are helpful to develop a rubric that could be used to monitor the engagement of stakeholders and planning of ICT projects.

### **1.8 Summation of adopted research method**

Glaser and Strauss (2017) developed the research process that forms the model applied in this study. The initial phase of the study is the identification and development of the identified topic of study. To reinforce the validity of the research topic, it is important to include a review of the relevant literature regarding the topic selected. In this regard, a

comprehensive literature review was undertaken. At the same time, a theoretical model of the proposed research is discussed in the literature review, thus linking the proposed project to the published theories. This was done alongside the project proposal. Upon confirmation of the project proposal and objectives, the location of participants for the study was undertaken. This was a collaborative affair, and it identified the relevant research participants in the various projects. The research tools were then developed for the study in order to aid in the collection of the relevant research data. Consequently, upon the testing of the data collection tools, the relevant data was collected, and various tools were used to analyse the collected data in line with the research questions and objectives proposed earlier (*for further details see Chapter Four*).

### **1.9 Key findings of the research study**

Through theory elaboration, the study structured the sequence relations of project management and stakeholder management constructs that could be used to assess and optimise the delivery of ICT infrastructure projects. As a result, the key findings of the study highlighted in the proposed assessment tool, suggest that ICT performance be measured against the achievement of stakeholder integration, project complexity, key performance metrics and realisation of benefits. Commitment to project objectives, competence of key stakeholders, alignment of stakeholder skills, understanding of core project processes and addressing stakeholder needs and expectations were found to be key to stakeholder integration and improvement of ICT project performance in Kenya.

### **1.10 Structure of the thesis**

The thesis is split into nine chapters as described below. Figure 1.1 provides a flow diagram summarising the research process.

#### **Chapter One**

This chapter outlines the knowledge gap leading to an overall research aim and individual research objectives being identified, along with the methods for achieving these objectives.

## **Chapter Two**

This chapter documents the review of studies that have been undertaken on ICT infrastructure projects in Kenya. The chapter also explores and examines the concepts and approaches of stakeholder integration. It gives a synopsis of project management theory and explores previous research on ICT project management, previous universal research on project management, and contemporary research on project management. The chapter further evaluates the concept of stakeholder integration in relation to key performance metrics, project complexity and benefits realisation of infrastructure projects. Lastly, the chapter looks at international comparison of ICT stakeholder integration and ICT project planning, justifying the need for the collection of empirical data for the Kenyan context.

## **Chapter Three**

This chapter presents the developed conceptual framework of the study by clearly evaluating the manner in which the variables in the study are related. The discussion in this chapter gives a clear understanding of how essential it is to link the variables under study with the defined problem in Chapter One. The chapter shows the linking of theory and practice, as explored in the research, thus justifying the context and aim of the study.

## **Chapter Four**

This chapter discusses and justifies the research philosophy, research strategy, pilot study, research method, validation and verification of the data and methods, sampling techniques, and data collection techniques employed to gather the empirical data for this study. The chapter further discusses in detail the data analysis techniques employed for both the quantitative and qualitative data collected.

## **Chapter Five**

This chapter reports on the research findings of the qualitative data, collected as described in Chapter Four. The chapter discusses the key themes that emerged germane to stakeholder integration, project complexity, project benefits realisation and improvement of infrastructure performance. These findings were used to develop the proposed assessment tool.

## **Chapter Six**

This chapter discusses the findings of the quantitative data collected and analysed as explained in Chapter Four. The chapter discusses the outcome of the analysis of the components that aided the development of the proposed assessment tool. The techniques used to analyse the quantitative data are explained and the relationships amongst the variables under study are established.

## **Chapter Seven**

This chapter presents the discussions of the findings for both qualitative and quantitative data, presented in Chapters Five and Six respectively, by linking them to the reviewed literature and theory in Chapter Two and the research aim and objectives in Chapter One, which justifies the outcome of the proposed assessment tool.

## **Chapter Eight**

This chapter presents the discussions on the proposed assessment tool. The chapter also discusses the validation of the tool and links the discussion to the outcome of Chapter Seven.

## **Chapter Nine**

This chapter revisits the overall aim and specific objectives of the research topic under investigation. From the qualitative and quantitative findings and the proposed assessment tool, conclusions are drawn and related to the specific research objectives. The implications of the study for theory, policy and practice are also drawn. This chapter also discusses the limitations of the work and provides recommendations.

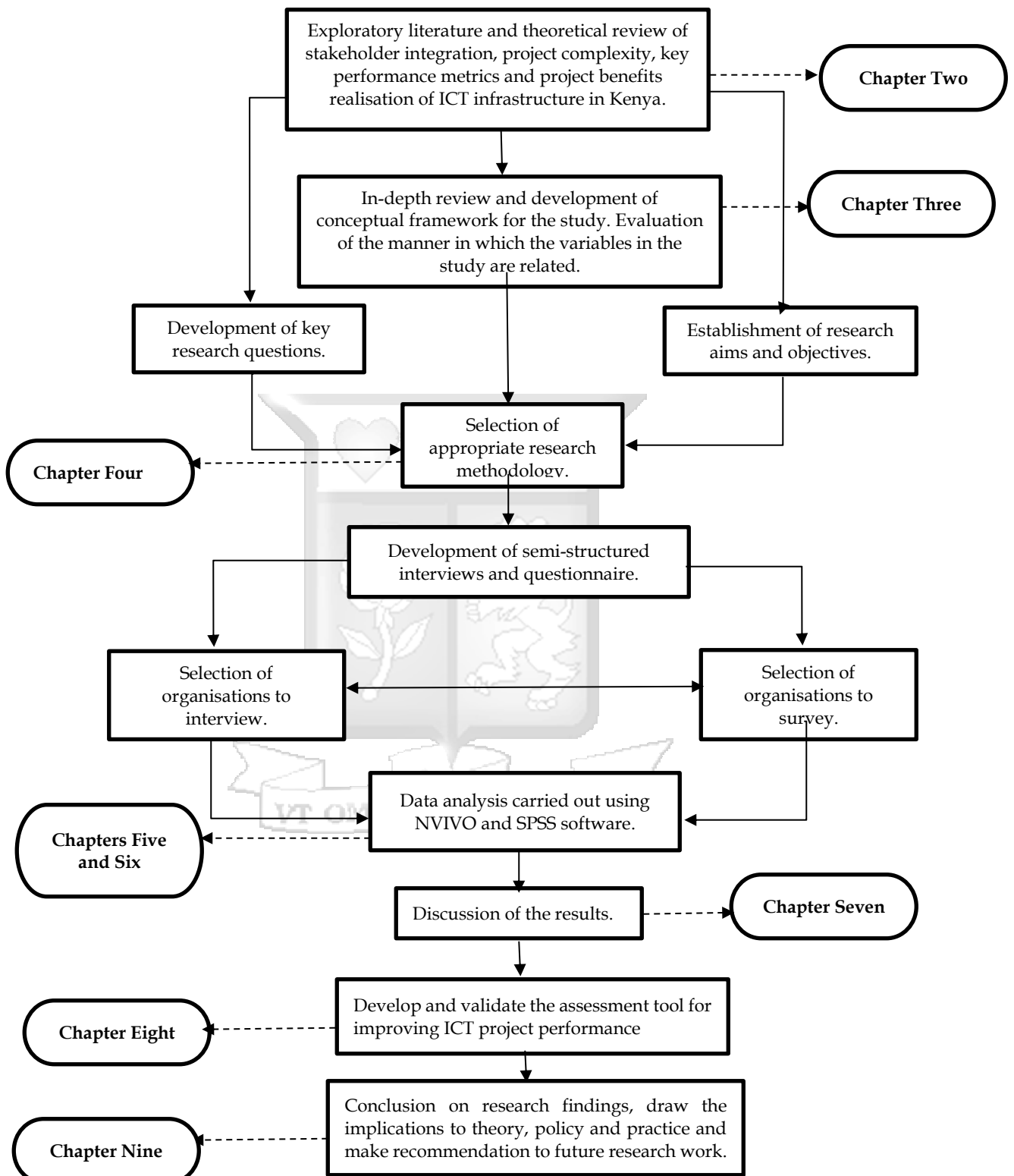


Figure 1.1: Research methodology flow chart

Source: Author (2020)

## 1.11 Chapter summary

This chapter discussed the rationale of the research study as well as the objectives that the research anticipates achieving. Moreover, this chapter discussed the research problem including the issues of stakeholder management within the context of the Kenyan ICT sector. In the subsequent chapter, a systematic review of the relevant literature is undertaken to establish the research context in relation to issues of stakeholder integration and project management in Kenyan ICT infrastructure projects.



## Chapter Two: Review of the Kenyan ICT Sector and Project Management Theories

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### 2.1 Introduction

This chapter explores the previous studies that have been undertaken on ICT infrastructure projects in Kenya. The chapter discusses the nature of the ICT infrastructure projects in Kenya in terms of their performance and the barriers to effective implementation of ICT projects within the country. The literature review also explores Kenya's economic, political and social philosophy within the context of ICT project implementation in Kenya. This is to enable the research to be a broader study regarding ICT project management and implementation in Kenya. In addition, this section includes an overview of the ICT context in Kenya, in which the national ICT infrastructure is evaluated along with the current implications of the ICT infrastructure in Kenya today for the implementation of ICT projects in Kenya.

Furthermore, this literature review explores the concept of stakeholder integration within the context of ICT project management. The review examines the various approaches of stakeholder sense-making in ICT project management. Recent changes in project management and the likely implications on project management are reviewed. In the concluding sections of the literature review, the emergent themes in ICT project management and stakeholder integration are reviewed with a view to developing an effective framework for ICT project management. The review chapter has been subdivided into five parts, namely:

- Part I: Overview of Kenya.
- Part II: An overview of the Kenyan ICT sector.
- Part III: A synopsis of project management theory.
- Part IV: Stakeholder integration, key performance metrics and complexity; and
- Part V: International comparison of ICT stakeholder integration and ICT project planning.

## 2.2 Part I: Overview of Kenya

This sub-section of the literature review offers an overview of Kenya as a country from the perspectives of its historical origin and where it sits on the continent. The section further discusses the growth of Kenya economically, politically and socio-economically. The purpose of this review is to give a foundation and background to how ICT infrastructure has influenced the eco-system of the country in general and to rationalise the research problem.

### 2.2.1 Country profile

As illustrated in Figure 2.1, Kenya covers a large area of diverse terrain, extending from Lake Victoria in the west to Lake Turkana towards the north (Ojany & Ogendo, 1973). To the south-east of the country lies the Indian Ocean. The country is bordered by Tanzania to the south and Uganda to the west; to the North of the country lies South Sudan while the north-western regions of the country border Ethiopia (Waters & Odero, 1963). The country extends over 581,309 km<sup>2</sup> with an approximate population of 48 million, based on the January 2017 census estimates (Abel *et al.*, 2016). The country consists of forty-three documented tribes but is also home to many expatriates who consider it their country regardless of their citizenship status.





**Figure 2.1: Map of Kenya**

**Source: Nations online (2020)**

Kenya's economic and social philosophy was founded on the Harambee spirit, which was conceived by the founding fathers led by the first president, Mzee Jomo Kenyatta (Abel *et al.*, 2016). The Harambee spirit was predicated on some form of African quasi-socialism, which promoted the philosophy of pulling together as a nation. While the country never officially embraced socialism as an economic template, the African socialist economic rubric and the Nyayo philosophy seem to have been a loosely crafted form of socialism but contextualised within the African social fabric (Rono, 2018). Over the years since its independence, the country has experienced massive transformation in terms of the social, economic and political infrastructure (Chege, 2017). However, despite the tremendous progress that the country has seen since 1963 when the independence was declared, successive governments have faced massive failures in terms of governance and various

other aspects of development, beginning from the era of the second president, Daniel Moi, all the way to the era of Mwai Kibaki and the current president, Uhuru Kenyatta (Abel *et al.*, 2016).

### **2.2.2 Economic growth**

Kenya founded its economic growth on diverse sectors, thus facilitating its progress from a low-income economy to a relatively higher economic performance in the post-independence era (Chege, 2017). For a very long time, the country relied on agriculture as its bedrock of economic growth, even though this had witnessed massive changes as the country gradually began to leverage other sectors of the economy to improve its economic performance. With the current human development index of 0.55, the country is considered to be on a gradual path towards being a middle-income economy in the near future (Miller, 2018). Based on United Nation Development Programme (UNDP) 2005 report, up to 18% of the Kenyan population were surviving on less than one dollar a day (UNDP, 2016). However, this has gradually improved thanks to the massive investments that the country has made to improve the conditions of the population (UNDP, 2016). In fact, a survey by the World Bank on the ease of doing business around the globe ranked Kenya number 92 in the world – an improvement on the previous five years (UNDP, 2016).

As noted earlier, the country has always majorly relied on agriculture as the main driver of its economy's growth and development even though, as described by the World Bank report, agriculture still remains one of the least supported sectors in the country (UNDP, 2016). Currently, 75% of the workforce in the country relies on the agricultural sector (Miller, 2018). This is comparable to the 2% workforce representation in countries that are considered "food secure" (Miller, 2018). Kenya has notably witnessed progressive growth and improvement in economic performance in the last fifteen years, posting an impressive record in the year 2007, where the growth rate was a massive 7% and there was a tremendous reduction in foreign debt (Miller, 2018). A report by the World Bank

further indicates that telecommunications and financial activity in Kenya now make up 65% of the country's GDP (UNDP, 2016). This is further reinforced by the argument of Miller (2018) that the ICT, tourism and transport sectors are likely to be the critical players in the growth of the Kenyan economy in the next decade.

Key developments in the ICT sector in Kenya have established the industry as a pillar of the economic, social and economic development in the country (Waema *et al.*, 2010). The ICT sector in Kenya is continuously gaining ground as an epicentre of the country's economic growth. The economic significance of the ICT sector is particularly notable in the telecoms industry, which is considered the key driver of business growth in the country. In fact, statistics from the Swedish trade and investment council, Business Sweden (2016) indicate that since 2015, the contributions of the ICT sector to Kenya's GDP have been on an upward trend. Mobile subscriptions are growing at an exponential rate, the reliance on mobile money transfers is increasing, and the general use of the internet in driving the economy is quite high. One gets the impression that the growth of the ICT sector in the country is driven by the mobile market – a fact corroborated by the performance of one of the leading players in the industry, Safaricom (Mokaya & Njuguna, 2017). While there is no elaborate data on the current growth metrics, the 2015 data gives an insight into the mobile industry in Kenya, which is a subset of the ICT industry in Kenya.

At the time of the Business Sweden report (2016), Kenya had the world's highest mobile money penetration rate. This corroborates the earlier assertion of Odero and Mutula (2017) that the ICT sector in Kenya is on an upward trajectory; if the penetration rate of mobile money is high, then it follows that the ICT infrastructure is exponentially expanding to accommodate the growing number of mobile money users. This infrastructural expansion means that accessibility – in terms of the Global System for

Mobile Communications (GSM), connectivity or internet connectivity – is advancing in Kenya, which is an indication that the country is undergoing a massive ICT revolution.

A conflation of factors led to the improved penetration of mobile money in the country. Chief amongst these factors was the aforementioned infrastructural development in the sector, precipitated by the amplified convergence of telecommunications and broadcasting. Moreover, the country had substantially increased its bandwidth speed with cheaper and faster connectivity – key requisites for business growth and development (James & Ogolla, 2017). To give a further glimpse into the state of the ICT sector in the country, the Swedish business report indicated that the country had 90% penetration rate in terms of mobile telephony; this is, however, likely to have grown in 2020, as the projections are positive (Mureithi, 2017). In fact, Kenya is only comparable to South Africa in terms of mobile telephony penetration in the continent.

While this study is cognisant of the challenges that the ICT sector in Kenya has faced, it echoes the assertions of various scholars, such as Opiyo *et al.* (2017) and Muchai and Kimuyu (2017), which the sector has massively grown. Various metrics have been used to give an insight into the extent to which the country's ICT sector has been transformed. What is evident is that such developments have had immense implications on the country's socio-economic and political fabrics. The subsequent sections of this chapter give an overview of the extent to which these developments in the ICT sector have influenced the various facets of development in Kenya. The growth of ICT infrastructure in Kenya brings to the fore an important narrative regarding project management of ICT projects in Kenya. The massive investment in various ICT products in the country indicates that the country needs to develop a framework to manage these projects within its advancing ICT sector. The accelerated investment in the ICT sector in the country is directed towards improving the economy of the country. Indeed, Kenya is leveraging its economic progress in the ICT sector and the economic blueprint of the country has

strategically listed ICT as one of the pillars of growth and development. Of particular interest is the advancement of internet connectivity in the country – an activity that is directed at elevating the Kenyan economy (Muchai & Kimuyu, 2017).

The economic survey of the country from 2002 gives an insight into the input of ICT in the economic development of Kenya. For the past fifteen years, the contribution of the ICT sector in the overall GDP of the country has been progressively growing (Kenya National Bureau of Standards, 2012). In fact, the World Bank states that the ICT sector has been the main driver of economic growth in the country (World Bank, 2012). The ICT sector has been pivotal in GDP growth in the country, with the growth of M-Pesa, broadband connectivity and mobile telephony driving the ICT sector and thus directly influencing economic growth (KNBS, 2012). While this research may not be able to document precisely the contribution of the ICT sector in terms of the economic development of the country, there are salient issues that are essential to understanding the contribution of ICT. One obvious fact is that the future of the country's economy is partly driven by the sector; ICT offers several solutions for various facets of the economy. The application of ICT solutions is evident in agriculture, finance, transport, education and all other components of the economy, giving the impression that the ICT sector provides valuable bricks and mortar on which the country's economy is built (Mokaya & Njuguna, 2017). Most importantly, based on the significance of ICT in Kenya's economic growth, Kenya is commissioning a lot of projects involving ICT infrastructure that require a practical framework in terms of project conceptualisation, implementation and evaluation (Huggins & Frosina, 2017).

Fabregas *et al.* (2018) found that the progress of the ICT sector in the country is not without problems. Specifically, the management of the various ICT projects in the country has not been well coordinated. In their assessment of the failures of ICT projects in the country, Huggins and Frosina (2017) suggest that the project management structure

in Kenya still requires a lot of polishing in terms of the engagement of stakeholders since the majority of projects, despite the fact that they succeed initially, failed the sustainability test. Overall, from a project management perspective, the impression of the ICT sector is that there is still no comprehensive project management scaffold, especially for public projects, that guarantees success and value for money for the public – a fact that necessitates the development of an assessment tool that would create a template on which ICT project management could be based.

As already stated, with ICT being a key pillar of the country's economy, deliberate attempts have been made by the relevant stakeholders to optimise the contribution of the ICT sector to the Kenyan economy. To ensure that the ICT sector in Kenya continues to play a significant role in the Kenyan economy, one gets the impression that there ought to be more interest in the manner in which the various ICT projects in Kenya are undertaken. Of special interest and focus for this study is the development of an effective project management and implementation assessment tool, which is likely to enhance the outcomes of these projects and generally improve their contribution to the general economy of Kenya. The Kenyan economy, as already discussed, has been leveraging the ICT sector to advance its economy exponentially. The implication of this is that a framework for effective project management in the ICT sector is prudent if the sector is to continue playing a central role in the advancement of the country's economy.

### **2.2.3 Politics**

As noted earlier, the overarching aim of this research study is to develop an effective assessment tool to enhance the delivery of ICT projects in Kenya. It is thus vital for the research study to undertake an inventory of some of the most critical factors that influence the implementation and delivery of ICT projects in the country. In this section, the research evaluates the extent to which the ICT revolution in Kenya has influenced the country's political economy.

Kenya is considered to have important geopolitical and economic significance in the global arena (Sindiga & Burnett, 1988). The country's political economy is thus considered the foundation of its wider economic prospects and thus all issues of governance and politics greatly influence the country's economic fabric. As there was evidently a significant change in the political and governance structure in the country, there were challenges that the country underwent because of this change. In the post-independence era, politics in Kenya was a critical driver of the economy of the country. The political morphology of the country was intricately intertwined with the general economic fabric, thus affirming the assertions of Miller (2018) that politics and the economy in Kenya are intricately woven. The adoption of the new constitution in 2010 brought with it a revolution of the role of the political class in the general growth fabric of the country, so that the centre of power gradually moved from the central government into devolved units (Cannon & Ali, 2018). The adoption of the county government structure led to a relatively decentralised flow of resources to the grassroots, which significantly improved the country's journey towards being a middle-class economy. The country has 47 county governments, which are semi-autonomous in their ability to drive their economic agenda (Nyikuri *et al.*, 2017).

But even with the transformative prospects of the new constitution, there were several issues to do with governance in the country that arose out of the political philosophy of the country. Kenya was still plagued by massive corruption and plundering of public resources - a challenge that was considered an impediment to the country's growth prospects (Cannon & Ali, 2018). Accountability in the management of public resources was still a mirage, and this was still suffocating the country's growth agenda. Nonetheless, accountability, as an aspect of governance, has been gradually introduced in the country and ICT has played a major role in the political economy of Kenya in terms of enhancing governance. Various aspects of ICT have had great potential to transform the participation of citizens in governance (Opiyo *et al.*, 2017). This is in addition to the

fact that ICT and its components are currently being adopted in service delivery in Kenya, which directly links ICT growth to the political development of the country. Service delivery frameworks, such as the concept of Huduma and the e-citizen platform, have given a new meaning to service delivery within the country. Such platforms have the ability to “positively impact citizen-government engagement and be used as a tool to amplify citizens’ voices” (Moraa, 2011). ICT is gradually finding a rooting in governance, an aspect of the political economy in the country – a fact that is likely to transform the management of the country’s resources.

The confluence of ICT and politics can be viewed through the lens of governance; the question is, to what extent has ICT adoption and growth influenced governance in Kenya? Based on the findings of Opiyo *et al.* (2017), the cornerstone of good governance in any political dispensation entails high quality service delivery (faster and efficient mechanisms or responding to people, accountability and even faster accessibility to services). The progressive adoption of ICT in the country has improved the service delivery template. The digitisation of these processes has gradually improved service delivery models in the country, thus directly improving governance in Kenya.

While this study is keen not to catalogue the contributions of the ICT sector to governance, it is notable that ICT adoption has been pivotal in the political processes in the country. One eminent issue is the open access to government information to the public, courtesy of the ministry digitisation programmes that have been implemented in the country. There is a sense in which these processes are geared towards the improvement of governance as a political process; in fact, Moraa (2011) argues that innovations in the ICT sector have gradually extended the human capacity to attain good governance. Kenya has studiously incorporated various aspects of e-governance and m-governance to enhance service delivery in the country. Evidently, there has been a paradigm shift from entirely e-governance to an integration of the e-governance model and M-governance. The strategy was to leverage the convergence of mobile technology

and internet technology in a bid to usher in a multi-modal tactic to deliver services to the citizens. This model evidently bypasses the traditional model in which physical interaction and communication were imperative, thus lowering the quality of services in the country.

As highlighted above, the political implications of the ICT sector in Kenya are evident. The ICT sector is a central player in the political economy of the country, and this is further harnessed by both the relevant actors in the ICT industry and the political players in the country. Since this research study aims to develop an assessment tool to improve the delivery and appraisal of ICT projects in Kenya, there is a sense in which the contribution of the ICT sector to the country is likely to improve significantly. But other than the improvement of the delivery of ICT projects in Kenya, one theme has emerged in the study, to the effect that politics and ICT are deeply intertwined. The political climate of the country has immense implications for the implementation of ICT projects. This therefore means that the development of an assessment tool for the improvement of the delivery of ICT-driven projects in Kenya must consider the political factors that have traditionally influenced the implementation and delivery of ICT projects in the country.

#### **2.2.4 Social economy**

That ICT is central to the social aspect of human life has been affirmed by the study of Barrett and Slavova (2017). Their study indicates that the ICT industry has adversely affected human relations today and with the continued advances in ICT products, it is envisaged that ICT will continually revolutionise the social fabric of society today. This section of the literature outlines the extent to which the ICT sector has impacted on the country's social economy. The aim is to explore, in detail, the extent to which ICT is relevant to the social fabric of the Kenyan economy and further evaluate the need for an ICT project delivery framework in the country.

The Kenyan economy has the highest human development index in the East African region, which points towards the social context of its economic growth today (Miller, 2018). The country's rapid population growth does, however, limit social development as the poverty rate is still very high and other social issues related to the high population growth limit the progress of the economy. Issues of gender inequality and mainstreaming are still critical components of the country's national narrative, based on the fact that no clear progress is being made as the country is still grappling with how to effectively implement the inclusion of women in governance. However, this does not indicate that progress has not been made, especially in women's political representation and the implementation of various national gender-equality mechanisms. The adoption of the new constitution evidently played a part in the development of the social economy of the country, but it is also significant to mention the contribution of ICT as a critical driver of the social development of Kenya's economic template.

Yue *et al.* (2017) explicitly explored the global social implications of ICT innovations and concluded that the ICT sector is redefining the fabric of society today. The discourse by Yue *et al.* (2017) views the social impacts of ICT growth through the lens of communication, in that the advancement of ICT infrastructure continues to influence the communication model in society. The evolution of social media continues to redefine social relations, and some scholars, such as Choudrie (2017), suggest that the ICT sector has brought families closer together; however, other studies indicate that social media is a double-edged sword, which has both built and destroyed the social fabric at the same time.

The broadband connectivity in Kenya has inherently improved the use of social media in the country (Muhoho-Minni & Lubbe, 2017). The social media demographics of the country reveal an increase in the uptake of various social media platforms, thus improving further the extent to which the country is connected in terms of the social

strands that bind individuals and organisations. The use of social media websites such as WhatsApp has been widely enabled through the improved broadband connectivity and this has gradually lowered the capital expenses in communication in society today, which has led to improved communication in the country. In addition, Kenya has witnessed an increased online presence to the extent that blogging and other aspects of social media marketing are beginning to occupy a prime position in society. According to data reviewed in the literature, by the close of the year 2019, there were up to 43 million Kenyans using the internet and up to 18 million of these users were on some kind of social media platform (Internet world statistics, 2019).

There is evidence from the Kenya National Bureau of Statistics (KNBS) that the accelerated growth of the ICT sector in Kenya continues to impact the social aspects of life today. Kenyans continue to engage in social media platforms on topical issues, which is an indication of the significance of ICT in the country. Indeed, the adoption of the new social media bill indicates the extent to which the country's ICT sector has impacted the threads of society. The fact that regulation of the sector was commissioned indicates that the adoption rate of social media platforms is gradually increasing (Kamau, 2017). The ICT forecasts in the Kenyan market show a vibrant sector that is not only going to be a driver in the economic growth of the country but also plays a key role in social transformation and governance. An overview of the Kenyan market thus predicts that the country's ICT sector will continue to occupy pole position in driving the growth of the Kenyan economy. This is based on several factors, outlined below.

- Data from the trade and industry ministries indicates that there is intensive growth in small and medium enterprises (SMEs) in Kenya and these enterprises are leveraging ICT to provide innovative solutions to their businesses as a way of driving their commercial agendas. The adoption of the internet by SMEs in the country points to the extent to which the broadband revolution in the country has been used to harness growth. According to a report by ministry of industry, trade

and cooperatives, SMEs are set to grow and expand in the next decade. Business entities are set to flourish considering the huge infrastructural investment and transformation that the country is witnessing. The overall SME growth in Kenya in 2017 was projected to be 6.4%, with a marginal increase expected in 2018 (Shibia & Barako, 2017).

- The growth of these enterprises has been further buoyed by the financial industry, which has provided credit facilities. What is thus evident is that with the projection that these SMEs are likely to increase, it is clear that the consumption of various ICT products is likely to increase as well (Wekesa Bunyasi, Bwisa & Namusonge, 2017). The consumption of mobile telephony services, the use of M-Pesa transactions, advertisements through various social media platforms, the use of broadband and even digital adverts are set to increase, which provides a huge market portfolio for the ICT sector. KNBS, however, looks at the ICT market using the population dynamics in the country. Young people are the biggest consumers of ICT products in the country in terms of internet connectivity (KNBS economic survey, 2016).
- Ogaji *et al.* (2018) indicate that with the huge growth of the youth population and the emerging middle class in the country, Kenya's consumption of the internet is gradually on the rise. While there are varying projections about the extent to which youths will drive the consumption of internet services in Kenya, the use of social media in the country today has been advanced by the younger generation – a fact corroborated by the KNBS survey (KNBS economic survey, 2018).
- There have been several economic transformations in the country that have inadvertently provided a framework for the increased use of ICT products. Chief amongst these are the digitisation programmes that have been adopted by various government ministries as a way of improving service delivery. For instance, the registration of companies and the declaration of tax returns are now undertaken through online government portals. The education sector has been left behind in

the adoption, with the country envisaging that digital content be considered as part of the syllabus in the future (Agufana *et al.*, 2018).

What these changes meant for the ICT sector was that there was a vast market for the industry. While not many studies have given empirical and quantitative evidence about the growth of the sector based on these metrics, the impression is that, based on the trajectory of these reforms in the private and public sectors, the market for ICT products is colossal. In fact, the World Bank reports that the country is one of the leading areas where mobile telephony and money transfer is used; the net implication of this is that the ICT sector in the country has a huge market which is yet to be exploited. This is seen through the performance of commercial entities in the ICT sector, such as Safaricom, whose performance in the market has been nothing but a success, which is an indication of the potential of the industry within Kenya (Mokaya & Njuguna, 2017).

There are two critical themes that emerged from the review of the impact of ICT on the fabric of Kenyan society. ICT obviously has a very strong influence on the social economy in Kenya. This is further reinforced by the emergent use of social media platforms in the country, which has been buoyed by the increased broadband connectivity. This study thus emphatically notes that the increased consumption of ICT products in society generally has influenced social relationships - a fact that inherently necessitates the development of a more comprehensive template to manage ICT projects in the country. Fundamentally, the social economy of the country equally influences the success rate of ICT projects in the country; the implementation of ICT projects within the country is directly influenced by various social factors. What this means is that in the conceptualisation of a framework to improve the delivery of ICT projects in Kenya, considerations have been made of the contribution of social factors to the ICT sector.

## **2.3 Part II: An overview of the Kenyan ICT sector**

In order to propose an assessment tool for ICT stakeholder integration and infrastructure performance improvement in Kenya, it is vital to carry out a review of the Kenyan ICT sector. The inclusion of this section is meant to offer a broader understanding of the Kenyan ICT sector.

### **2.3.1 ICT industry**

This section of the chapter reviews the ICT industry in Kenya. The section evaluates the ICT policies in Kenya with a view to assessing the manner in which these policies have influenced the growth of the ICT sector in Kenya and the ways in which they could improve in line with the country's vision for the sector. At the same time, this section of the study focuses on discussing the advancement of the sector in the country. In this respect, the study is keen on discussing the application of various strategies to advance the ICT sector in Kenya. By reviewing the various publications regarding ICT infrastructure development in Kenya, this section offers a consummate discussion as to the structures that the country has established in order to realise the objective of growing the sector as well as some of the barriers experienced in the advancement of the ICT industry in Kenya. Moreover, the section discusses the national development plans for the ICT sector in Kenya as well as the various features of ICT projects in the country. The essence of this section is to give readers a broader understanding of the condition of the ICT sector in Kenya. Most notably, the section discusses the methods that have been applied by the national government to place the ICT sector in the position of being an important driver of the country's advancement.

### 2.3.2 Overview of the ICT sector in Kenya

Kenya, like many other developing economies, is leveraging the ICT industry as a driver of its economic agenda (Wulff, 2015). In essence, this means that a lot of the economic blueprints of the country, similar to other developing nations, are tethered to ICT products. The industry is thus seen as a key player in the growth of the economic and social aspects of society. Bearing this in mind, the country launched a lot of ICT-related projects to facilitate its growth and development. While there are not many reports on project performance related to the ICT sector in Kenya, this section of the literature review explores some of the strides that Kenya has taken in terms of actualising some of the ICT-related projects in the country and the general dimensions of these projects. A review of some of the major ICT projects in the country reveals that Kenya is yet to learn how to effectively manage its projects related to the ICT industry. For instance, Demo and Weiss (2016) note that, while on a general scale the country has made significant strides in the implementation of some very important projects and even realised the objectives of these projects, more often than not these projects have been immersed in a lot of uncertainties, indicating that there is an urgent need for structural reforms regarding project management in the ICT sector in the country.

Not many publications have been authored that review the trajectory of ICT projects in Kenya. However, a few scholars who have written about ICT project management in the country have argued that the status of project implementation is very weak in terms of management (Ngorett *et al.*, 2016). This is partly due to the immense political interference that has been noted as hitting such projects hard. Gesare *et al.* (2017) assert that the general timelines of the implementation of ICT projects in Kenya has never really been faithfully met. In a study of the impediments to projects implementation in the Kenyan political economy, Taros *et al.* (2015) reveal that the majority of these projects are never achieved within the specified timelines – an issue that has not only led to inflated bills for the taxpayers but also promotes a lot of inefficiency. Haxby and Lekhi (2017) also argue that

the red-taping and bureaucratic tendencies of the government are largely to blame for the inefficiency in the implementation of ICT projects in Kenya.

In summary, the report on the status of ICT project management and implementation in Kenya is not very encouraging. The Kenyan industry, just like that of other developing nations, is immersed in a lot of inefficiencies (Ochara, 2010). This does not mean, however, that the country has not made tremendous progress in the actualisation of its goals related to the ICT industry. What is evident from the reviewed Kenyan studies is that there seems to be fundamental flaws in the manner in which the ICT projects are handled (Tarus *et al.*, 2015). A number of studies suggest that these weak management structures could be overcome through structural changes in the manner in which the government operates. For instance, Hooker (2017) notes that procurement in the government sector compounds issues for the implementation of ICT programmes in the country. This is further corroborated by Haxby and Lekhi (2015), who note that issues of corruption have equally dogged the smooth implementation of various ICT-related projects in Kenya. The verdict of the majority of the publications reviewed is that the state of project delivery and implementation in the ICT sector in the country ought to be improved. Critically, an interrogation into the methods involved in implementing ICT projects in the country is a step that ought to have been taken seriously. The conceptualisation of a new and effective operational model amongst the stakeholders involved in the actualisation of ICT projects in the county is more urgent now than ever. One fact that emerged from the review is that the barriers to effective ICT project management in the country are mainly due to administrative bureaucracies in the government. There is sufficient evidence in the study by Huggins and Frosina (2017) to show that administrative issues and processes are the biggest threats to the success of any ICT project in the country; it can thus be concluded that any remedy to the problem must focus on addressing these two issues.

An in-depth understanding of the ICT context in Kenya was crucial to the conceptualisation of an effective assessment tool that can be used by infrastructure policy makers and senior project practitioners in Kenya to ensure a mind-set of accountability and a structured approach to ICT project planning, delivery and stakeholder integration. In deliberating about how to improve the delivery of ICT projects in Kenya, there was a need to review the current status of the ICT sector in the country, which this part of the study has done.

### **2.3.3 National ICT infrastructure**

ICT infrastructure entails all the devices, protocols and networks that are applicable in the ICT industry as a way of fostering interactions amongst various stakeholders. ICT infrastructure entails both the hardware and software components of ICT. Odero and Mutula (2017) describe ICT infrastructure as any condition that is essential for the deployment of the various ICT services. ICT infrastructure is thus considered as the factors that enable the deployment and establishment of various forms and components of ICT (Mokaya & Njuguna, 2017). In discussing the national ICT infrastructure in Kenya, this study aims to address some of the enabling conditions for the institutionalisation and operationalisation of ICT in the country and how they have influenced the general progress of ICT.

Kenya's ICT infrastructure can be viewed on several fronts: the hardware, which entails the actual machinery, tools and equipment that are critical to the progress of ICT in the country; and the software, which provides a platform to operationalise the hardware and includes the programs and applications that are critical to running the hardware. Furthermore, as an enabling environment, human resources and policy issues are also considered critical components of the ICT sector and the significance of these in the ICT sector cannot be overemphasised (Barrett & Slavova, 2017). ICT policy aids in the provision of a legal framework on which the operations of the sector hinge. This is in addition to the human resource capital, which directs the operations of the sector through

the provision of various levels of skill in managing the sector. While it is generally agreed that the country has made tremendous progress in the ICT sector, one emergent fact from this review is that the various forms of IT infrastructure in the country have not developed uniformly.

This part of the review evaluates the ICT infrastructure in Kenya: the software and hardware, the ICT policy, the regulatory framework for the ICT sector, and the service and professional development of the ICT sector in the country. One of the key objectives of the research is to examine the nature of ICT projects in Kenya and subsequently propose the relevant improvements to stakeholder integration in the industry – an objective that can be achieved effectively if the ICT context in Kenya is well understood. In reviewing the ICT context in Kenya, this segment of the study aims to gain a more detailed understanding of the current state of ICT in Kenya in order to make the development of an assessment tool for improving ICT project delivery more effective.

#### **2.3.4 Hardware and software**

There are not many scholarly publications that offer an insight into the current state of the software and hardware infrastructure in the ICT sector in Kenya. However, recent progress made in terms of hardware infrastructure in the country gives comprehensive information as to the state of this infrastructure in the country. In terms of hardware development, there is no doubt that the country has witnessed the most revolutionary transformation of the sector. The adoption of the digital transmission model as a way of conforming to global expectations gives an indication of the extent to which the country has been able to progress in terms of the hardware (Ndemo & Weiss, 2017). Currently, TVs are reliant on digital boxes as a way of transmitting signals, which is an indication of the progress in the hardware of the ICT sector. Furthermore, the KNBS survey and the World Bank report consider mobile telephony and connectivity; there are indications that

the hardware laid down by the various service providers in the mobile telephony sector has enhanced the adoption of ICT in Kenya (Ndemo & Weiss, 2017).

The country is cognisant of the relevance of infrastructural development in the advancement of ICT consumption in the country. This is the reason the government has been very consistent in rolling out a number of infrastructural developments geared towards promoting the consumption of ICT products in the country (Barrett & Slavova, 2017). While the government was not directly involved in rolling out these infrastructural developments aimed at ensuring the ICT adoption in the country was improved, its contribution cannot be overemphasised. The majority of these infrastructural projects were embedded within the public-private partnership investment framework. In summary, there is logic in the argument made by Odero and Mutula (2017) that a majority of the ICT hardware projects in the country championed by the central government are founded on the fact that the private entities are supported by the central government to roll out this infrastructure, and this is evident through the TEAMS project.

A review of the manner in which the ICT hardware in the country had been rolled out shows there were emergent themes that could be drawn out. One fact is that these infrastructural developments had been pursued through the public-partnership arrangement or entirely private arrangements under the support of the central government (Kimani, 2017). Entirely public-driven infrastructural projects relating to hardware in the ICT sector have been limited in number. In fact, there is a lot of sense in the thesis that the government was seeking to support the private sector in rolling out this infrastructure that was meant to support the ICT sector in the country. The same trend can be seen in the software infrastructure in the country.

Software, as an ICT infrastructure, appears to be the reserve of the private sector with the support of the government. One fact that emerged from the study of software development in the country is that the role of the Kenyan government is limited to the establishment of enabling factors in the development of these applications, which are necessary to support the growth and development of the ICT sector in the country. There is a sense in which the Kenyan government has limited its role in application development, to the extent that it only supports private enterprises to pursue the same; this is evident in the establishment of various hubs that incubate software development in the country, the most recent one being the Microsoft software testing centre in Nairobi. The approach that the government has used is that of limiting its role in supporting application development by various enterprises, even as it extends support to these enterprises in other ways. Essentially, this means that the government of Kenya views software development as the domain of private investors – an opportunity that seems to be strengthening the ICT sector in the country (Odero & Mutula, 2017).

In order to propose an integrated ICT project delivery assessment tool that effectively comprises appraisal approaches, delivery methods and stakeholder integration strategies, there is a need to evaluate the current state of ICT hardware and software infrastructure in the country. This is based on the fact that ICT, in a broader context, consists of both hardware and software aspects. In reviewing the hardware and software infrastructure in the country, there is a sense in which the current state of ICT development in the country is well established – a factor that is essential in trying to develop a project delivery assessment tool for ICT projects in Kenya.

### **2.3.5 ICT policy issues**

The evaluation of the ICT policies in Kenya can be summarised into two key aspects of policy intervention. One is the expansion of the ICT sector in the country. The policy framework in the country's ICT sector seeks to ensure that the adoption of ICT is optimised. Indeed, an evaluation of the policies developed in the ministry over the past

decade attests that the key theme was the expansion of the use of these ICT products in the country. Across major ministries in the country, there have been concerted efforts to integrate the ICT infrastructure in their daily operations, with the latest being the rolling out of the judiciary process onto digital platforms so that cases can be filed and processed online. The other key aspect of the ICT policy model in Kenya is that it is based on regulation. The policy formulations in the industry act as key guidelines to ensure that the operations in the sector are well regulated (Kunyenje & Chigona, 2017).

This study is well aware that the ICT policy framework is considered an essential component of ICT infrastructure, which contributes to the development of the sector through the development of a regulatory framework for the operations of the sector. The conceptualisation of any ICT policy framework is not meant to limit the growth or development of the sector, but rather to streamline the operations of the sector as a way of optimising operations. This section is concerned with the evaluation of the national ICT policy in the country and explores the implications of the national ICT policy on the performance of ICT projects. Kenya has operationalised an ICT policy with the overarching aim of optimising the uptake of ICT products in the country through the development of a comprehensive regulatory framework. In fact, the broad strategy of the ICT framework adopted in 2016 was based on the need to promote the uptake of various forms of ICT in the Kenyan economy (Kivikuru, 2017). One critical role of the ICT policy in the country worth debating based on its relevance to this study is the fact that the policy aimed to promote investment in the ICT sector.

In essence, this means that the government intends to roll out several projects related to ICT as a way of advancing the growth of the sector (Kivikuru, 2017). The conceptualisation of the ICT policy, one can argue, aims to initiate as many ICT-related projects in the country as possible, since investments translate to the development of significant projects aimed at increasing the adoption of these ICT projects in the economy. The 2016 ICT policy in Kenya indicates the desire of the country to enhance the use of

ICT services (Kivikuru, 2017). Indeed, this is evident in the national objectives of the policy. Many analysts have admitted that the policy was developed with the sole realisation that ICT is a central component to economic growth in the country and thus its potential needs to be harnessed by all the stakeholders. Looking at such objectives as the encouragement of innovation, facilitation of the delivery of ICT-based systems for health, education and agriculture, facilitation of accessibility to broadband, and the enhancement of the human resources in the sector, the impression is that the overarching aim is to promote the uptake of ICT services in the country.

The development of any ICT framework for guiding ICT projects can effectively be achieved through the establishment of a policy framework. In exploring the national ICT policy, the research aims to find out if there are existing gaps and opportunities that could be considered if an integrated framework for ICT projects in the country is conceived. This research is keen to evaluate the type of relationship that exists between theory and practice in relation to ICT project delivery, which means that issues of policy have to be studied in depth. Are there specific gaps in the current national ICT policies that have fundamental implications for ICT project delivery?

### **2.3.6 Regulatory environment**

The growth of the sector requires a rational approach in terms of the development of a regulatory scaffold onto which ICT operations can build. While this study is keen not to document the regulatory approaches that Kenya has instituted in the ICT sector, it does focus on some of the milestones the country has achieved in trying to develop an effective operational rubric based on which the ICT activities operate. With the realisation about the relevance of the ICT sector in the growth of the economy, the Kenyan government were very keen on the development of a proper operational framework for the sector (Kivikuru, 2017). In 2012, for instance, the Kenyan government, keen to have a more coordinated approach to the operationalisation of ICT in the country, came up with a formula to regulate the sector.

The regulatory environment of the ICT sector in Kenya has been a subject of debate for a while now. Until very recently, the country did not have any comprehensive regulation regarding the use of the internet or any forms of cybercrime – an issue that was addressed in the recent past through the actualisation of the Computer Misuse and Cybercrimes Act, 2018 (Aina, 2018). Regardless of the feelings regarding the cybercrimes bill, the impression is that Kenya is gradually adopting a legal stance regarding online activities, and it appears that the country is seeking to expand its regulatory approaches to the operations of the sector. It is thus admissible that, while the country has not effectively adopted a comprehensive regulatory approach and guidelines in the sector regarding the use of the internet, mobile telephony and even the infrastructural growth in the sector, there are indications that the country is keen on having a firm grip on the operations of the sector, and this is effectively corroborated through the institutionalisation of these regulations. The Communications Authority of Kenya (CAK), formerly Communications Commission of Kenya (CCK), has been effectively used in the development of a platform onto which the operations of the sector are aligned with the constitutional provisions. In fact, study of the restructuring of the former CCK gives an indication of the extent to which the country has reformed the operations of the sector.

The ICT sector, just like any other industry, must be well regulated if the desired objectives of the industry are to be fully realised (Barrett & Slavova, 2017). To improve ICT project delivery in Kenya means that the stakeholders ought to develop an effective regulatory framework that effectively addresses the challenges faced by ICT projects in the country. In a bid to propose an integrated ICT project delivery assessment tool in Kenya, which comprises appraisal approaches, delivery methods and stakeholder integration strategies, an effective regulatory scaffold ought to be developed by the stakeholders.

### 2.3.7 Advancement of ICT

A massive revolution has been witnessed in the ICT industry around the globe (Watanabe *et al*, 2015). In various domains, disruptive technology continues to witness massive transformation as inventors seek to modernise ICT tools already in the market. Moreover, new inventions are still being made in order to make a more meaningful impact in the world today. In the context of the suggestions of Kostoska and Kocarev (2019), research has been the most notable driver of these changes in the ICT sector. Manufacturers are continuously seeking to develop newer ways to solve global issues through the use of ICT. What this means is that the globe is witnessing a massive transformation, and adoption of ICT products is a way of advancing change in society. In terms of infrastructure, Barrett and Slavova (2010) note that there seems to be a massive focus on ensuring that ICT infrastructure supports the ICT inventions that are currently being rolled out in the market. While there is no data regarding the total expenditure on ICT infrastructure globally, Barrett and Slavova (2010) note that the figure for total ICT expenditure globally could be used to give an insight into the advancement of ICT globally. Empirical evidence from Statista (2019) suggests that in the past decade, global investment in ICT has risen exponentially annually. From 2016, there was progressive growth in capital investment in the ICT sector globally. This paint a picture of an industry that is growing rapidly. This trend has also been witnessed in Kenya; there has been massive investment in the sector.

While discussing the advancement of ICT, the focus has been on innovation and infrastructure development as well as the development of human capital in Kenya. Moreover, in discussing the advancement of ICT, the question of services as well as the emerging technologies in the ICT sector was addressed. In Kenya, just like the rest of the world, there has been considerable improvement in the ICT sector; this has led to a significant improvement in service delivery within the country. There have been considerable advancements in ICT infrastructure, which has fundamentally transformed the service delivery model in the country as well as the business environment.

### 2.3.7.1 ICT industry infrastructure contribution to GDP

The information on the ICT sector in Kenya gives credence to the assertions of Waema and Ndung'u (2012) regarding the contribution of the sector to the GDP of the country. The value of Kenya's ICT sector was estimated to be \$500 million, and this was anticipated to grow to \$1 billion by the close of 2020 (Kenya Economic Update, 2019). In 2014, the ICT sector contributed 2.9% to the country's GDP and this was anticipated to increase to 10% by 2018 (KNBS Economic Survey, 2017). This affirms the earlier admission by the World Bank that ICT was projected to form a critical pillar for the development of Kenya's GDP. In terms of sectoral growth within ICT, the Kenya Economic Update (2017) indicates that growth in the ICT sector has been driven by the mobile segment. Perhaps this is why Kimani (2017) indicates that M-commerce, a subset of ICT in the country, is set to include more business transactions as it progressed from person-to-person transactions.

With these statistics, it is evident that the ICT infrastructure is a critical driver of the GDP of Kenya. The projections in the economic outlook of the country affirm that ICT is set to remain a critical component of the growth of the economy going forward. But as earlier intimated, this contribution of the ICT sector as a critical factor in the country's GDP could be based on the fact that the sector permeates all facets of the economy – from healthcare to education and even agriculture. All these industries rely on ICT solutions to provide a very firm background of business operations that are likely to positively impact the economy (Mwaniki *et al.*, 2017). This is why the government has highlighted ICT as one of the critical drivers of the country's economy.

IGI Global (2015) defines ICT infrastructure as *"the devices, networks, protocols and the procedures that are employed in the ICT field with a view to fostering interaction amongst the different stakeholders."* In essence, no ICT-driven project could be implemented if the ICT

infrastructure was absent. The implication of this is that in the development of a framework for the implementation of ICT projects, the aspect of infrastructure must be looked at in depth. The fact that the research aims to evaluate the scale of ICT project delivery in Kenya means that ICT infrastructural development must be evaluated. Understanding the scale of ICT project delivery in Kenya necessarily encompasses evaluation of the ICT infrastructural development in the country, since ICT projects cannot take off without the development of the relevant infrastructure. In the assessment of the effective ways of improving ICT project delivery in Kenya, there is a need to incorporate the infrastructural aspects of ICT as well; so, in proposing ways in which to improve the delivery of ICT projects in Kenya, the research also focuses on the infrastructure. The proposition of an ICT project delivery assessment tool – the aim of this research study – cannot effectively be achieved if the infrastructural aspect of ICT is ignored. In proposing an effective project delivery assessment tool for ICT projects in Kenya, the research explores the delivery methods of these ICT projects and further evaluates the stakeholder integration strategies relevant to these ICT projects; this is best done through an in-depth evaluation of ICT infrastructure.

#### **2.3.7.2 ICT innovations**

There have been deliberations amongst the stakeholders in the ICT sector about how to nurture and incubate innovative ICT solutions as a way of promoting the operations in the sector. In fact, the government operations in the last fifteen or so years affirm that there have been efforts by the government to nurture these inventions in the sector (Onsongo & Schot, 2017). Many scholars, like Mokaya and Njuguna (2017), agree that the development of the ICT sector has been largely promoted through the goodwill of the government, and this is evident in the manner in which innovative ideas in the industry have been nurtured by the stakeholders in conformity with the country's ICT policy. The idea behind the "ihub", for instance, can be traced to the innovative models of developing ICT consumption in Kenya (Ndemo, 2017). The objective was to ensure that these

innovative skills were aligned with the country's economic rubric and would objectively contribute to the country's development template. The ihub concept was meant to precipitate the technological development by integrating entrepreneurship skills with the relevant ICT skills to catalyse growth. Founded in 2010, these innovations played a significant role in the progression of the country's ICT sector (Sambuli & Whitt, 2017).

There is an impression that Kenya was keen on nurturing ICT development through these innovations. The Kenyan ICT masterplan cited the establishment of the ICT authority as a move towards harnessing the power of ICT in developing the country. What is evident is that the country was keen on ensuring that its ICT service platform remained competitive, and the country aimed to achieve this by encouraging innovations in the sector. The fact that the ICT authority was mandated to develop methods to ensure these inventions were nurtured and developed to contribute to the long-term goals of economic development points to the fact that these inventions were critical factors in the consumption of ICT products in the country. In the restructuring of the ICT ministry, one concept that emerged was that the ministry would be focusing on identifying innovators and financiers to "*accelerate inclusive development and economic growth*". What this meant was that the country was keen on ensuring that innovative ideas were nurtured and that the relevant support was offered to nurture economic growth; this had been witnessed in the conventions of national digital innovation, which directly focused on enhancing the development of these innovative ideas aimed at improving ICT uptake in the country (Sambuli & Whitt, 2017).

The ICT sector evidently relies on innovation as a way of enhancing the outcomes of the sector. There is an impression that the government and other stakeholders are keen on using innovation as a platform to improve the extent to which ICT contributes to the general economy. Since this research study is keen on developing methods through which ICT project delivery can be improved in the country, innovation is considered a key variable that can be used to enhance the performance of ICT projects in Kenya.

Improving ICT projects involves a conflation of many factors, innovation being one of them (Ndemo, 2017).

### **2.3.7.3 ICT human capacity**

Human resource capital is a critical part of the infrastructure in the development of ICT (Whitfield, 2007). The development of the sector is impossible without the necessary human resource capital. In their evaluation of the problems facing the implementation of an integrated ICT policy in Kenya, Waema and Nyambura (2010) note that the country had, for a long time, lacked the relevant human capital to undertake a massive transformation in the sector. Gichoya (2005) indicates that the country has struggled with the development of an effective programme to promote the operations of the sector because of insufficient skills in the sector; there seems to be inadequate human capacity to navigate the challenges of the ICT sector today.

Amidst these points, it is notable that the country had made quite a leap in the development of human resources to consolidate the gains in the sector and even to propel the sector into the next phase of growth (Gichoya, 2005). Various programmes related to ICT have been rolled out, from the lowest learning level to the highest, to develop the internal capacity of the country to manage its ICT activities. In fact, the University of Nairobi was ranked as one of the leading institutions in terms of the academic programmes pertaining to ICT within East Africa, which shows that Kenya's human capacity to advance the growth of the ICT sector is being well taken care of by stakeholders (Tarus *et al.*, 2015). The government mandated institutions of higher learning to align their educational goals with the ICT policy as far as ICT training was concerned. This was geared towards the development of well-equipped human resource capital to help in the development of ICT in the country.

The development of human resource capital does not, however, negate the fact that Kenya is still in need of a comprehensive training programme to ensure that the skills are relevant to the practical needs of the country. Specifically, Tondeur (2015) points towards the implementation of ICT projects where it was notable that adequate human resource capital was required to enhance the outcome. Many studies are critical of the current training models that do not arm people with the relevant skills in ICT but rather emphasise rote learning. What is critical is the establishment of a training platform where the content is directly applicable in the industry (Gichoya, 2005).

There is also the question of basic literacy, which cannot be avoided while discussing the progress of human resource capital in the ICT sector. There have been fears in the past that a policy needs to be developed to ensure that basic ICT skills, such as using computers, are disseminated to the public as a way of preparing the next generation of professionals. From the reviewed literature, it can be established that there have been some important milestones in achieving these, from the integration of various ICT skills in certain courses to other units that empower individuals to have a basic understanding of computers. However, the adoption of the digital literacy programme is deemed to be merely an initial step in the development of a well-skilled human resource capital to drive the implementation of the ICT policy in Kenya (Rono, 2018).

Human capital is perhaps one of the most important parts of the ICT sector and individuals must be engaged in every step of ICT project implementation and delivery. In discussing the significance of developing an effective management rubric for human resources in the ICT sector, Ndege and Okello (2018) suggest that the industry relies heavily on human capital to drive its objectives and so a proper management framework for human resources is central to improving the delivery of ICT projects in Kenya. This research aims to propose an integrated ICT project delivery assessment tool, a proposal that is achieved through the development of ICT project appraisal approaches, delivery

methods and stakeholder integration strategies, a feat that could not be achieved without the input of human resource capital.

#### **2.3.7.4 Service and professional development in Kenya**

ICT service and professional development in Kenya has been quite transformative (Waema *et al.*, 2018). Despite the challenges in the sector, many of the commentators paint a picture of a resilient sector with massive opportunities for development. That Kenya has become an important investment destination in the ICT sector in the past fifteen or, so years is a further indication of the service and professional development in the ICT sector in the country. In terms of the service side of the industry, Svensson (2017) traced the development in the sector and postulates that intensive professional and service development in the ICT sector in the country could have been precipitated by the emergence of the mobile industry as opposed to the fixed telephones that the country had been using in the past. One can thus adequately theorise that mobile telephony growth was the foundation of the growth of the ICT service sector in the country. With the emergence of mobile telephony, ICT services spread quite fast, beginning with internet connectivity, which was effectively advanced through mobile telephony services.

Therefore, without getting deeper into the history of ICT services in the country, the input of mobile telephony could be seen as having been a central player in the service provision in the ICT sector in Kenya. One of the leading service providers, Safaricom, has been at the frontline in advancing various other ICT platforms in the country, which were directly related to mobile telephony in the country; for instance, the mobile money transfer system gained traction as a revolutionary invention in ICT, finance, agriculture and many other sectors of the country's economy (Mureithi, 2017). Through mobile telephony, broadband connectivity has been on the rise, which has impacted other sectors of the economy as well. The ICT service industry is thus predicated on two critical components of the industry: mobile telephony and internet connectivity.

### 2.3.7.5 Internet of things

The development of a project delivery assessment tool for Kenya should take into consideration emerging infrastructural management concepts such as the internet of things. This study can authoritatively confirm that such initiatives have not been developed in Kenya, a phenomenon that could be contributing to the poor project delivery in the country. The concept of internet of things in project delivery could be effectively used in monitoring and evaluation since it saves time, reduces costs and enhances productivity. The concept entails the networking of physical devices, thus enabling a seamless data exchange model (Stojkoska & Trivodaliev, 2017). One of the most notable features of the internet of things is the fact that it allows for the control of objects within a specific network (Emmanuel *et al.*, 2017). When augmented with sensors, the technology is essential in monitoring. There is no evidence that the technology has been implemented in any form of project management in Kenya, yet it is an opportunity to enhance efficiency in project delivery through monitoring and evaluation of the outcomes of the project. For policy makers, perhaps the adoption of such technological approaches in project monitoring and evaluation could be included in the development of a management template for ICT projects in the country.

### 2.3.7.6 Artificial intelligence (AI)

The globe is gradually shifting towards machine intelligence, where the roles of natural intelligence are being gradually replaced by the abilities of machines (Fujii & Managi, 2017). The concept of artificial intelligence (AI) is based on the fact that machines are becoming increasingly more rational, thus enhancing their capacity to offer services that were traditionally restricted to humans. As an aspect of ICT, the concept of AI provides a firm framework through which decisions can be made with very little input from humans but rather based on computer reasoning. The research of Sakurai *et al.* (2017) indicates that the adoption of AI would be transformative to project management in Kenya. The management of stakeholders in ICT projects, for instance, is often marred by

competing interests, which usually impairs the progress of a project; Sergi *et al.* (2018) propose that these are instances where various aspects of AI could be invoked to aid in the seamless implementation of the ICT projects. Evidently, from the studies of Sakurai *et al.* (2017), Kenya's progress towards the incorporation of AI in the management of ICT projects seems to be on course. This is, however, threatened by the lack of a legislative and technical framework, meaning that even if the infrastructures have been put in place, the optimal contributions of these elements in the project management matrix may not yet be realised. It is because of such gaps that this study aims to develop a more practical ICT project delivery assessment tool for the ICT sector.

#### **2.3.7.7 Big data analytics**



In the development of its ICT masterplan, Kenya recognised that there was no repository for ICT project management and implementation. This meant that there was still a lack of an inventory where data could be obtained regarding projects in the ICT sector, thus enabling the project implementers to make empirical and data-driven decisions (Chandy *et al.*, 2017). This invokes debate on the issue of big data analytics, a concept that entails the process of evaluating large sets of data with a view to discerning trends and patterns as a way of informing the future decisions made regarding the data. Within the project management model, big data could be a factor in making decisions regarding new projects in the future, in the sense that having an inventory of data regarding ICT-related projects in Kenya could give critical information about how to handle other projects in the country. As noted by Kshetri *et al.* (2017), the central role of big data is to enhance the quality of decision-making in a project. Within the context of sense-making and stakeholder management, having a comprehensive database of other projects and other related issues pertaining to that project could provide valuable platforms for the development of a framework for the implementation and management of these projects.

### **2.3.7.8 Wireless broadband spectrum and cyber security**

Kenya's transformative approach to ICT projects received a boost in the past year with the introduction of a new spectrum policy aimed at enhancing service delivery in the ICT sector (Chetlapalli *et al.*, 2017). With the realisation that the internet was the chief driver of ICT programmes, the government is keen to leverage the internet provision as a way of enhancing economic growth. The policy aims, amongst other things, to propose guidelines for raising spectrum fees to improve service delivery. What the whole policy coalesces around is the promotion of coverage in the country; this can be seen through the promotion of incentives and obligations related to coverage, especially in rural areas. The essence is to enhance the extent to which the internet covers the country. With the spread of the internet in Kenya, other issues that have arisen highlight the need for the development of a legal framework through which the ICT consumers in the country could operate (Macharia, 2016). This provision was well captured in the recently enacted national cybercrimes act, which criminalised those abusing the internet. One fact emerging from this is that with the ubiquity of the internet in Kenya comes the responsibility to initiate a regulatory approach to ensure that the consumption of internet products is done within the law (Macharia, 2016).

The development of the national cyber security regulatory framework in the country was an obvious pointer towards the increased consumption of ICT products in Kenya. Many commentators argue that the development of the framework hinged on the need to regulate a sector that has witnessed a massive influx of users, with the intention of eventually reigning in any form of illegal use of ICT platforms in the country. What is evident is that the continuous adoption of various ICT products in the country is likely to promote or widen the regulatory scaffold in the industry and this has been witnessed in the Kenyan context (Ndemo, 2017). The increased use of mobile telephony, for instance, brought in the gradual and systematic adoption of various measures to regulate the sector. The registration of SIM cards, for example, was geared towards developing

regulations that would aid smooth operations in the sector. What this study aims to emphasise is the fact that the adoption of these regulatory strategies indicates that this is a growing sector of the economy. However, of more significance is that with the development of a national framework for cyber security, there is a sense in which the government seems to be endorsing the ICT sector as the driver of the country's economic growth. The significance of this in this research study is that there is equally a need to have an elaborate project delivery framework, because if the ICT sector is increasingly becoming an important pillar of national development, there is an urgent need to develop and operationalise a project delivery model that will act as a foundation of the management of various ICT projects in the country.

### **2.3.8 National development plan and ICT in context**

It is evident from the studies reviewed so far, as well as Kenya's development blueprints, that ICT is considered the fulcrum of the country's development. In reviewing development plans, such as Vision 2030, there is sufficient evidence that Kenya is keen on leveraging ICT to advance various sectors of the economy. In this respect, it can be confidently suggested that the national development plan is relying on various aspects of ICT in the country. While discussing the country's development plan, this research strictly considers the manner in which the country is applying ICT in its development plans across several sectors of the economy.

As earlier intimated, Kenya is keen on leveraging ICT as a key part of its developmental plan. Indeed, with a review of the current publications regarding the country's economic, social and political advancements, one is able to clearly see that every proposal of advancement is closely tied to ICT infrastructure. The country's Vision 2030, though segmented into a number of economic development indices, largely rests on ICT. As Gichoya (2005) highlights, the country is relying on a platform of sound ICT infrastructure in order to proceed with sound socio-economic and political developments. Vision 2030 gives a view of the role of ICT in the development and growth of the Kenyan

economic fabric. One of the critical pillars of Vision 2030 is founded on the need to have a robust ICT infrastructure, which is likely to propel the country to be more productive. As a pillar of economic growth, Vision 2030 is counting on various aspects of ICT, including the conceptualisation of BPO services. Wulff (2015) asserts that a study of the Vision 2030 development plan indicates that other than the direct role of ICT in the development of the country, Vision 2030 is seeking to include ICT concepts in almost all the ministries in order to improve service delivery and enhance the growth of these economies. In evaluating the 2030 economic blueprint, what is evident is that development of whatever nature cannot progress if the ICT component is neglected. The role of ICT in the development of the economy is emphasised in the study of Wulff (2015), who suggests that through supporting other sectors of the economy, the various components of ICT provide a very firm and solid background onto which countries can build their economic growth.

Business process outsourcing has been identified as a key driver of the development of an economy directly through the ICT sector. The concept of business process outsourcing involves a support plan for the economy, where businesses rely on the input of ICT infrastructure and services to advance their growth. While this study does not delve into the discussion of the Vision 2030 economic blueprint, it lays emphasis on what is already known about the input of ICT in the enhancement of growth in all sectors of the economy. In agriculture, for instance, ICT is expected to be the driver of the market in terms of linkages and networking (Ayanso & Lertwachara, 2015). The ICT sector is equally expected to be the platform through which Kenya's tourism programme seeks to market its products and even to promote various aspects of tourism in the country. In terms of education, ICT infrastructure is anticipated to enhance learning and promote content development. It is clear that Vision 2030 is founded on ICT. The question the nation ought to ask is, therefore, how can Kenya directly harness the power of ICT? Hence, this research intends to propose effective ways of improving ICT project delivery and identify

key stakeholder integration determinants that can be used by policy makers and senior project practitioners to enhance ICT project planning in Kenya.

As highlighted in the previous sections, Kenya has witnessed a massive leap in terms of the digital space in the country; this is a fact that is evident throughout the literature reviewed. However, there are concerns regarding the regulatory framework in the country. Of course, there have been strides taken in the development of a regulatory approach, especially in the recent enactment of cyber security legislation, but more needs to be done in terms of filling the market efficiency gap and the access gap. Connectivity in rural areas, for instance, is still not at its best, thus limiting the connectivity of Kenyans to the internet; this is an issue that the government could resolve through a public-private partnership approach. Recently, there have been calls to conduct more research into developing AI as a way of harnessing the power of ICT to contribute to economic development; however, there seems to be no meaningful legal framework through which these ideas can be crystallised and effected. In this regard, more needs to be done to generate resources to be able to fully harness the input of ICT in the general economy. The next section provides an overview of previous and contemporary project management research.

#### **2.4 Part III: A synopsis of project management theory**

In this section, the concept of project management is discussed in detail. This section gives an overview of what project management entails as well as assessing the research progress in project management today. To this end, extant publications germane to project management theory, stakeholder management and performance metrics were reviewed.

## 2.4.1 Overview of project management

The development of the ICT industry in any economy relies on sound infrastructure established for the sector (Binder, 2016; Podgórska & Pichlak, 2019; Guma & Monstadt, 2020). Regardless of the soundness of the policy models established to advance the industry, no meaningful growth can be seen if no infrastructural framework has been established within the economy. Indeed, Bateman *et al.* (2019) unequivocally state that the reliance on ICT as a driver of economic development is in vain unless there is systematic investment in ICT infrastructure. This essentially means that project management in ICT ought to be optimised in order to reap the full benefits of ICT infrastructure. In this section of the review, the concept of ICT project management is discussed.

### 2.4.1.1 Project management methodologies and applicability in the Kenyan ICT infrastructure context

Project management methodologies applicable in a project are determined by a number of factors (Špundak, 2014). Kliem *et al.*, (2007) aver that project management teams are required to have a broader understanding of the project context before configuring the right methodology applicable for the project. A project methodology essentially refers to the various principles, techniques as well as the regulations that guide the implementation of the project. Systematic care ought to be taken in a bid to apply the right methodology that yields the right project objectives.

One of the most important factors to take into consideration before the selection of a specific project management methodology is the level of the complexity of the project. In essence, the project management team needs to interrogate not only the level of complexity of the project, but also evaluate the nature of the complexity of the project as this enables the team to evaluate the principles applicable to guide the project. At the same time, it is prudent that the project management team assesses the rigidity of the operational environment during the project execution initiative. In a sense, if one is

engaged in a dynamic environment, then the project methodology applicable therein varies with a rigid environment.

#### **2.4.1.1.1 Agile methodology**

Iterative approaches in project management allow the management team to segment the project into a number of phases (Ilieva, 2004). Within each of these stages, the management team is engaged in a well-developed collaborative framework to enhance the project objectives. Agile project management rubric is characterized by the conception of tasks when the demand arises. The methodology has been predominantly applied in the software development environment from where the feedback of the customers is consistently integrated within the project to enhance the project outcomes.

Project teams applying the agile concept need to increase their speed of development and ensure that they adequately collaborate with the other stakeholders in order to foster the ability of the team to adequately respond to the trends in the market. The agile concept, observes Singh (2008), leans on four critical principles in project management. The first principle is the concept of collaboration, an important concept that links the consumers of the product to the project team. In concept, agile project management concept requires that customers must be engaged constantly in order to give the feedback of the project instead of the conventional contract negotiation.

Secondly, the agile concept is keen on elevating responses to changes in the project as opposed to the strict pursue of the project plan. This means that the project team is not entirely confined to the original plan of the project, but they are rather guided by the emergent needs of the consumers (Singh, 2008). Moreover, the team must elect to engage individuals as well as interactions instead of the project execution tools or processes. McCormick (2012) document that the key tenets of the agile framework included transparency in the project management, customer focus, adaptability of the project,

sense of project ownership and continuously improvement of the project quality. While there have not been detailed studies on the project methodologies and applications in the Kenyan context, a review of the suggestions of Gwaya *et al.*, (2014) can be instrumental in appraising the agile project methodology in the country. Notably, one of the main issues affecting project management in Kenya is project sustainability. Kahura (2013) argued that there is limited incorporation of the input by the project consumers during the project. A critical review of the suggestions by Kahura (2013) affirmed that the application of agile project methodology in the Kenyan project management context would be instrumental in the improvement of project outcomes in the Kenyan context. Since the iterative model encourages a collaborative framework and a customer driven project execution, it is anticipated that the adoption of agile model is likely to enhance the project outcomes.

#### **2.4.1.1.2 Scrum project methodology**

The conceptual framework of scrum project methodology in project management is anchored on the concept of “sprinting” where projects are planned, and the project team commits to the execution of specific tasks before the timeline approaches. The general scaffold of the scrum methodology is premised on iterative processes considering that the consumers consistently give input during the project process; the project methodology is basically incremental. The process is based on defined practices that are clustered under specific blocks (sprints) which are distinct entities that provide a complete outcome. At the start point of the scrum methodology, the project team lists their objectives in the project plan. The project client is wholly responsible for the prioritization of these objectives.

One of the most important aspects of the scrum methodology is the concept of scalability. It is argued that the iterative model, onto which the procedure is founded, makes it very easy for the project team to rivet their focus on specific deliverables for the project. This means that it equally provides a framework for flexibility for any changes in the project.

Pries and Quigley (2013) contended that the agile model is an important methodology in terms of ensuring the compliance of the project to the consumer expectations. The client, notably, is able to establish their expectations during the project and indicate the value of each of the project requirement in the project. Other advantages of the scrum perspective in project management include the concept of risk reduction and the timely prediction of the project progress.

The overall project context in Kenya based on the findings of Kahura (2013) would endorse the development of the scrum framework in the ICT projects in the country. One of the most important considerations herein would be the time factor in the project execution. One of the fundamental issues argued by Haxby and Lekhi (2017) as of concern in the project management in the country is the question of flexibility and the timeliness of these projects. Rigid project infrastructure limits the ability of the consumers to effectively contribute to the general progress of the project. Pries and Quigley (2013) observed that the ultimate consumers of the project are actually “robbed” of being the main driver of the project. In a number of project appraisal evaluations, the salient finding has been that these projects are not “consumer driven” to mean that they are not adequately involved. Thus, the context of scrum methodology opens up the project management context in Kenya to more engagements with the consumers.

The other relevance of the scrum methodology is notable in terms of the time factor. It is estimated that up to sixty-five percent of the Kenyan infrastructural projects in Kenya never complete in time leading to exorbitant cost variations. Governments reports are replete with a number of projects that have not only overshot their budgetary apportionments but have equally defined the timelines therein. Taking this into context, it is theorised that the emphasis in the timelines (sprints) in the scrum framework would offer an important solution to the problem of timelines in the Kenyan project management context.

#### **2.4.1.1.3 PRINCE 2**

Process based project management initiatives were initially meant to improve the project outcomes by laying emphasis on the processes leading to the outcomes. The concept behind the PRINCE 2 model of project management is conceived on the idea that there needs to be a progressive justification of the business case of the project. In essence, the emphasis is that the project team must consistently justify the reason for the continuation of the project (Vaníčková, 2017). PRINCE 2 principles also indicate that there needs to be a very elaborate stakeholder sensemaking platform in the sense that there needs to be a framework where the project team learns from experience to optimise the project operations in the future. The concept being advanced by the methodology is that by reviewing the past operations, critical lessons on the project process can be learnt to ensure that the project succeeds in realising its defined benefits. Project team members must have defined responsibilities to enhance productivity and accountability (Vaníčková, 2017).

#### **2.4.1.1.4 Waterfall**

Project management initiatives can map out projects in sequences and subsequent phases commences when the previous ones have been completed. The concept behind waterfall model in project management is hinged on the notion that project objectives can be adequately achieved if particular phases are completed first then the next follow. It is a linear procedure with each phase being discreetly undertaken (Kisling, 2019). The salient attribute of the model, as espoused by Petersen *et al.*, (2009) is that it ensures that all the elements of one phase are exhausted, and approvals done before getting to a different phase.

Usually, the waterfall model relies on very clear - cut set of rules that ought to be followed by the project team. The model is considered to be a reliable approach in the project management schema since the phases are very straightforward. Anyone in the project

team can comfortably understand the process giving them a better understanding of the project. Petersen *et al.*, (2009) noted that the waterfall model is generally applicable in very complex and long-term projects. This is largely because of the notion that the waterfall model is a very rigid project management model where the project team often relies on several multiple mobile segments of the project. The linear processes are usually very simple enabling the project team to track tasks. Considering that each of the phases has to be fully exhausted before a new phase is commenced, it thus follows that finding and fixing issues in the project lifecycle is relatively easy and straightforward. Petersen *et al.*, (2009) mentioned that the waterfall model is rather easy to manage since there are no task overlaps; handling operations is a lot easier in the model.

The very theoretical and conceptual template of the waterfall project management methodology may not really be the precise solution to the ICT project management context in Kenya. A review of the general context of the ICT infrastructure projects in Kenya indicates that majority of these projects do not require the level of rigidity that is agitated by the waterfall model. A very flexible framework of project management allows the project team to remain innovative and scale the complexities involved in the project execution. Fundamentally, the ICT project management model in Kenya requires a more flexible approach which is not really advocated for by the waterfall model. Secondly, while there are a number of projects (ICT) that can be clustered as very complex in terms of their scope, one would argue that the scope of the majority of the ICT projects in Kenya is not as broad to fit in the waterfall model of project management. As earlier discussed, the waterfall concept has been noted to work very well for very big, complicated and long-term projects, an observation that is entirely different in the Kenyan context. The classification of the ICT infrastructure projects first of all indicates that not many of them are very complex. This therefore means that the waterfall may not be entirely meeting the needs of the Kenyan ICT project management context.

As earlier mentioned, there is no evidence indicating a robust research on the type of project management methodologies applicable in the Kenyan ICT infrastructure projects. An assessment of the project management context in the Kenyan banking system the proposed model was the PRINCE 2 model. The argument by Kahura (2013) was the flexibility of the PRINCE 2 approaches in managing the projects within the country noting that the country has not invested in a robust infrastructure that can adequately support these projects. More flexibility is thus required to optimise the outcomes of these projects.

A further discussion by Kariuki *et al.*, (2018) emphasised the essence of the agile project management in the construction industry. Kariuki *et al.*, (2018) argued that the agile project management model, comparatively, has a high rate of success when applied in the construction industry. The paper points out to the iterative methods as applied in the agile concept as a critical component that drives project success in the Kenyan construction industry. To be particular, the concept of very close collaboration appears to be a salient discussion point in the proposition that agile methodology in construction projects appear to optimise the project outcomes. These two studies, couples with the assertions of Kariuki *et al.* (2018) who interrogated the project management landscape, would give credence to the assertion that the agile and PRINCE 2 models can be important avenues of addressing the problem challenges in Kenya.

#### **2.4.1.2 Previous research on ICT project management in Kenya**

While there has been a considerable amount of research undertaken in the discipline of project management in the Kenyan context, there is a huge gap in the topic of ICT infrastructure in Kenya. A review of the research in the ICT sector in Kenya revealed that there had been quite a lot of work done in terms of policy, regulation, progress and the need to expand ICT infrastructure in the country, but very little attention had been given regarding the progress of ICT infrastructure projects in Kenya. In an evaluation of the

current state of ICT infrastructure in Kenya, Guma and Monstadt (2020) opine that there had been no systematic themes in academia that would paint a picture of the trends in research in ICT infrastructure projects. Binder (2016) discusses ICT infrastructure in the context of absorption of ICT in the education sector. Guma and Monstadt (2020) disclose that the use of ICT in education has been largely impaired due to funding issues. The study suggests that the technological lag witnessed in high schools in Kenya has been largely due to poor funding. Moreover, the authors suggest that there is inadequate infrastructure in these institutions, thus limiting the adoption of ICT in Kenya.

In view of the suggestions of Gichoya (2005), the question of budget becomes key in the debate about ICT infrastructure in Kenya. Indeed, a considerable number of research papers undertaken to review the progress of ICT growth in Kenya have been very vocal about the question of budget. Bateman *et al.* (2019) suggest that the need to expand connectivity and advance the consumption of internet in the country has been largely hampered by the inadequate budgetary allocations to facilitate the consumption of ICT in the country. Looking at studies such as Guma and Monstadt (2020), the question of stakeholder management in ICT appears to be a much-disregarded topic. There are not many studies that specifically discuss ICT infrastructure in Kenya within the context of ICT stakeholder management. Bateman *et al.* (2019) could be considered the closest in discussing the trends of stakeholder management in the country's ICT projects. This study does suggest that the country ought to devise a well-framed stakeholder management model and platform to ensure that these ICT projects are sustainable in the country.

#### **2.4.1.3 Previous universal research on project management**

The development of a project management assessment tool in any discipline entails a deeper understanding of past practices and the current model and envisaging a future model through the improvement of the current model. As disclosed by Binder (2016), the

development of a management framework is conceived based on the failures of previous models – if there are any. What this means is that the understanding of the previous concepts and research directions of project management give a meaningful insight into the extent to which current templates can be modelled into a practical and effective project framework that addresses Kenya's needs. This is perhaps why Ochieng *et al.*'s (2017) work is emphatic that in a bid to understand fully the field of project management, the onus is on the individual to research previous theories.

Despite the fact that the concept of projects is traceable to the earliest forms of civilisation, the discipline of project management is a very recent discipline (Ghaffari & Emsley, 2015). The conceptualisation of the fundamental management principles of any project began in earnest in the mid-twentieth century. However, earlier forms of project administration and management have been noted, even though these were not based on the theoretical precincts of project and programme management. What this means is that project management is a central pillar in both the private and public sectors. Ghaffari and Emsley (2015) highlight the centrality of project management as the basic fabric from which efficient management of public and private resources are managed. Moreover, Pinto (2015) places project management as an important pedestal of general management as a discipline.

Many publications, such as those of Winter (2006), trace the beginning of an organised discipline in project management to the mid-twentieth century. According to the findings of Hornstein (2015), who developed a chronology of the development of project management, PERT, or the programme evaluation and review technique, marked the beginning of the programme management discipline. The majority of research studies currently focuses on the development of techniques that would be critical in the analysis of the tasks that are involved in the completion of any project. As discussed in the works of Schwalbe (2015), for the initial developments of the discipline of programme

management, the focus was simply to assess the tasks that were involved in a specific project. Breaking down the activities to be undertaken in the implementation of any project was the focus of the majority of the research studies that focused on project management in the early days. This is corroborated by Hornstein (2015), who notes that earlier research on project management was based on developing a plan for the execution of various activities that were involved in the project. It was as simple as breaking down the tasks that would be pursued during a specific project and then completing them.

There are not many publications that have exclusively explored past research on project management; this means that there are not many systematic reviews of publications that have been tracking the key themes in research involving project management. As established by Schwalbe (2015), despite the presence of many other studies that have appraised project management, there are not many reviews of these studies. There is no consistent critical appraisal of those studies that have appraised project management. However, there are indications of the progress of research that has been undertaken in terms of focus in the past several years in regard to project management. Hobday (2000) outlines some of the progress made in terms of research on project management and reveals that in the earlier days, the scientific aspect of project management was not very evident. The discipline of programme management was not viewed as a scientific process – an issue that seemed to change in the late twentieth century, when scientific procedures were effectively implemented in the discipline of project management (Schwalbe, 2015).

The development of project management as a discipline in Kenya can only be assessed through the institutions of higher learning and the structure of the curriculum. There are no academic research papers that focus on the development of project management in Kenya or that evaluate the milestones in the country. However, the progress of the discipline within the higher education sector is essential in understanding the development of the discipline in Kenya. Perhaps one of the notable reasons as to why

project management has been expanding in the country's educational sector is the need to develop skilful manpower to help in the implementation of the various projects in the country that are geared towards the improvement of the economy. Various institutions have now integrated project management as a core component of their courses as a way of promoting knowledge and skills in the sector. Kagaari *et al.* (2010) note that there is evidently a need for the establishment of project management courses to help address the issues faced in project management and implementation in Kenya. These advances in project management and the expansion of the curriculum to delve deeper into the contemporary issues in project management in the country are an indication that the country is seeking to develop more insight into the discipline to address the unique problems facing project management in the country.

What is evident from this review is that Kenya has reviewed the methods and structure of project management within its borders (Huggins & Frosina, 2017). The ways in which various projects in the country have been undertaken highlight the urgency with which an assessment tool for project management was developed not only in the ICT sector but also across various other sectors of the economy. In fact, according to Kimani (2017), there was a need for the country to develop a comprehensive template for project management within the various industries that support its economy.

Kivikuru (2017) observes that while project management in other sectors, such as civil works, have witnessed massive improvements in terms of theory in the country, the implementation of ICT projects in Kenya lacks any meaningful framework for implementation and delivery. This is evident even in terms of the academic research studies that have been conducted in the field. There are few studies that are geared towards developing a theoretical framework for understanding ICT project delivery in Kenya, let alone any that guide the implementation of ICT projects. Perhaps this is the contributing factor towards what seems like a lack of a coordinated approach in the

conceptualisation and subsequent implementation and monitoring of ICT projects in the country.

#### **2.4.1.4 Contemporary research in project management**

In the global context, Winter *et al.* (2006) proposes the rethinking of project management theory in terms of the conceptualisation of future research directions for project management. There is a general agreement amongst scholars in the project management discipline that the most urgent research needs to explore the theory of the practice of project management (Newton & Greenberg, 2017). This entails the development of the lifecycle model of a project and the conceptualisation of theories about the complexity of projects and project management. This means that academia must channel its energy towards the development of newer models and theories that are capable of recognising the complexity of projects and project management at all levels.

The implication of such a research dimension is that the need for several multiple approaches informing project management is as urgent as it can be (Pinto, 2015). Other than the development of these newer models of project management and complex projects, there is a sense that the theory for practice was conceived within the framework of projects as instrumental processes and social processes. Kerzner and Kerzner (2017) develop this by indicating that this should focus on social interactions amongst the people, with a view to illuminating the inflow of events and the actions of humans in framing projects, as opposed to the erstwhile instrumental lifecycle view of projects as a linear chain of tasks. In the context of developing theory for projects, the future must also focus on developing a broader concept of projects with *“concepts and approaches that facilitate broader and ongoing conceptualisation of projects as being multidisciplinary and open to renegotiation”* (Winter *et al.*, 2006, p. 647). This is, however, in contrast to the current view, where the methodologies are based on the narrow conceptualisation that projects commence from well-defined objectives that are usually given as soon as the project starts and later framed along a single discipline.

Most notable is the development of a theory in practice in project management as a guideline for future research. Based on the philosophical dispositions of Winter *et al.* (2006), the theory in practice seeks to move from the maxim that practitioners in project management are trained technicians, to the principle that practitioners are reflective practitioners. In this regard, Ghaffari and Emsley (2015) suggest that future research should focus on developing learning and development content that focuses on the development of practitioners who are capable of learning and adapting within complex projects, either through intuition or experience. This would be a development from the current view that practitioners in projects are trained by following detailed procedures and operational techniques as prescribed by the project management tools.

With the trends of globalisation witnessed today, it is clear that the discipline of project management has undergone massive transformation. Indeed, this is evident today considering the emerging issues in the discipline, which have been the focus of academia and practitioners around the world (Kerzner & Kerzner, 2017). One of the focal themes in the project management debate is the development of a project management structure that considers the multicultural nature of today's projects. Projects, regardless of their magnitude, are not restricted to a monocultural setting. This means that the boundaries of project management have been stretched, so that projects currently extend not only beyond regional borders but even beyond national borders (Pinto, 2015). Kerzner and Kerzner (2017) offer an insight into the progress of research studies on project management in multicultural environments. Furthermore, Hornstein (2015) develops the idea that project managers have comprehensive knowledge about how to navigate the challenging domain of global projects.

The current research issues in project management give us an insight into project management in Kenya, especially in regard to the ICT sector. In fact, a review of the projects implemented in the industry in the past decade affirms that they were implemented by foreign entities, even though the Kenyan government was part of the arrangement. What is evident is that there is a trend in which the majority of projects being implemented in the country rely on foreign entities; therefore, a global framework for undertaking research in multicultural set-ups should be urgently considered. A rational approach in project management is required to navigate global projects (Pinto, 2015). Compared to other projects that are confined to national boundaries, global projects require a much more complex matrix of knowledge to ensure successful implementation and outcomes.

The argument that the thematic shifts in terms of the philosophical constructs that were relevant in the field of project management currently are entirely based on the fact that there are several changes in the society. The emerging global challenges necessitate a fundamental paradigm shift in the field of project management as practitioners are seeking to adjust to these changes (Binder, 2016). One fact that is evident today is the globalisation of the concept of project management as a discipline, and so multicultural project management is viewed through a wider scope. In fact, the post-nineteenth century project management template lays a lot of emphasis on the management of multicultural and multi-sectoral projects. Luthans and Doh (2018) give a glimpse into the themes that populated project management in the nineteenth century, and this was adequately explained through the emergence of globalisation.

Many studies currently view project management from a broader perspective owing to the fruits of globalisation. Countries are getting into projects that transcend beyond their borders and even engage in projects that are patterned, thus requiring a unique approach

to manage these resources. In fact, within the context of the ICT sector, there has been a revolution, to the extent that the majority of these projects do not involve individual countries but are a conflation of many countries working on a single project and transcending beyond the borders of a single entity. What this means is that a shift in thought has been realised and a global approach is truly essential; less wonder Kerzner (2018) and (Binder, 2016) were riveting their insights into the methods of inclusion in multicultural projects or global projects for that matter.

Research into project management has moved from more of a mono-cultural model to a multicultural model. The theoretical framework of the research encourages stakeholders in project management to develop the right skills for managing global projects. But Harrison and Lock (2017) also bring forth a crucial idea while evaluating the changes in project management. In a comparative study of past and current project management rubrics, they found that accountability is gradually becoming a salient theme in project management research. Has there been a paradigm shift from the conservative project management template, where the whole exercise is limited to the nucleus agencies implementing the project, to a more liberal approach (Harrison & Lock, 2017)?

A keen review of the studies of Binder (2016) and Kerzner (2018) gives credence to the idea that project management seems to be transforming from the past conservative philosophy, when projects were considered an exercise of a nucleus of individuals, which is an indication of the limited public participation in these projects. What is notable in the current framework is a gradual and systematic shift in thought, whereby the issues of accountability are driving project management implementers to engage as many stakeholders as possible in the execution of these projects. In fact, the majority of the discussions in twenty-first century project management circles show a keenness on developing the right skills in stakeholder management as a way of advancing the extent

to which the stakeholders are adequately engaged in the conceptualisation, implementation and subsequent evaluation of these projects (Luthans & Doh, 2018). Brunet (2019) reviewed project management practice and redefined the theoretical challenges in contemporary project management theories. Moreover, in their study, Alotaibi and Mafimisebi (2016) note that considering the incessant problems in project management, such as project delays and cost overruns, it is very hard to discuss the concept of success in project management. While this assertion is discounted in Qiu *et al.* (2019), the context of the admission by Alotaibi and Mafimisebi (2016) is that the practice of project management in the current century is more challenging now than ever before. In particular, the theoretical challenges that exist in project management discourse today make it even harder to propose an agreeable model of management acceptable in project implementation. Alotaibi and Mafimisebi (2016) suggest that there is a need to develop a project management theory that is keen on ensuring that the defined benefits of the project are realised.

Is it tenable to use project management approaches to derive any tangible benefit for organisations? Binder (2016) opines that the theoretical challenges of the twenty-first century ought to be well understood. Most importantly though, as a corollary of their findings, Alotaibi and Mafimisebi (2016) are keen on projecting the notion that project management runs from the planning phase to the termination phase. Their study indicates that the employment of a project management approach is essential in the creation of values and relationship with stakeholders. While they do not explicitly suggest any theoretical model for doing this, the emergent theme in the project theory that Alotaibi and Mafimisebi (2016) talk of is the creation of a stakeholder engagement forum. The findings of this study seem to corroborate the elements of project management that are canvassed by Derakhshan *et al.* (2019), to the effect that the current project management scheme ought to be reviewed in terms of stakeholder management and inclusion. One could therefore suggest, from a more specific perspective, that project

management theory today is all about the need to balance the interests of the stakeholders in the project. Could the question of stakeholder management in the project management framework today be a result of cultural integration? Silvius and Schipper (2019) argue that there is reason to believe that one of the salient challenges of project management today is the question of multicultural teams in the project delivery.

Geraldi *et al.* (2020) have equally been very deliberate about the progression of current project management discussion in research. In an evaluation of the past trends in project management, they note that there is little research regarding landmark projects in the past. They therefore propose that there is an urgent need for stakeholders in the industry to be able to delineate what he terms “project history”, which ties project management to history. A deeper review of the paper suggests that the interest of Geraldi *et al.* (2020) is not the historicity of project management but a documentation of past project management challenges that inform future decisions in projects. From these discussions, there is an allusion that researchers are beginning to review the past trends of project management and use this to inform future decisions. Geraldi *et al.* (2020) talk about evidence-based project management schemes. According to Geraldi *et al.* (2020), it is prudent that past performance is used to project the future performance of these projects. However, while the works of Söderlund *et al.* (2017) have been much unwritten in the evaluation of historicity of project management by evaluating the past and present of megaprojects. Although their study is not very descriptive of the current issues in project management, it does lift the lid on the progress of research in project management today; it offers an important insight into the dimension of research that ought to occupy the centre of today’s research. According to the appraised study, understanding the past of project management in terms of management, history and technology aids in a deeper understanding of project management today.

What is critical in the works of Söderlund *et al.* (2017), and what is relevant to this research, is the question of management? Various project management variables have to be conceived on a sustainable platform. This is why Söderlund *et al.* (2017) insist that management is an important aspect of project sustainability. The study by Geraldi *et al.* (2020), which reviewed perspectives from different journals, suggests that project management is allied to other disciplines in way that we may not understand. However, they highlight eight disciplines that are connected to project management. In a ranking undertaken by Jonas (2019), the findings show that organisational behaviour and human resource management is ranked third in the matrix. From a more critical viewpoint, the question of human resource management in project delivery is directly related to stakeholder management. This can be viewed from the assertions of Pitsis *et al.* (2014), who note that human resource management in projects can be viewed from a broader viewpoint of stakeholder management in projects. In this context, therefore, the discourse by Geraldi *et al.* (2020) seems to be advancing the notion that project management today has to be discussed within the larger context of stakeholder management.

These reviewed studies, while a bit diverse in terms of their research focus, seem to intersect at one locus – stakeholder management. Pitsis *et al.* (2014) offer a more direct debate regarding project management research trends today. They suggest that one aspect of project management that has found footing in research today is “project citizens”. The project citizens in the context of Geraldi *et al.* (2020) refer to the stakeholders in the project. The study quotes the work of Pitsis *et al.* (2014), who discuss the concept of sense-making as an aspect of project management that improves project outcomes. In their summary, Pitsis *et al.* (2014) argue that the voices and experiences of various stakeholders in the project can be used to construct cues about the project to enhance project outcomes. While the study does not make a direct reference to the theory of stakeholder sense-making, it seems as if it borrows from various aspects of stakeholder

sense-making as an approach to enhancing stakeholder inclusion in projects. Kwak and Anbari (2009) note:

*“Project managers attribute narrative elements from their projects to enrich their own professional life story. They thus embark upon their adventures where challenges are met, and risks are handled, and tell stories about their thrilling experiences, elaborating on successive retellings and thus enriching their life story.”*

The underlying theme in the suggestions of Kwak and Anbari (2009) is stakeholder management – a key concept of stakeholder integration. Is this an important consideration in the advancement of project goals? The suggestions of Kwak and Anbari (2009) are that the construction of cues and experiences in the project management scheme is a factor in the improvement of project outcomes. This is the core concept discussed by Brunet and Forgues (2019) in the stakeholder sense-making model. Therefore, as an emergent trend in project management today, the question of stakeholder integration is becoming an increasing focus of project management and implementation.

The studies reviewed give an insight into a theme that is critical in project management today – stakeholder management. The prominence that current studies offer to stakeholder management can only mean that it is an important success factor in the advancement of project outcomes. Nearly all the reviewed studies that relate to project management and stakeholder management validate this inference – the ability of the project to meet the defined project benefits largely hinges on the ability of the project delivery teams to harness the synergy between stakeholders. In summary, the stakeholder management framework adopted by the project delivery team drives the trajectory of the project.

#### **2.4.1.5 Emerging themes identified in the project management domain.**

Generally, there are very few publications that focus on stakeholder sense-making in Kenya, especially in the context of ICT projects in the country. In terms of project management, the reviewed studies generally give a global context for project management. In the discussion about the trajectory of project management in Kenya, there is sufficient evidence that the works reviewed lacked a more contextualised approach to the Kenyan situation, especially within the context of discussing ICT projects. This presented a challenge and meant that a more generic approach had to be taken in developing the literature review. Therefore, the research could not build a more contextualised understanding of the advances in project management in the country, particularly within the context of the ICT sector.

The majority of the studies reviewed seem to view projects in an entirely different dimension. The fear in using such resources in building a narrative in any research study is using resources that are from outside the context of the research study. In reviewing the studies on ICT development in Kenya, the resources used give a more nuanced approach in discussing the progress of the ICT sector in Kenya. Comparatively, based on the fact that the resources used in discussing ICT development in Kenya directly discuss issues within the Kenyan context, the earlier fears of using resources that had a global context were evident again. Nevertheless, the study developed a progressive approach in building a theoretical framework for the research topic from the global context and later limited it to the Kenyan situation.

Developing the theoretical framework for understanding complexity and stakeholder engagement in Kenya was even more challenging in compiling this work. Again, the problem of developing an argument from a global context and fitting it within the Kenyan context was very hard. For instance, Mok *et al.* (2015) talks of sense-making in the construction industry, which appears to be entirely very different from what

Hornstein (2015) writes regarding the concept of sense-making in organisational change. What was critical, therefore, was that the philosophical disposition of each author regarding a specific concept was understood clearly before selecting the work to be used to build an argument in the literature review. The next section appraises stakeholder integration, key performance metrics and complexity.

## **2.5 Part IV: Stakeholder integration, key performance metrics and complexity**

In order to propose guidelines that can be adopted to enhance stakeholder integration and infrastructure performance, it is vital to appraise stakeholder integration, key performance metrics and complexity. Moreover, this section examines the manner in which stakeholder integration influences the ability of the project to realise the KPIs established for the project.

### **2.5.1 Stakeholder integration key performance metrics (KPM) for ICT project delivery in Kenya**

A well-defined stakeholder management model adopted in any project effectively contributes to the realisation of the project indicators (Austin *et al.*, 2002). By adopting the right stakeholder model to manage the delivery team, the progress of the project in terms of meeting the defined objectives is highly likely. Indeed, this is the focus of stakeholder management theories developed for project management today. For example, Austin *et al.* (2002) discloses that project management leverages effective stakeholder management in order to enhance the ability of the project to realise its defined benefits. The correlation between stakeholder integration in project management and key performance metrics (KPMs) is therefore undisputed. Within the context of Kenya, academia has not been very consistent in discussing project management and stakeholder integration in ICT projects (Gichoya, 2005). In fact, there are no comprehensive studies that particularly underscore the essence of stakeholder integration in the elevation of the project's progress and the ability of the project to meet its objectives. The discussions of Gichoya (2005), which are considered to be most relevant to stakeholder integration in the ICT sector in Kenya,

evaluate the need to have a well-thought-out management plan for project stakeholders in the ICT sector in Kenya. Gichoya (2005) equally notes that the sustainability of any project in Kenya is predicated on the ability of the project management team to have a platform for corresponding as a way of realising the benefits of the project. These two studies are considered to be the most elaborate discourses that focus on stakeholder management and the ICT sector. It is notable in this regard that there is a need to further open debate regarding project stakeholder integration in Kenya with particular interest in the ICT sector.

### **2.5.2 Stakeholder integration in project management**

In any given project, there are varied interests that have to be somewhat fulfilled during the implementation of the project (Freeman & McVea, 2001). The term “stakeholders” refers to the entities, individuals or even groups who are affected by the project in one way or another. Any decision about the project or the outcome of the project fundamentally influences the stakeholders (Freeman, 2010). According to the Project Management Institute (2013, p. 6), the stakeholders in any project entail:

*“...an individual, group, or organisation, who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project.”*

Similarly, Jones *et al.* (2017) suggest that stakeholders are tied to a project through their interest in it, which gives the impression that project stakeholders have an expectation from the project and their level of activity or engagement in the project is the pursuance of their expectations or interests. Harrison *et al.* (2015) simply states that the stakeholders in any project entail the participants in the project at whatever level. Participants, in this case, are qualified by the term “expectations”, meaning that the stakeholders participating in the project expect some form of fulfilment from the project. From a more commercial perspective, the studies by Ferro *et al.* (2017, p. 7) aver those stakeholders include:

*“...a group (or an individual) that can influence the achievement of a company’s goals and the work as a whole. Stakeholders are therefore all individuals or groups in an organisation whose contribution (work, capital, resources, etc.) is a basis for the success of the company.”*

This is further discussed by Plaza-Úbeda *et al.* (2009, p. 5), who assert that stakeholder management entails:

*“...the systematic identification, analysis, planning and implementation of actions designed to engage with stakeholders.”*

One emergent theme is that stakeholders have an “interest” in or “expectation” of any project and this is simply because the outcome of the project will fundamentally influence them in one way or another. These definitions emphasise that the stakeholders in any project must therefore be rightfully engaged in almost every aspect of the project if the outcome of these projects is to be guaranteed (Freeman, 2001). In consideration of the fact that project stakeholders attempt to influence the project in line with their expectations, it is therefore clear that the management of stakeholders in a project is a vital project management strategy. Of more significance, based on the reviewed definitions, is the fact that the performance of any project is deeply intertwined with the level of management of the stakeholders in the project.

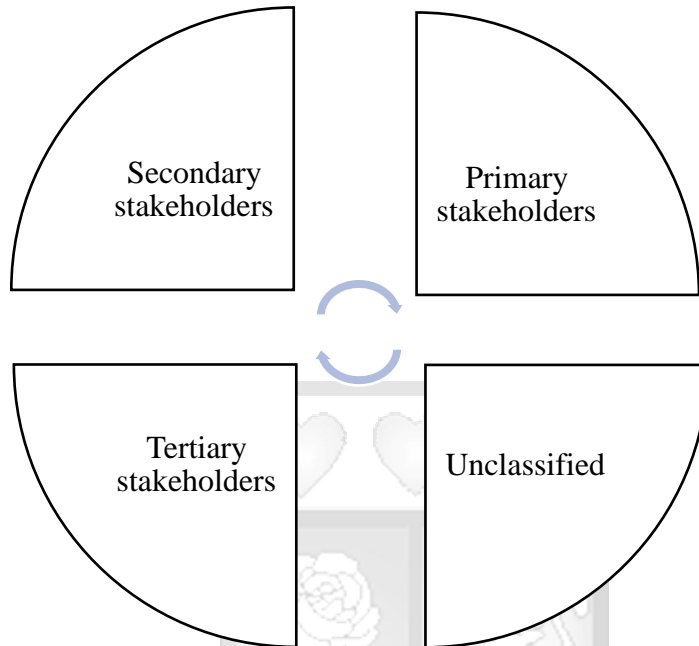
The concept of project integration is evidently a central focus of project management theory. As a principle of stakeholder management, stakeholder integration is a model of operation where positive, yet collaborative relationships are cemented with a wide variety of stakeholders in a project (Heugens *et al.*, 2002). Andriof *et al.* (2017) emphatically argue that it means the inclusion of all the relevant stakeholders in the progression of the project. In this regard, one can clearly see the nexus between stakeholder management and stakeholder engagement. Stakeholder engagement is clearly a subset of management of stakeholders.

The basis of stakeholder integration is their “inclusion and involvement” in the project (Payne & Calton, 2017, p. 18). In essence, the element of stakeholder engagement, in consideration of the earlier definitions of what stakeholders are, infers that the integration of stakeholders in any project is a systematic approach whereby the various classes of stakeholders in any project are apportioned some level of involvement and engagement in the implementation of the project. Heugens *et al.* (2002, p. 41) affirm that stakeholder integration entails the development of a framework of “mutually enforcing relationships” and this could be undertaken either internally or through external partners. Of course, this takes into consideration the level of stakeholders’ influence on the project and the anticipated extent to which the outcomes of the project influence them (Bourne, 2016).

The conceptualisation of a stakeholder theory, which extensively discusses the segmentation of stakeholders within any project management framework, is based on the idea that the levels of influence projects have on individuals differ (Garrido-Miralles, 2016). At the same time, the expectations or interests that individual have of or in any project also differ immensely, and so in the development of interactions between these stakeholders, roles should be assigned depending on the level of influence and expectations. This is perhaps why a number of stakeholder classes have been developed by studies such as Strand and Freeman (2015) to guide the development of a stakeholder management theory in any project.

As illustrated in Figure 2.2, the concept of stakeholder integration entails the development of a model of operation in which all classes of stakeholder in the project are included in the project execution. All the clusters of stakeholders in any project, be they primary, secondary or tertiary stakeholders, must be fully engaged in the actualisation of

the project if the success of the project is to be guaranteed; this is further illustrated in Figure 2.2.



**Figure 2.2:** Integration of stakeholders

**Source:** Cuppen *et al.* (2016)

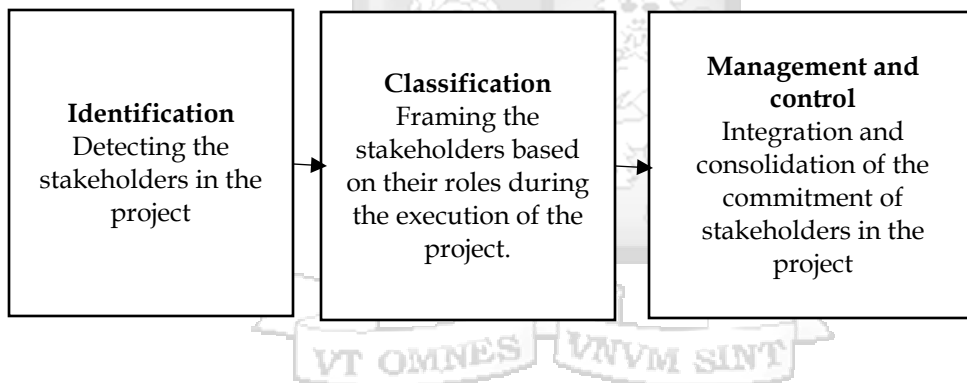
Cuppen *et al.* (2016) suggest that to achieve the successful integration of stakeholders in any project, it is imperative that three variables are appraised:

- a) **Identification:** this entails the detection of the stakeholders in the project, regardless of their level of involvement.
- b) **Classification:** this entails the design of a strategy to be employed in the integration of the stakeholders in the project. Specifically, it gives project managers an opportunity to design:

*“...the integration strategy among the different stakeholder roles in the project execution, since it frames them according to their role, thus simplifying management and control.”* (Cuppen *et al.* 2016, p. 31)

- c) **Management and control:** management and control effectively seek to consolidate, after integrating, the commitment of the stakeholders in the pursuance of project goals. Moreover, the integration and consolidation of the compliance of the stakeholder activities in the project are realised in consideration of the classification of the stakeholders.

Project integration is a process in itself and is aimed at achieving the project objectives. Figure 2.3 summarises the project integration procedure as a progressive activity that begins with the identification of the stakeholders in the project, then classifies these stakeholders into various groups depending on their interests and inputs in the project. Further, the classification gives the project management team an idea of how to manage and control their input in the project.



**Figure 2.3:** Project integration procedure

**Source:** Crawford (2014)

As a domain of project management theory, stakeholder integration aims to develop a framework through which the relevant players in the project are able to collaborate in the advancement of the project goals. In reviewing the concept of stakeholder integration in project management, the question of how to bring the stakeholders onto a platform from which they are able to work in advancing project goals thus becomes critical. From the suggestions of Cuppen *et al.* (2016), in any project, the stakeholder integration model aims to develop a scheme through which these stakeholders can be identified, classified and

managed (*see Figure 2.3*). In order to contextualise this within the research, the three aspects of project stakeholder integration procedure delineated in Figure 2.3 above become crucial. Since the research aims to examine the manner in which the integration of stakeholders in the project can be harnessed in the delivery of ICT projects in Kenya, it therefore follows that before the integration, these procedures should be used to “identify” the stakeholders who are part of the project, “classify” them into the various stakeholder clusters, and then proceed to “manage” them.

Stakeholder integration looks at ways in which the relevant stakeholders in the project can be identified (Garrido-Miralles, 2016). Garrido-Miralles (2016) consider this using the concept of stakeholder mapping and suggest that project delivery teams ought to have methods through which they are able to detect the stakeholders in the project. By detection, Cuppen *et al.* (2016) mean discerning the kind of stakeholders who are involved in the project. The question of identifying stakeholders involves an in-depth analysis of the various stakeholders who are directly or indirectly involved in the project. In the context of this research, the proposal of a stakeholder integration assessment tool cannot be complete if the stakeholders are not identified and mapped according to their levels of influence in the project (Garrido-Miralles, 2016). Notably, advancing a framework for engaging stakeholders in any project requires an extensive process whereby not only are all the stakeholders involved identified but their segment of influence is also established.

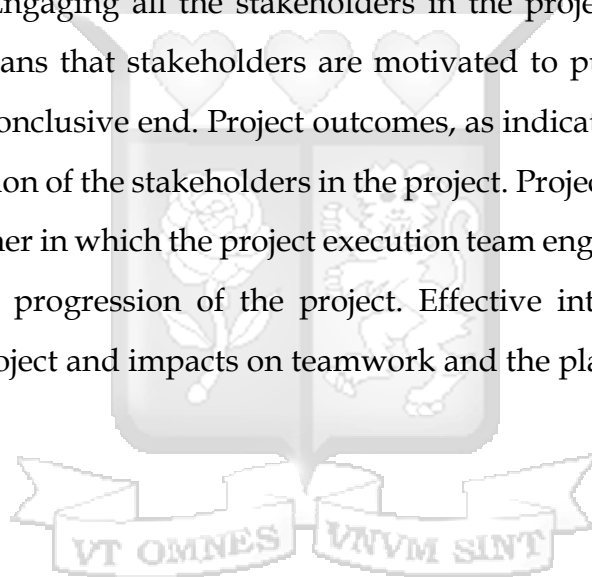
From the expositions of Cuppen *et al.* (2016), a clear nexus can thus be seen in reference to stakeholder integration and the need to develop an assessment tool for ICT stakeholder integration and infrastructure improvement in the Kenyan ICT sector. One important concept can be understood from the framework of integration procedure projected in Figure 2.3. Notably, if the research aims to deliver an assessment tool for ICT stakeholder integration, then it is imperative that the study gives a nuanced discourse on what stakeholder integration entails. Most profoundly though, the framework for stakeholder

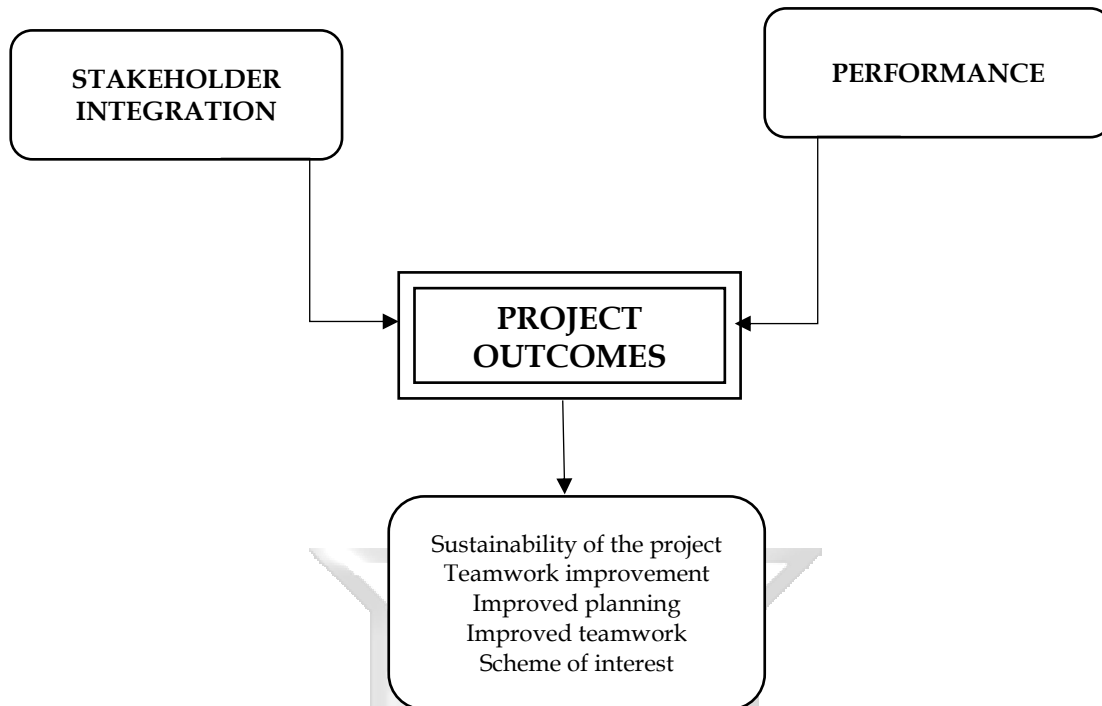
integration shown in Figure 2.3 provides an important scaffold for the development of an assessment tool for ICT stakeholder integration and infrastructure performance improvement in Kenya. First of all, there is a need to identify the stakeholders that need to be integrated in the project. This means that the development of the tool for assessing stakeholders would need the project implementation team to have a broader understanding of these stakeholders who are to be integrated in the project (Crawford, 2014). Similarly, mapping these stakeholders is prudent in the sense that they ought to be evaluated in terms of their level of influence or interest in the project and, lastly, the ways in which they are to be managed.

### **2.5.3 Appraisal of stakeholder integration and project performance**

One theme that is salient throughout the reviewed literature and is germane to the research is that stakeholder integration, as a concept of stakeholder management, is a critical component in project performance. Watson *et al.* (2018) suggest that the integration of stakeholders in any project fundamentally leads to the development of a scheme of interest of the stakeholders, thus giving a framework for meeting these interests. This is equally the focus of Crawford (2014) in his stakeholder appraisal template, where it is argued that the interest of the project management team should be the evaluation of these stakeholders in terms of their levels of interest and contribution to the project and then their influence should be harnessed to advance the project outcomes. Project stakeholder integration models have also been suggested as being crucial in the development of a template for team management so that stakeholders with similar interests are urged to harness their synergy towards the realisation of their expectations. This argument is further developed by Garrido-Miralles (2016), who notes that the various elements of stakeholder integration highlight the need to scale these stakeholders in the project depending on what they bring to the project. These two arguments are instrumental in advancing the need for stakeholder appraisal in any project. While it is important to include all the stakeholders of whatever nature, the levels of engagement of these stakeholders in the project differ fundamentally. This is probably

why the concept of stakeholder mapping has been characterised by the discussions of Caputo *et al.* (2016). In essence, there is a general rule of thumb that stakeholder appraisal offers the project delivery team an opportunity to weigh the stakeholders and establish their contribution to the project as well as their level of influence. According to Caputo *et al.* (2016), there is a logical conclusion to the effect that the involvement of various stakeholders in project execution enhances the richness of the implementation process by considering the diverse proposals from the various stakeholders engaged in the project. More fundamentally, though, the primary role of a project integration template in the advancement of project performance could be based on the sustainability of the project (Caputo *et al.*, 2016). Engaging all the stakeholders in the project, depending on their levels of influence, means that stakeholders are motivated to pursue their roles in the project lifecycle to its conclusive end. Project outcomes, as indicated in Figure 2.4, partly depend on the integration of the stakeholders in the project. Project outcomes are directly influenced by the manner in which the project execution team engage the various clusters of stakeholders in the progression of the project. Effective integration improves the sustainability of the project and impacts on teamwork and the planning of the project.





**Figure 2.4:** Project performance and stakeholder integration

**Source:** Caputo *et al.* (2016)

Enhancing the quality of project outcomes is thus a result of the stakeholder appraisal and integration methodologies adopted in the project. Garrido-Miralles (2016) advances this theory by suggesting that no meaningful project outcome is possible if the stakeholder management matrix in the project is ignored. The implications of this assertion are that the success of any project is founded on the need to understand the stakeholders who are involved in the project. While this is not dealt with in the works of Caputo *et al.* (2016), the disclosures of Garrido-Miralles (2016) are quite direct in discussing the relationship between stakeholders and project outcomes. A complete understanding of the project stakeholders, in a strict sense of the word, means that the project delivery teams have not only identified the stakeholders but have mapped them as well. When talking of appraisal, the concept of mapping comes to mind; this means that the stakeholders in the project have been assessed as being critical drivers of the project objectives.

In their assessment of the mechanisms for stakeholder integration, Driessen *et al.* (2013, p. 18) suggest that the emergent trends in disruptive technology, such as the use of social media platforms, has led to “*easier communication with more and more interconnected stakeholders*”. The study, however, proceeds to appraise stakeholder integration as the cornerstone of effective project execution by noting that stakeholder integration emphasises the coordination of various project deliverables. From the perspective of stakeholder theory, Driessen *et al.* (2013) seem to be projecting stakeholder integration as a principal variable in driving the extent to which various project deliverables are optimised through coordination. Specifically, two organisational outcomes are identified as critical factors related to stakeholder integration that are essential in driving projects – achievement of task-related objectives and organisational identification (Zhai *et al.*, 2009).

The significance of stakeholder integration as an element of stakeholder management is further emphasised by Mok *et al.* (2015). The element of stakeholder integration, according to Andersen *et al.* (2006, p. 27), is key to the overall success of the project. The study suggests that effective design and project delivery not only led to the timely delivery of the project but also take into account whether the completion of the project is to the full satisfaction of the “*societal and commercial needs*” that led to the initiation of the project in the first place. In essence, this means that no project could be said to have been successfully concluded if the stakeholders have not been adequately part of it.

Muszyńska (2016) looks at stakeholder integration from more of a communication perspective. Stakeholder integration allows for the development of a communication framework that essentially improves the engagement of stakeholders in the project (Yap *et al.*, 2017). In the context of communication, a number of other studies, such as Lauren (2018) and Krecková *et al.* (2020), note that the elements of stakeholder integration ultimately link stakeholders together in an endeavour to advance the project objectives.

Perhaps this is why Butt *et al.* (2016) discuss stakeholder integration within the framework of sense-making approaches. Notably, when stakeholders in any project are integrated, they are first of all engaged in an activity of sharing their experiences regarding the project. But while this is largely a part of project review, advanced studies such as Yap *et al.* (2017) describe this aspect of project management in stakeholder integration as using experiences to advance project objectives. The work of Zulch (2016) calls it a sense-making model in project stakeholder integration.

In view of the discussions summarised herein, one emergent theme is that stakeholder integration frameworks are similar to communication models in projects. Developing a framework for integrating stakeholders in projects is essentially the establishment of an operational platform through which the individual is also able to contribute to project advancement. In this regard, one can talk of “linkages”, as described in the works of Butt *et al.* (2016), Krecková *et al.* (2020) and Yap *et al.* (2017). Integrating the stakeholders in any project therefore means they are linked together in a locus in which they are able to work together to advance the project objectives. This position is further developed by Johansen *et al.* (2014) in the evaluation of the stakeholder benefits assessment in project delivery. Yang *et al.* (2018) developed a template for handling both internal and external stakeholders as a way of enhancing the success of the project. Projects can adequately find immense opportunities and benefits suppose they define the opportunities in the management process. The opportunity management process, on the other hand, entails the creation of avenues through which projects can benefit from the various opportunities created by the identified cluster of stakeholders in the project. Within the context of opportunity management and creation of utility, KPMG (2014) further suggest that project management has to be constructed on a very firm monolith of relationship building, suggesting that:

*“...connecting with the right people and satisfying stakeholder demands throughout the planning and execution phases can significantly affect the perception of a project’s utility.” (KPMG, 2014, p. 8)*

This suggestion seems to be further positioned the concept of relationship building as pillar of project management. However, what is evident in these reviewed studies is the emphasis that is put on stakeholder management and integration as critical success variables in any project. These studies unanimously suggest that the development of an assessment tool for the delivery of any project has to consider the methods through which the various stakeholders can be engaged and managed in the project. What is more critical though, and what forms a very important strand in this study, is that there is a need to propose a scale of measurement for the extent to which any form of project has engaged its clusters of stakeholders in the project. In other words, if project delivery, as already established in the reviewed literature, relies heavily on stakeholder management/integration to succeed, then it is paramount that a scale is established to evaluate the extent to which stakeholders in any project are integrated.

It is evident from the assertions of Yang *et al.* (2018) that stakeholder appraisal is an important concept in project advancement. However, what models of stakeholder integration can be applied to enhance project outcomes? While the relevance of stakeholder integration in project delivery is undoubted, an overall strategy for appraising these stakeholders has not been adequately developed in the ICT sector within the Kenyan context. Indeed, the review of stakeholder integration concepts in the Kenyan ICT sector reveals that there is very little in terms of research that paints a picture of the Kenyan context. Nonetheless, the concept of stakeholder integration appraisal resonates immensely in the context of this research study. One could suggest that the development of any assessment tool in the stakeholder integration equation is essentially a form of stakeholder appraisal.

#### 2.5.4 Key performance metrics (KPM) in project management

Successful project management requires that a project management team is able to consistently monitor the progress of the project against the set objectives of the project (Widiningrum *et al.*, 2020). However, effective project monitoring requires the establishment of key performance metrics for the project. As noted by Jitpaiboon *et al.* (2019), project implementation teams have to frame their success on a number of key variables that define a project. A number of success factors have been identified to be used in evaluating project progress in project management. These include metrics such as project costs. Tabassi *et al.* (2019) propose that the management team bases project success on the pecuniary aspects of the project; indeed, this is considered to be the most common metric for the evaluation of project success. If staying within the budgetary allocation for the project is important, then the management team has to adopt cost implication as a scale by which to measure project success. In discussing cost variance as a project performance metric, Hughes *et al.* (2019) suggest that cost variance tracks the planned project capital expenses and compares it to actual expenses. In this regard, the key metric of cost would be looking at the fidelity of the project to the defined project cost. According to Jones (2019), projects are restricted within the envisaged project costs. Cost variations over and above the projected capital expenses paint a picture of a faulty execution plan. This is why there needs to be a well-defined scale that details the boundaries of expenses associated with the project.

Most of the reviewed research studies view capital budgeting and costs as key metrics for measuring project success. As earlier intimated in the description of project management phases, the planning phase comes up with a project budget that is meant to support the implementation of all the project variables that have been conceived. What this means is that projects rely on capital to achieve their outcomes and the capital is predetermined, in the sense that it has to address specific project areas. In conceiving the element of cost as a driver of project performance metrics, Jahangirian *et al.* (2017) suggest that projects have to operate within the defined capital expenditure plans. This means

that that the objectives of the project are to be met but within the established project costs. The arguments of Cruz Villazón *et al.* (2020) support this discussion by noting that the elements of budget and costs mean that project implementation teams ought to have their deliverables effectively permuted to fit into their budgetary plans.

The question of cost as a metric for the performance of the project directs one to the question of value. This is considered by Widiningrum *et al.* (2020), who propose that the project management metric related with project costs proves the entire value of the project, and this is further viewed in terms of the return on investment (ROI) of the project. Limiting the project to within the projected costs essentially means that the scope of the project is maintained (Edstrom *et al.*, 2019); it shows that all parameters of the project were adequately adhered to and therefore the capital expenditures were within the defined boundaries.

It therefore follows that any form of variation in the costs of the project means that the KPIs related to cost have not been adequately met. In a number of studies, this has been emphasised. Omar and Fayek (2016) suggest that an effective project management model has to take into consideration the original budgetary requirements of the project. This is equally the argument of Jahangirian *et al.* (2017) when talking about resource allocation for projects. The work suggests that project management best practices involve the evaluation of cost inputs versus the outputs. These studies lay emphasis on proper planning methodologies that will ensure that any form of cost and budgetary variation in projects is eliminated. Taking into consideration the suggestions of Parmenter (2019), it therefore follows those projects can be evaluated on the basis of their fidelity to the previously outlined budgetary appropriations. In the development of the stakeholder assessment tool, the question of cost and budgeting is evident. Effective stakeholder integration strategies in projects essentially improve the ability of project teams to remain within the confines of the budget (Cruz Villazón *et al.*, 2020).

The suggestions of Jitpaiboon *et al.* (2019) about project measurement and evaluation outline other performance indicators in projects that are relevant to this study. Other than the cost implications of the project, the total capacity of the project is considered to be an important scale in project measurement. According to Hughes *et al.* (2019), the total capacity of the project is an indication of the potential hours that the staff involved in the project have available to execute their responsibilities. In terms of performance, Ekström *et al.* (2019) seem to opine that the success of the project could be weighed based on the input offered in terms of labour. Indeed, this is the focus of Hughes *et al.* (2019), who discuss the schedule variance in projects; they talk about the timelines as well as the amount of work that has been applied in the project to realise the established project objectives. The capacity of the project, according to Widiningrum *et al.* (2020) is all about establishing the duration of work that has been applied in the project in the realisation of the project objectives. Within the context of monitoring and evaluation, project implementation teams would want to establish the input of the team into the project in terms of labour hours.

Recent studies in project monitoring and evaluation, such as Jitpaiboon *et al.* (2019), have been keen on discussing the utilisation rate as a factor of project success as well. Jitpaiboon *et al.* (2019) describe the project utilisation rate as the percentage of time that has been devoted to the operations in the project. The utilisation rate is closely related to the total capacity of the project and ought to be 100% where the overhead time has not been factored. Measuring project progress thus means that project implementation teams are able to establish the actual time that was utilised in the implementation of the various project processes.

But while the KPIs developed by Widiningrum *et al.* (2020) have been applied in project monitoring, the discussions of Jahangirian *et al.* (2017) have been at the centre of discussions and research in project management metrics. Ekström *et al.* (2019) divide KPIs

into a number of segments. Process KPIs, according to Hughes *et al.* (2019), are meant to measure the productivity of these projects. A systematic review of project performance and monitoring found that while there were various sub-classes of project performance indicator, they were clustered into several types. In this regard, it is imperative that any project defines its performance indicators based on these types of KPI. At the same time, and in consideration of what Jitpaiboon *et al.* (2019) notes, the KPIs adopted in projects are dependent on a number of factors. This means that there is no uniform platform for measuring project metrics of performance, even though some metrics are commonly applied in almost all projects, such as cost implications. What is significant is that project implementation teams evaluate the project scope and use it to define the performance indicators of the project. Regardless of the project performance indicators defined for specific projects, they fall into the sub-classes proposed by Mesa *et al.* (2019). These comprise process metrics, input KPIs and output KPIs, which are outlined below:

According to Mesa *et al.* (2019), process metrics are meant to establish the level of efficiency as well as the productivity of a project. Mesa *et al.* (2019) call these the “*internal aspects of the project*”. The essence of process metrics is to establish the ease with which certain variables in the project could be executed or attained. The question of timelines is considered an important aspect of process metrics in project delivery. In reviewing the suggestions of Mesa *et al.* (2019), it is clear that process metrics is increasingly becoming an important scale for monitoring project processes, especially in infrastructure development. Every infrastructure project is bound by specific timelines. At the same time, in the realisation of certain project processes, it is important to have specific project timelines for the task. Indeed, recent studies, such as Ekström *et al.* (2019), consider timelines the most important aspect of project management measurement. Input KPIs are critical in the measurement of assets as well as the resources used in the project. The input KPI sub-class views projects from a pecuniary perspective. It hinges on the notion that the driver of any project, or rather the denominator, is the financial aspect of the project.

Partly, the input metric is all about capital budgeting because it evaluates the extent to which the project has been able to absorb the budget that was allocated to it. Developing a project measurement model based on the input, according to Mesa *et al.* (2019), is predicated on the question of resources that have been pumped into the project in order to meet its objectives. Mesa *et al.* (2019) also talk of the output KPIs, which view projects in terms of their results. The measurement in this instance, based on the suggestions of Ekström *et al.* (2019), is non-financial. Mesa *et al.* (2019) are very vocal about the importance of output metrics in evaluating project progress. The study notes that projects cannot just be evaluated on their financial aspects. There are qualitative models that can be used to establish the impact that these projects have, based on the earlier defined project objectives.

The development of a tool for assessing stakeholder integration in ICT projects in Kenya is meant to ensure that the project performance indicators are met. The need to configure a practical model for stakeholder integration largely hinges on the need to ensure that the various indicators of performance for the project are met. A framework for integrating stakeholders in the project assists in the realisation of the key factors of project success. As noted earlier and in the context of the works of Ante *et al.* (2018) and Jahangirian *et al.* (2017), having a well-thought-out stakeholder integration framework for any form of project basically improves the extent to which the delivery team can realise the key performance metrics for the project. Within the cost metric, it has been established that an effective framework of engagement is critical in the formulation of operational guidelines that will limit any form of cost variation. In the context of Kenyan ICT infrastructure, the aim of the study is to configure an assessment tool to enable the project stakeholders to be well integrated in the project by developing an assessment tool for stakeholder integration. By developing a model of engagement and integration for the stakeholders, the outcomes of the projects are more likely to be met (Cruz Villazón *et al.*, 2020). The evaluation of key performance metrics in project advancement thus means that

when the stakeholders in the project are included in the project advancement, they are likely to optimally contribute to the realisation of the project objectives, as defined by the performance metrics of the project (Ante *et al.*, 2018).

### **2.5.5 Level of project complexity in project management**

The understanding of the level of project complexity is an important aspect of project management in the sense that it informs the project management model (Austin *et al.*, 2002). The complexity of project management, according to Bakhshi *et al.* (2016), defines the scope of project management that is adopted by project implementation teams. Qazi *et al.* (2016) describe project complexities and the extent to which they influence the project outcomes. However, before attempting to review the level of project complexity in project management, it is important to understand the definition of project complexity. The subsequent sections of the study offer an overview of what levels of complexity entail in project management.

There is no universally adopted definition of project complexity (Tatikonda and Rosenthal, 2000). However, Qazi *et al.* (2016) propose a template for understanding what project complexity all is about and further argue that understanding the complexity of infrastructure projects helps the delivery team to adequately prepare a risk mitigation strategy. According to the suggestions of Qazi *et al.* (2016), the project complexity model in any project ought to entail an understanding of the number of variables as well as the interfaces in the project. This means that the project management model to be applied is very complicated. At the same time, Bakhshi *et al.* (2016) identify the ambiguity of the project as a definition aspect of project complexity. In terms of ambiguity, the level of awareness involved in the project regarding causality as well as the events in the project are aspects of project complexity. This means that project implementation teams have to have a better understanding of events related to the project as well as the causes of these events. This, according to Tatikonda and Rosenthal (2000), is fundamental in the development of an effective risk mitigation model for these projects.

The question of project predictability has been at the centre of discussions in emergent research on project complexity. Gidado (1996) defines predictability within the larger context of risks in the project. There are seen as well as unseen risk factors in any project, and the unpredictability of any project can be viewed from the perspective of project uncertainties. The inability to know what lies ahead or the inability to have an accurate prediction of the future of the project complicates the progress of the project. But while this is considered to be a huge risk in project delivery, the discussions of Tatikonda and Rosenthal (2000) pinpoint dynamics in the project lifecycle as equally important considerations in project complexity. Accordingly, the rapid rate of change in the project ecosystem presents a new environment for operationalising project variables.

Most importantly, the debate on project complexity has centred on social structure and interrelationships – two key aspects of complexity that are very relevant in this study. Project complexity is viewed from a stakeholder integration perspective, as revealed in the discussion regarding social structure as well as the interrelationships of the stakeholders in the project. In terms of social structure, the types as well as the number of interactions are included as critical determinants of project complexity (Baccarini, 1996). It follows that when the types and number of stakeholder interactions in the project are not well defined, the level of project complexity is heightened. This aspect of gauging project complexity is discussed within the larger context of project stakeholder integration because stakeholder integration in any project, according to Gidado (1996), is viewed from the perspective of interactions. But Vidal and Marle (2008) also view it in terms of the interrelationships amongst the various stakeholders in the project. In effect, the many interdependences and connections that exist in the project define the level of complexity. Vidal and Marle (2008) argue that any project that consists of many moving parts that are interdependent could be considered a complex project. Baccarini (1996) suggests that the element of project complexity is predicated on the relationships in the

project, so project complexity can be defined by the nature of the stakeholder relationships in the project.

Within the context of social relationships, the question of stakeholder integration comes into play. When project complexity is viewed from the perspective of social relationships and the interrelationships amongst the implementing agencies, one can opine that stakeholder integration is at the core of project complexities; in fact, Gidado (1996) notes that the complexity of projects can be discussed within the larger framework of stakeholder relationships. It thus appears that when evaluating the complexity of any project, it would be prudent to consider the manner in which the various players in the project interact. Erkul *et al.* (2016) has been particularly involved in researching stakeholder correlations, especially within the context of project ecosystems. In its evaluation of multicultural construction projects, the study seems to opine that the management model of multicultural projects is at variance with other forms of project. Evidently, these assertions seem to build on the admission that the understanding of the project complexity in a project, means the manner in which the stakeholders relate in the project (Tatikonda & Rosenthal, 2000). In the context of this study, what is notable is that by developing a tool for the assessment of ICT stakeholder integration, the research will be essentially seeking to solve the problem of project complexity in the ICT industry. The earlier admission that stakeholder relationships are an aspect of project complexity means that when the study proposes a validation tool for stakeholder integration, it is highly likely that the tool will be solving complexity issues in projects related to the ICT industry. If project complexity is gauged through stakeholder relationship qualities, then the tool is likely to be an important avenue to enhance the quality of these relationships and assist in the project delivery schedule. Table 2.1 provides a summary of the research variables appraised in the previous sections (*Table 2.1 has been split into three parts-namely: Table 2.1A, Table 2.1B and Table 2.1C*). The measures and sources are used to highlight the

trend of infrastructure project delivery, stakeholder integration, key performance metrics and project benefits realisation.

**Table 2.1A: Research study variables**

Research variables with their measures and sources		
Variables	Measures	Sources used.
Infrastructure project complexity	<ul style="list-style-type: none"> <li>▪ Level of stakeholder integration</li> </ul>	Andriof <i>et al.</i> (2017), Bourne (2016), Caputo (2016), Caputo <i>et al.</i> (2016), Chung <i>et al.</i> (2009), Cuppen <i>et al.</i> (2016), Derakhshan <i>et al.</i> (2019), Driessen <i>et al.</i> (2019), Erkul <i>et al.</i> (2016), Ferro <i>et al.</i> (2017), Freeman (2010), Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014), Jones <i>et al.</i> (2017), KPMG (2014), Mok, Shen and Yang (2015), Tabassi <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Formulation of project business case</li> </ul>	Freeman (2010), Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014)
	<ul style="list-style-type: none"> <li>▪ Application of project processes</li> </ul>	Thiry (2016), Payne and Calton (2017)
	<ul style="list-style-type: none"> <li>▪ Compliance and regulatory requirements</li> </ul>	Nugroho <i>et al.</i> (2015)
	<ul style="list-style-type: none"> <li>▪ Communication</li> </ul>	Muszyńska (2016), Butt <i>et al.</i> (2016), Yap <i>et al.</i> (2017), Zulch (2016), Lauren (2016), Křečková <i>et al.</i> (2020)
	<ul style="list-style-type: none"> <li>▪ Scope uncertainty</li> </ul>	Edstrom <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Alignment of project phases</li> </ul>	KPMG (2014), Jahangirian <i>et al.</i> (2017)
	<ul style="list-style-type: none"> <li>▪ Management of project teams</li> </ul>	Widiningrum <i>et al.</i> (2020), Tabassi <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Political influence</li> </ul>	Bateman <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Project scheduling</li> </ul>	Widiningrum <i>et al.</i> (2020), Jahangirian <i>et al.</i> (2017)
	<ul style="list-style-type: none"> <li>▪ Lack of country/cultural awareness</li> </ul>	Hornstein (2015), Pinto (2015)
	<ul style="list-style-type: none"> <li>▪ Technological complexity</li> </ul>	Qazi <i>et al.</i> (2016), Bakhshi <i>et al.</i> (2016), Austin <i>et al.</i> (2002), Tatikonda and Rosenthal (2000), Vidal and Marle (2008), Austin <i>et al.</i> (2002), Baccarini (1996), Gidado (1996)
	<ul style="list-style-type: none"> <li>▪ Resource coordination</li> </ul>	Geraldi <i>et al.</i> (2020), Pitsis <i>et al.</i> (2014), Ekström <i>et al.</i> (2019)
Determinants of stakeholder integration	<ul style="list-style-type: none"> <li>▪ Commitment to project objectives</li> </ul>	Mesa <i>et al.</i> (2019), Ante <i>et al.</i> (2018)
	<ul style="list-style-type: none"> <li>▪ Understanding of core project processes</li> </ul>	Ferro <i>et al.</i> (2017), Freeman (2010), Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014)
	<ul style="list-style-type: none"> <li>▪ Competence of key stakeholders</li> </ul>	Chung <i>et al.</i> (2009), Cuppen <i>et al.</i> (2016), Derakhshan <i>et al.</i> (2019), Driessen <i>et al.</i> (2019), Erkul <i>et al.</i> (2016), Ferro <i>et al.</i> (2017), Freeman (2010), Freeman and McVea (2001),

		Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014)
<b>Table 2.1B: Research study variables. Cont...</b>		
	<ul style="list-style-type: none"> <li>▪ Evaluation of stakeholder needs</li> </ul>	Caputo <i>et al.</i> (2016), Chung <i>et al.</i> (2009), Cuppen <i>et al.</i> (2016), Derakhshan <i>et al.</i> (2019), Driessen <i>et al.</i> (2019), Erkul <i>et al.</i> (2016), Ferro <i>et al.</i> (2017), Freeman (2010), Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014)
	<ul style="list-style-type: none"> <li>▪ Readiness to project changes</li> </ul>	Muszyńska (2016), Butt <i>et al.</i> (2016), Yap <i>et al.</i> (2017), Zulch (2016), Lauren (2016), Křečková <i>et al.</i> (2020)
	<ul style="list-style-type: none"> <li>▪ Stakeholder communication plan</li> </ul>	Muszyńska (2016), Butt <i>et al.</i> (2016), Yap <i>et al.</i> (2017), Zulch (2016), Lauren (2016), Křečková <i>et al.</i> (2020), Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014)
	<ul style="list-style-type: none"> <li>▪ Stakeholders' cultural orientation</li> </ul>	Caputo <i>et al.</i> (2016), Chung <i>et al.</i> (2009), Cuppen <i>et al.</i> (2016), Derakhshan <i>et al.</i> (2019), Driessen <i>et al.</i> (2019), Erkul <i>et al.</i> (2016), Ferro <i>et al.</i> (2017), Freeman (2010), Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014)
	<ul style="list-style-type: none"> <li>▪ Addressing stakeholder needs and expectations</li> </ul>	Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014), Jones <i>et al.</i> (2017), KPMG (2014), Mok, Shen and Yang (2015)
	<ul style="list-style-type: none"> <li>▪ Alignment of stakeholder skills</li> </ul>	Caputo <i>et al.</i> (2016), Chung <i>et al.</i> (2009), Cuppen <i>et al.</i> (2016), Derakhshan <i>et al.</i> (2019), Driessen <i>et al.</i> (2019), Erkul <i>et al.</i> (2016), Ferro <i>et al.</i> (2017), Freeman (2010), Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014)
<b>Key performance indicators</b>	<ul style="list-style-type: none"> <li>▪ Budget variance</li> </ul>	Cruz Villazón <i>et al.</i> (2020), Jitpaiboon <i>et al.</i> (2019), Ekström <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Cost performance index</li> </ul>	Cruz Villazón <i>et al.</i> (2020), Jitpaiboon <i>et al.</i> (2019), Ekström <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Resource utilisation</li> </ul>	Hughes <i>et al.</i> (2019), Widiningrum <i>et al.</i> (2020)
	<ul style="list-style-type: none"> <li>▪ Client satisfaction</li> </ul>	Cruz Villazón <i>et al.</i> (2020), Jitpaiboon <i>et al.</i> (2019), Ekström <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Operational expenses</li> </ul>	Cruz Villazón <i>et al.</i> (2020), Jitpaiboon <i>et al.</i> (2019), Ekström <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Return on investment</li> </ul>	Cruz Villazón <i>et al.</i> (2020), Jitpaiboon <i>et al.</i> (2019), Ekström <i>et al.</i> (2019)
	<ul style="list-style-type: none"> <li>▪ Cost variance</li> </ul>	Widiningrum <i>et al.</i> (2020)
	<ul style="list-style-type: none"> <li>▪ Capital expenses</li> </ul>	Hughes <i>et al.</i> (2019), Widiningrum <i>et al.</i> (2020)
<b>Project benefits realisation</b>	<ul style="list-style-type: none"> <li>▪ Clearly defined expected outcomes</li> </ul>	Ante <i>et al.</i> (2018), Qazi <i>et al.</i> (2016)

<ul style="list-style-type: none"> <li>▪ Clearly defined strategic objectives</li> </ul>	Hughes <i>et al.</i> (2019), Widiningrum <i>et al.</i> (2020)
<b>Table 2.1C: Research study variables. Cont...</b>	
<ul style="list-style-type: none"> <li>▪ Sufficient resources</li> </ul>	Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014), Jones <i>et al.</i> (2017), KPMG (2014)
<ul style="list-style-type: none"> <li>▪ Review outputs and outcomes</li> </ul>	Hughes <i>et al.</i> (2019), Widiningrum <i>et al.</i> (2020)
<ul style="list-style-type: none"> <li>▪ Engagement of stakeholders throughout the project</li> </ul>	Freeman and McVea (2001), Garrido-Miralles <i>et al.</i> (2016), Harrison <i>et al.</i> (2015), Heugens <i>et al.</i> (2002), Johansen <i>et al.</i> (2014), Jones <i>et al.</i> (2017), KPMG (2014), Mok, Shen and Yang (2015)
<ul style="list-style-type: none"> <li>▪ Cost and schedule</li> </ul>	Cruz Villazón <i>et al.</i> (2020), Helsper (2011), Selwyn (2002), Jones (2019), Stojkoska and Trivodaliev (2017)
<ul style="list-style-type: none"> <li>▪ Alignment of effort, resources and investments</li> </ul>	Mesa <i>et al.</i> (2019), Ekström <i>et al.</i> (2019), Ante <i>et al.</i> (2018), Jahangirian <i>et al.</i> (2017)
<ul style="list-style-type: none"> <li>▪ Clarified roles and responsibilities</li> </ul>	Strand and Freeman (2015), Hughes <i>et al.</i> (2019)
<ul style="list-style-type: none"> <li>▪ Adopting a communication plan for all stakeholders</li> </ul>	Muszyńska (2016), Butt <i>et al.</i> (2016), Yap <i>et al.</i> (2017), Zulch (2016), Lauren (2016), Křečková <i>et al.</i> (2020)

**Source:** Author (2020)

## 2.6 Part V: International comparison of ICT stakeholder integration and ICT project planning

This section of the study is cognisant of the need to review the project management scheme in other jurisdictions in order to develop a best practice model for the country. By reviewing the manner in which ICT stakeholder integration is affected in other countries, the research assesses ICT project delivery practices in the UK, Singapore and New Zealand as the top three countries consistent in improvement of ICT projects delivery, indexed on 2017 IDI listing (Jorgenson & Vu, 2018). The essence of this approach is to assess the challenges as well as opportunities and draw comparisons with the Kenyan context. This aided in making an informed decision regarding the conceptualisation of an assessment tool for ICT stakeholder integration and infrastructure performance improvement in Kenya. The rationale for this was to draw

lessons from these three countries and see how similar practises could be adopted in Kenya.

### **2.6.1 United Kingdom (UK) viewpoint**

In terms of the ICT development index, the UK ranks fifth globally – an indication that the UK has instituted a well-thought-out framework of ICT infrastructure project delivery (ICT, 2017). Comparatively, since 2016, the UK has made a leap in terms of their scores in the ICT development index, which could be attributed to the policy framework that the UK established to stimulate the performance of the ICT sector, especially with the methods of project control under different environment, highlighted and recommended by PRINCE2. In terms of accessibility, the UK scored 9.15 points, which indicates that the country's rate of ICT development is very high (ICT, 2017). In fact, this is corroborated by the statistical evidence provided by the IDI, which states that the UK has 122.32 mobile cell phone users for every 100 individuals. This is comparable to the fixed line subscriptions of 52.2% and, in terms of internet connectivity, 91.25% of the population can access broadband (ICT, 2017).

The revelations from the IDI statistics could be an indication of the progressiveness of the ICT guidelines and the policy measures that the country has adopted (IDI, 2017). There is a need for an appropriate policy framework for cementing growth in any sector, and so the assumption that this study has made, based on the evidence from Barrett and Slavova (2017), is that the UK had laid a very solid foundation onto which it aimed to gradually further establish its performance in ICT growth (ICT, 2017). An overview of the policy documents in relation to the ICT sector in the UK corroborate this argument (ICT, 2017). First of all, the high rate of connectivity could be based on the fact that the country's policy focus, amongst others, is the improvement of ICT infrastructural coverage (Duncan *et al.*, 2014). At the same time, the country is keen on engaging all the stakeholders in the ICT development plan to be able to contribute uniquely to the growing demand for ICT products (ICT, 2017).

The UK's ICT project planning and stakeholder integration framework is founded on the need to standardise government ICT (Helsper, 2011). The policy dimension of ICT project planning and stakeholder integration in the UK is based on the need to "reduce costs and inefficiency" in ICT projects, but the government is also keen on enhancing the implementation of ICT projects in the UK (Helsper, 2011, p. 23). To achieve this, the UK adopted a number of ICT policy templates to drive the implementation of ICT infrastructure projects in the country (PRINCE2, & Selwyn, 2002). The UK government is keen to ensure that the level of efficiency in ICT projects is unrivalled. The adoption of the ICT strategy in March 2011 indicates that the UK was keen on restructuring its operational approach towards the planning of ICT-related projects (Helsper, 2011). The UK, therefore, provides a very important example of how ICT projects are delivered, as it integrates a number of elements considered as key in the progression of project planning around the globe.

The ratification of the 2011 ICT strategy in the UK significantly restructured the landscape of project planning and ICT management. Chief amongst the objectives of the plan was to "reduce waste and project failure" as a way of further stimulating growth through the ICT sector in the UK (Helsper, 2011, p. 22). At the same time, the adoption of the plan was geared towards the creation of a common ICT infrastructure, using various aspects of ICT to deliver change. The fact that the foundation of the ICT plan in the UK is to enforce planning as a critical component of the sector seems to be in resonance with the proposals of Helsper (2011), which state that a project planning template is essential if project goals are to be realised. The UK government's ICT strategy is fundamentally designed to entrench a comprehensive planning approach in ICT projects in the UK. Looking at the current best practices in project management and delivery, one can affirm that the UK is gravitating towards agile practices in ICT planning (Jorgenson & Vu, 2016).

A number of observations arise when the ICT strategy in the UK is taken into consideration and juxtaposed with the best global practices. One emergent fact is that the plan is spread across the continuum of ICT operations in the UK. This means that the masterplan adopted by the UK government considers that there is a need to focus on all processes of ICT implementation less wonder stakeholder integration was entailed as an issue to be streamlined in the policy document. What is evident, therefore, is that parts of the masterplan thus dovetail and cover a broader spectrum in ICT planning in the UK (Abreu *et al.*, 2011). The plan is also keen on the establishment of a framework of stakeholder identification in ICT project execution and asserts the need to have a broader engagement with the stakeholders to enhance efficiency in the sector. The emphasis on stakeholder integration points to the larger picture that the UK is developing a systematic approach through which ICT project execution could be undertaken through proper planning procedures and engagement of the relevant stakeholders.

Critical lessons can thus be learnt from the UK ICT planning model. One is the essence of stakeholder integration in the implementation of ICT projects in the UK. The fact that the UK government insisted on stakeholder integration approach to be used was paramount in the realisation of the project goals where reason was replicated in the country. Kenya requires a more specific planning model for its ICT projects as a guideline in the enhancement of ICT project performance in the country (Abreu *et al.*, 2012).

### **2.6.2 Singapore viewpoint**

In 2016, Singapore was ranked at number twenty in the IDI rank with an IDI value of 7.85. In 2017, Singapore had made significance strides to be ranked eighteenth with a value of 8.05 IDI units (IDI, 2017). Evidently, this was a massive leap in the country and an event that was attributable to a number of key policy initiatives. The country's active broadband users at that moment were 144.6% with the individuals who could access net standing at 81% (IDI, 2017). The percentage of households with internet connectivity in 2017 was 91%, making it one of the highest in the globe (ICT, 2017).

What is crucial in the data is the role of policy provisions in the development of the ICT framework in any jurisdiction. One would want to authoritatively state that the growth and development of the ICT infrastructure is directly in correlation with their strategic growth and development plans. In this review, the key areas of policy on which Singapore lays emphasis, engagement is key. Singaporean ICT policy framework has a lot of interest in the development of an operational loci where the stakeholders who contribute, in any way, to the growth of the ICT sector are engaged in almost all decision-making processes (ICT, 2017); this not only opens the door for communication towards the improvement of the sector but also leads to a structured engagement process between the various stakeholders. Evidently, this seems to have been paying off in the development of the country's ICT infrastructure.

As observed from the reviewed literature, Singapore was keen on implementing what was described as "Connected Singapore" (Siew & Leng, 2003, p. 14). In trying to actualise this, the country pursued the vision of "infocomm" as a driver of this plan. The emphasis of the Singaporean government in the adoption of the ICT plan is the engagement of the stakeholders in the progression of any ICT vision in the country (Siew & Leng, 2003). Looking at the key concepts of the policy formulations related to ICT in Singapore affirms that the country is keen on developing its ICT infrastructure with full inclusion. In supporting its strategies for ICT development, the focus is on capacity development and technology planning, which are considered key ingredients in the development of any ICT-related project.

In reviewing the Singaporean and UK approaches in terms of policy focus in their ICT sectors, one could suggest that these two countries have leveraged the integration of stakeholders as key players in the progression of ICT infrastructure development and planning. The implication of this for the Kenyan context is that planning is key in the

development of the ICT sector. Within project management, there is a sense in which an assessment tool is required in the country to guide the planning in the ICT sector.

### **2.6.3 New Zealand viewpoint**

New Zealand's 2017 ranking in the IDI index fell by one position compared to 2016, even though its IDI value had improved (ICT, 2017). The country's IDI access index placed it at 4.19 with the value of those owning computers at 13% (ICT, 2017). From the data, 24.5% of the country uses the internet – a relatively low number that requires a new strategy approach (ICT, 2017). But while in general terms there has been an improvement in the ranking of the country, it appears the level of permeation of the ICT infrastructure has not been in line with expectations. New Zealand enacted a number of legislations to complement its efforts in the provision of ICT infrastructure (Ming, 2010). Over the years, the country has witnessed massive infrastructural growth, focusing on the provision of various ICT services – a feature that was achieved through a collaborative framework (Ming, 2010). The ICT policy framework in New Zealand is focused on widening the consumption of ICT in the country through improved infrastructural layout.

The government ICT strategy of the country further seeks to ensure that New Zealand remains a dynamic technology environment, which resonates well with the plan of the government to enhance ICT consumption in the country (ICT, 2017). One of the chief areas of focus in New Zealand's ICT policy is the maximisation of value from technology investments and partnering with the other stakeholders from private entities, to come up with a rubric to further improve technological consumption in New Zealand (ICT, 2013). The integrated ICT work plan, ratified in 2017, focuses on five critical areas of focus in regard to ICT development in the country: digital services, information, technology, investment and leadership. To achieve success in these focus areas, the government precipitated linkages as a way of enhancing investment in the ICT sector. From a more critical viewpoint, one gets the sense that, just like Singapore and the UK, New Zealand

is leveraging infrastructural expansion and linkages as a way of enhancing the operations of the ICT sector in the country.

## **2.7 Comparison of identified practices**

Two aspects of ICT policy in the three countries are evident – the role of stakeholder inclusion and the development of a comprehensive plan to facilitate the growth of ICT. These countries lay a lot of emphasis on the need for planning and inclusion in order to improve the sector. Kenya could draw several lessons from these countries in terms of how it plans for ICT growth in the country (Siew & Leng, 2003). In specific reference to the UK, it is notable that any planning is very broad so that a detailed action plan is established to guide the ICT sector but as well as the plan, the success of any ICT policy framework seems to be based on the need to have a more inclusive environment for various stakeholders to contribute (Kozma, 2005). Based on these, the study is keen on proposing an assessment tool that focuses on infrastructure performance (planning and delivery) and also evaluates the stakeholder integration approaches used, as these appear to be essential policy determinants for the two countries.

## **2.8 Challenges and comparison of studies identified from the reviewed literature.**

While there has been significant discourse in academia regarding project management in ICT as well as stakeholder integration, the review herein suggests that this discussion has not been very advanced in the Kenyan environment. This research did not find any publication relating stakeholder integration to project management within the ICT sector. Most of the studies appraised herein do not directly discuss the integration of stakeholders in ICT projects in Kenya. Further, it is evident from the review that the project management domain in the ICT infrastructure industry or sector has not been adequately explored. To be clear, this research could not adequately establish the progression of research in ICT infrastructure projects in Kenya in relation to stakeholder integration. What is noted are discussions on factors affecting the implementation of

these projects? This means that these studies are limited in having a broader understanding of the current state of ICT infrastructure projects in Kenya. In essence, therefore, this research adds to the literature that discusses the concept of stakeholder integration in Kenyan ICT infrastructure projects.

As shown in the previous sections, there is no validation tool that has been developed to guide stakeholder assessment in the ICT sector. While stakeholder appraisal, as evidenced in Heugens *et al.*, (2002), is a common practice in project management, there seems to be no assessment tool that has been developed in evaluating stakeholder integration in ICT projects. In the context of Kenya, it was found that there are no studies that have particularly discussed the concept of stakeholder integration in ICT projects. While there are a number of studies that have looked into stakeholder management practices in the country, there has been no focus on stakeholder integration as a concept of stakeholder management in the ICT sector. What this means is that there is a need to propose a model for assessing the stakeholder integration model in the ICT sector in Kenya. This research contributes to the advancement of studies involving project management and stakeholder integration within the Kenyan ICT sector. It is notable that there are no research studies that have particularly focused on project management models in the ICT sector in Kenya. The majority of the reviewed studies in project management in Kenya are descriptive studies keen on describing the problems or the situations of ICT projects in the country. As established from the reviewed literature, there are no existing studies that have extensively appraised either project management trends in Kenya or the achievement of stakeholder integration in the ICT sector. Thus, there is need to fulfil the following objectives:

- **Objective 1:** Establish the complexity of project delivery and propose improvements to policy makers and senior project practitioners of ICT infrastructure projects in Kenya.
- **Objective 2:** Examine the nature and identify key stakeholder integration determinants that can be used by policy makers and senior project practitioners to enhance ICT infrastructure project planning in Kenya.

- **Objective 3:** Identify key performance metrics that are specific, measurable and relevant to the achievement of stakeholder integration and ICT infrastructure planning in Kenya.
- **Objective 4:** Assess how infrastructure policy makers and senior project practitioners could prioritise and ensure there a holistic end-to-end commitment to realise the defined benefits of ICT infrastructure in Kenya; and
- **Objective 5:** Propose and validate an assessment tool for ICT infrastructure project that can be used by infrastructure policy makers and senior project practitioners in Kenya.

## 2.9 Chapter summary

This chapter discussed the context of ICT infrastructure development in Kenya. To achieve this, the drivers of ICT development and the progress and advancement of ICT in Kenya were discussed. The policy issues were equally discussed in terms of how policy has influenced the advancement of ICT in Kenya. The chapter also discussed project management and narrowed it down to the question of ICT development in Kenya and then undertook a comparative analysis of the UK, Singapore and New Zealand. The review tracked the research that has been ongoing in the areas of ICT project implementation and stakeholder integration and contextualised it in the Kenyan situation. Notably, the review found there is a need to further research stakeholder integration in the ICT sector in the country because it appeared not to be a well-researched area. In the subsequent chapter, the conceptual framework of the study is discussed.

## Chapter Three: Proposed Conceptual Framework and Theoretical Elaboration

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### 3.1 Introduction

A comprehensive discussion of the conceptual framework is essential in understanding the manner in which the variables in a study are linked. This chapter appraises the conceptual framework and theoretical elaboration of the stakeholder and project management theories through their pre-exist constructs. It evaluates the manner in which the variables are interrelated and essentially aids in highlighting the link between theory elaboration and practice.

### 3.2 Summation of research problem

Stakeholder integration is a critical component of project management (Legris & Collette, 2006). Indeed, no project is able to successful realise its objectives if there is no well-framed stakeholder integration framework. The concept of stakeholder integration is a subset of stakeholder management that also contributes to the realisation of the goals and objectives of the project (Caputo, 2016). In a review of the project management model in Kenya, the assertions of Gwaya *et al.*, (2014) reveal that there is no framework for stakeholder integration. Gwaya *et al.*, (2014) note that the project management model that has been adopted in the country has faced immense problems including project sustainability – an issue that has been largely attributed to the lack of an effective stakeholder integration framework in the country. In this respect, there is a need to formulate an effective stakeholder engagement and integration framework that would enhance the delivery of these projects. But then, how can the level of stakeholder integration in these ICT projects be evaluated? Thus, this research aims to devise an assessment tool that could be used by policy makers and senior ICT project practitioners to improve the integration of stakeholders delivering ICT projects and promote a mind-set of accountability and a structured approach to ICT project planning, delivery and stakeholder integration in Kenya.

This research, in cognition that there is a gap in the management of ICT infrastructure projects in the context of stakeholder integration, seeks to develop an evaluation tool for the assessment of the stakeholders in the project in a bid to improve the performance of these infrastructures in the country. The research problem presented herein can be succinctly understood through the conceptual and theoretical framework developed in the research.

Kerin *et al.*, (2012) defined theoretical framework in a study as the development of the underlying theoretical construct within the study. It is used to represent the structure that gives a description of the underlying theories used in supporting an investigation. Leshem and Trafford (2007) mentioned that it entails some of the key theoretical concepts that advances the key theories as applied in the research process. It gives a broader understanding of how the key theories related to an investigation link together to advance the specific research objectives. Rocco and Plakhotnik (2009) observed that the theoretical framework in an investigation aids in the presentation of any particular theory as applied in the research or investigation. This is equally affirmed by Kerin *et al.* (2012) who intimated that the concept defines the study scaffold; it offers the reader with the foundation onto which the concepts in the study have been framed. It thus means that the theoretical concept of a study is an important framework to understand the themes of the study.

Leshem and Trafford (2007) contends that a conceptual framework in the research process is meant to illustrate the variables in the study and further, define the relationship between these variables as related to the study. Developing a conceptual framework in any study is also critical in the representation of abstract ideas conceived in the research into clear ideas that can be well understood by the readers Rocco and Plakhotnik (2009). While the conceptual framework of a study is crucial in the illustration of the general ideas therein, it is incomplete without the application of the theoretical framework in the

study. These are two very important elements in the research process that go together. Within the context of this study, the conceptual framework was largely based on the synthesis of the reviewed studies in Chapter 2 and the relevant variables in the investigation as captured in Figure 3.7. The next section appraises the key steps taken in developing the conceptual framework for the study.

### **3.2.1 Developing conceptual framework in the research process**

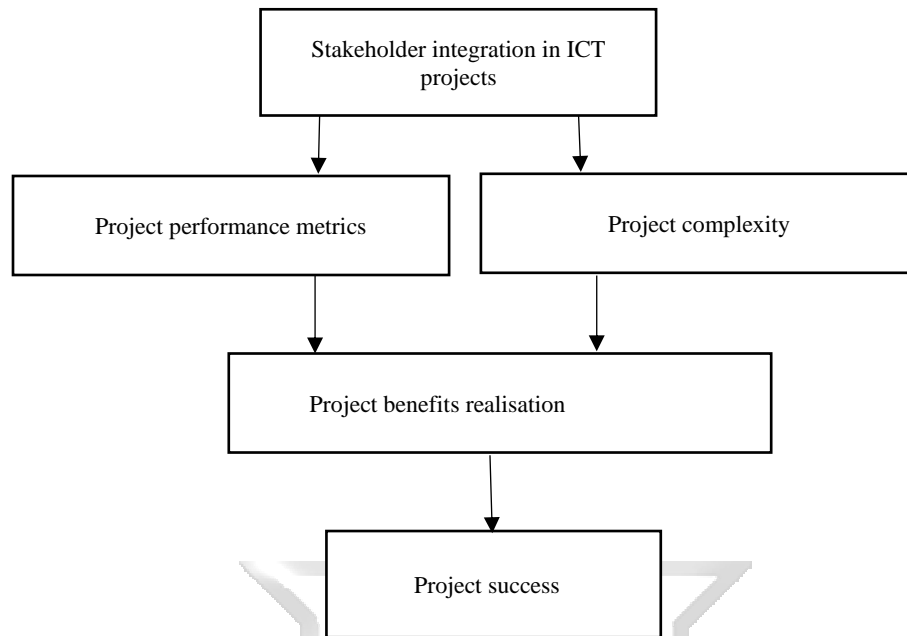
The foundation of any conceptual framework in any investigation is the analysis of the existing evidence of variables as related to the research (Leshem and Trafford, 2007). This means that there has to be a detailed review of the key concepts in literature that are conceived to be important in the research of interest. In this study, the researcher reviewed the relevant literature on the themes that were investigated, offering key discussions on the abstract ideas surrounding the themes in order to bring them to a deeper understanding. Consequently, the important variables were selected to enable the researcher to configure out the relationship of these constructs. Upon identifying the constructs, the relationship between of the variables were then explored; the framework was built by evaluating existing literature that relates to the selected constructs in order to give a broader understanding of the relationship existing between the key variables as shown in Figure 3.7.

### **3.3 Theoretical elaboration and coherence of the study**

The interrelationships amongst the research variables paint a picture of the theoretical coherence of the study. Based on the suggestions of Bourne (2016), it can be conceived that the advancement of any project, at any stage, is based on the effectiveness of the stakeholder management practices in the project. In the development of the stakeholder integration theory in this research, it is evident that project outcomes and benefits realisation need to be enhanced. In essence, as depicted in Figure 3.1, project management theory suggests that there are a number of project aspects that are relevant in enhancing

the output of these projects. The theoretical coherence of this study is aimed at evaluating the veracity of the link between stakeholder integration in project management and the outcome of projects.

The literature in Chapter two presents a review of ICT infrastructure project performance, performance measurement and performance metrics for infrastructure projects. As shown in this Chapter, the structuring of sequence relations of project management and stakeholder management constructs was used to assess and optimise the delivery of ICT infrastructure projects, and this was achieved through the adoption of theory elaboration. Fisher and Aguinis, (2017). noted that “theory elaboration is the process of conceptualisation and executing empirical research using pre-existing conceptual ideas or a preliminary model as a basis for developing new theoretical insights by contrasting or structuring theoretical constructs and relations to account for and explain empirical observations”. Within the context of this research, theory elaboration entailed the process of conceptualisation and executing empirical research. This required specifying constructs, relations and processes at a conceptual level and assessing the fit of those relations empirically. This dual process facilitated the connections within and between the conceptual and empirical planes of the study, thereby nurturing a logic of discovery and validation (Van *et al.*, 2007).



**Figure 3.1:** Variables flow diagram.

**Source:** Author (2020)

The research is espoused within the stakeholder management and project management theories. The assertions made herein are that stakeholder management and integration are key concepts in the enhancement of the project outcomes. As indicated in Figure 3.1, the concept of stakeholder integration ought to take into consideration the level of complexity of the project and the project performance metrics in the project. Critical determinants of stakeholder integration in project management ought to be taken into account in the enhancement of project outcomes in the country. Stakeholders need to remain committed to project objectives and understand the core project processes.

Essentially, these variables work towards the enhancement of the stakeholder integration in the projects. Yang *et al.*, (2018) viewed the concept of stakeholder integration as a derivative of readiness to project changes and cultural orientation of the stakeholders. These are important theoretical precincts of stakeholder integration that are critical in enhancing project performance. Extant literature on stakeholder integration revealed that there is need for stakeholders to be aligned to specific skills in order to find a locus of

being integrated in the project. Other than that, there is emphasis on the development of a robust communication plan that is meant to reinforce the collaboration amongst the stakeholders in the project. This further fosters a strong commitment to the project objectives. The other important theory germane in the study of stakeholder integration is the concept of stakeholder needs. The inference herein is that there is need for the assessment of the needs of the stakeholders before adopting a stakeholder integration template. The conflation of these variables, so to say, contributes to the effective integration of stakeholders in the project.

### **3.4 Overview of project management**

In providing an overview of project management, this study takes into consideration the template of infrastructural project management developed by Zhang *et al.*, (2008). This template provides a very important outline onto which the concept of stakeholder integration will be developed in this research. To begin with, Zhang *et al.*, (2008) identify a number of aspects of project management that are germane to this study. The question of stakeholder management is central to project management. Zhang *et al.*, (2008) view project management operations from more of a relationship management platform.

There is a sense in which the project management ecosystem calls for a more structured way of managing and handling competing human stakeholder interests. Therefore, in the overview of project management, one of the cardinal aspects of project management on which this study aims to base this discussion is the question of stakeholder management. As illustrated in Figure 3.1, having a stakeholder management plan in project implementation entails maintaining good relationships amongst the stakeholders who are involved in the process. In summary, the framework for stakeholder engagement in the project sums up the whole discussion regarding stakeholder integration in projects. Project delivery teams have to configure a plan to engage stakeholders in the project in such a way that each of these stakeholders are able to advance the project objectives (Lewis, 2008).

Secondly, as a component of project management, Ward and Chapman (2003) talk of project objectives. This sums up the suggestions of Lewis (2008) that the project objectives ought to adequately be managed to ensure that the scope of these projects are adhered to as delineated in the planning phase. This research views project objectives in the broader context of performance indicators. Notably, the project performance indicators define the trajectory of the project and the milestones towards the realisation of the project aims, known as KPIs, which this research views as being vital to project delivery (Takim & Akintoye, 2002). It is important to ask whether the project implementation processes help to ensure that the project objectives are met. The question of whether project objectives or KPIs have been met depends on the key performance management strategy of the project. In this research, the question of key performance metrics of the project is discussed within the larger context of project management.

As well as discussing project objectives, benefits realisation during the project implementation process is also an important component of the project process that is taken into account in this research. The project benefits realisation concept in project management configures those strategies applicable to the realisation of the project objectives. Dupont and Eskerod (2016) view the concept as more of a roadmap towards the realisation of the project objectives. The relationship between this and the project process is clear. Any project management process has to develop a strategy through which the perceived benefits of the projects shall be realised. In project benefits realisation, the action points to implement in order to achieve the project outcomes are documented. According to Lange *et al.* (2012), the project benefits realisation model provides a template through which the project delivery teams have to align their operations in order to reach the project objectives.

Bradley (2010) discusses the factors of project complexity that are essential to the project management progress. The question of project complexity entails the factors that affect the standard manner in which the project delivery teams respond or achieve the objectives of the project. One salient issue that emerges in this discussion is the question of risk and risk management in projects. For the purpose of this research, and in consideration of the suggestions of Kazmi *et al.*, (2016), project complexity is taken as a vital component of the project management process. Within any framework of project management, it is prudent to check whether a risk management and contingency plan has been configured. This is based on the notion that project objectives cannot be adequately realised if the risk mitigation measures in the project have not been adequately dealt with by the project delivery teams (Bradley, 2010).

In view of the components of project management discussed herein, a number of issues arise that are critical to this research study. Notably, this study does not view project management theory from the deterministic model that has been adopted by studies such as Bradley (2010) and Kazmi *et al.* (2016). Rather, this study adopts a more open definition of project management. This is notable through the way in which the various components of project management have been described herein. As illustrated in Figure 3.2, the definition of project management that has been adopted in this research includes various aspects of stakeholder management. As already discussed, in any management of projects, the delivery team has to be cognisant of the methods that ought to be applied in the management of the various stakeholders involved in the project. To corroborate this, this research borrows from the suggestions of Westland (2007), who states that the project management lifecycle has to conceive the ways in which the players in the project can be adequately managed to ensure that their synergy is harnessed as a driver towards the project aims.

Secondly, this research affirms that as a component of project management, the aspects of project benefits realisation and project performance metrics are crucial to the project management schema. This research argues that when the delivery teams are developing a management model, they have to configure the plan within the larger framework of the project benefits delivery flow. As noted earlier, the project benefits realisation template is an illustration of the pathways towards the realisation of the perceived project benefits, or the project aims. In theory, therefore, the project management process cannot be discussed without incorporating some of the strategies through which the objectives can be realised (project benefits realisation).

Notably, the question of KPIs, encapsulated within the project performance metrics, ought to be managed as well. This means that the project performance metrics of any project provides a solid variable through which project management can be interpreted. This essentially means that project teams cannot develop a management plan without discussing the project metrics. This can be looked at more from an evaluation viewpoint. Developing performance metrics is all about the characterisation of the project outcomes. It is all about the description of the dimensions that the project ought to take in order to achieve its desired goals. It thus follows that the management of any project is incomplete if the project has not developed the manner in which the KPIs of the project are to be managed. Managing the KPIs means that the project defines the deliverables and establishes a structure through which they can be addressed and evaluated.

### **3.5 Project management and stakeholder integration**

The development of a project management framework through a stakeholder integration approach is incomplete without an understanding of the project management processes. The proposals of Beringer *et al.* (2013), in the evaluation of the behaviour of internal stakeholders in project management, highlight that the development of the right framework for stakeholder engagement in projects is vital for project success. The study

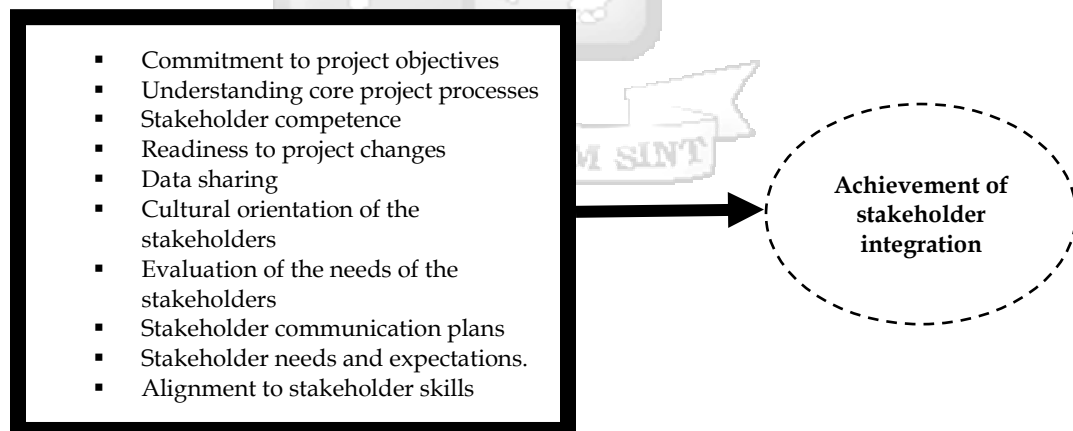
applied an empirical study design to help understand the correlation between project success and the stakeholder inclusion programmes adopted in projects. From a purely managerial perspective, the outcome of the study suggests that managers in any project ought to be keen on the adoption of the intensity of their engagement to the various requirements of the project at every phase. What this means is that it is imperative for project management teams to focus their attention on resource management in such a way that the various project processes are seen as key resources (Beringer *et al.*, 2013).

The question of the strategic management of stakeholders has also been the focus of Ackermann and Eden (2011) in theorising stakeholder management practices in projects. In their discussions on the theory and practice of project management, they suggest that top management teams in projects are able to widen the robustness of their project delivery strategies by ensuring that they are able to attend to what the study describes as “*important concepts emerging from the stakeholder literature*”. The theoretical framework of the suggestions of Ackermann and Eden (2011) is to the effect that project implementation teams ought to conceive their project management strategies based on key aspects of stakeholder theory.

In developing a management theory for stakeholder management, the question of stakeholder influence features heavily in the suggestions of Ackermann and Eden (2011). What this means is that by developing a stakeholder influence network, the implementing teams are able to understand more of the input from the stakeholders in the project. Studies confirm that capturing both formal and informal stakeholder relationships offer project management teams a chance to develop relationships amongst stakeholders in the project. Therefore, the question of developing relationships is key in stakeholder management and project outcomes. Looking at the implications of stakeholder management in enhancing project outcomes, the relationship between project management outcomes and stakeholder management initiatives are clear. In this research, the project stakeholder management initiatives are viewed from the perspective

of Ackermann and Eden (2011), who discuss the drivers of stakeholder management in projects that this study has adopted.

In order to propose a comprehensive stakeholder assessment tool, this study considers some of the determinants of stakeholder integration. In the evaluation of the factors applicable in project management to enhance stakeholder integration, the research identified a number of “explainers” or determinants of stakeholder integration. As illustrated in Figure 3.2, stakeholder integration in project management can be explained through a number of determinants. Figure 3.2 illustrates the various determinants established from the reviewed literature, highlighting the concept of stakeholder integration in the context of project management. The measures outlined in Figure 3.2 were derived from a number of stakeholder management models and form the basis of the adopted conceptual framework for the study. These models include the rational and emotional stakeholder mapping model proposed by Siltaoja and Lähdesmäki (2015). Moreover, the views of Mitchell *et al.* (2017) in the salience model were reviewed to link the essence of stakeholder management to research outcomes.



**Figure 3.2:** Essential determinants of stakeholder integration

**Source:** Author (2020)

This study, therefore, looks at some level of correlation between the stakeholder integration determinants illustrated in Figure 3.2. This is supported by studies such as Viglia *et al.* (2018), to the effect that stakeholder integration within the project is all about the construction of relationships amongst project implementation teams. In this context, the essential determinants of ICT stakeholder integration are viewed in this research as factors that aid in building relationships amongst the various players in the ICT sector to be able to realise the project outcomes. As earlier intimated in the studies of Legris and Colletterte (2006), the overall outcome of ICT stakeholder integration is enhancement of the project outcomes. Conceptualising a stakeholder integration model in the ICT sector means contributing to the overall results of the project. Project implementation teams focus on enhancing stakeholder integration initiatives to be able to build a solid framework for relationships that eventually aid in the enhancement of these project outcomes.

From a quantitative viewpoint, it therefore follows that the essential determinants of ICT stakeholder integration are variables that can be manipulated in order to achieve a specific stakeholder integration plan. As adduced in the studies of Bourne (2016), the stakeholder integration models adopted in any project differ yet all aid in the achievement of specific project outcomes. The stakeholder integration concept is also a pointer towards the ultimate project outcomes. Quantitatively, therefore, determinants of ICT stakeholder integration are essential variables that describe the nature of stakeholder integration in any ICT project. At the same time, the stakeholder integration model adopted in any ICT project ultimately influences the overall outcome of the project.

### **3.6 Assessment of the link between stakeholder integration and project management**

Project management and delivery rely on effective stakeholder management practices to ensure that the perceived benefits of these projects are realised. In essence, therefore, it can be argued that the development of a stakeholder management framework for projects is incomplete without exploring stakeholder integration. This study is cognisant of the

significance of understanding the phases of stakeholder management in any project and the benefits accrued by project implementers having a comprehensive stakeholder management template. This section of the study evaluates the various phases of stakeholder management and links them to project management.

### **3.7 Stakeholder management**

Any stakeholder management theory adopted for any project directly impacts towards the outcome of the project. As shown by Crane and Ruebottom (2011), effective management of stakeholders in any project is one of the critical components of the successful delivery of projects. A positive and meaningful relationship amongst the stakeholders in any project comes with immense benefits to any project. Stakeholder management thus entails the development of an operational framework through which the various interest of the stakeholders in a project are taken care of. Managing stakeholders in projects is critical since it describes to the project management team how to address every concern of all classes of stakeholder in the project with a view to ensuring that the relationship amongst the various stakeholders positively influences the progression of the project being implemented. Stakeholder management lays emphasis on key principles of engagement, such as communication, consultation, relationships, risk management, planning and responsibility (Bryson, 2004), all of which are critical drivers of project success.

### **3.8 Phases of stakeholder management**

In order to develop an effective stakeholder engagement framework for project management, it is important to understand the stakeholder management phases in projects. This section of the research study thus discusses the link between stakeholder management initiatives in project management and the implications of stakeholder management initiatives in enhancing project outcomes.

### 3.8.1 Identification of stakeholders

The development of stakeholder management theory and practice begins with the identification of the stakeholders in the project. The identification process is focused on scanning through and coming up with a list of the relevant stakeholders who have some sort of an influence on the project. The identification process also entails the selection of the stakeholders in the project. Moreover, it is notable that managing a stakeholder in a project means that the position of the stakeholder in the project is already known. Since managing entails the development of a platform through which the various interests of the stakeholders are looked into, then it follows that these stakeholders must be selected. This ought to be done before the management platform is established. The integration of stakeholders in the project is impossible if the identification of the stakeholders is incomplete. The opinion of Bryson (2004) is that the project execution team has to be very clear from the outset about who the stakeholders in the project are. The identification phase not only identifies the relevant stakeholders in the project but also goes on to cluster them as well. From a critical viewpoint, it is imperative to note that not all the stakeholders have the same level of influence in the project. As noted by Mitchell *et al.* (2011), various clusters of stakeholders have varying levels of influence in the project – an attribute that is largely based on the stakeholder's interest in the project.

Since the stakeholders in the project have varying levels of interest in the project, it thus follows that their level of influence in the project differs as well. This essentially means that the engagement levels of these stakeholders will be quite different. What this suggests, and what Crane and Ruebottom (2011) highlight, is that the development of an identification strategy for project stakeholders ought to be done methodologically. Project implementation teams have to be able to assess the relevance of the various stakeholders identified in the project in terms of their contribution to general project continuity. A number of studies, such as Shane *et al.* (2015), have developed a framework for evaluating stakeholders in project management by noting that this could be conceived in terms of the level of interest that the stakeholders have in the project. But other than the question

of interest, it is equally notable that the identification can be evaluated in terms of the “directness” by which they are influenced by the project. Bryson (2004) calls this identification process, the “depth of influence” that the project has on the stakeholders.

### **3.8.2 Segmentation of the stakeholders**

The identification of the stakeholders in any project is preceded by the clustering of these stakeholders depending on various factors, chief among them being the ability of these stakeholders to influence the project. Basically, the stakeholders are clustered based on their input in the project and their influence on the objectives of the project. Some stakeholders have a very high level of influence on the project while others have a medium or low influence; therefore, their levels of engagement in the affairs of the project will vary immensely (Bourne, 2016). The segmentation of the stakeholders also takes into account the level of involvement of the stakeholders in the project, so stakeholders may be directly or indirectly involved in the project. Others may be offering regulatory functions so that they are grouped under the “interest” groups. The segmentation phase offers the project implementers an opportunity to come up with a proper framework of engagement with the stakeholders, because the management principle of stakeholders in any organisation hinges on the fact that the management of these stakeholders varies with the level of engagement or influence of the stakeholder in the project.

The segmentation of stakeholders in the project is considered to be part of the larger section of the stakeholder analysis phase. The segmentation is all about clustering the stakeholders. An assessment of the progress of stakeholder engagement in project management shows that project management strategies ought to have a very firm template to ensure that stakeholders are placed in the relevant class based on their levels of influence on the project or the extent to which the project affects them. Stakeholder segmentation requires that a well-formulated stakeholder register is developed in the process; this helps in the maintenance of an operations and engagement plan for the stakeholders in the project. An engagement model in any project management initiative

rests on the outcome of the stakeholder clustering. Actionable initiatives for stakeholder engagement can only be pursued if project implementation teams have a well-developed stakeholder management register. Implementing an integration framework means that the teams have adequately understood the profiles of these stakeholders.

### **3.8.3 Stakeholder analysis**

Managing stakeholders is preceded by the analysis of the extent to which the identified stakeholders in the project influence the outcome of the project objectives (Bailur, 2006). Basically, the stakeholder analysis phase in stakeholder management gives the project implementers an opportunity to understand the power of the stakeholders in the project. The stakeholder analysis platform gives the implementers a further understanding of the level of power that the identified stakeholders have and the extent to which their power influences the project.

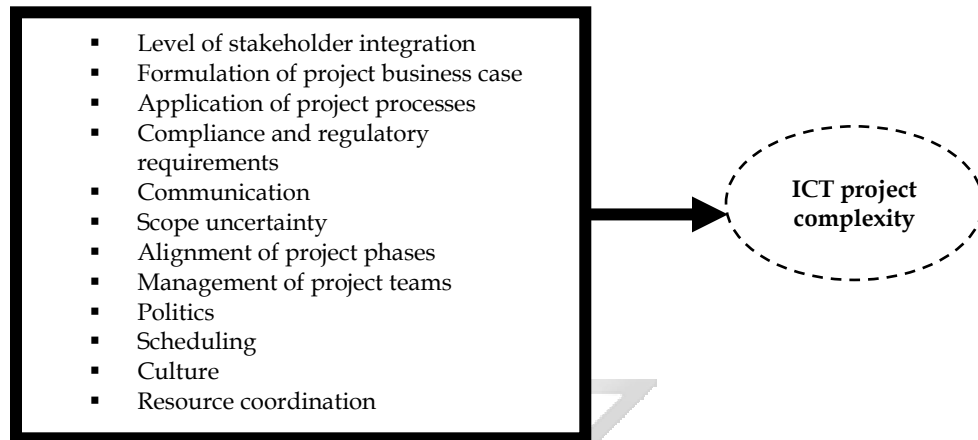
The stakeholder analysis further aids in the determination of the desired levels of influence and support in the project. Several tools are available to map the extent to which the project stakeholders are capable of influencing project outcomes. The analysis gives the implementers an opportunity to engage them depending on the level of support and influence that those stakeholders wield towards the project. The relevance of the stakeholder analysis in project management is well understood through the study of Bourne *et al.* (2016), who reveal the significance of engaging various clusters of stakeholders in any project. In fact, Johansen *et al.* (2017) succinctly note that the success of any project is directly related to how effectively the implementers are able to engage the stakeholders in the project. In the development of a stakeholder management model, which is one of the primary objectives of this research study, it is significant to have an in-depth understanding of stakeholder management. This is because the stakeholders are central to the success of the project.

### **3.9 Linking project complexity to stakeholder integration in projects.**

Infrastructure projects are described as being very complex (Ndegwa *et al.*, 2017). Complexity, in this context, entails a combination of factors that affect the activities undertaken in the achievement of the project outcomes. Notably, the nature of project complexity essentially limits the ability of the project to realise the defined benefits of the project. A number of factors have been suggested as notable in the debate on project complexity, including factors such as inherent complexity, uncertainties in the project, organisational inherent complexity, overlap of phases and concurrency, number of technologies involved, and rigidity in the project as per the studies of (Opiyo *et al.*, 2017; Muchai & Kimuyu, 2017) . In linking the two variables, stakeholder integration appears to be an important aspect of project complexity. It thus appears that the development of a stakeholder integration model in projects is important in reducing the project complexities associated with stakeholder management. The development of a platform through which the project stakeholders are effectively integrated into the project is critical in the reduction of these project complexities.

It thus follows that the reduction of project complexities, especially those that are associated with stakeholder management, can be significantly addressed through a stakeholder integration strategy. This insight offers an important outlook regarding the relationship between stakeholder integration and project complexity. When stakeholders in the project are well managed (in terms of communication, engagement, integration, remuneration, etc.), there are indications that all the project processes are likely to run smoothly. On the contrary, poor stakeholder management is likely to complicate these project complexities. In conclusion, it is notable that when the project complexities are well managed in any project, the ability of these projects to realise the project objectives is higher. As illustrated in Figure 3.3, there are a number of factors that can cumulatively lead to project complexity. These variables are basic determinants of the complexity of projects, meaning that any form of project complexity ought to be keenly discussed in

these variables. In this research study, these project complexity variables are considered to be indicative of the nature or level of ICT project complexities.



**Figure 3.3:** Project complexities in ICT

**Source:** Author (2020)

### **3.10 Aligning stakeholder integration concepts to project management.**

In a review of the project implementation cycle, one theme that emerges is the question of managing project stakeholders. All the way from the initial project planning, the role of stakeholder inclusion is noted. The significance of having a platform through which all the players in the project implementation teams are brought on board is very clear. The management of the project planning phase, borrowing from the proposals of Johansen *et al.* (2014), means that attempts have to be made to ensure that the different players in the project, regardless of their class, have to be placed on a pedestal from which relevant decision can be made regarding the project. In developing this conceptual framework, this research takes note of the relevance of the engagement of key stakeholders in the advancement of the project; this is why, within the project planning phase, the question of stakeholder integration features so eminently (Zhai *et al.*, 2009). Through stakeholder integration, the execution phase of project delivery and management becomes clearer. One of the aspects of project execution discussed earlier is the emphasis on “people management” as a key driver in the advancement of project

goals (Yang *et al.*, 2018). By managing people in the context of project management, it follows that the stakeholders in the project have to be adequately included within the execution phase. Their input in the “management of people” is as important as ever. This study thus looks at project management as a very integrative process. As a concept in project management, stakeholder integration provides an effective platform through which the various classes of stakeholder in the project are engaged. It creates a framework through which all the cadres in the project can be involved in its advancement.

Project management, according to Heugens *et al.* (2002), entails harnessing synergy towards the creation of value for the stakeholder through the project. It includes all attempts to satisfy the interests of the various stakeholders in the project. The propositions of Mok *et al.* (2015) and Zhai *et al.* (2009) about the creation of value for the stakeholders in the project thus sum up the correlation between project management theory and stakeholder integration. In the process of the creation of value for the stakeholders in the project, understanding the interests of these stakeholders in the project is imperative. The integration of the stakeholders in the project thus offers project implementation teams a chance to gain a broader understanding of the interests of the stakeholders in the project. Moreover, stakeholder integration methods in the project management schema are essential in aligning the project goals to the expectations of the stakeholders.

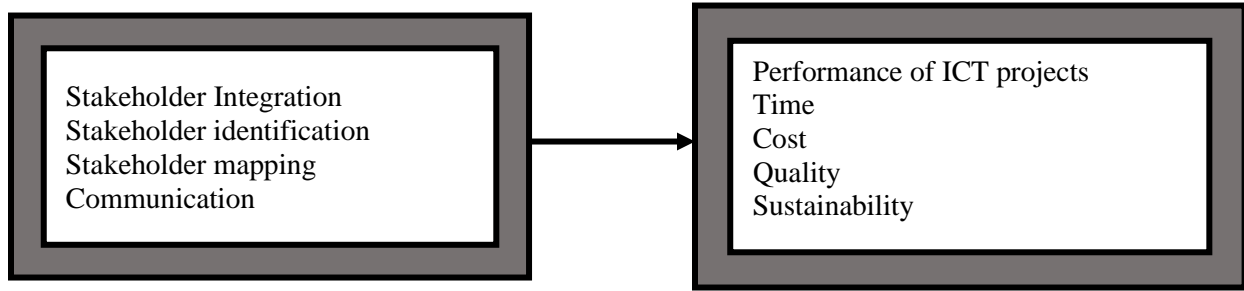
The various elements of stakeholder integration that have been discussed in this research are critical aspects of effective project management initiatives that ought to be applied within any project management framework. Borrowing from the assertions of Heugens *et al.* (2002) regarding the critical factors of stakeholder integration, the integration of stakeholders within the project aims to maximise all project outcomes as well as the approvals of the project. From the perspective of project management, it is the avenue through which the needs and expectations of the stakeholders are not only identified but

also managed. From the suggestions of Johansen *et al.* (2014), it is evident that stakeholder integration within any project, whether ICT, construction, energy or even infrastructure, directly benefits project management.

Effective project delivery of ICT projects relies on the ability of the stakeholders to articulate their thoughts regarding the project. Being mindful of the project, as noted earlier, is considered a critical component. Mindfulness entails all the stakeholders involved being conscious of the project. One critical assertion that this study is keen to develop further is that the level of mindfulness and consciousness regarding a project is dependent on the class of the stakeholders. Different clusters of stakeholders in any project have varying levels of consciousness or mindfulness regarding the project and this should inherently influence the stakeholder management framework.

### **3.11 Exploring the link between stakeholder integration and project performance indicators.**

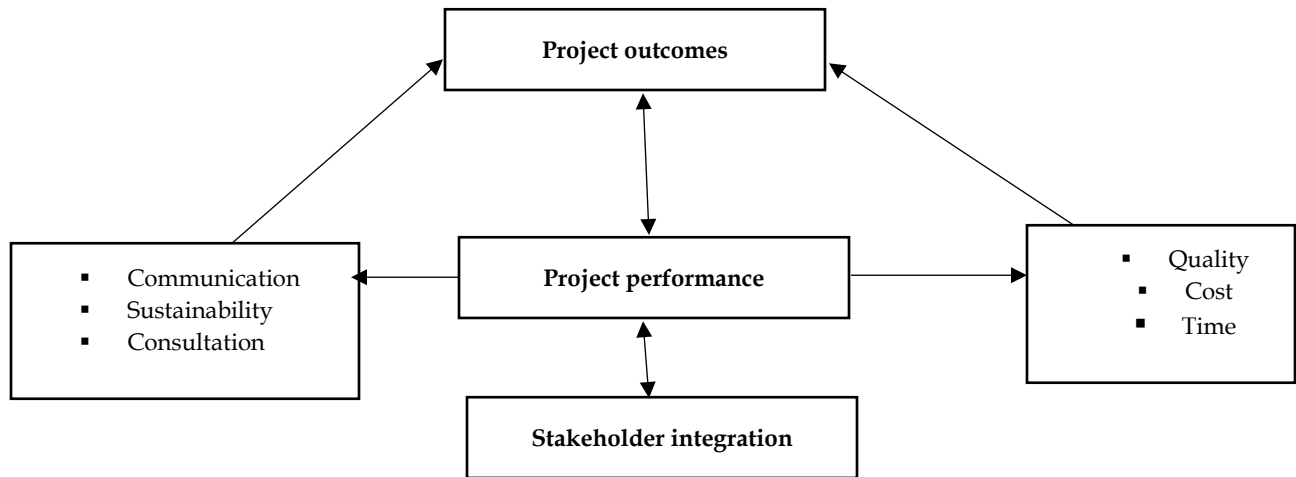
Regarding stakeholder management, Johansen *et al.* (2014) suggest that the stakeholders in any project have immense influence on the direction of the project. This can be seen in terms of normative, coercive or utilitarian perspectives. Heugens *et al.* (2002) further affirm that the engagement of stakeholders in the project implementation overall improves the project in terms of time factors, cost issues and the sustainability of the project. In effect, as illustrated in Figure 3.4 below, there is a very strong correlation between stakeholder integration and the performance of ICT projects. As illustrated in previous sections, stakeholder integration influences the time, cost, quality and sustainability of projects – four critical variables that play a part in the success of any project.



**Figure 3.4:** Stakeholder integration and project performance indicators

**Source:** Author (2020)

It is worth noting that in most ICT projects, regardless of the complexity, key stakeholders ought to be defined in terms of their input into the project. Watson *et al.* (2018) suggest that all clusters of stakeholders, whether primary or even tertiary stakeholders, must have their project input well defined to have a grasp of their contribution to the problem in terms of the project goals. This is why Mok *et al.* (2015) propose that a stakeholder approach is essential in understanding the planning and delivery of ICT projects. The adoption of the stakeholder engagement model, from a commercial perspective, is invariably intended to broaden the vision of the management in terms of its role in ensuring that the project aims are realised. Watson *et al.* (2018) suggest that stakeholder engagement must take into account the nature of the project. Certain projects require a more robust framework for engagement compared to others but, all the same, a broader engagement platform ought to be considered if project success is to be assured. Figure 3.5 suggests that the outcomes of any project are a result of a number of variables: time, cost, sustainability, quality, communication and consultation. In essence, any project success formula has to include these, yet they originate in the effective management of stakeholders during the project execution.



**Figure 3.5:** Stakeholder integration and infrastructure performance

**Source:** Yang *et al.*, (2018)

The dispositions of Yang *et al.*, (2018), as captured in Figure 3.5 on stakeholder integration, give a foundational framework and highlight the significance of engaging stakeholders in the whole project lifecycle. The proposed assessment tool will be used to provide a scaffold for the development of an assessment tool for ICT stakeholder integration and infrastructure improvement performance in Kenya. The analysis explores the following thematic areas in relation to the research framework:

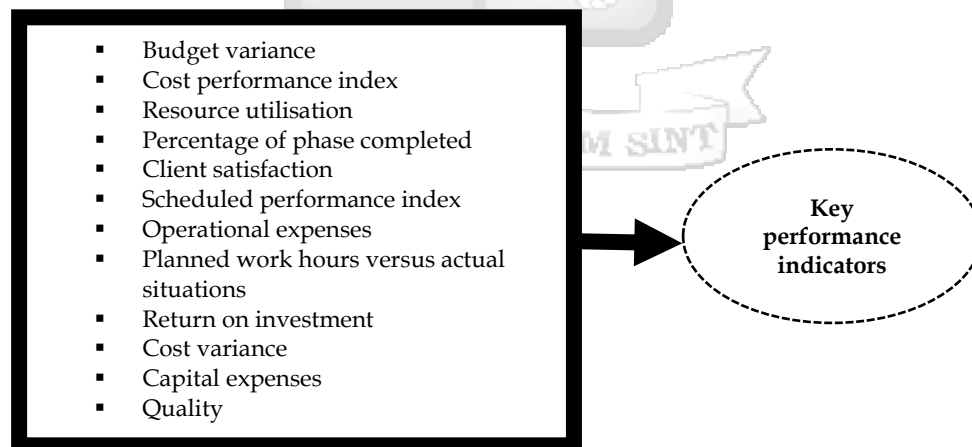
- The role of stakeholder management in influencing project outcomes.
- The role of senior ICT project practitioners in promoting stakeholder integration and a mind-set of accountability.
- The ways in which selected project variables enhance the quality of the project.
- Stakeholder integration as a key determinant of ICT project success.

In order to develop the proposed assessment tool, the research study has made an assumption that integration of that matter is correlated to the project outcomes, and this

is based on the assumption that stakeholder integration has the ability to influence the following outcomes of the project:

- Quality
- Cost
- Time
- Communication
- Sustainability

In this research study, a number of variables were found to be significant. The suggestions of Mok *et al.* (2015) were considered and aligned to the metrics and the monitoring strategies of the ICT projects. In order to fully understand the concept of project KPIs, a number of variables were used to define the contextual model of key performance metrics in the ICT sector. An illustration of the correlation between the variables is captured in Figure 3.6.



**Figure 3.6:** Key performance indicators

**Source:** Author (2020)

In this research study, these variables were treated as the basic factors that determine whether the projects are able to realise the project objectives. This essentially means that

any manipulation of these performance metrics in the project adjust the performance indicators of the project. It is equally clear that the key performance indicators of the project cumulatively act towards the achievement of the project outcomes, as discussed earlier.

### **3.12 Coherence between the theory and reality of the study**

The development of a stakeholder integration framework in any study, from a theoretical perspective, is critical in the enhancement of the project outcomes. Looking at the discussions of Epstein *et al.*, (2017) regarding the optimisation of project outcomes through stakeholder integration, the relationship between the theory of project stakeholder integration and the practice of stakeholder integration is as clear as can be. It is evident that the integration of stakeholder in any project management context improves the contribution of the stakeholders in the advancement of the project objectives. What is evident herein is that the development of a comprehensive stakeholder's management and integration theory in project management translates into the realisation of the project defined benefits.

Stakeholder management models in project management are critical in the delivery of projects. The essence of this study is conceived through stakeholder management models, since the integration of stakeholders in projects is considered to be important in advancing project objectives. By developing an assessment tool for stakeholder integration, this study evaluates the extent to which the stakeholders are involved in the delivery of ICT projects in Kenya. From this review, project management teams can develop a model for integrating these stakeholders into the project in order to realise the project objectives. The key aspect of this study that links theory to practice is that it seeks to understand the methods through which stakeholders in projects - including ICT projects - could be effectively managed in order to realise the project objectives. The objectives of this study, in summary are to:

- Establish the complexity of delivering ICT projects in Kenya and propose improvements for managing the complexities. According to the suggestions of Gichoya (2005), understanding the complexity of projects is essential in the development of risk mitigation measures to deal with these complexities. In the context of the ICT situation in Kenya, understanding the complexities would offer the implementing team a chance to develop initiatives to address them and ensure that the project steadily pursues its objectives.
- Examine the nature of ICT stakeholder engagement and identify key stakeholder integration determinants. In achieving this, the study borrows from the proposals of Odhiambo and Kaibui (2016), who discuss the factors that influence stakeholder integration in projects. Stakeholder integration in projects effectively defines project progress. In this context, the factors that influence stakeholder integration have been discussed in order to propose strategies that could be applied in ensuring that the integration of stakeholders in Kenyan ICT projects is well above board as a way of ensuring that the project goals and objectives are realised.
- Identify key performance metrics relevant to the achievement of stakeholder integration and ICT infrastructure planning in Kenya. Notably, defining project KPIs gives the implementing team an opportunity to draft a strategy for approaching the project. This research, by identifying the key performance metrics in the ICT sector, basically constructs a foundation for evaluating these projects but within the context of stakeholder integration.
- Assess how infrastructure policy makers and senior project practitioners in Kenya can prioritise and ensure there is a holistic end-to-end commitment to realise defined benefits with assignment ownership and responsibility for adding value through an ICT infrastructure planning realisation process.
- Propose and validate an assessment tool that can be used by infrastructure policy makers and senior project practitioners in Kenya to ensure a mind-set of

accountability and a structured approach to ICT project planning, delivery and stakeholder integration.

In concept therefore, the development of a stakeholder integration and validation tool offers the project team an important framework that can be used to evaluate the level of stakeholder integration in the ICT infrastructure projects in the country. The reality is that while there is a lot of emphasis for project teams to ensure that stakeholders are well integrated therein, there is no tool for assessing the extent to which this has been achieved. The conceptualisation of this validation tool thus integrates the theory of stakeholder management and integration into the project management concept.

### **3.13 Proposed research conceptual framework**

As already discussed, various factors are essential in the enhancement of the delivery of the project outcomes. In this study, a number of findings emerged that helped in constructing a broader conceptual model for the research. One notable finding is that in the ICT project management process, a number of factors were found to be associated with project process management (*see Figure 3.7*). The emergent factors, as earlier intimated, include: key performance metrics, benefits realisation, stakeholder integration and level of complexity. It thus follows that an effective project management process has to work towards the enhancement of these factors. Other than these factors, the study also notes that a number of measures can be used to explore the variables, as extensively reviewed in the literature. For example, in the discussions regarding project stakeholder integration, a number of factors were found to be critical determinants of stakeholder integration. These variables cumulatively define the categories of project management. It therefore follows that these variables have to be well considered in order to discuss these factors of project management. The overall conceptual model is summarised in Figure 3.7.

As illustrated in Figure 3.7 below, a number of factors explain the project complexity variable. In essence, it means there is a direct relationship between these factors and project complexity. The factors are: level of stakeholder integration, formulation of project business case, application of project processes, compliance and regulatory requirements, communication, scope uncertainty, alignment of project phases, management of project teams, politics, scheduling, culture, and resource coordination. The factors build on project complexity as an aspect of project stakeholder management. This means that these factors, discussed under the project complexity variable, individually enhance project complexity. This can be clearly seen in the sense that when issues of communication, for instance, are taken into account, the project management team is basically addressing complexities related to project communication. However, of more significance here is that these factors directly contribute to project complexity. The project complexity concept, in turn, directly influences the stakeholder model developed in the project and this leads to improved project outcomes.

The proposed conceptual framework also builds on the earlier discussion regarding the key metrics of project performance. A number of factors generally influence project KPIs (see Figure 3.7). These are: budget variance, cost performance index, resource utilisation, and percentage of phase completed, client satisfaction, scheduled performance index, operational expenses, and planned work hours versus actual situations, return on investment, cost variance, capital expenses, and quality. There is a direct correlation between these factors and the project's key performance metrics. It follows that harnessing every resource to address these factors essentially contributes to the realisation of these metrics in the project. In essence, as described in the diagram, there is a direct correlation between these variables as well. Realising these KPIs in the project fundamentally contributes to the advancement of the project metrics. Moreover, and fundamentally, the advancement of the project metrics contributes to the project's stakeholder integration, which ultimately enhances project delivery.

This same direct relationship is witnessed in the project benefits realisation, where the listed factors contribute to enhanced project realisation. At the same time, project benefits realisation is equally a factor of stakeholder integration in the project. However, having discussed the direct relationship between these factors and the variables in the study, it is notable that these factors are independent factors. For instance, the factors explaining project complexity in the study are independent of each other and do not form associations with each other that can be scientifically defined. However, as already seen here and is further illustrated in Figure 3.7, these factors are directly related to project complexity. This is the same for project benefits realisation as well as performance metrics.

The conceptual framework, evidently, is espoused from the stakeholder integration theory. The stakeholder integration theory contends that it is critical for project teams to establish positive “collaborative relations.” The conceptual framework herein recognises these positive relationships are essential determinants in the project performance. On the same note, the development of a stakeholder integration model requires that the level of complexity of the project is taken into consideration (Dao *et al.*, 2016). This is the focus of the discussions of Dao *et al.*, (2016) who intimated that the level of integration ought to resonate with the level of complexity of the project. A critical review of project stakeholder integration reveals that project stakeholder integration ought to work towards the realisation of the defined benefits of the project (Derakhshan, 2019). In this respect, it is important to take into account the ability of the project to realise the proposed objectives. Conclusively therefore, the developed conceptual framework in this study integrates the stakeholder integration theory, project complexity models as well as the concept of project outcomes.

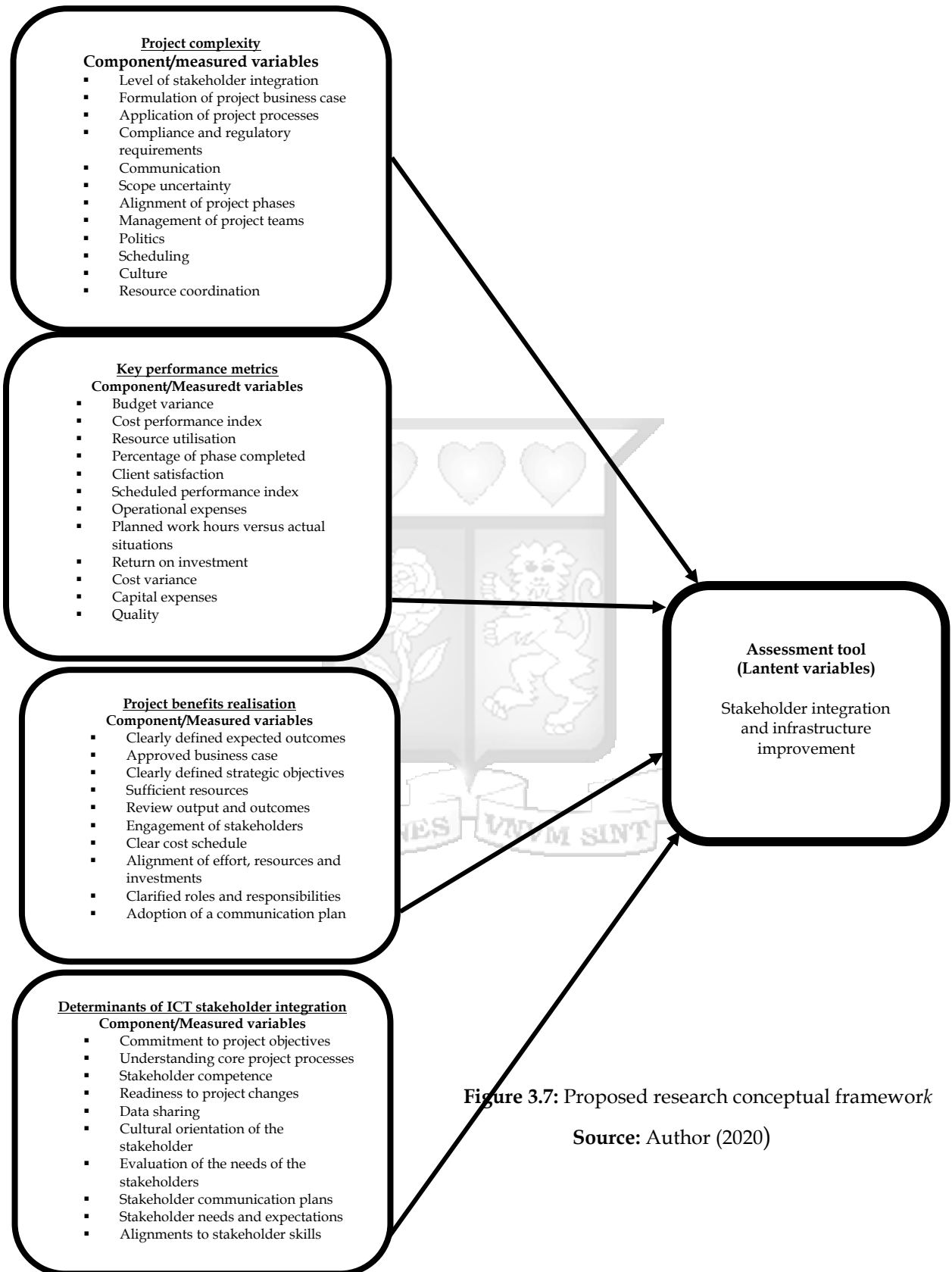


Figure 3.7: Proposed research conceptual framework

Source: Author (2020)

### 3.14 Chapter summary

This chapter discussed the conceptual framework applied in the study. The variables that feed into the proposed conceptual framework were discussed in this section of the study, with emphasis on their application to successful project management. This section of the study also linked the theoretical underpinning of the research to the practical application of the study. In the next chapter, the focus is on the methods applied in the study to collect and analyse data.



## Chapter Four: Research Methodology

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### 4.1 Introduction

This chapter of the thesis presents a detailed discussion of the research methods that were applied in the collection and analysis of the data before making the inferences made in the study. Basias and Pollalis (2018) describe research methodology as the specific procedures that are applied in the identification, selection, processing and analysing of obtained raw data regarding the topic under study. This chapter appraises these processes in detail and relates the processes to theory. Furthermore, this chapter of the thesis justifies the application of the various processes applied in this research study. It aims to answer the question of “how” the data was collected and analysed. Moreover, the interest of this chapter of the thesis is to assess the reliability and validity of the findings of the study in the sense that it evaluates the procedures that were applied in order to ensure the results of the study are reliable and valid.

The development of any research and the inferences made from it are correlated to the beliefs of the researcher. In this context, when developing an assessment tool for ICT stakeholder integration, the beliefs of the researcher are fundamental (Basias & Pollalis, 2018). This is why this chapter discusses in detail the research philosophy and paradigm. Furthermore, the strategy and the method of study applied in the development of the research tool are discussed herein. The chapter gives a detailed discussion as to why the various research strategies and methods were selected and the rationale behind their selection. Moreover, based on the studies of Mohajan (2018) and Taherdoost (2016), which regard sampling as an important component of any research study, this chapter of the thesis discusses the procedures that were applied in the selection of the relevant samples that were interviewed in the study.

## **4.2 Overview of research philosophy and research paradigm**

The research process, as mentioned earlier, entails a series of interactive processes that work together towards the achievement of the research aims. The suggestions of Cuervo-Cazurra *et al.* (2017) in the “research onion” propose that these processes ought to be in harmony with each other if the inferences made in the research are to be valid and reliable. Through the processes of gathering, analysing and applying the data in the research study, the research is guided within a set of beliefs. This is why Kumar (2019) notes that the manner in which a research study is conducted can be conceived of within the wider framework of a research philosophy. The concept of research philosophy thus entails the beliefs of the researcher regarding the manner in which information should be obtained and applied in the study. In his discussion of research philosophy, Taherdoost (2016) notes that the epistemology of the study, which is essentially that which is known to be true, is much more applicable than the doxology of the study, which is that which is believed to be true. Understanding the frame of mind of the researcher in the development of the research is critical in the interpretation of the outcome of the study (Basias & Pollalis, 2018).

### **4.2.1 Philosophical stance and research paradigm**

Ontology is classified into subjectivism and objectivism (Basias & Pollalis, 2018). Within the domains of objectivism, the ontological dispositions perceive objects within the prism of what Teddlie and Tashakkori (2006) describe as “social actors”. Accordingly, the ontological dispositions in research contend that reality can only be conceived outside social factors. This is in contrast to subjectivism, which is concerned with the various social phenomena that emerge from the consequences of the social factors that are concerned with the existence of these phenomena.

This research study embraces both the subjectivist and objectivist ontological viewpoints of knowledge. The qualitative aspect of research relies on the opinions and feelings of the participants in the study to generate knowledge. This is discussed within the suggestions of Rahman (2017) and Kumar (2019), to the effect that knowledge can be perceived from the subjective dispositions of participants in the study. While discussing the stakeholder management models in the Kenyan ICT sector and the need to develop an assessment tool for assessing stakeholder integration, the study proposed to interrogate various entities in the ICT sector in Kenya. This was largely done within the subjectivist ontological philosophy, which contends that knowledge can be generated from the conceptions and consequences of the various social actors that are largely concerned with their existence.

The quantitative aspect of this research was achieved within the objectivist ontological perspective. The very foundation of quantitative research is that it uses statistical analysis to reach certain conclusions. What can be adduced herein is that “reality” and “objectivism” emerge in the sense that the generated knowledge is viewed entirely objectively. No personal opinions are required in the objectivist ontological perspective. The study equally adopts a positivist philosophy, which lays emphasis on measurement as an avenue through which factual knowledge can be established (Rahman, 2017). Notably, positivism is predicated on the notion that the researcher is only limited to the collection of relevant data, which is then used to conduct relevant statistical analyses to generate knowledge. The essence of positivism is to “explain” and “predict”, meaning that a sample is studied, and the trend of the outcome is extrapolated to the general population (Basias & Pollalis, 2018). It is equally notable that the study embraces the interpretivist research philosophy, which notes that human interests are the drivers of knowledge which is based on the opinions and feelings of the participants in the research study. The adoption of the qualitative design in this study affirms that the interpretivist

research philosophy was adopted in the study. Tables 4.1 and 4.2 below provide some of the perceived strengths and weaknesses of the two philosophies applied in this study.

**Table 4.1:** Advantages and disadvantages of interpretivism

<b>Advantages</b>	<b>Disadvantages</b>
Associated with high level of validity since data in such instances is trustworthy.	The approach is subjective, meaning that it leaves room for bias.
Data is easier to obtain since not very many respondents are interviewed during the research process.	The primary data obtained in the interpretivist approach cannot be extrapolated, since it heavily relies on personal views and opinions.
The approach in research is considered holistic and contextual, meaning that an in-depth study of an issue can be undertaken.	Very intensive in terms of resources; data collection process and analysis are intense.
Data collection and analysis can proceed simultaneously.	It poses a possibility of low reliability if the data collection process is not managed well.

**Source:** Author (2020)

**Table 4.2:** Advantages and disadvantages of positivism

<b>Advantages</b>	<b>Disadvantages</b>
Data can be extrapolated to reflect the general thinking of the whole population.	Development of a data collection tool that reflects the research objectives is difficult.
Data analysis may be technical but takes less time.	Process of data analysis requires immense technical knowhow.
Quantitative approaches applied in positivist research are more reliable.	Inflexible, since the approach requires the belief that everything can be measured and calculated.
Positivism follows a well-designed structure during the research process.	Strong belief that objective inferences and conclusions can only be achieved if the person doing the observations is objective and disregards his or her emotions.

**Source:** Author (2020)

### **4.3 Research approach**

The development of any research study relies on a framework of arguments that guides the whole study concept (Rahman, 2017). Rahman (2017) further notes that before the conceptualisation of any study, the researcher has to be in full cognition of the approach or argument that is intended to guide the study. Is an entirely new theory being developed or is it building on existing knowledge? The whole research approach is premised on the dimension of argument in the research. Is its form general or specific or otherwise? Kumar (2019) identifies three research approaches – deductive, inductive and abductive. In this study, the inductive and deductive approaches were applied.

#### **4.3.1 Deductive approach**

Saunders (2007) identifies two research approaches in his research methodology model. The deductive approach, according to Saunders (2007), develops a hypothesis from an already existing hypothesis. The deductive research approach hinges on the notion that knowledge can be transformed from a very general perspective into a specific perspective. According to Rahman (2017), a general theory of knowledge is first of all developed within the deductive model, then the specific aspect of knowledge that is gained from the research is tested against it. Within the context of this research, the deductive approach entailed showing that stakeholder integration is a crucial aspect of enhancing ICT project outcomes. Deductive research explores a theory that is already known then proceeds to test if the theory is valid in certain instances. It is already known that stakeholder integration is a very important aspect of project management theory. However, this research study, in full cognition of the relevance of stakeholder integration in project management theory, proceeded to develop a stakeholder integration assessment tool.

### 4.3.2 Inductive approach

On the contrary, the inductive research model is keen on creating a new theory as opposed to developing an already existing theory (Teddlie & Tashakkori, 2006). The inductive approach is characterised by a shift from specific towards general in the sense that no framework is applied in the data collection; this can be formed after the data has been entirely analysed and the relevant inferences made (Creswell *et al.* 2007). This is a common method applied in qualitative research and was used in this research study. The proposals made by the participants in the study regarding stakeholder integration in ICT projects were used to generate an assessment tool for assessing the extent to which research projects have applied and continue to apply stakeholder management theories. It can therefore be suggested that this research applied both the inductive and deductive research approaches in the development of an assessment tool for ICT projects in Kenya. Tables 4.3 and 4.4 below summarise some of the perceived strengths and weaknesses of the reasoning methods applied in this study.

**Table 4.3:** Advantages and disadvantages of deductive approach

Advantages	Disadvantages
Time saving since it is straight to the point; Can be simpler because one argues.	Requires a very technical exploration of issues since one has to test a specific hypothesis.
Study or research begins from known theories to unknown, providing a framework for a deeper discourse on the phenomena under research.	Requires a very detailed methodology.

**Source:** Author (2020)

**Table 4.4:** Advantages and disadvantages of inductive approach

<b>Advantages</b>	<b>Disadvantages</b>
Very elaborate and extensive; this means that the study outcomes are very detailed.	This approach does not encourage divergent thinking.
Research is based on empirical evidence, thus limiting instances of research bias.	It is limited in terms of scope as well as inaccurate references.
Research is easy to relate to, since one argues from a specific to a general phenomenon.	It only comes to a probable conclusion. It can also be very subjective, since no inductive argument goes beyond the initial premises.
Flexible: the researcher does not have to follow a specific model of research.	It dictates that a large sample of observations is required to yield a sound conclusion.

**Source:** Author (2020)

#### **4.4 Research methods adopted for this study**

The framework of research methods as well as the techniques applied in the study constitute the research design (Rahman, 2017). The study framework gives the research a template or the bounds of the research process in terms of the techniques applied in the collection and subsequent analysis of the data collected in the research. It allows the researchers to be able to select the approaches in treating the data collected in the study in line with the objectives of the study. The study adopted mixed methods research design, specifically, exploratory sequential design, where the qualitative findings were validated through the quantitative research findings.

##### **4.4.1 Qualitative research method**

Qualitative and quantitative methods of research have often been juxtaposed as representatives of two designs of study relevant in a rational enquiry (Mohajan, 2018). Qualitative research studies are based on exploratory models, which are used to gain a deeper understanding of opinions and motivations as well as the reasons behind certain phenomena. The essence of qualitative research is to enable the researchers to provide certain insights into the problem under study by evaluating the opinions of specific

participants considered to be well versed with the phenomena under study (Fletcher, 2017). The very nature of qualitative data is non-numerical (Basias and Pollalis, 2018). Since the data, or rather the information, is based on the feelings and opinions of specific individuals, it follows that the information contained in qualitative data does not follow the numerical attributes that is notable in the quantitative model of research (Silverman, 2016).

The essence of qualitative data hinges on the ability of the method to uncover emerging trends in terms of the opinions and thoughts of the respondents regarding the research problem. Flick (2014, p. 542) suggests that qualitative research *“is particularly interested in offering a consummate analysis of the subjective meaning or the social production of issues, events, or practices by collecting non-standardised data and analysing texts and images rather than number and statistics”*. This definition of qualitative research, in essence, seems to stress the manner in which individuals are able make sense of phenomena in society. Denzin and Lincoln (1994, p. 2) claim that qualitative research is *“multi-method in focus, involving an interpretive, naturalistic approach to its subject matter”*. From this definition, it is indeed apparent that a qualitative research study has multiple perspectives; little wonder Flick (2014, p. 542) defines it as *“an array of interpretive techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world”*. In this regard, it follows that qualitative research is an overarching concept within which various issues can be placed.

#### **4.4.2 Quantitative research method**

Bryman (2012, p. 35) suggests that the concept of quantitative research lays emphasis on *“quantity”*. Notably, the quantitative research design involves calculating something about the data. This research method seeks to offer a comprehensive investigation regarding the question of *“how many”, “how much”* and *“to what extent”* (Rasinger, 2013). In essence, the quantitative investigation stresses measuring variables in the data. This means that the type of data that is collected in quantitative research is numerical in

nature. Rahman (2017) talks of quantitative data being keen on “*separating the social world into empirical components*”, otherwise referred to as variables. These variables, as earlier intimated, are represented numerically either in terms of rate or frequency. The associations of these variables can be established through various statistical analyses (Basias & Pollalis, 2018).

The selection of the quantitative model of research as part of this study is supported by the discussions of Fletcher (2017) and Silverman (2016), in the sense that the outcomes of quantitative studies can be generalised. Carr (1994) notes that “*the quantitative findings are likely to be generalised to a whole population or a sub-population because it involves the larger sample which is randomly selected*”. The responses of the relevant participants in this study were extrapolated to apply to ICT project practitioners in Kenya based on the assertions of Fletcher (2017) regarding generalisations of sample responses to the point of interest.

#### **4.4.3 Mixed research method**

The QUAL-QUANT research model is developed from the systematic combination of qualitative and quantitative study designs. In essence, the mixed method, as adopted in this research, triangulates the qualitative findings with the quantitative findings. The adoption of the mixed research method in this study was based on the question of validity (Tsui *et al.*, 2018). The integration of the qualitative and quantitative research models aids in the collection of very rich data relevant for the study. The qualitative data collection strategy developed in this study comprised interviews with open-ended enquiries – an approach that complements the closed-ended questions in the quantitative method of data collection. What this means is that the data collected from these two approaches of research had a greater reach in terms of contribution to the research objectives (Rahman, 2017). At the same time, the mixed method offers a platform through which the results from the two methods of research can be compared. As revealed earlier, this is a question of validity in the sense that the findings from qualitative research are validated by the outcome of the quantitative research.

Qualitative research approaches have been noted to be crucial in the provision of rich as well as detailed analysis of individual opinions regarding a subject matter. By design, qualitative approaches seek to evaluate the opinions and experiences of interviewees in respect to the theme under study (Mohajan, 2018). Based on this, what is seen clearly is that the qualitative research method is very detailed; through participants discussing their experiences and opinions regarding a subject matter, any form of qualitative analysis inherently comes out as a very detailed discourse. Rahman (2017) suggests that it *“looks deeper into the opinions of the respondents”*. This informed the selection of the design in this study. The selected participants in the study were professionals with significant experience in the area of ICT projects in Kenya. In this respect, the assumption was that these respondents have vast knowledge and experience in managing these ICT projects, meaning that their opinions and experiences are valid for making meaningful inferences regarding the need to develop a validation tool for stakeholder integration in the ICT sector.

An ethnographical approach was employed in the research study, and this was critical in the creation of openness and the stimulation of individuals sharing their experiences. Ethnography, while restricted to the study of the cultural subscription of the respondents, also means that the operational cultures of the respondents were taken into account. In the qualitative data collection process employed in the study, the operational cultures of the respondents were considered in the sense that the specific details of the operations of these companies in the context of stakeholder integration, project complexity and key performance metrics of ICT projects were discussed (Rapp, 2017). The research was keen on assessing the current operational practices that are employed by the respondents in their ICT projects and then assessing the implications of the practices in terms of stakeholder integration, project complexity and key performance metrics of ICT projects. The selection of the qualitative method of study in this sense was based on a quasi-

ethnographic model and this essentially improved the understanding of the individual experiences in terms of the stakeholder management theories adopted by these organisations (Blomberg, Burrell & Guest, 2009).

The adoption of a qualitative method in the research study therefore hinged on two attributes of qualitative design studies. One was the depth of the collected data in the study. This was based on the suggestions of Cuervo-Cazurra *et al.* (2017), who note that the methods of data collection applied in a qualitative study method allow for a broader understanding of the key issues being researched. To put this into the perspective of this study, the adoption of a semi-structured model of enquiry under the qualitative research model was very detailed as stakeholder integration, project complexity and key performance metrics of ICT projects were discussed in detail, and the development of a tool for evaluating stakeholder integration, project complexity and key performance metrics of ICT projects was also discussed. Another justification for the adoption of the qualitative design was based on the suggestions of Blomberg, Burrell and Guest (2009) regarding the openness and experiences of the respondents. Adopting a qualitative model of study offered the respondents a chance to be able to share some of their experiences in ICT projects in terms of stakeholder integration, project complexity and key performance metrics. This was why the quasi-ethnographic model was chosen, so participants could discuss some of their practice experiences as related to ICT project management and stakeholder integration. Tables 4.5 and 4.6 below provide a summary of the strengths and weaknesses of the two research methods utilised in this study.

**Table 4.5:** Advantages and disadvantage of qualitative research method

<b>Advantages</b>	<b>Disadvantages</b>
Very broad in terms of discussion.	Outcome ought not to be extrapolated; Personal bias prominent.
Looks further and deeper than just the numerical evidence provided; looks for new categories.	Data to be analysed is voluminous and detailed.
Looks for trends in the data, thus is comprehensive.	Requires an elaborate research process.

**Source:** Author (2020)

**Table 4.6:** Advantages and disadvantages of quantitative research method

<b>Advantages</b>	<b>Disadvantages</b>
Can involve a huge number of respondents.	Data analysis requires immense technical knowledge.
Data collected not voluminous.	Data collected is narrow.
Limited chance for research bias compared to qualitative techniques.	Results only carry numerical discussions rather than detailed narratives.
Research outcome can be extrapolated to the general population.	Limited in scope.

**Source:** Author (2020)

#### **4.5 Research strategies adopted in this study**

Within the larger context of a research method, the onus is on the researcher to strategise the manner in which to approach the study. Creswell *et al.* (2007) suggest that the concept of a research strategy emanates from the options for treating the information that has been collected from the design phase of the study. According to Leech and Onwuegbuzie (2009), the research strategy applied in a research study is all about the method that was applied by the researcher in synthesising the collected data. Under the qualitative research method, Teddlie and Tashakkori (2006) propose several research strategies, such

as grounded theory, phenomenology, case study and ethnography. The quantitative research method employs experimental, correlational, descriptive and causal strategies. In this study, the adopted strategies under the qualitative research method included phenomenology and grounded theory. Within the precincts of quantitative design, descriptive and correlational strategies were applied.

#### **4.5.1 Phenomenological study**

The phenomenological qualitative method of research, according to Leech and Onwuegbuzie (2009), is based on evaluating the experiences of individuals regarding specific issues under study. The concept of phenomenological qualitative research method hinges on the idea that human experiences form a very important background through which knowledge can be extrapolated (Leech & Onwuegbuzie, 2009). The philosophical basis of phenomenological discourse is founded on the interpretivist research philosophy, which proposes that knowledge of phenomena can be generated from the analysis of the feelings and opinions of individuals in society – feelings and opinions that emanate from their experiences in life. The phenomenological design was evident in this research in the sense that the method applied in the development of an assessment tool for ICT project delivery relied on the feelings and opinions of various practitioners in the ICT sector. At the same time, grounded theory was applied in the study through the qualitative approach.

#### **4.5.2 Ethnography**

Ethnographic research study individuals within their cultural context (Campbell & Stanley, 2015). The objective of the ethnographic study is to narrate the cultural disposition of the community, or the individuals being studied and explain the rationale behind their practices. As a branch of anthropology, ethnographic studies explore the cultural phenomena of a community through a number of theories. As a methodology of inquiry, ethnographic research relies heavily on the observations made on the participants. Essentially, the researcher participates in the study setting with the

participants in the study. Usually, the researcher is only engaged in the observation of the participants and then subsequently documents the observations from the research. As discussed by Basias and Pollalis (2018), ethnographic studies enable the researchers to detail the patterns of interactions that the participants have in their social contexts and use various sociological theories to be able to explain these interactions

Generally, ethnographic research applies qualitative research methods to achieve their objectives. Even through there are instances where quantitative data has been applied in the permutation of individual behaviors in their social contexts, the primary research method applied therein has been the qualitative research design. In a number of research studies involving the ethnographic model, mixed design approach has been applied with very valid outcomes (Creswell *et al.*, 2007). Even though the ethnographic study model has been noted to be an important approach in not only predicting and understanding human behavior, but it has also been observed that the research method is replete with a number of disadvantages in terms of the achievement of the study objectives. For example, Basias and Pollalis (2018) argued that the participants are likely to act whenever the researcher is around documenting the behavioral constructs that are to be measured. This means that the outcome of the observation may not reflect the truth as it ought to be since the participants are likely to act up during the observation influenced by the presence of the researcher.

#### **4.5.3 Grounded theory**

Grounded theory, as a type of qualitative research design, allows theories to be derived from the collected data in the study (Creswell *et al.*, 2007). Within the precepts of an inductive study model, attempts were made in the research to come up with the relevant stakeholder integration theories that guide project management in ICT in the Kenyan context. The application of grounded theory was evident in the sense that the experiences of ICT practitioners in the management of stakeholders in Kenyan ICT projects were used to generate tool for, or rather a theory of, integrating stakeholders in the delivery of these

projects while being cognisant of existing project complexities and performance metrics. Teddlie and Tashakkori (2006) opine that grounded theory is framed within the phenomenological approach, except that new theories or knowledge are generated in this instance. In the development of a stakeholder integration tool for the Kenyan ICT sector, it was evident that a new form of knowledge was developed, which aids in the management of stakeholders in Kenyan ICT infrastructure projects.

#### **4.5.4 Descriptive research**

The descriptive aspect of the research was evident in the analysis of the various phenomena related to stakeholder integration, project complexity and performance metrics in Kenyan ICT infrastructure projects. According to Leech and Onwuegbuzie (2009), as a quantitative research method, the descriptive research model seeks to give a very clear description of the identified variables in the research. The population of the study is defined and explored in descriptive research (Campbell & Stanley, 2015). The adoption of this design in the study was meant to outline the attributes of the samples that participated in the research. Moreover, the descriptive model, as applied in this study, was meant to establish the data trends evident in the research and, most notably, set a base for further detailed analysis of the research. This was particularly applied in the quantitative aspect of the research study.

#### **4.5.5 Correlational research**

The correlational research design studies the extent and the direction of relationships amongst variables in a study (Edmonds & Kennedy, 2016). It allows the researcher to establish the trends as well as patterns of relationships amongst variables. In the development of an assessment tool that comprised the variables of stakeholder integration, project complexity and key performance metrics, it was imperative that the types of relationship that exist amongst certain variables were evaluated and that the extent to which they are related was computed (Campbell & Stanley, 2015). The adoption of the correlational design for the quantitative study was thus applied in addressing the

extent to which the linear relationships amongst these variables can be interpreted in the development of an assessment tool for enhancing the delivery of ICT projects.

#### **4.6 Phase One: Qualitative research method**

##### **4.6.1 Steps taken in carrying out the qualitative research.**

Basias and Pollalis (2018) give a general framework for carrying out qualitative research. In the analysis of qualitative research data, they propose a five-step process. The study proposes that the foundation of the study is the assessment of the research questions to be answered. Focused questions are central to the qualitative research process in the sense that the researcher ought to be well aware of the questions that the whole research seeks to answer. Subsequently, it is imperative that the design of the study is well-developed. In this phase of the study, the researcher concentrated on the question of “who” the study was collecting information from, “when” the information was collected, and “how” this was achieved. Consequently, the data collection model, based on the question of “how” discussed previously, was developed, after which the analysis and the inferencing was undertaken (Silverman, 2016).

This research study adopted the five-step model of qualitative research developed by Basias and Pollalis (2018). In the initial sections of the study, the research questions that were to be answered were developed. The study focused on the development of the assessment tool that would be applied in the achievement of stakeholder integration and the enhancement of infrastructure performance improvement in Kenyan ICT projects. In order to develop this tool, the study evaluated the sorts of enhancements applicable by infrastructure policy makers and senior project practitioners to improve Kenyan ICT projects. Moreover, it was the interest of the research study to be able to evaluate what sorts of impact well-developed stakeholder integrated plans have regarding the delivery of ICT infrastructure projects in Kenya. To further validate the assessment tool applicable in Kenyan ICT infrastructure projects, the research was keen on evaluating whether the

current performance metrics being used by ICT infrastructure policy makers and senior project practitioners in Kenya are specific and measurable as well as relevant to ICT infrastructure planning and stakeholder integration in Kenya. This was in addition to the evaluation of whether stakeholders in ICT infrastructure projects have been able to prioritise and ensure that there is a holistic end-to-end commitment to realise defined benefits along with assigned ownership and responsibility for adding value through the ICT infrastructure planning realisation process.

The sampling model developed before the collection of the qualitative data targeted ICT policy makers and senior ICT project practitioners based in Kenya. Independent policy makers in the ICT sector, such as ICT infrastructure consultants, were considered to be the primary implementers of the Kenyan ICT infrastructure vision; therefore, their input was relevant in the development of a stakeholder integration model for Kenyan ICT projects. The professionals interviewed in the research were picked from government funded as well as privately funded ICT projects in the country. The privately financed projects are those that have been entirely financed by private entities and have no government interest in terms of pecuniary obligations, does this mean the government still has some input in terms of regulation? Not quite clear; the government-funded or -facilitated projects are those that are directly funded and implemented by the government. A total of forty-seven participants were interviewed, consisting of ten ICT policy makers and thirty-seven senior ICT project practitioners.

#### **4.6.2 Participant selection**

The interest of the research study is to develop an assessment tool for ICT stakeholder integration and infrastructure performance improvement in the Kenyan ICT sector. This confined the qualitative study to the ICT sector within the Kenyan economy. The population of interest were the practitioners in the Kenyan ICT sector who are involved in the implementation of ICT infrastructure projects within the Kenyan economy. The selection of a population of study was based on the relevance of the population in

responding to the research objectives that the study aims to achieve (Suri, 2011). The locus of the research participants in a study ought to be evaluated in terms of the extent to which they are experienced in the field of interest that the study is keen on researching, as well as their accessibility. These two factors were taken into consideration when coming up with the firms from which the participants to be interviewed would be selected. The other aspects of consideration in the inclusion of these firms in the study were the following:

- i. The firms had to be currently involved in the implementation of active ICT projects in Kenya.
- ii. The firms had to have been involved in the active implementation of ICT projects in Kenya for not less than eight years cumulatively.
- iii. The projects that were being implemented by these firms were not less than \$500,000 in terms of capital outlay.
- iv. The implementing teams of the ICT projects in the firm had to be composed of Kenyans. This means that the project had to be directly implemented by Kenyans on the ground.

The study, having taken into consideration all the factors above, used an inclusion criterion through which the participants for the qualitative research interviews were selected. The profiles discussed below identified twenty-three firms or entities who were selected under this inclusion criteria to participate in the study. It was notable that some of the entities that were identified in the study for the selection of the study sample were government departments under various ministries but were not entirely independent companies. This hinged on the notion that they were directly involved in the implementation of the ICT projects. The interest of the study was the implementing agencies or entities. This research considered a “company” not in a legal sense but based on the unit that was implementing these ICT programmes. This was based on the notion that if the stakeholder integration tool was to be developed, then it was imperative that

those who are directly involved in the programme implementation were considered. As mentioned earlier, the projects are either under the PPP model of capital investment or are entirely funded by the government of Kenya. In line with the confidentiality policy in research studies and as highlighted by Simons and Usher (2000) in their discussion about ethical principles in research studies, these companies were abbreviated using letters of the alphabet (*Company A–V*) and are outlined in the participant profiles below.

### **Company A**

Company A, a telecommunications company, was founded in 1965. The company operates in a multinational arena in the provision of information technology products and services. It covers 130 countries worldwide. Company A is recognised for the technological solutions it offers its customers. Commitment to innovation has placed it at the forefront in the development of technological products, including the recent 5G network. Currently, it has over 6.4 billion subscribers.

### **Company B**

Company B is one of Africa's leading communications solutions providers. The company's presence in East, Central and South Africa gives it a formidable status in technological solutions. The connectivity it provides is top class, as is the hosting functionality of the company. The company has massively invested in fibre networks and data centre technology in Africa. Additionally, it offers leading cloud-based services across its fibre footprint. Company B strives to enhance its customer experience through its combined offering in the digital era.

### **Company C**

Company C is a Kenyan company established in 1999. The mandate of the company is to serve higher education and research institutions. The company focuses its efforts on the provision of internet to the institutions. The company's strategic blueprint commits to the provision of technological solutions to its customers. The company plays a key role in leading ICT-based education.

### **Company D**

Company D is a body corporate domiciled in the ICT ministry in Kenya with a mandate to rationalise and streamline ICT functions. The corporation is required to oversee government electronic communication and enforcement of ICT standards. The company works on the capacity of ICT as well as education to allow innovation that solves day-to-day problems.

### **Company E**

Company E owns an extensive ICT data infrastructure that operates throughout Africa. The infrastructure has enhanced the capacity to provide technological solutions to catapult economic development in the continent. Its ability to come up with new solutions and its subsequent deployment in response to user requirements is laudable.

### **Company F**

Company F was founded in 2006 in Kenya. The company provides integrated ICT solutions to enterprises. The company is known for its provision of high-value, innovative technological solutions. Customer satisfaction is guaranteed through its application of strategic technological partnerships, high compliance, quality improvements and high levels of efficiency.

### **Company G**

Company G is a big telecommunications company in the Kenyan market. Company G was the first company to have 3G technology. The company offers state-of-the-art technological solutions that have revolutionised people's lives and how businesses operate. The technology products it offers include telephone services, money transfers, fibre optic services, e-commerce platforms and cloud computing solutions.

### **Company H**

Company H is a leader in the provision of integrated communications. The company also focuses its technological development efforts on the provision of enterprise technology-based solutions. The company has partnered with global players to deliver broadband internet solutions and cloud solutions as well as web development and mobile applications development.

### **Company I**

Company I is headquartered in Nairobi, Kenya, and is among the largest well-established ICT companies. The company has expanded its coverage and moved to the neighbouring countries, i.e. Ethiopia, Burundi, Uganda and Rwanda. The company provides ICT solutions to governments and corporations.

### **Company J**

Company J is a Facebook division. The connectivity needs of users led to the birth of the division to handle matters related to Facebook connectivity. The division partners with the mobile network companies as well as internet providers to enable the provision of fast, affordable and reliable Wi-Fi hotspots in public spaces.

### **Company K**

Company K is an authority mandated to regulate communications in Kenya. The authority facilitates the development of the ICT sector in the country. The scope of the mandate includes broadcasting, cybersecurity, telecommunications, e-commerce, multimedia and courier and postal services.

### **Company L**

Company L is a technological company in Kenya. The company's network coverage is 80% of the Kenyan population. It is a low-cost leader through value-for-money solutions. It offers formidable competition in the telecommunications market, which is monopolised by a few key players. The low-cost model makes it an option for users for their telecommunications needs.

### **Company M**

Company M is a telecommunications company that offers internet services to public and private organisations. The company is a subsidiary of the Dimension Data group. The company has a big data centre space in Africa. Indeed, the company has commanded space for the provision of technological solutions.

### **Company N**

Company N is based in South Africa and has operated since the early 2000s. The company has over 20 million subscribers. The company offers 2G, 3G and LTE services. The company has rolled out its LTE technology, which has high download speeds. Company N operates on three key bands: 900 MHz, 1800 MHz and 2100 MHz.

### **Company O**

Company O is a carrier, cloud and vendor-neutral data centre provider. The company provides renowned cloud solutions and data centre services. The company has a data centre hub with 18,000-plus connections. The company was the first to provide a highly resilient, vendor-neutral data hub in sub-Saharan Africa. Company O is the backbone of Africa's internet.

### **Company P**

Company P, a multinational Chinese technology company, deals with the provision of telecommunications products. The products are mainly in the category of consumer electronics. The company also provides operators in the telecommunications sector with the necessary equipment to support the building of operating networks. It also offers consultation services to boost companies' operational efficiency.

### **Company Q**

Company Q is a multinational US-based technology company. The company specialises in the provision of internet services as well as technological products. It has a globally used search engine and cloud computing solutions. It has also created technological solutions to support online advertising.

### **Company R**

Company R is a Kenyan company with sole responsibility for checking and ensuring that the country has connectivity. It is therefore mandated with the task of ensuring easy communication as well as boosting the delivery of government services. Internet connectivity is a key deliverable and thus the company is focusing on the implementation of the fibre optic network.

### **Company S**

Company S is a system integrator and business partner in the provision of telecommunications, power and ICT infrastructural solutions in East Africa. The company is committed to technological excellence. The user experience is key in the design of its technological solutions. The company has made strides in major partnerships that facilitate its technological discourse.

### **Company T**

Company T is a technological company based in South Africa. The company has properly managed fibre optic connectivity. It offers excellent technological solutions including cloud computing, video conferencing, data solutions such as recoveries and backups, and voice over the IP. The company has adequately invested in fibre installation that serves its customers.

### **Company U**

Company U is an ICT company based in Kenya which develops infrastructure software. The company provides enterprise and network security, cloud security, security architecture and deployment, security assessments, and custom security solutions, as well as offering risk management and professional services.

### **Company V**

Company V is a subsidiary of the government involved in managing project X in Kenya. Project X is a government-led ICT integration project that supports and enhances the attainment of curriculum objectives in Kenyan schools. The project is aimed at transforming the education system and supporting the economy through its ICT solutions.

### 4.6.3 Interviewee selection

The selection of the interviewees in a research study is critical to the development of valid research (Nastasi & Schensul, 2005). The extent to which the inferences made in a research study can be considered to be valid is directly related to the model applied in the selection of the interviewees (Brewer & Crano, 2000). In qualitative research, as discussed by Nastasi and Schensul (2005), only a subset of the population will be selected for the study. In cognition of the relevance of sampling in the advancement of the study, the hybrid model of participant sampling was adopted in this research.

According to Basias and Pollalis (2018), there are instances where a sampling model applied in a research study may be complemented in the study. This means that a researcher, based on his or her own judgement, may deem it fit to integrate two or more models of sampling in order to compensate for the limitation of one sampling model and generate the most suitable sample to be studied. The sampling model employed by this research is based on this hybrid model. Fletcher (2017) talks of the application of the hybrid model of sampling in instances where the researcher is suspicious that the data that is anticipated to be collected from the study would be “imbalanced”. At the same time, the hybrid model comes with the advantage of widening the data boundaries in the sense that the sample identified for the collection of the data would not be limited. In an evaluation of the dangers of having an imbalanced dataset, Seiffert, Khoshgoftaar and Van Hulse (2009) intimate that *“models built on data where the examples of one class are greatly outnumbered by examples of the other class(es) tend to sacrifice accuracy with respect to the underrepresented class in favour of the maximizing the overall classification rate”*. Seiffert, Khoshgoftaar and Van Hulse (2009) therefore propose the hybrid data sampling model as a solution to this problem.

A mixed sampling model essentially solves the problem of a limited study sample. In an evaluation of ICT projects in Kenya, there was a limit in terms of the individuals to be interviewed based on the criteria of inclusion developed in the study. This means that when a multi-stage model of sampling is applied, it becomes more likely that the desired number for inclusion in the research will be realised. Seiffert *et al.* (2009) further suggest that by adopting different models of sampling in a study, there is a sense in which a rich variety of sampling methodologies are applied in the study to enhance the validity of the outcomes. Based on the argument made by Fletcher (2017) and Seiffert *et al.* (2009), from the population of twenty-three entities implementing ICT projects, this study clustered the possible interviewees into the following groups:

- i. ICT policy makers
- ii. Senior project practitioners
- iii. Project engineers
- iv. Project consultants
- v. Project management teams
- vi. Project directors
- vii. Project planners

The qualitative research anticipated and ensured that all of these interviewees were included in the research study across the twenty-three entities that were selected in the study. The essence of this inclusion was to ensure that the research captured a variety of responses across several project implementation actors in order to draw well-grounded conclusions based on the experiences of the respondents. Looking at the pool of respondents that the study anticipated interviewing, it was notable that their core objectives were confined to the following aspects of project management: project forecasting, project controls, project planning, project management, coordination of projects and coordination of project resources.

#### 4.6.4 Sampling strategy adopted

McCusker and Gunaydin (2015) group sampling into probability and non-probability sampling methodologies. The probability sampling techniques adopt some form of random selection, so that all the participants that are to be included in the study have an equal probability of being selected for the study (Moser & Korstjens, 2018). Simple random sampling is an example of the probability sampling model. Other examples of the probabilistic model include the stratified sampling, random cluster sampling and systemic sampling models. The application of the probabilistic model of sampling is predicated on the notion that it reduces sampling bias, especially in very diverse populations. Moreover, it is a very important approach in the creation of an accurate sample to be studied. The non-probabilistic model of sampling is predicated on the need to identify specific units within the population that the researcher aims to study. The selection of the samples for this study was based on what Fletcher (2017) describes as the “subjective judgement” of the researcher. This essentially means that the probability of participants being selected for the research was not equal. In essence, therefore, based on the subjective nature of the strategy, it follows that the inclusion criteria were biased. Suri (2011) describes purposeful sampling as involving the identification of “*information rich cases as related to the phenomenon of interest*”. It is a type of non-probability sampling model where the researchers base their selection of the respondents according to their own judgement but guided by their set inclusion criteria. To aid in this purposive model of sampling, the inclusion criteria developed for the research study were:

- i. Years of experience in the areas of project management identified. The respondents were not to have less than five years in terms of experience in discharging their various roles in the sector.
- ii. Roles and responsibilities of the respondents in their project management responsibilities. This could be in terms of forecasting, control, planning, management, or coordination of resources and work. The respondents were to be confined to only these roles.

- iii. Rank above management level in the project management schema.
- iv. The respondents must have been employed for not less than three years in the specific entities from which they were selected.

Based on this inclusion criterion, the initial model of inclusion identified sixty-nine respondents from the twenty-three entities or projects described under the participant selection section. However, it was noted that based on the various designations of the interviewees noted earlier, such as project consultants, project engineers and controllers, there were certain projects that lacked some of these designations in the workplace. This would interfere with the outcomes. Therefore, the purposive model of sampling was employed based on the selection criteria. Only five projects had human resources functions, and this meant that there needed to be a restructured approach to the sampling model. In this context, the study took into consideration the dispositions of Fletcher (2017) and Mujere (2016) regarding sampling for maximum variation, sampling for the study scope, and sampling for data richness.

Table 4.7 gives a summary of the total number of respondents that were considered for the qualitative interviews based on the companies or entities they worked, and their different responsibilities related to ICT projects, as conceived under the inclusion criteria. Evidently, as noted in Table 4.7 below, the absence of some personnel in a number of companies raised the problem of variation in the selection of respondents for the study. For instance, Participant B lacked project management teams but has senior project practitioners whereas Participant L has neither. This problem was partly solved through the hybrid sampling system.

**Table 4.7:** Participant profiles and numbers sampled.

Entities or projects Participant	ICT policy makers	Senior project practitioners	Project engineers	Project consultants	Project management teams	Project directors	Project planners	Total participants
A	2	4	8	5	5	11	1	36
B	3	2	6	2	-	7	3	23
C	-	-	7	2	4	9	-	22
D	1	3	4	2	1	4	4	19
E	3	3	4	2	1	4	4	21
F	3	3	4	2	1	4	4	21
G	4	3	4	2	-	5	4	25
H	-	3	4	-	-	5	4	16
I	1	1	4	-	-	5	6	17
J	1	1	4	2	-	5	6	19
K	1	-	4	2	-	5	6	18
L	1	-	4	2	-	2	6	15
M	4	-	4	3	-	2	3	16
N	2	7	5	3	-	3	2	23
O	1	-	5	3	-	3	1	13
P	2	3	3	-	-	4	1	14
Q	1	3	7	-	1	4	5	21
R	1	2	1	3	1	3	-	12
S	1	1	1	3	-	2	-	8
T	1	-	2	4	-	2	-	19
U	1	-	4	1	-	9	-	16
V	-	-	-	-	2	-	-	2
<b>Total participants</b>	<b>35</b>	<b>39</b>	<b>89</b>	<b>43</b>	<b>15</b>	<b>99</b>	<b>60</b>	

Source: Author (2020)

A quota system based on the suggestions of Etikan and Bala (2017) was developed to select the respondents for the study while taking into account the question of variation and data richness. As illustrated in Figure 4.1, the sampling in the qualitative research followed a hybrid model. In all the entities that were sampled for the study, at least one project engineer was selected for the interview session. This meant that a total of twenty-three interviewees who are project engineers were selected for the study. The consideration was based on the notion that project engineers are involved in the design and implementation of projects and also coordinate project progress. The assumption made herein was that the role of the project engineers somewhat integrates all the other roles of the prospective respondents in the study. Within the precincts of the purposive sampling design, the most senior engineers involved in the projects were selected for the study based on the established criteria of sample inclusion.

In instances where the inclusion criteria were unable to select a participant for the research study, other considerations were made, such as their background in ICT project management and implementation, their level of experience not only in a particular project but also in other engagements related to ICT project implementation. Where no particular candidate emerged, a consensus was reached amongst the company members as to who to select for the interview. In this research, the inclusion criteria applied clearly identified twenty-three project engineers for the qualitative part of the research. This was entirely based on the purposive model of sampling respondents. To be as inclusive as possible and ensure that the respondents selected for the study were as representative of the population as possible, the quota model was considered instrumental in the sense that all project management teams were to be included in the research. The project directors were not included in the quota based on Etikan and Bala's (2017) proposal that their role is somewhat similar to that of the project management team. In this regard, therefore, the research noted that for the ICT policy makers, a total of five interviewees would be picked for the study. At the same time, the senior project practitioners to be included in the study totalled five respondents, the consultants were to take five slots, and the directors and

project planners were to take five slots each. This meant that a total of twenty interviewees were selected for the study based on the quotas developed. The quotas developed were based on the relevance of the teams in the project management schema. For instance, the research was not very keen on the administrative aspect of project management but rather the execution, and so the quota devoted more slots for the teams that were directly involved in the project execution.

A probabilistic sampling model, the random sampling model to be precise, was then applied in the selection of the project ICT policy makers, senior project practitioners, project consultants, project directors and project planners. From the initial assessment, the total number of the project policy makers was noted to be thirty-five, the senior project practitioners totalled thirty-nine, the project consultants' forty-three, project directors ninety-nine and the project planners sixty. To reach the desired frame for sampling the respondents, as noted earlier, the systematic random model of sampling was adopted. A total of fifty respondents were required to form the sampling frame to be interviewed in the research. Therefore, to enable a proper selection of the participants while ensuring any form of bias was eliminated, the sampling frame was established using equation 1 below.

- N = sampling frame number of cases (this was used for every designation in the work)
- n = number of cases in the sample size required in the study
- K= the sample size

Therefore, to establish the sampling frame for the selection of the project policy makers, the formula applied was:

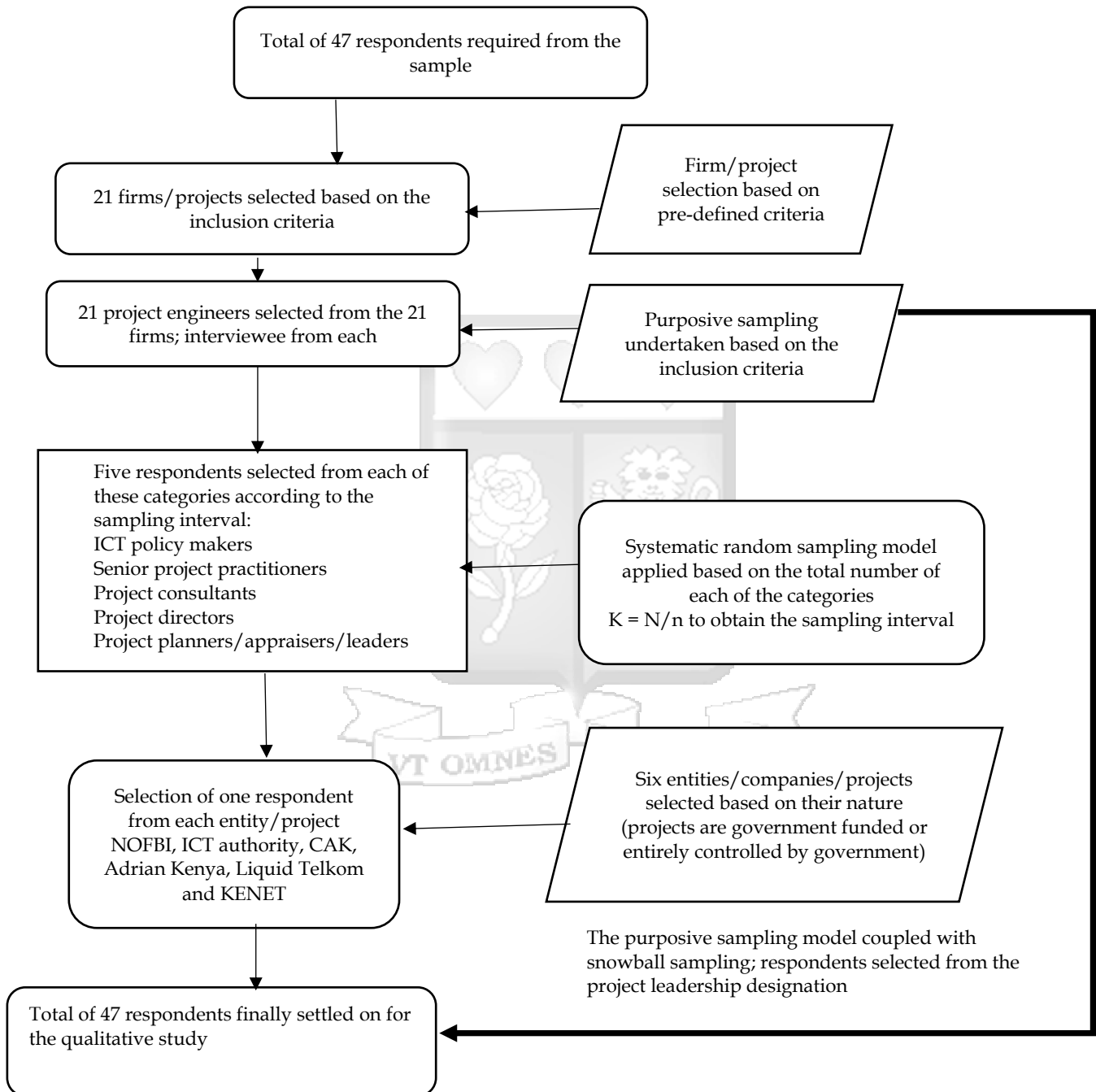
$$\begin{aligned}
 k &= N/n && \dots\dots\dots \{1\}. \\
 &= 35/5 \\
 &= 7
 \end{aligned}$$

This meant that the frame of sampling the ICT policy makers would be after every seventh. This was done to ensure that each of the respondents amongst the selected

entities were offered a chance to be selected for the study. The suggestions of Rahi (2017) were taken into consideration, in the sense that the systematic random sampling model offers each participant an equal chance of being selected for the research study. In order to select the companies/entities or projects, they were to be listed in alphabetical order before the sampling frame was applied. This process was applied to the other designated positions as well. In total, therefore, the number of respondents selected for the interviews was twenty-one project engineers and twenty other respondents that included ICT policy makers, senior project practitioners, project consultants (network engineers), project directors, project planners, project appraisers, project managers, and project leaders. This meant that a total of forty-one respondents were selected for the study.

The discussions of Martínez-Mesa *et al.* (2016) in restructuring sampling models to enhance the research objectives informed the next course of action in modelling the sampling frame for the study. Since the research study was keen on developing tools for the integration of stakeholders in the context of Kenya, it was imperative that the weighting was more towards the firms that have been domiciled within the Kenyan ICT project framework. This necessitated the next approach, whereby seven more respondents were snowballed into the research sample. Since the study anticipated having fifty respondents but had forty-one based on the two sampling models selected, it was crucial that a framework for reaching the targeted number was developed. National Optic Fibre - Kenya (NOFBI), the Information and Communication Technology Authority, the Communications Authority of Kenya (CA), Adrian Kenya, Liquid Telkom and Kenya Education Network Trust (KENET) were selected for inclusion in the next phase of sampling. Specifically, six respondents from the project management teams of these institutions were selected for interview. The selection of the six entities listed herein was based on the nature of their ICT projects, which were exclusively Kenyan. Moreover, some of these entities were domiciled under the Kenyan ICT ministry as implementation vehicles. This means that their projects in the ICT sector were entirely conceived within

the context of Kenya and not entirely profit-making. The flow diagram in Figure 4.1 below outlines the sampling process applied in the research study.



**Figure 4.1:** Representation of sampling strategy

**Source:** Author (2020)

#### 4.6.5 Participant profiles

In total, forty-seven was selected as the final number of respondents who were interviewed for the research. The selection of forty-seven interview participants did not hinge on any scientific procedure but rather was conceived out of the inclusion model developed for the study as discussed earlier. The final list of the participants in the qualitative part of the study is illustrated in Table 4.8 below. For the purposes of data analysis, the entities or project participants were coded using letters of the alphabet.



**Table 4.8: List of participant profiles**

Participant	Current job title	Type of contract	Gender	No. of years worked	Role and responsibility
A	Regional director	Main contractor	Female	20	Managing projects
	Project manager	Sub-contractor	Male	10	Coordination of work
B	Project director	Sub-contractor	Male	9	Managing projects
	Project planner	Sub-contractor	Male	6	Planning projects
C	Project manager	Main contractor	Female	8	Managing projects
	Network manager engineer	Main contractor	Male	17	Network expansion, building and upgrade
	Project manager	Main contractor	Female	5	Managing projects
D	Chief network manager	Main contractor	Male	7	Coordination of network expansion
	Project engineer	Main contractor	Male	12	Coordination of work
	Project planner	Main contractor	Male	6	Planning projects
	Transmission engineer	Main contractor	Male	19	Network expansion
	Project manager	Main contractor	Female	13	Managing projects
E	Project appraiser	Main contractor	Male	9	Evaluates projects
	Network operation engineer	Main contractor	Male	19	Coordination of network expansion
	Project manager	Sub-contractor	Male	8	Managing projects
	Assistant project manager	Main contractor	Female	7	Coordination of resources
	Project leader	Main contractor	Male	5	Coordination of work
	Project planner	Main contractor	Female	8	Planning projects
F	Project manager	Sub-contractor	Male	6	Managing projects
G	Regional director	Main contractor		26	Strategy and new services
	Project manager	Sub-contractor	Male	13	Managing projects
	Head of project management	Main contractor	Male	22	Connectivity and special projects
	Network operation engineer	Main contractor	Male	23	Coordination of network expansion
	Project planner	Main contractor	Female	10	Coordination of work
	Assistant project manager	Main contractor	Male	9	Coordination of resources
	Project leader	Main contractor	Female	7	Coordination of work
	Project director	Main contractor	Male	20	Director of corporate standards
H	Project manager	Sub-contractor	Female	12	Managing projects
	Project planner	Sub-contractor	Male	6	Coordination of work
I	Project manager	Sub-contractor	Female	15	Managing projects
J	Project manager	Sub-contractor	Male	13	Managing projects
K	Project manager	Sub-contractor	Male	11	Managing projects
	Assistant project manager	Sub-contractor	Male	6	Coordination of resources
L	Network operation engineer	Main contractor	Male	17	Coordination of network expansion
	Project manager		Female	14	Managing projects
	Project leader	Sub-contractor	Male	7	Coordination of work
M	Network operation engineer	Main contractor	Male	25	Coordination of network expansion
N	Project manager	Sub-contractor	Male	10	Managing projects
O	Project manager	Sub-contractor	Male	11	Managing projects
P	Network operation engineer	Sub-contractor	Male	22	Coordination of network expansion
Q	Project manager	Sub-contractor	Female	14	Managing projects
R	Network operation engineer	Sub-contractor	Male	18	Coordination of network expansion
	Project manager	Sub-contractor	Female	8	Managing projects
S	Project manager	Sub-contractor	Male	12	Managing projects
T	Project manager	Sub-contractor	Male	14	Managing projects
U	Project manager	Sub-contractor	Female	16	Managing projects
V	Project manager	Sub-contractor	Male	12	Managing projects

## **4.6.6 Data collection method and analysis**

### **4.6.6.1 Focused group discussions**

As well as interviews, focused group discussions have been noted to be an important data collection method. Focused group discussions involve a type of interview that involves the use of a discussion methodology. The topic and the questions to be discussed are introduced in an open discussion with a predetermined number of participants and an outcome is noted (Blee & Taylor, 2002). The essence of a focused group discussion is to enable the participants to have an extensive discussion of the issue being studied; it enables the researcher to understand the opinions of the participants regarding the research topic, and the data collected takes note of any inconsistencies between participants, Baumbusch, (2010). This method was useful during the validation of the assessment tool; the participants were involved in discussions of the variables that formed the assessment tool, which were obtained after data analysis. Despite its significance, the focused group discussion came with a limitation in terms of privacy. It limited the ability of some participants to fully express themselves since the participants were clustered into groups.

### **4.6.6.2 Interviews**

The use of interviews is one of the methods of data collection in qualitative research in which primary research is applied. Baumbusch (2010) notes that the use of interviews in qualitative research is one of the most detailed data collection methods, since information received in this way can be corroborated and discussed. It involves a direct conversation between the researcher and the participants regarding the specific phenomena under study. In qualitative interviews, the conversation can be structured or unstructured but focused on the specific research questions (McCusker & Gunaydin, 2015). In most cases, the questions asked in qualitative research interviews are open-ended questions based on the individual beliefs and opinions of the participants about the research questions being investigated.

Semi-structured interviews rely on open-ended questions developed by the researcher in line with the research objectives to enquire about the proposed questions of study (Kallio *et al.*, 2016). As a data collection approach under the qualitative research method, the semi-structured model has predetermined research questions and the researcher has more control over the enquiry. This research adopted the semi-structured interview approach based on the ability of the strategy to be able to encourage a two-way model of communication. The participants offered detailed insights into their operational styles in relation to stakeholder integration, project complexity and key performance metrics of ICT projects in Kenya, thus enabling the research team to come to meaningful conclusions.

As mentioned by Blee and Taylor (2002), the development of an effective framework for semi-structured interviews is founded on the basis of a candid debate that fully reflects the thoughts of the respondents. The priority is having a well-structured interview session and moving with clarity to meet the objectives of the research. McCusker and Gunaydin (2015) note that researchers must keep their objectives in mind before engaging in these interviews, because the idea is to seek answers to established research questions. The selection of the semi-structured interview method in this research was further based on its application as a rational enquiry into the individual experiences of the respondents regarding stakeholder integration in Kenyan ICT projects and the need to establish the current state of stakeholder management in the Kenyan ICT sector. Data was collected through semi-structured interviews (*see appendix A*). Semi-structured interviews do not necessarily follow the formal outline of an interview (Baumbusch, 2010).

### **Advantages of semi-structured interviews**

- Encouraged two-way communication between the researcher and the participants in the study. This means that the stakeholders in the ICT infrastructure projects in Kenya had a way of engaging with the researcher to establish some of the existing gaps in stakeholder management and integration.
- Allowed for open-ended interrogation, meaning that detailed information regarding the ICT project management and stakeholder integration approaches was established.
- The information from the interviews was compared to other instances of stakeholder integration and the state of stakeholder integration in Kenyan ICT projects was established.

### **Disadvantages of semi-structured interviews**

- Time consuming: each interview session with a research participant took one hour. The data analysis process was equally time consuming.
- In order to assess the current state of stakeholder integration in Kenyan ICT projects, a number of these projects had to be evaluated, meaning that the semi-structured interviews were resource intensive in terms of collection and analysis.
- In order to establish the current state of ICT projects in terms of stakeholder integration, it was imperative that many research participants were interviewed.
- It was possible to interfere with the research findings if the participants were asked leading questions.

Though there was a set of interview questions that was used to guide the interview sessions, the adopted model of interviewing allowed for a broader discussion of the issues mentioned in the interview questions. Notably, the semi-structured model was selected based on its ability to encourage a detailed discussion regarding the topics and

issues mentioned in the research objectives. The interview sessions lasted one hour precisely. The participants were contacted by e-mail or cell phone to establish an appointed time for the interviews. The interviews were undertaken entirely at the convenience of the respondents. The adoption of the semi-structured interview session was equally based on the ability of the model of data collection to allow for clarification of certain issues discussed with the respondents. Dearnley (2005) states that interview sessions offer the researchers a platform through which they are able to ask the respondents for a detailed explanation of their responses.

Upon confirmation of their presence and appointment at the relevant time, the interviewees were required to sign a consent form affirming that they were bound by the terms of the interview session. In line with the proposals of Baumbusch (2010), the questions in the interview were read through by the research team to ensure that the meaning intended was highlighted to the respondents. Data was collected by recording and then was transcribed and fed into the NVivo 11 qualitative data analysis platform. Within certain organisations, data was collected as a group. This was more of a focused discussion amongst the respondents – an approach applied based on subject availability. This meant that the responses were treated as emanating from a single individual. To ensure that this did not influence the internal reliability of the study outcome, it was established that there was a consensus amongst the respondents regarding the contents of the final interview. In the data coding and analysis, these responses were treated as single responses from one individual.

Practices in the development of data collection tools in research have traditionally followed the framework outlined by Moser and Korstjens (2018), in the sense that the tool has to be directly related to the research objectives. Indeed, Mohajan (2018) emphasises that the data collection tool adopted in a study ought to show direct responses to the research questions that have been conceived. Moreover, they ought to directly contribute

to the main theme of the study. The development of the data collection method in the qualitative research part of this study conformed to the suggestions of Moser and Korstjens (2018). The key questions developed were in line with the critical themes that were conceived for the research. Under theme one, the scale of ICT project complexity was explored; under theme two, the nature of stakeholder integration in the Kenyan ICT sector was discussed; theme three was on project performance metrics and stakeholder integration in the Kenyan ICT sector; theme four particularly explored the question of ICT planning and delivery; and theme five considered the concepts of accountability and delivery.

The five themes formed the mainframe of the data analysis in the study. Thematic analysis of data was embraced in the study. The data obtained from the field was transcribed into a text document. The NVivo program was used in the transcription of the data from the audio transcripts to text documents. The responses to each of the questions under the five themes were grouped. In order to make sense of the data, the themes emerging were then framed into a catalogue. This meant coming up with the main points emerging from each of the questions asked under each of the major themes in the interviews. These were catalogued under various codes. Subsequently, the connections between these themes were established. This entailed the development of a list of the nodes and grouping them into specific themes or sub-themes. This also involved developing the comparisons that emerged between these participants. The most important aspect of the qualitative modelling developed in the NVivo platform was to evaluate the emergent themes under the major themes of the research.

#### **4.6.7 Steps taken in collecting secondary data.**

The study predominantly used primary data to review the state of stakeholder integration, project complexity and performance metrics in Kenyan ICT projects. Nevertheless, in the literature review and in the corroboration of the research findings, the research employed secondary data. Greenhoot and Dowsett (2012) define secondary

data as information that has already been collected and is used for reference purposes. This means that secondary research relies on already published information. The use of secondary data was critical in building the theory of this study in the literature review as well as giving evidence about the various research outcomes established in Chapters Five and Six.

The selection of the secondary data for application in this study was based on convenience. In order to find out the situation of stakeholder integration, project complexity and performance metrics in the ICT sector in Kenya, the secondary approaches in research were very convenient to use. Various publications about Kenyan ICT projects were easily available to support the various claims made about them in this research. At the same time, the question of cost informed the idea behind the selection of secondary data in the research study. Secondary data involves desktop research, meaning that documents can be perused at the comfort and convenience of the researcher (Donnellan & Lucas, 2013). No elaborate travelling or logistical challenges were experienced in this research. These were critical considerations for the application of secondary data in the study.

In addition, this research had an immense amount of data to be collected, collated and synthesised – a situation that meant huge volumes of information would be used. Hox and Boeije (2005) opine that in instances where the information collected is vast, secondary data is quite relevant because it comes with some sort of convenience to the researcher. In the context of this study, a number of projects were appraised – including the cyber cabling project (TEAMS) and the NOFBI project as well as other ICT projects – meaning that there was a huge amount of data that was considered to obtain the right information regarding the methods of stakeholder integration, project complexity, and performance metrics and benefits realisation in these projects. At the same time, the nature and state of the ICT sector in Kenya was evaluated, necessitating reliance on secondary research data.

#### 4.6.7.1 Sources of secondary data

The literature review relied on a number of books related to project management. These books were either obtained from online platforms or accessed remotely from the local library. The majority of these books discuss project management models, with quite a number evaluating the concept of stakeholder integration, which is the focus of this research study. However, other discuss broader issues, such as the state of project management in Kenya, the various components of project management in other countries selected for comparison, and the challenges faced in the sector. These books formed critical secondary data that buttressed the literature section of the study. Other than the books, the study also relied on journals, i.e. peer-reviewed research papers.

Online repositories such as EBSCOhost, JSTOR, SAGE, PMI, Wiley, Elsevier and APM were appraised. A number of research papers from the University of Nairobi journal repository, especially related to the Kenyan ICT sector, were also examined. In accessing these journals, a Boolean search protocol was applied to ensure that the quality of the research papers retrieved were aligned to the research problem. The Boolean search protocols in these databases ensured that the journals selected specifically addressed the issues that the literature review anticipated discussing.

Other data that was used in the study included that from administrative reports, especially those from the Kenyan ICT sector. These were able to give a clear report on the ICT industry in the country and also project the trajectory of the sector in the development of the Kenyan economy. Moreover, policy reports were used, especially in the description of the current ICT policies in the country and the impacts thereof in ICT project management. Furthermore, news and other stakeholder reports were important in understanding the state of the ICT sector in Kenya. In some instances, newspapers were utilised but only as supporting documents to the main secondary academic sources used in the study. The study also used government websites to obtain a number of reports considered to be relevant to the advancement of this research.

It is important to state herein that the use of secondary data was not only limited to the literature review. The secondary data was also important in validating some of the statements, or rather conclusions, from the primary research undertaken in the study. As a way of enhancing the validity of the conclusions of any research, it is imperative that the findings from the primary research are juxtaposed with various publications that are relevant to the contents under discussion. In this sense, while the secondary research data was not exclusively used in the research process, certain secondary materials were used to validate the findings of the study, thus giving more credence to the primary findings of the research. For instance, in explaining the levels of ICT project complexity in Kenya, the research was keen on integrating secondary data to supplement the findings of the primary data collected from the participants in the study. In this context, the secondary data was used more as a supportive strategy to the primary data collected. This was to ensure that the conclusions made in the study were not only valid conclusions supported by literature but were also very reliable.

#### **4.6.8 Validity and reliability of the qualitative research method**

The concept of validity in qualitative research is embodied in the “appropriateness” of the methodology of the study. This includes the tools applied in the data collection, the processes of synthesising data and even the manner in which the analysis has been undertaken. The choice of the methodology of the study is considered instrumental in the research process in terms of whether the considered research questions are valid for the outcome or otherwise (Cypress, 2017). In the assessment of the validity of any research study, the challenges can begin from the epistemology as well as the ontological debates on the issues that are being discussed in the research. What this means is that the choice of the research method applied ought to enable the researcher to place the research findings within the relevant context. In terms of sampling, the methods that have been applied ought to be appropriate, particularly for the research paradigm. In this research study, a number of considerations were made to enhance validity in terms of sampling

the respondents, the development of the data collection tool, and the treatment of the data collected from the research study.

Validity in qualitative studies requires consistency as well as a level of trust in the methods applied (Natow, 2020). In the case of internal validity, this research considered triangulation of the collected data. Fusch *et al.* (2018) define triangulation as an aspect of research where the sources of information are corroborated. To develop a comprehensive understanding of the stakeholder integration, project complexity and key performance metrics of projects in the companies and projects selected, it was prudent that the responses from the interviewees were corroborated in one way or another. Cypress (2017) identifies four key aspects of triangulation, all of which were applied in the research. These are: investigator triangulation, data source triangulation, theory triangulation, and method triangulation.

In terms of data triangulation, the responses from single respondents were verified by other staff members in the specific organisations. The suggestions from the respondents that were not very clear were cross-checked with other staff members, especially the leadership, who were instrumental in setting up the interview sessions. In terms of investigator triangulation, this was equally achieved through the cross-checking of responses from the selected participants in the research study. Within the precincts of data triangulation, Natow (2020) opines that it is possible to have a broader source of verification of the relevant data in terms of theory. This was achieved in the development of the study through the literature review; there was more discussion of ICT projects but from a broader view. This was also achieved through the adoption of the mixed study method, where the QUAL-QUANT design of study was applied in the research. At the same time, the research adopted several theoretical frameworks and concepts in order to ensure the validity of the study was assured.

## **4.7 Phase Two: Quantitative research method**

To validate the outcome of the qualitative phase of the study, the quantitative research model was adopted. This involved the adoption of a questionnaire to explore the views of the participants on the concepts of stakeholder integration, project complexity, and their effects on the performance of projects in the ICT sector. The participants in the quantitative study were very senior project practitioners and policy analysts involved in ICT project management. Both government-funded and privately funded projects were the focus of the sampling used in the research study.

### **4.7.1 Quantitative data collection method**

#### **4.7.1.1 Survey**

The survey data collection method is considered to be the most common approach applied in the quantitative research process (Roberts & Priest, 2006). The underlying feature of the survey model is that data is obtained from primary sources; they act as the test pool. Individuals in the study population are sampled using numerous sampling methodologies and interviewed in strict conformity to the designed research objectives. The essence of survey research is that the outcome of the study can be extrapolated to reflect the general population. In the context of this study, the adoption of the survey method is notable in the sense that data obtained from the sample, which had been selected out of the population, was generalised to reflect the general feelings of the entire population. The application of the survey model is based on the question of the cost of research (Campbell & Stanley, 2015). Collecting data using the survey method is cheaper and this is partly the reason it was used in this study. Online surveys have been particularly noted to have a very small cost for each participant and data collection takes a shorter time. There is also the question of reaching a huge number of respondents in order to collect the relevant data and information. These advantages informed the decision to adopt the survey data collection method in the research.

#### 4.7.1.2 Questionnaire design and structure

Canals (2017) offers a framework for the development of a data collection tool in both quantitative and qualitative models of research. The suggestions of Canals (2017) are to the effect that the research objectives and questions have to be the guiding precepts in the development of the data collection tool. In this research, the use of a questionnaire was considered appropriate as a complementary approach to the qualitative model of the study. As noted earlier, this approach was used to validate the qualitative data; it was an approach applied to triangulate the findings or the data from the qualitative research method. The adopted questionnaire model embraced both open-ended and closed-ended questions (*see appendix B*). Moreover, the questionnaire had scaled questions, such as Likert questions, that aimed to measure the level of responses that were adopted by the participants in the research study. A five-point likert-type of scale was used to increase response rate and quality along with ensuring the respondents' frustrations levels are reduced by being able to read out the complete scale descriptor (Babakus and Mangold 1992).

The development of the questionnaire was undertaken through the input of several participants in the study to ensure that the questions that were asked were effectively aligned to the research objectives. To aid in the descriptive analysis of the data, the first sections of the questionnaire sought to establish some general information about the participants in the study. The other section explored the emergent themes in ICT infrastructure project delivery, from which the levels of complexity of Kenyan ICT projects were assessed. These were assessed under the Likert model of questioning. In order to have a deeper understanding of the concept of stakeholder integration in Kenya, the tool evaluated the determinants of ICT stakeholder integration in Kenya. Moreover, the need to develop performance indicators in the Kenyan ICT sector related to stakeholder integration meant the tool needed to assess the key performance metrics in the Kenyan ICT sector as well as project benefits realisation. The open-ended questions

discussed the difficult factors related to stakeholder integration, project benefits realisation and performance and also asked the respondents to develop what they considered to be strategies for improving these factors in the various projects.

Taherdoost (2016) suggests that the reliability of a data collection tool can be affirmed through pre-study data collection and by adjusting the notable discrepancies – a process recommended by Roberts and Priest (2006) through Cronbach’s alpha analysis. The tool was revised during the pilot study to assess the usability of the questionnaire for the purposes for which it was developed. The relevant adjustments related to the content were made. However, to enhance reliability, it was tested for internal consistency through Cronbach’s alpha analysis using dummy data from the pre-study run. Cronbach’s alpha analysis is crucial in the establishment of the internal reliability of the tool. It essentially evaluates the extent to which the Likert scales used in a survey are reliable.

$$a = \frac{N^2 Cov}{\sum 2 S item + \sum cov item} \dots\dots\dots\{ 2\}$$

Where:  $N$  = the number of items in the pool

$Cov$  = covariance (average) that exists between the items

$a$  = alpha value

$s$  = variance

From the equation 2, it can be adduced that for each item in the developed Likert scale, it is possible to establish both the variance within the item as well as the covariance that exists between the particular item and any other item that has been identified on the scale developed. Thus, a variance–covariance matrix of all the items can be established. In the equation 2, the top half has the number of items in the tool ( $N$ ) squared; this is then multiplied by the covariance (average) that exists between the items. At the bottom, of the equation, the sum of the variances of all the items as well as the covariance are calculated.

#### **4.7.2 Sampling strategy adopted.**

The respondents in the quantitative study were senior project practitioners and policy analysts involved in ICT project management. Moreover, the sampling population that was considered in the data collection included project directors, project managers, project planners, project engineers, network lead consultants and other leading project administrators. The larger population of study in the quantitative study meant that it was important to have a well-defined sampling model that would not only limit the biases foreseen in the study but would also enhance the richness of the collected data. In order to begin the sampling model, a list of companies that were used in the interviews was generated.

Initially, the study was keen to have 500 respondents as the sample of interest in the study, but the initial assessment revealed that within the earlier developed inclusion criteria, this number could not be achieved. To work round this limitation, the research included more companies and projects and further included junior managers in ICT projects as long as their levels of experience in these projects were satisfactory, i.e. more than four years. A total of thirty companies and projects were selected as population sources to be studied. These projects were either government-funded or privately funded projects. Altogether there was a total of 3,300 possible respondents. However, this was an expanded number where certain provisions of the inclusion criteria were overlooked, such as the level of management of the employees.

The sampling model adopted in the study followed the systematic model of sampling from the population studied. The systematic sampling framework is founded on the random model of sampling, since the members forming a larger population were to be selected from the pool of respondents based on a random starting point but within a fixed interval – the sampling interval. Etikan and Bala (2017) give a framework for the development of a systematic model of sampling, which begins with the definition of the population from which the sample to be studied is selected. This is then followed by the

selection of the sample size, then calculating the fraction of sampling proceeded by the sample selection. From the initial assessment, 300 participants were to be selected to be interviewed. To obtain the sampling fraction, this would be:

$$K = 3,300/300 = 11$$

Where: **K**= the fraction of the sampling to be adopted

Essentially, this meant that within the total population, the eleventh respondent was to be selected for the research. A total of 300 questionnaires were sent for data collection. However, fourteen participants did not return their questionnaires, meaning that a total of 286 respondents were finally settled on for the study. The questionnaires were administered online to forty-seven respondents through the Survey Monkey tool. Eighty-six respondents had their questionnaires e-mailed directly, while the rest of the participants (153) filled in hard copies. The data was cleaned and entered into the SPSS 23 data analysis template for analysis.

#### **4.7.3 Quantitative pilot study**

The pilot study targeted ten respondents in one of Kenya's government entities currently involved in ICT infrastructure projects. The selection of the sample was based on the suggestion of Saunders (2007) that not less than ten respondents should form part of the pilot study in quantitative research. Three questionnaires were sent via e-mail while two were administered directly to elicit respondents' opinions on the state of ICT projects in Kenya and stakeholder integration issues as well as project performance metrics and benefits realisation in Kenya. Notably, the relevant adjustments were undertaken in order to align the questionnaire with the research objectives. Moreover, the language of the questionnaire was adjusted in order to ensure that the study participants were able to relate well to the questions. Further, the responses coded in the pilot study were used in undertaking reliability tests through the SPSS platform.

#### 4.7.4 Quantitative data analysis

Data analysis was done through the SPSS quantitative data analysis tool. The analysis consisted of descriptive analysis, where descriptions of the respondents were gathered, i.e. gender, job titles, experience in ICT projects, and roles and responsibilities. Moreover, correlation analysis was undertaken in the study to assess the levels of correlation amongst the variables in the research.

##### 4.7.4.1 Correlation analysis

In the evaluation of the correlations between two variables in any statistical analysis, the covariance of the variables is taken into account. In this study, the Spearman's correlation analysis was undertaken on variables in the study to establish the manner in which these variables are related. The Spearman's correlation coefficient is considered a non-parametric statistic that can be applied when the dataset used has violated the parametric assumptions. The analysis works by ranking the data then applying Spearman's equation to the ranks that have been generated. In instances where the ranks are not tied, the Spearman's correlation can be established:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)} \dots\dots\dots \{3\}$$

##### 4.7.4.2 Factor analysis: Dimension reduction

In order to evaluate the project management applications for ICT projects in Kenya, the study applied principal component analysis (PCA). PCA finds the linear combination within a set of variables that have maximum variance (Kong, Hu & Duan, 2017). Subsequently, it eliminates the variance, thus effectively removing the effect of the variance and successively repeating this (Ait-Sahalia & Xiu, 2019). The aim of using PCA in this study was to reduce the number of variables in the data related to the various aspects of the ICT projects that were being studied in the research (Kong, Hu & Duan, 2017). It provided a framework for the extraction of the important variables related to project management from a large pool of variables. PCA operates by doing what Jolliffe

and Cadima (2016) refer to as “the normalisation of the predictors” and this is achieved through the subtraction of the mean from each of the data points in the dataset. The essence of the normalisation of these variables is to establish the variance in the dataset. Next, the covariance matrix for the data was established in a bid to measure the manner in which these variables move together (Kong, Hu & Duan, 2017).

Jolliffe and Cadima (2016), in discussing the manner in which PCA can be implemented on a 2-D dataset, note that the initial step is the normalisation of the data, meaning that the respective means of the variables are subtracted from the numbers in the respective columns. It essentially means that supposing there are two dimensions, X and Y, all those in Y become  $y - \bar{y}$  while those in X become  $x - \bar{x}$ . The outcome is that the dataset that is produced has a mean of zero. Based on the dataset selected (2-D), a 2-2 covariance matrix is the outcome as shown in equation 4 below:

$$\text{Matrix (Covariance)} = \begin{bmatrix} \text{Var} [X_1] & \text{Cov} [X_1, X_2] \\ \text{Cov} [X_2, X_1] & \text{Var}[X_2] \end{bmatrix} \dots\dots\dots\{4\}$$

Notably,  $\text{Var} [X_1] = \text{Cov} [X_1, X_1]$  and  $\text{Var} [X_2] = \text{Cov} [X_2, X_2]$

The eigenvalues as well as the eigenvectors for the covariance matrix are then calculated. The square matrix makes it possible to obtain the eigenvalues and eigenvectors as well. Taking  $\lambda$  to be the eigenvalue for a matrix, A, gives equation 5:

$$\det (\lambda I - A) = 0 \dots\dots\dots\{5\}$$

Where I is the identity matrix that has the same dimension as A.

This is a required condition for the matrix subtraction as well in this instance and the “det” is the determinant of the matrix. It thus follows that for each eigenvalue  $\lambda$ , there is a corresponding eigenvector v, which can be established through equation 6 below:

$$(\lambda I - A) v = 0 \dots\dots\dots\{6\}$$

Consequently, it is important to order the eigenvalue from the largest value to the smallest value in order to list the components in terms of significance. This is the part that is synonymous with the reduction of dimensionality. Assuming that one has a dataset with a total of T variables, then the corresponding values of T eigenvalues and eigenvectors are present. What is evident is that the eigenvector corresponding to the eigenvalue that is the highest is considered to be the principal component in the dataset. In order to reduce the dimensions, the first  $\rho$  eigenvalue is selected, and the rest are ignored. Subsequently, the feature vector and matrix of vectors are formed – eigenvectors. Since two vectors were selected herein, both eigenvectors are selected:

$$\text{Feature vector} = (eig_1, eig_2) \dots\dots\dots\{7\}$$

The final stage in PCA is the formation of the principal components in the dataset. The transposed feature vector is multiplied to the left with the scaled version of the original dataset – the transposed version:

$$\text{NewData} = \text{FeatureVector}^T \times \text{ScaledData}^T \dots\dots\dots\{8\}$$

The new data therein is the matrix that consists of the principal components while the future vector is the matrix that is formed through the application of the eigenvectors that have been selected. The scaled data refers to the scaled version of the original data. The superscript, T, is the transposition of the matrix formed when the columns have been interchanged to rows and vice versa.

**4.7.5 Steps in carrying out PCA and correlation analysis in SPSS**

The PCA analysis in SPSS is predicated on the concept of dimension reduction of variables. What this means is that the analysis relies on variance and covariance amongst the variables in order to reduce the number of variables that explain a specific variable. The data that were coded under the Likert framework to explain various aspects of stakeholder integration were particularly used in the analysis. As earlier noted, using

SPSS to conduct *PCA* aims to replicate the correlation matrix through the use of a set of a few components as well as linear combinations of the original dataset. To undertake *PCA*, the variables from the Likert scale were reduced under the “dimension reduction”. These variables were then extracted and the unrotated factor solution as well as the scree plot were calculated. The extraction was done based on eigenvalues greater than 1. *PCA* was run by reducing the dimensions of the Likert questions. Under the “Analyse” menu in SPSS, dimension reduction was selected. All observed variables were selected for the analysis. The analysis method was *PCA*, which was selected together with the correlation matrix and unrotated factor solution under the display menu. The extraction adopted the use of eigenvalues greater than 1. This was then run to give the *PCA* outcome.

#### **4.8 Ethical considerations**

Participation in the research study was voluntary; the participants had the option of pulling out from the study at any stage. Moreover, the data collection process was commenced upon with the consent of the participants, who signed the data collection consensus forms. This essentially affirms that the participants in the study had given informed consent before engaging in the study. There was also the question of privacy and anonymity in the research. To affirm the confidentiality of the participants in the study, the coding developed in the qualitative study assigned pseudonyms for the identification of the respondents. Moreover, both the quantitative and qualitative data collected avoided identifying the participants in the research. Conclusively, the whole research process was undertaken within the boundaries of Strathmore University ethical provisions whereby the university’s research ethics committee – mandated to give clearance on matters to do with possible risks posed by the study prior to undertaking the actual data collection – gave the go ahead and a copy of this clearance was shared with all the participants in the study before data was collected. In addition, the research was approved by the Kenya National Commission for Science, Technology and Innovation (NACOSTI) - (*see appendix C*) and a certificate was issued to the researcher as

proof of clearance of any risks; this implies that the research practices did not pose any risk to the research participants.

#### **4.9 Validation, verification and reliability**

The study took measures to ensure external, content and internal validity and reliability. As discussed by Yu and Ohlund (2010), external validity of research is ensured through the sampling model adopted. Importantly, a maximum variation purposive sampling model for quantitative and hybrid sampling model for qualitative was selected to provide a diverse range of viewpoints relevant to ICT project performance in Kenya; this resulted in a sample that included respondents with a variety of project management experience (project directors, project managers, project planners and senior project engineers) from the selected organisations. In the context of content validity, the data collection tools i.e the questionnaire for the survey and semi-structured interview questions for interviewing sessions were evaluated by three senior ICT professionals to ascertain the extent to which the contents were addressing the proposed research questions. Internal validity was assessed through multiple factorial tests, Pearson correlation and the Cronbach's alpha test. Kaiser-Meyer-Olkin was used to measure how suited the quantitative data would be for the factor analysis. Bartlett's test was used to determine if the k samples had equal variances. It was also used to validate the assumption of equal variances before undertaking Pearson correlation (Snedecor and Cochran, 1989). The Cronbach's alpha test was employed to assess the internal consistency of the questionnaire as a way of enhancing the reliability of the quantitative research study. In reporting the data, no identifying details were provided, ensuring participant anonymity.

#### **4.10 Research limitations**

The sample size, especially in terms of the quantitative method of data collection, was limiting. Contrary to the expectation of 500 respondents, only 286 participants were involved in the research study. This essentially limited the quality of information related to stakeholder management in the Kenyan ICT sector. Secondly, the adopted model of

data collection in the qualitative research – a semi-structured interview, based on the idea that the researcher ought to be present – essentially limited the ability to obtain free and rich data regarding some of the ways in which the selected companies or projects were handling their stakeholder management issues. The other major limitation of the research was noted in terms of the accessibility to literature. Notably, there are not many scholarly articles or publications that discuss ICT projects in Kenya. This fundamentally limited the scope of the study, and a complete engagement could not be furthered regarding the study since the supporting literature was limited. However, these limitations did not have fundamental implications for the inferences that were made in the research.

#### **4.11 Chapter summary**

This section of the study discussed the methods that were applied in the study in terms of the identification of the relevant research population, the selection of a relevant sample to participate in the study, and the manner in which the data was collected and later analysed. This chapter gave a detailed discussion on the justifications of the selection of these methods in the research study. This means that other than the proposal of the strategies applied in the research, the chapter has been emphatic about why these research approaches were selected in the research, drawing from various theoretical concepts that support the research methods selected. In cognition of the relevance of validity and reliability as aspects of academic research, this methodology chapter was keen to assess the manner in which the research ensured that the outcome of the study is not only valid but also reliable. The chapter also outlined some of the ethical issues that were noted in the research study. In this sense, the study identified some of the ethical provisions in the study that were adopted in the research process. In the next chapter, the outcome of the data collection and analysis is reported in detail.

## Chapter Five: Qualitative Findings

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### 5.1 Introduction

This chapter of the study presents a detailed discussion of the qualitative findings. The forty-seven participants interviewed in this study highlighted significant aspects of ICT stakeholder integration as well as infrastructure performance improvement. The qualitative findings were used to develop the proposed assessment tool. During the analysis, a number of key themes emerged germane to stakeholder integration and improvement of infrastructure performance. The salient theme that was consistently noted in the study was aligned to project complexities in the Kenyan ICT sector. Table 5.1 provides a summary of themes, sub-themes and key findings generated from the qualitative raw data.



**Table 5.1:** Qualitative research themes, sub-themes and key findings

Themes	Sub-themes	Key findings
<b>Objective 1:</b> Complexity of delivering ICT projects in Kenya	<ul style="list-style-type: none"> <li>Propensity to project complexity</li> <li>Project complexity in Kenyan ICT infrastructure projects</li> </ul>	<ul style="list-style-type: none"> <li>Contextualising project complexity in Kenyan ICT infrastructure projects</li> <li>Nature of project complexity in Kenyan ICT projects</li> <li>Extent to which project complexity influences ICT project delivery</li> <li>ICT project delivery in the Kenyan context</li> </ul>
<b>Objective 2:</b> Nature of ICT stakeholder engagement	<ul style="list-style-type: none"> <li>Stakeholder management and project outcomes</li> </ul>	<ul style="list-style-type: none"> <li>Contextualising stakeholder integration in Kenyan ICT projects</li> <li>Stakeholder management template in the Kenyan ICT project management</li> <li>Management methods of stakeholders and influence on project outcomes</li> </ul>
<b>Objective 3:</b> Key project performance metrics	<ul style="list-style-type: none"> <li>Accountability and delivery</li> </ul>	<ul style="list-style-type: none"> <li>Project planning approaches and project delivery</li> <li>Contingency measures in project execution plans</li> <li>Project team management in planning and delivery of ICT projects</li> <li>ICT project key performance indicators</li> <li>Variables involved in project accountability assessments</li> </ul>
<b>Objective 4:</b> Prioritisation of a holistic end-to-end commitment	<ul style="list-style-type: none"> <li>Project benefits realisation</li> </ul>	<ul style="list-style-type: none"> <li>Achievement of defined benefits realisation</li> <li>Ownership and responsibility</li> </ul>

**Source:** Author (2020)

## 5.2 Complexity of delivering ICT projects in Kenya

The forty-seven research participants interviewed in this study identified a number of issues related to the delivery of ICT projects in Kenya. The participants documented what they considered to be the meaning and context of ICT project complexity. At the same time, the study asked participants whether any of their projects have ever experienced some form of project complexity during the implementation of ICT projects and the nature of this complexity. Moreover, the project complexity issues identified by the participants were quantified and rated adequately within the larger context of ICT project delivery.

### 5.2.1 Propensity to project complexities

During the interview sessions, there was consensus amongst the forty-seven participants that, in one way or another, they had faced various delivery complexities in their ICT projects. In this specific sub-theme, it was evident that all of the projects in the Kenyan ICT sector that were appraised in this study had faced insurmountable challenges in terms of delivery. All the participants in the study agreed that different levels of delivery complexity were inevitable aspects of project progress that could not be ignored. For instance, Participant A disclosed that:

*“We have faced complexity in project delivery, one of them is you need equipment it is an uphill task presenting to the board because the budget may not be ready. So, it’s on you to provide solutions internally, which can be a challenge. Another one is timeline; an unrealistic timeline is always a challenge when dealing with ICT projects. Resources versus timeline may never match with what the board wants.”*

Interestingly, most of the participants in the study claimed to have experienced certain project complexities, which adversely affected the ability of projects to realising their defined benefits. Within this sub-theme, it was further emphasised that one of the delivery complexities of ICT projects faced in the Kenyan ICT infrastructure context is traceable to the issue of equipment and hardware used in the management of these projects. The question of project resources in terms of infrastructure used in the advancement of projects is discussed by Edmondson and Nembhard (2009) and Zdanytė and Neverauskas (2011), who highlight that one of the limiting factors in effective project delivery in Africa can be traced to the lack of access to the relevant equipment that can be used in the implementation of these projects. Within the context of project timeline and its ability to influence the success of the project, Participant G suggested that:

*“The projects we handle tend to have different and huge magnitudes and that comes with a lot of complexities because of the number of stakeholders you have to influence, the nature of the beneficiaries, and the nature of the owner or the customer, which also comes with its own uniqueness and attributes associated to it. For example, you have to report weekly to high-level authorities and there is a high level of public interest or of political class.”*

A number of participants equally mentioned that project delivery complexity arises from timelines set by clients. As observed from the findings, participants considered their inability to meet the set timelines in realising the project deadlines as an issue that can be attributed to a number of strategic, operational and project factors. Participants further stated that communication is an equally important contributor to project complexity in ICT infrastructure projects. Under the sub-theme of project complexity, a number of participants suggested that there is no structured communication model in project implementation teams, thus limiting the ability of the project to realise the desired benefits. Participant D noted that:

*“The aspect of communication is complex, because it affects my project tasks. In most of the projects I have been involved with, I have found communication to be a highly detrimental factor.”*

The suggestions by the participants in relation to project complexity essentially echo the proposals of Zulch (2014), which state that the communication models developed within any project initiative have significant levels of influence on the ability of the project to realise its objectives. The views of Participant D, especially, in reference to communication as an aspect of project complexity, highlight how project management consultants need to frame the relevant model of communication in enhancing project delivery in Kenya. It is vital that the communication framework conceived for ICT projects resonates adequately with the project context. As discussed by Ramsing (2009),

when project implementation teams fail to adopt the right model or frame of communication, the managers of the project are exposed to several project limitations. Communication provides the foundation onto which the various project lifecycles are managed (Zulch, 2014). Framing the right approach in managing communications in projects further enhances the ability of the projects to achieve the established project goals.

Participant F brought forth the question of stakeholder management as a critical project complexity that ought to be dealt with in the project delivery schedule. Under the sub-theme of project complexity, the participant acknowledged that the management methods of project stakeholders in the project come with several complexities. The participant noted that the levels of complexity they have been faced with in their projects can be traced to the huge number of project stakeholders whose interests ought to be managed. The question of influencing the stakeholders in the project features prominently as far as project complexity is concerned. Participant F noted that due to the huge number of interests involved in each project, there is a chance that the ability to influence stakeholders can become challenging. This can constrain the project team from fully and adequately realising the set objectives of the project. As elucidated by Participant F:

*“The biggest project complexity is lack of stakeholder integration; it’s a challenge starting a project where some key stakeholders are not aware and were never involved at the conception stage, which may make people not feel like they “own” it at the implementation stage.”*

The comments by Participant F echo what was discussed earlier in terms of the stakeholders in the project and managing their expectations as a critical driver of the stakeholder management model. This is an admission that the stakeholders, in terms of their number and unique attributes, are aspects of complexity in project management that have to be adequately dealt with as part of the lifecycle of an ICT project. By

acknowledging that these two aspects of project practices are critical in influencing the directions of the projects, the participants are reinforcing the dispositions of Karlsen (2002) regarding stakeholder management. Accordingly, it is imperative that the implementing team in the project operate within a well-defined project stakeholder management matrix to be able to advance in terms of the aims and objectives of the project.

### **5.2.2 Project complexity in Kenyan ICT infrastructure projects**

Baccarini (1996) describes project complexity as entailing many varied and interacting parts that can be operationalised in terms of interdependency and differentiation. This means that project complexity is the measure of the level of difficulty that the project implementing teams face during the project implementation process. In consideration of the studies of Bertelsen (2003) and Baccarini (1996), the concept of project complexity can be looked at from the context of managerial perspective, meaning that it ought to involve the planning or bringing together of various components of project tasks within the workflow. In terms of the operative as well as technical perspective, project complexity entails some of the technical intricacies as well as the various difficulties that are involved in the execution of specific tasks. According to Participant A, the environment where the project is being implemented is not very flexible and this essentially complicates the project implementation and delivery landscape for the project team:

*“The environment is not flexible because of the challenges. For example, competition and different ICT brands are not so well known in the market.”*

The mention of the flexibility of the environment shows that the legal framework for implementing these projects in the country seems to be very rigid. This is evident in the management of government projects, which have been noted to be immersed in a lot of bureaucracy and red tape. This means that the decision-making process is quite slow, thus limiting the ability of the project to be delivered within the specified project timeline.

But with the admission of the rigidity of the projects being a form of complexity, the question of managerial decisions comes to mind. Earlier, it was noted that project complexity is segmented into managerial and technical complexity and so by talking of flexibility in the environment, the participant is addressing the issue of managerial flexibility. From the assumptions of Aaltonen and Kujala (2016), it follows that when managerial decisions are pursued without taking into account the operational environment, project implementation teams are likely to experience several types of project delivery complexity.

Participant C described the lack of a policy guideline in addressing the various project complexities associated with ICT projects in Kenya. The question of policy is an issue in project management, according to Karlsen (2002). Developing policy guidelines to manage project complexity has been found to be vital for solving issues related to project complexity in project management. This is because when the policy guidelines take into account managerial and technical decisions, the project goes through the management cycle smoothly with minimal challenges. By emphasising policy challenges, the majority of participants were keen on informing policy makers of the gaps that exist in policy implementation as far as project management is concerned. It basically informs the policy makers that some of the notable project issues in the ICT sector can be adequately addressed through the enactment of more rational policy guidelines. The second section of the Participant C's response reads:

*"We lack standards."*

This suggest that there is no standard procedure for monitoring and evaluating various aspects of ICT projects, thus limiting the manner in which these projects can be examined and improved. In relation to the question of project delivery complexity, the outcome of this suggestion is that there ought to be a developed practical standard that can be used to measure and assess the progress of ICT projects. This is at centre of the discussions of

Aaltonen and Kujala (2016), who suggest that the development of a practical and relevant project management schedule is imperative if a high standard of assessment is to be achieved in Kenya. In other words, and in relation to the response of Participant C, the suggestion is that Kenya needs to have a contextualised measurement model that can be used to assess project process so that technical and managerial complexity in ICT infrastructure projects can be benchmarked using other case scenarios.

Another emerging challenge in relation to project complexity and the environment in the Kenyan context is the question of funding. Funding, as a project complexity, is linked to managerial decisions. Participant D suggested that other than limited funding, the bureaucracy entailed in the management of ICT infrastructure projects is unprecedented. Participant D stated:

*“Yes, very simple, we fund ourselves, we do not borrow.”*

As established in this study, project funding presents several project continuation obstacles in infrastructure development. This means that the project management model developed within any infrastructure project has to be well grounded in very clear financing procedures. While the Kenyan context does not have data on project funding, there have been several projects that have been abandoned along the way due to financial hindrances. In essence, the comments by Participant D resonate well with the findings of Aaltonen and Kujala (2016), who found that project implementation teams, before the initiation of any infrastructure project, have to develop a roadmap through which the project can be funded to its completion. Sunder (2016) shows that unclear funding models in projects come with immense complications in advancing the projects through to the next phase of project delivery. The conception of any remedial strategy in dealing with project delivery complexity thus must include the study of the pecuniary arrangements of the projects.

This is particularly true of big projects in developing countries, where large infrastructure projects are budgeted for with the donor funding in mind (Karlsen, 2002). This means that the sustainability of projects, or rather the completion of these projects, is in doubt, especially in the event that the donors are not willing to inject more cash into the project. The findings of Sutter and Kihara (2019) are quite significant in understanding this aspect of project management, in the sense that there has to be a clear structure for the funding of projects. The capital budgeting model developed for the project has to include the funding options that have been configured in order for the project to progress successfully. In general, therefore, while evaluating the nature of the Kenyan environment in terms of ICT project delivery, a number of issues have been examined in this study.

### **5.3 Nature of ICT stakeholder engagement**

Effective stakeholder management initiatives in any project are affected through comprehensive stakeholder integration procedures. The participants, in the context of evaluating the nature of ICT stakeholder integration, were asked to express their views regarding their interpretation of stakeholder integration in projects in the ICT sector. Moreover, the participants discussed their preferred stakeholder integration template and further evaluated their management models related to stakeholder integration. In reference to the nature of ICT stakeholder integration, Participant A noted:

*“Stakeholder integration is a key component to project success. We have to balance their interests because they are important. In order to deliver ICT projects successfully, we need their support.”*

The suggestion of Participant A quoted above is to the effect that stakeholder integration is the act of balancing the interests of stakeholders in a project. The views of Participant A are in agreement with the proposals of Aaltonen and Kujala (2016) in regard to stakeholder interests and the need to develop a matrix through which these interests are defined, and a model of operation developed to take care of these interests. Participant A

emphasised the role of stakeholder integration by suggesting that it is a critical component of project success. What is notable is that stakeholder integration is an aspect of project management where the project management team brings on board all the stakeholders in the team to evaluate their interests and the manner in which they intend to pursue their interests in the project (Sunder, 2016). This is the context in which Participant C described their understanding of stakeholder integration:

*“Bringing all the stakeholders to the table and having the process defined and how the project will be carried out.”*

The propositions of Participants A, B, C and D in reference to the question of stakeholder integration all point towards bringing together stakeholders in the project to a platform where they are able to engage with each other regarding the project. The salient theme in these responses is what Sunder (2016) calls a *“consensus building”* in the project management matrix, in the sense that it helps the client to have a chance to develop a working model throughout their project. To the stakeholders, the opportunity to build a consensus regarding the project process hinges on the notion that each stakeholder has a different opinion regarding the manner in which the entire project is to be executed. At the same time, the level of expectation that these stakeholders have in regard to the project dimension is entirely different. This means that a point of congruence of these interests ought to be pursued by all those who are involved in the project so that the project progresses smoothly. The comments by the four participants affirm that stakeholder integration is an aspect of managing stakeholder expectations. Moreover, it aims to confine the expectations of the various stakeholders within a certain agreeable framework in order to guide the operations of the project.

From the reviewed literature and the appraised primary raw data, there seems to be no management model that has been implemented in the management of project

stakeholders in Kenya. This was evident in the responses received herein, suggesting the need to urgently develop an integration model that can be used by both private and public sector senior practitioners. This finding suggests that a stakeholder integration model is an essential ingredient of stakeholder management. Participant A noted that:

*“We don't have a stakeholder implementation model because each project is dynamic. When the projects are similar is when we can have a template but still we will have challenges because of the environment.”*

Either in the form of policy or academia, the suggestions of Participant A seem to assert that no template of stakeholder integration has been developed to enhance the project outcomes in the Kenyan ICT sector. The views from Participant A further suggest that this is because of the dynamism of projects, meaning that each project comes with its own challenges and requirements in terms of stakeholder integration. However, this contradicts Gumu *et al.* (2017), who note that regardless of the differences in these infrastructure projects, there is a general template that can be used to define the needs of stakeholders in a project and evaluate their levels of inclusion so that they are equally taken care of in the project management model. The veracity of this statement has been noted in the proposals of Sutter and Kihara (2019), who argue that some of the reasons infrastructure project management in Kenya is not sustainable is that there is no proper model for including and engaging stakeholders in projects or for evaluating their levels of interest in these projects. The question of variance in the projects as a limitation to the conceptualisation of a single project management template of the stakeholders was also noted by Participant B. However, the participant affirmed that there is an established model of management of the integration of stakeholders in projects. Participant B stated that there are no defined templates for the integration of stakeholders within the general project management structure. This is equally the opinion of Participant E. Participant B further suggested that:

*“We don’t have a defined integration model in place. We have not implemented a model for that. Before we define, we do feasibility to understand customer requirements.”*

As suggested in the second section of responses from Participant A, there are several aspects of engagement or rather integration of stakeholders, but this is not directly attached to a particular project stakeholder integration model. The interpretations contained in the responses of Participant F allude to the earlier suggestions that no elaborate framework has been established as a guideline for managing the integration of stakeholders, but they have established a number of guidelines that are used in the management of stakeholders. Participant F further asserted that there have been trials to develop tools, such as risk management tools, to guide stakeholder integration. This is considered to be a positive step towards the conceptualisation of a tool for evaluating stakeholder integration in projects. Within the confines of stakeholder management, this means that, to a certain extent, there is a general template for evaluating stakeholder integration in Kenya. However, in the context of Sutter and Kihara (2019), these have not been developed based on solid theoretical and practical precepts related to Kenyan infrastructure project management practices. Participant G highlighted that:

*“We have guidelines that we use to help agencies identify the stakeholders they need to deal with, how to deal with them and the frequencies. It’s a model that we use to facilitate [ICT governance standards] we have tried to provide some tools, e.g. risk management, identification, analysis, evaluation and response. Provide a guide on legal contracts, strategic planning, how to close a project, to manage issues, stakeholder management and how to communicate.”*

Participant G averred that there is a well-established model for stakeholder integration. The participant did emphasise that a programme for integrating all the relevant stakeholders in the project is imperative if the success rate of the project is to be improved. Moreover, Participant G went to underscore that:

*“Yes, we have guidelines in place to help us integrate all the stakeholders involved. Yes, we do categorise stakeholders and we look at the impact of the stakeholders, interest of the stakeholders and their roles in the project implementation.”*

Participants J, K, L, M and N all suggested that the uniqueness of the various ICT projects in which they are engaged limit their ability to work within a predefined stakeholder model. Further enquiry revealed that there is an informal model of integration that they use but there is the question of unique project attributes, meaning that a single platform cannot be used. Their responses do not coalesce towards the direct endorsement of a particular model but rather talk of project attributes that are unique and thus require an entirely different stakeholder integration template. For example, Participant J asserted that:

*“Every project exhibits unique features and is thus treated differently. Stakeholders must be identified first and then mapped. Then the stakeholders may be categorised into groups such as influencers. A register and communication plan is made prior to guide the project. At the initial stage, it has to be clear what the project is.”*

### **5.3.1 Stakeholder management and project outcomes**

Effective stakeholder management is considered to be an instrumental strategy in enhancing project outcomes (Gidado, 2006). Project management practitioners are keen to model relevant stakeholder strategies that aid in the improvement of project outputs. In the context of Kenyan ICT infrastructure projects, the question of stakeholder management and outcomes is critical. Most of the participants agreed that the aim of developing a robust stakeholder management model is to influence the general outcomes of the project. Participant A stated that:

*“When we clearly define the interests and the role of all the stakeholders in the organisation, there is a high chance that conflicts will be minimised in the management or the execution of the ICT project.”*

According to Participant A, the question of stakeholder management can be adequately discussed within the premise of stakeholder conflict management. This suggestion is well established in the conflict resolution strategy proposed by Curcija *et al.* (2019), which suggests that the foundation of any conflict resolution in any project is consensus building across the various project stakeholders. Admitting that the management model for stakeholders is impactful for resolving conflicts, Kirira *et al.* (2019) found that within the Kenyan context, there is a lot of significance in the systematic management of project stakeholders. These suggestions essentially mean that the management of stakeholders in a project directly influences the outputs of the project.

The outcome of this theme also affirms that stakeholder management is critical in espousing an effective mode of communication – a soft project determinant that is critical in enhancing outcomes of ICT projects. ICT infrastructure projects, in a bid to perform well in respect to the project objectives, have to configure the strategies through which the stakeholders are being integrated within the project management matrix. Within the context of communication, it is suggested that having well-managed project implementation teams would not only be essential in defining the project progress but would also address arising conflicts, as discussed earlier in the previous section. Participants D, G and K seem to share the same view. For instance, Participant D disclosed that:

*“Effective stakeholder management means that the communication model that has been adopted in the project is well-defined. To an extent, this aids in the elimination of abrasions and conflicts in the project, which can directly improve the general project outcomes.”*

There seems to be a very direct relationship between the results, or rather the output of the projects and the developed stakeholder management model for the project. Adopting excellent strategies of managing stakeholders in these projects means that some level of accountability is integrated into the project. This can be seen in the context of monitoring and evaluation, as discussed by Kirira *et al.* (2019). It essentially means that when project practitioners, or rather the stakeholders in the project, are well integrated into the project through a well-designed stakeholder management framework, the defined benefits of the project are realised. In the case of ICT infrastructure in Kenya, the question of project sustainability has been the focus of academia in the past, with a number of studies, such as Ndegwa *et al.* (2017), arguing that the defective stakeholder management model that has been adopted in these projects has led to the lack of a sustainable project implementation model. This has been discussed within the general finding that the projects have failed to progress at some stage because some of the key stakeholders (both primary and secondary) have been left out of the management and implementation equation. The suggestions of Participants G, I and K indicate that the management of stakeholders' correlates to the realisation of defined project objectives in terms of project sustainability. Participant I, for example, noted that:

*"When project stakeholders are managed well, the sustainability of the project is assured in the sense that the stakeholders can consistently put each other in check regarding the project and the deliverables of the project. This is a way of enhancing project accountability as a result of influencing the outcome of the projects."*

The tool for stakeholder management has been highlighted as being a significant monitoring tool for evaluating the contribution and performance of various employees in a project. The suggestions of Participants B and H affirm that, in one way or another, when projects have a well-defined stakeholder management model, they are essentially anchoring their project attributes to a very sustainable practice, in the sense that they are able to evaluate how stakeholders are progressing in their responsibilities towards the project. For instance, Participant B avowed that:

*“Having a management tool for stakeholder management aids in the development of a platform for the stakeholders to be able to review the progress of the stakeholders in their various responsibilities in the project. This is to mean that the progress or the status of the project is well taken care of if the stakeholders in the project consistently engage.”*

Participant H, admitting that the management of stakeholders can improve the outcome of a project, noted that:

*“Projects where the stakeholders are in constant roundtables tend to be sustainable in the sense that the stakeholders are consistently expressing their interests and assessing whether these interests are being met in the project.”*

In the context of project outcomes in relation to the stakeholder management scheme, the outcomes of the discussion were centred on conflict resolution, accountability, evaluation and project accountability. Essentially, the majority of participants averred that the outcome of the projects is directly influenced by the management models that have been developed by the project implementing authorities. These findings are documented by Oppong *et al.* (2017), who suggest that the development of a well-defined model of managing project teams or interested parties essentially defines the output of projects; the sustainability of these projects can be discussed within the perspectives of the project stakeholder management model.

#### **5.4 Key project performance metrics**

Standard key performance metrics are critical in measuring the progress of any infrastructure project (Yun *et al.*, 2016). The participants were interviewed regarding the key performance metrics as related to the various projects with which they were involved. The majority of participants did suggest that their projects lacked a standard model but stated that they have key performance metrics that are instead aligned to the

specific business project with which they are involved. This was mentioned by Participants O, P, Q, R, S, T, U and V.

*“Key performance indicators (KPIs) are more aligned to business. The ICT project teams also make their own KPIs to guide ICT projects. The technology department ensures it does fit into the end product. Customer satisfaction, among others, drives the projects. Efficiency metrics in waterfall projects is always needed. Agile teams are expensive especially when expertise is needed. The advantages of agility have to be strong to support the methodology used.”*

In theory, the comments by Participants O, P, Q, R, S, T, U and V show that there is no established standard through which ICT project management teams can measure progress but rather they each have unique templates that coincide with specific project goals. This supports what Gransberg and Villarreal-Buitrago (2002) note as the need to evaluate projects on a case-by-case basis and not use a general template for all the projects that are being implemented. Participant D was equally non-committal as to whether they have a standardised model of measuring project progress:

*“Budget, cost, resources, operational expenses, return on investment, planning project cost variance, percentage of phase completed, client satisfaction, scheduling, quality and capital expenditure are quite important. Compliance and regulation are very key factors.”*

According to Participant D, there are several performance metrics that are important in evaluating project progress and these are applied in managing projects. The comments by Participant D are in agreement with those of Participants O, P, Q, R, S, T, U and V, to the effect that the Kenyan infrastructure project management domain has not developed a unique standard key performance metrics tool that can be used to measure ICT project outcomes. Rather, what has been adopted is a set of case-wise key performance metrics

for ICT projects. Participant C did not explicitly admit the existence of a standard plan but rather mentioned that any planning is consultative. Particularly, Participant C acknowledged that clients are best placed to be consulted in the planning of the project because they are the beneficiaries. This was equally the suggestion of Participant B, who disclosed that the level of consultation with the clients ensures that project implementation teams are able to monitor the project progress adequately. Participant C further noted that:

*“We involve clients in planning. In terms of coming up with a solution, we need to factor in contingencies and how messy they can be; because it can be messy, cost is another issue. We have created a need to analyse documents that are given to sales people to allow us to capture customer needs and help us in the contingencies. If one is not clear, there is a model that enables work to continue.”*

From the above findings, it can be suggested that there is no standard template for evaluating project outcomes. In essence, the key performance indicators that are used in the measurement of project success can be adapted to fit a specific project.

#### **5.4.1 Accountability and delivery**

In this study, it was found that the variables that are aligned to project accountability vary. According to Participant A, cost, time and team management strategies are crucial determinants of project management, which have to be satisfied for the project to be a success:

*“Cost: I have to ensure that the final budget makes sense. Time: has to be factored in. The team is the work of the vendor, not me as a project manager. The vendor is in charge. We put pressure on vendors to implement and not on our side. If we happen to do the project in-house, we normally consult our technical guys.”*

Participant G argued that the *“level of agreement”* is the most significant variable for accountability and the delivery of projects. The question of level of agreement is particularly directed at the issue of stakeholder integration or management. Participant G was essentially suggesting that the most relevant variable for addressing accountability assessment is the inclusion of all the stakeholders in the project and ensuring that the stakeholder integration model adopted in the project is aligned to the project objectives. This suggestion is the focus of the discussions of Curran and Spillane (2020), who regard the stakeholder agreement as a critical aspect of project management that can be used to enhance project accountability for ICT projects. Engaging the stakeholders in the project improves the ability of project implementation teams to build consensus regarding project progress, which is an aspect of accountability in project management.

Participant D did note that there are several factors or rather variables that are immersed in project accountability and would be essential if included in the accountability assessment tool developed for ICT projects. Participant D affirmed this in the interview by noting that:

*“Budget, cost, resources, operational expenses, ROI, planning project cost variance, percentage of phase completed, client satisfaction, scheduling, quality and capital expenditure are quite important. Compliance and regulation are very key factors.”*

The suggestions of Participant D follow the proposals of Kerzner (2017), which state that budget, cost and scheduling are aspects of project accountability that have to be adequately checked as elements of project accountability. Indeed, by suggesting that these three elements are critical drivers of project accountability, Participant D was effectively arguing that when developing any accountability assessment tool, these elements have to be integrated therein. Furthermore, the participants identified resources, operational expenses, return of investment, satisfaction and capital expenditure as other key aspects of project accountability that have to be included in the

project management matrix to enhance the accountability of the project (Amadi *et al.*, 2019). This can be seen in the response of Participant E, who noted that:

*“The business case has assumptions that we set which help us to stay within business case provision. Once the project has been started, we have to check whether we are within the set assumptions. If there is variation an explanation is normally given.”*

The responses of Participants J, K, L, M and N seem to be very much contextualised in the specific project, with no clear reference to the variables that are involved in general project delivery in terms of proposing an accountability assessment tool for ICT projects. Participants J, K, L, M and N further suggested that:

*“It fits into the strategy. An overarching strategy guides on what projects to focus on. There are clear guidelines such as responsibilities and roles as it becomes clear on how they are executed. The structure and culture; for instance, if you choose the waterfall method, then you know what resources you need. From each methodology, expectations are known prior.”*

Participant I noted that:

*“In the consumer area, changes are dynamic. Data privacy is crucial. Guidelines don't just change according to the process but also according to the external factors. Project sponsors need to be known so that it is known who has that accountability. During the delivery stage, also the various persons, such as coding persons, are known. It also helps to know who the 'owner' of that risk is, so that it is known who is responsible. Governance of the project will determine the success of the project.”*

A significant number of the participants interviewed suggested that the variables that could be included and entrenched in the accountability framework for ICT projects vary from project to project. This is evident from their responses, which were contextualised to their specific project contexts. Nonetheless, a critical review of these responses did suggest that budget and costs are some of the most essential aspects of project management and are relevant in enhancing project accountability. In this respect, the emergent theme in these responses is that when proposing an accountability assessment tool for ICT projects, it is imperative that the question of budget and costs, as well as stakeholder inclusion, are given priority. Participants O, P, Q, R, S, T, U and V proposed the following:

*“Timelines: one must be held accountable. Quality: the quality is important for audit purposes.*

*Lessons learned: to help future projects. Budget: costs need to be accounted for. Project hour’s resources among others need to be accounted for. ICT projects, however, are shielded so much from this and it is our views that this should be incorporated into ICT projects so that efforts lead to rewards.”*

As evidenced in the responses of Participants O, P, Q, R, S, T, U and V, the question of budget and costs are key aspects of ICT project delivery that ought to be included in the accountability assessment tool for ICT projects. Participant E affirmed this in the interview by suggesting that:

*“We have to be accountable in every project. We have contracts that require cost to be tracked, we have to stay within budget. Cost: our teams have to do projects within the budget. Timeliness: time is of the essence because we have to deliver within the agreed period.”*

In essence, the question of cost implications, capital expenses and stakeholder integration emerged as critical factors to take into consideration in developing assessment criteria for project accountability. Within the Kenyan ICT project context, developing an evaluation model would thus mean that these three factors are incorporated within the assessment criteria. At the same time, the question of project timelines appears to be an equally important aspect of ICT infrastructure project management that ought to be incorporated into the assessment criteria for accountability in ICT infrastructure projects.

### **5.5 Prioritisation of a holistic end-to-end commitment**

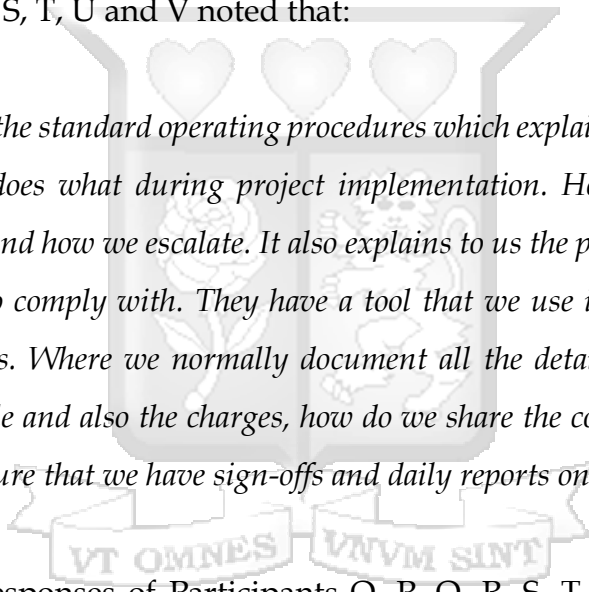
Project benefits realisation is the ultimate objective of any project implementation procedure (Fleming & Koppelman, 2016). All aspects of project delivery are aimed at realising the defined benefits of the project. The majority of the participants affirmed that, within the Kenyan context, two critical factors of prioritisation of a holistic end-end commitment in achieving project benefits realisation are eminent. The first is the question of expected project outcomes that come with the achievement of benefits realisation. Participants J, K, L, M and N further went on to state that project benefits realisation is:

*“Defining project outcomes or rather scoping the project in a way that the various details of the project are riveted towards meeting the defined project objectives.”*

In the above extract, Participants J, K, L, M and N demonstrated the importance of directing project outcomes towards meeting the defined project objectives. Project performance outcomes of infrastructure projects in the Kenyan ICT sector can thus be discussed within the larger context of scoping the project and developing methods through which the various project inputs lead to the defined project outcomes. Moreover, the participants described the value of and need for a clear definition of the strategic objectives of the project, which means that project implementation teams have to construct a working strategy through which they can have a crisp operational structure

geared towards realising the project objectives as well as attaining project ownership and responsibility. The second factor that eminently featured in terms of holistic end-to-end commitment is the question of ownership and taking responsibility during project implementation. A well-conceived commercial case articulating the ownership and responsibility of various aspects of the project emerged as a critical model for project approval today. Fleming and Koppelman (2016) refer to it as a crucial “deliverable” in project delivery. Viswanathan *et al.* (2020) argue that the prioritisation of holistic end-to-end commitment factors in project performance and the question of ownership and responsibility are pivotal in enhancing project delivery.

Participants O, P, Q, R, S, T, U and V noted that:



*“We have the standard operating procedures which explain how issues are escalated and who does what during project implementation. How to deal with different activities and how we escalate. It also explains to us the performance timelines that we have to comply with. They have a tool that we use in managing service level agreements. Where we normally document all the details of who should be held accountable and also the charges, how do we share the cost? The last thing we do, we make sure that we have sign-offs and daily reports on project performance.”*

As evidenced in the responses of Participants O, P, Q, R, S, T, U and V, it is vital to emphasise ownership and responsibility during project implementation by operating within established standard procedures to curb emerging issues. Mollaoglu-Korkmaz (2013) affirms that project success depends solely on the effectiveness of the defined project outcomes and how well defined are the benefits to be realised. As established by Participants O, P, Q, R, S, T, U and V, keeping performance reports is one way of sustaining project ownership and responsibility. A holistic end-to-end commitment can only therefore be achieved through proper integration of the relevant stakeholders during project implementation. Participants A and B further affirmed this by suggesting that:

*“Yes, we do have strategic plans which will enable us to create awareness, as we establish our stakeholders and help them to engage, especially those affected by the masterplan. After that we do public participation and assure the benefits of the projects to their issues, and this enables easy project implementation. Further, we also create a regulatory framework on how to engage stakeholders moving forward.”*

## **5.6 Chapter summary**

This chapter described participants’ accounts of stakeholder integration and infrastructure performance in the Kenyan information communication and technology (ICT) sector. The results of the interview indicate that it is crucial to develop an assessment tool in the ICT sector particularly for enhancing the integration of stakeholders and improving infrastructure performance. Participants’ accounts were related to their opinions and experiences within their organisations and projects they had participated in or were currently participating in. However, opinions about enhancing stakeholder integration and infrastructure performance improvement appeared to be similar across the various project managers, policy makers and project directors interviewed across the organisations, although some organisations appeared to cope better with the ever-accelerating pace of change in the ICT sector. Though the dynamics and adversity of stakeholder integration and infrastructure performance contributed a lot to project complexity, the participants in this study showed that there are many ways to cope, especially where stakeholders have been well engaged and integrated.

The discussion of the results in this chapter shows that poor or lack of stakeholder integration and lack of clarity on various indicators of project performance measures can do considerable damage to the delivery of ICT projects. Irrespective of the organisation, participants clearly indicated that lack of or poor stakeholder integration is a major contributor to project complexity. This chapter offered a new dimension to the interpretation of stakeholder integration and infrastructure performance in ICT projects. With the rising demand for project success, the participants showed that various aspects of project complexity are paramount and must be looked into at the inception of the

project, i.e., project scheduling, technological complexity, level of stakeholder integration and communication. The findings have not furnished any final answers to the research objectives, though they do support the idea that stakeholder integration and infrastructure performance have pronounced effects on the project delivery of ICT projects in Kenya. As shown in this chapter, the challenge of integrating stakeholder and infrastructure performance of ICT projects is to learn how to mitigate the complexity of its measures during project delivery, to assess the impact of each measure/indicator, and to build the right structure and procedures to promote project success. In the next chapter, the quantitative results are presented in relation to the research themes.



## Chapter Six: Quantitative Findings

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### 6.1 Introduction

This chapter of the thesis presents the outcome of the quantitative research pertaining to the development of an assessment tool for ICT stakeholder integration and infrastructure performance improvement in Kenya. In order to develop a tool for assessing ICT stakeholder integration as well as infrastructure improvement, a number of variables were appraised. The nature of ICT project complexities is discussed as a component of the stakeholder integration assessment tool. The quantitative research findings also endeavoured to assess how infrastructure policy makers and senior project practitioners in Kenya can prioritise and ensure there is a holistic end-to-end commitment to realise the defined infrastructure benefits. These findings, coupled with the outcome of the qualitative research findings in Chapter Five, complement the conceptualisation and validation of the proposed assessment tool. As specified in this chapter, principal component analysis (PCA) was used to reduce the dimensionality of the data, and Spearman's correlation analysis was used to establish the relationships amongst the variables. Descriptive analysis was used to establish the allotment in the quantitative data.

### 6.2 Target sample

In order to have diversified representation in the survey, it was important to have "representatives" from diverse project backgrounds. To achieve this, project engineers, project managers, project coordinators and senior managers from diverse ICT projects were included in the survey. To be precise, responses from up to 286 individuals from organisations were collected. The entities that were represented included both private sector actors as well as public sector entities. The selected entities were primarily engaged in the implementation of certain ICT infrastructure projects. Some of these projects were

ongoing while others had been completed. The selected entities were all involved in the implementation of ICT infrastructure projects.

Descriptive analysis was used in order to appraise the distribution of the data. Mishra *et al.* (2019) emphasise that the essence of undertaking a descriptive analysis is to enable the researcher to comprehend the salient features of the collected data. Descriptive analysis of the respondents is essential in describing the respondents and understanding the patterns of the data; it aids in highlighting the trends in the dataset (Holcomb, 2016). Further, as described by Mishra *et al.* (2019), before undertaking any form of advanced data analysis, it is important to have a visual summary of the data. It is critical to have an understanding of the patterns that emerge from the dataset; thus, it is vital to utilise descriptive analysis in the initial data analysis phase. In this research, the initial analysis was undertaken through a descriptive approach in order to gain a general view of the respondents who were part of this study.

The initial analysis focused on evaluating the profiles of the participants in the research survey. In this regard, as summarised in section 6.3 and Table 6.1, a description of the respondents in terms of their profiles in the various companies selected for the study was generated. Moreover, the genders of the respondents were evaluated and recorded in Table 6.2 to give a preview of the composition of the respondents in terms of gender. The descriptive analysis was also important in describing the duration of time that the respondents had spent in their work or rather in their various positions in the organisations selected for the study, as well as their roles and responsibilities in project management and their duration in project management.

As already stated, descriptive analysis is a statistical analysis that provides a summary of the individuals that have been selected to participate in the research study as well as the measures that have been selected for the particular research study. In the output tables presented in the descriptive analysis, the sample that was selected for the study is clearly indicated; the centre of the data is equally noted in the output tables, since various

measures of central tendency have been applied therein. On the same note, the spread of the distribution is notable in the output tables generated in the descriptive analysis. Conclusively, data presented in the form of the descriptive outputs generated herein is easy to visualise and describe. It was important to describe some of the salient features of the data collected for the development of a validation tool for stakeholder integration in ICT infrastructure projects in Kenya, thus allowing for simpler interpretation of the data.

### 6.3 Profile of survey participants

Developing an assessment tool for ICT stakeholder integration and infrastructure performance improvement required the input of various participants in the project management cycle. In order to ensure that the quantitative findings were reliable and valid, the participants for this study were carefully selected. The survey participants in the quantitative analysis were involved in project forecasting, project control, project planning, management, work coordination and the coordination of project resources. Table 6.1 provides a summary of the designations of the participants in the survey. It describes, numerically, the number of participants who responded in the quantitative research in terms of their job titles.

**Table 6.1:** Job titles of respondents

Respondents' job titles		Frequency	%	Valid %	Cumulative %
Valid	Project director	48	16.8	16.8	16.8
	Project manager	99	34.6	34.6	51.4
	Project planner	91	31.8	31.8	83.2
	Other	48	16.8	16.8	100.0
	<b>Total</b>	<b>286</b>	<b>100</b>	<b>100</b>	

**Source:** Author (2020)

As can be seen in Table 6.1, the majority of the respondents (99) were project managers (34.6%). Project planners were the second largest group in terms of the numbers (91 – 31.8%). The project directors accounted for 48 (16.9%) of the total respondents. Other

employees, such as project engineers, totalled 48 (16.8%). It is worth noting that the participants were primarily involved with the delivery of ICT projects.

### 6.3.1 Gender

Table 6.2 outlines the profiles of the respondents in terms of gender. The majority of the respondents were male (208 – 72.7%) rather than female (78 – 27.3%). The findings in this theme suggest that the ICT sector in Kenya is heavily male dominated. To address this challenge, it is vital for the sector to work closely with the government and institutions to look into how training programmes can be introduced to train women in Kenya. The researcher believes that the introduction of apprenticeship degree programmes would improve the development of women in the ICT sector. Moreover, the government and senior practitioners working in the ICT sector have to introduce policies and guidelines that can be used to dispel misconceptions about the recruitment of women in the ICT sector. Interestingly a study commissioned by the European Institute for Gender Equality (2018), showed that ICT jobs offer satisfactory working conditions for both women and men. It was further found that working hours are often more flexible and workers have more independence in adapting them to their requirements. Additionally, the study showed that females working in ICT are better paid overall and the pay gap between females and males is smaller than in other sectors. Thus, the above determinants could be used in Kenya to maximise women’s interest in choosing careers in ICT.

**Table 6.2:** Gender of respondents

Gender of participants		Frequency	%	Valid %	Cumulative %
Valid	Male	208	72.7	72.7	72.7
	Female	78	27.3	27.3	100.0
	<b>Total</b>	<b>286</b>	<b>100</b>	<b>100</b>	

**Source:** Author (2020)

### 6.3.2 Duration working in the sector

In order to establish the experience of the respondents in the quantitative study, it was prudent to evaluate the duration of time that the respondents had worked in the ICT sector. This hinged on the notion that the validity of the outcome of any study can be well achieved through the selection of the right participants. As revealed in the summary output Table 6.3, a significant proportion of the participants (141 – 49.3%) had spent between six and eleven years in the ICT sector.

**Table 6.3:** Number of years respondents have worked in the Kenyan ICT sector

Years of working in the sector		Frequency	%	Valid %	Cumulative %
Valid	Less than 5 years	2	0.7	0.7	0.7
	6-11 years	141	49.3	49.3	50.0
	12-17 years	100	35.0	35.0	85.0
	18-23 years	16	5.6	5.6	90.6
	Over 24 years	27	9.4	9.4	100.0
	<b>Total</b>	<b>286</b>	<b>100</b>	<b>100</b>	

**Source:** Author (2020)

The summary output, as revealed in Table 6.3, also shows that 35% (100) of the respondents had spent between twelve and seventeen years in practice. This is comparable to the 9.4% (27) respondents who were noted to have spent more than twenty-four years working in the ICT sector. The results also suggest that the least number of respondents (2 – 0.7%) had stayed in the ICT sector for less than five years. The findings indicate that the majority of the respondents in the study had extensive experience in the delivery of ICT projects in Kenya. It is evident that the ICT sector in Kenya needs to continue to invest resources in human capital development and to create an enabling environment for ICT employees. From the above, one could suggest that by investing in human capital development, the sector has a high chance of enhancing employee satisfaction, return on investment and retention rates and improving ICT organisational culture in Kenya.

### 6.3.3 Duration managing ICT projects

The conceptualisation of an assessment tool for stakeholder integration and improvement of ICT infrastructure projects requires the appraisal of project management variables. From the summary analysis output depicted in Table 6.4, it can be seen that the majority of respondents had more than eight years of project management experience (113 – 39.5%). This was followed by those respondents who had spent between five and seven years in the management of projects in the ICT sector (109 – 38.1%). It was also noted that 47 (16.4%) of the respondents had one to four years' experience of ICT project management. Notably, the least number of respondents (17 – 5.9%) had spent less than one year in the management of ICT projects.

**Table 6.4:** Number of years respondents have been managing ICT projects

Respondent years of managing ICT projects		Frequency	%	Valid %	Cumulative %
Valid	Less than 1 year	17	5.9	5.9	5.9
	1-4 years	47	16.4	16.4	22.4
	5-7 years	109	38.1	38.1	60.5
	Over 8 years	113	39.5	39.5	100.0
	<b>Total</b>	<b>286</b>	<b>100</b>	<b>100</b>	

Source: Author (2020)

### 6.3.4 Roles and responsibilities

The findings of the analysis in regard to the roles and responsibilities of the respondents in their institutions of work show that the majority of respondents were in management (102 – 35.7%). Twenty-one of the respondents were involved in work coordination in various ICT projects. This is comparable to the 44 respondents (15.4%) who were in the planning departments. Furthermore, 15% (43) of the respondents were in the control departments and 27 (9.4%) were involved with the coordination of resources. The table below gives the summary of roles and responsibilities.

**Table 6.5:** Respondents’ project roles and responsibilities

Respondent project roles and responsibilities		Frequency	%	Valid %	Cumulative %
Valid	Control	43	15.0	15.0	15.0
	Planning	44	15.4	15.4	30.4
	Managing	102	35.7	35.7	66.1
	Work coordination	60	21.0	21.0	87.1
	Coordination of resources	27	9.4	9.4	96.5
	Other	10	3.5	3.5	100.0
	<b>Total</b>	<b>286</b>	<b>100</b>	<b>100</b>	

**Source:** Author (2020)

Stakeholder integration effectiveness was assessed in terms of stakeholders’ contribution to project outcomes. As can be observed in Table 6.6, the majority of respondents suggested that effectiveness is moderate (144 – 50.3%). The “less effective” responses accounted for 70 of the respondents (24.5%) and 68 (23.8%) disclosed that stakeholder integration has been “very effective”. Finally, 1.4% of the respondents (4) suggested that these strategies have not been effective in their organisations. Table 6.6 details these findings.

**Table 6.6:** Stakeholder integration effectiveness in recent ICT projects

Levels of scale		Frequency	%	Valid %	Cumulative %
Valid	Very effective	68	23.8	23.8	23.8
	Less effective	70	24.5	24.5	48.3
	Moderately effective	144	50.3	50.3	98.6
	Not effective	4	1.4	1.4	100.0
	<b>Total</b>	<b>286</b>	<b>100</b>	<b>100</b>	

**Source:** Author (2020)

### 6.3.5 Construct validity

Internal validity in a multidimensional construct can be statistically assessed to examine the extent to which various dimensions can be considered internally consistent and therefore valid. Principal component analysis (PCA) was applied to assess the internal validity (in terms of interrelatedness of measures) of the four variables that had multiple measures, namely factors for project complexity, factors for stakeholder integration, key performance indicators, and project benefits realisation. Even though the recommended sample size for PCA varies across the literature – for instance, minimum 50 and ideally above 100 according to Hair *et al.*, (2010) and a minimum of 200 according to MacCallum *et al.* (1999) – the sample size in this study ( $n = 286$ ) was generally higher than the existing thresholds in the literature. PCA was conducted for the measures in the four variable categories for the 286 respondents. The KMO outcome affirmed that the sample size was sufficient for undertaking factor analysis ( $KMO=0.914$ ). The KMO suggested that it is well above the recommended value of 0.5 (Weide & Beauducel, 2019). Bartlett's test of sphericity  $\chi^2(100)$ ,  $p(0.000) < \alpha(0.005)$  suggested that the correlations that exist between the items are significant. In the present case, Bartlett's test of sphericity also showed an adequate outcome for factor tests, with approx. chi-square (1081) =18,560.00 and Pearson correlation.

### 6.4 Project management application to ICT projects in Kenya

Developing an effective project management environment entails the application of evidence-based practices and approaches in projects (Ramadhan & Muigai, 2016). Several aspects of project management have been theorised to be instrumental in optimising project outcomes. A number of variables were investigated in terms of their relevance to project management application in ICT projects in Kenya. The results in this section of the study summarise the outcome of the analysis germane to project management application in ICT projects in Kenya.

The application of PCA, in this thesis, as earlier intimated, was based on its significance in the interpretation of the dataset collected. It was applied herein based on the ability to reduce the number of variables that were used to explain specific aspects of project management in ICT infrastructure projects in Kenya. It retained the original trends of the data as well as its patterns while simplifying the huge dataset. The data was transformed into fewer dimensions, which then act as summaries of the features. As noted in Table 6.7, the thirteen variables used to describe the ICT project complexities were reduced or clustered by projecting them into simpler components with the intent of finding the best data summary.

#### **6.4.1 ICT project complexity**

Several variables were used in the quantitative data collection tool to examine the level the ICT project complexity in the country. A total of thirteen variables were used in the analysis of project complexity: level of stakeholder integration, formulation of project business case, application of project process, compliance and regulatory requirements, communication, scope uncertainty, alignment of project phases, management of project teams, political influence, project scheduling, lack of cultural awareness, technological complexity, and coordination of resources. These variables were all considered to be associated with a latent variable that was not directly measured in the analysis – ICT project complexity. In order to evaluate the thirteen variables, it was imperative that a factor loading was undertaken. In essence, the thirteen variables were reduced to a single variable under ICT project complexity and the eigenvalue thus measures the variance of the observed variables that the factors can explain ICT project complexity in Kenya.

Table 6.7 below suggests that out of the thirteen variables that are associated with ICT project complexity, four factors explain 60% of the total variance. The four determinants that significantly explain the total variance were: level of stakeholder integration, formulation of project business case, application of project procedures, and compliance and regulatory requirements.

**Table 6.7:** Principal components of ICT project complexity in Kenya

Determinants for ICT project complexity	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total
Level of stakeholder integration	3.049	23.453	23.453	3.049	23.453	23.453	2.328
Formulation of project business case	2.393	18.408	41.861	2.393	18.408	41.861	2.180
Application of project processes	1.299	9.989	51.850	1.299	9.989	51.850	1.783
Compliance and regulatory requirements	1.151	8.856	60.706	1.151	8.856	60.706	1.600
Communication plan	.933	7.178	67.885				
Scope uncertainty	.811	6.238	74.123				
Alignment of project phases	.747	5.743	79.865				
Management of project teams	.615	4.732	84.598				
Political influence	.512	3.938	88.536				
Project scheduling	.486	3.735	92.271				
Lack of cultural awareness	.390	2.999	95.270				
Technological complexity	.324	2.496	97.766				
Coordination of resources	.290	2.234	100.000				

Extraction method: Principal component analysis

Source: Author (2020)

#### 6.4.2 Essential determinants of ICT stakeholder integration

The analysis was keen to assess some of the essential determinants of ICT stakeholder integration in ICT projects. In this regard, the original ten variables considered as “essential determinants” of ICT stakeholder integration were reduced in order to evaluate the manner in which each of the variables explains the stakeholder integration concept in Kenyan ICT infrastructure projects. Table 6.8 below suggests that five variables explain 77% of the total variance. The variables identified as significantly associated with the latent variable were addressing stakeholders’ needs and expectations, alignment of stakeholders’ skills, understanding of core project processes, commitment to project objectives, and stakeholder communication plans. The outcome of this analysis implies that these five variables can be used to enhance ICT stakeholder integration in Kenya.

Notably, commitment to the project objectives ranks as a significant aspect of stakeholder integration (23.6%). These findings correspond to the suggestions of Jamil and Fathi (2016), who note that the commitment to project objectives is an aspect of stakeholder integration in that it improves information sharing. Commitment to the realisation of the project objectives would inherently lead the implementing teams to be inclined to share information regarding the project status. This is equally the essence of the discussions of Xia *et al.* (2017), who note that the commitment to project objectives positively influences the perceptions of project progress, especially through individual propensity to report to the others the progression of the project. In addition, understanding the core project processes is an essential aspect of stakeholder integration, as noted in Table 6.8 below. In consideration of the suggestions of Jamil and Fathi (2016) regarding project processes, it is evident that when project implementation teams are able to fully understand the project processes, the integration of stakeholders in the project is assured. This can be discussed from the perspective of Jamil and Fathi (2016), who note that in all project processes, there is a need for very close cooperation amongst the project implementation stakeholders.

The competence of key stakeholders is an essential aspect of the integration of the stakeholders in the project. This is evidenced in the research outcomes herein. Competency in this sense can be looked at from the perspective of the qualifications of the stakeholders in terms of their manageability in the project. In essence, the experience and qualifications of these stakeholders' further aids in their integration into the project (Jamil & Fathi, 2016). The other emergent issue notable in the findings of the study as related to stakeholder integration determinants is the readiness to adapt to project changes as well as data sharing. Readiness to adapt to project changes is essentially the ability of the team to remain pliable within the project management style (Jamil & Fathi, 2016). What this infers is that the ability of the stakeholders to remain flexible in addressing the emerging issues raised in the project is an important determinant of the

ability of the stakeholders to be part of the project. These findings show that the project management cycle can be adjusted. This means that the project, at one point, may encounter certain changes that would require a very rational approach to incorporate. In essence, therefore, for the stakeholders in the project to remain committed to the project objectives, they ought to be ready to remain flexible to the changes made within these projects.

The question of data sharing also comes out as an important, in fact critical, component of stakeholder integration in project management. Building a culture of data sharing in project management, as discussed by Kucharska and Kowalczyk (2016), is an essential aspect of project monitoring and evaluation. As a determinant of stakeholder integration, Jernigan, Ransbotham and Kiron (2016) propose that integrating stakeholders in project implementation relies on the ability of the project management team to share information regarding the project progress. These findings seem to support the notion that when a project develops a framework of data sharing, the stakeholders in the project are motivated to interrogate the project progress. It offers the implementing team the opportunity to query the progress based on the objectives of the project. What is of essence though, and relevant to the findings of this study, is that the concept of data sharing in the project motivates the stakeholders to be part of the project progress (Kucharska & Kowalczyk, 2016).

**Table 6.8:** Key determinants of ICT stakeholder integration

ICT stakeholder integration determinants	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings <sup>a</sup>
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total
Addressing stakeholders' needs and expectations	2.363	23.634	23.634	2.363	23.634	23.634	2.041
Alignment of stakeholders' skills	1.762	17.623	41.257	1.762	17.623	41.257	1.754
Understanding of core project processes	1.474	14.738	55.995	1.474	14.738	55.995	1.652
Commitment to project objectives	1.094	10.944	66.939	1.094	10.944	66.939	1.399
Stakeholder communication plan	1.020	10.205	77.144	1.020	10.205	77.144	1.204
Stakeholders' cultural orientation	.718	7.178	84.323				
Evaluation of stakeholders' needs	.550	5.500	89.822				
Data sharing	.480	4.797	94.619				
Readiness to adapt to project changes	.337	3.370	97.989				
Competency of key stakeholders	.201	2.011	100.000				

**Extraction method:** Principal component analysis

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

**Source:** Author (2020)

### 6.4.3 Key performance indicators of projects

To assess some of the key performance indicators associated with ICT projects, the study examined twelve variables. As can be seen in Table 6.9, it was imperative that a dimension reduction was undertaken for the data in order to establish the variables that significantly capture the overall variance in the observed factors. The evidence in Table 6.9 suggests that only four out of the twelve variables could be used to assess the significance of key performance metrics in ICT infrastructure projects in Kenya. Out of the variables under the key performance indicators for projects, the results of the quantitative analysis suggest that four variables cumulatively represent 62% of the total variance in the study. These four factors are: operational expenditure, client satisfaction, resource utilisation, and capital expenditure.

Operational expenditure is an important method of measuring project progress (Banihashemi *et al.*, 2017). The output of this research theme affirms that one of the determinants of the progress of ICT projects in Kenya is operational expenditure.

Prayogo *et al.* (2018) discuss this in the context of capital budgeting for infrastructure projects and suggest that the success of a project is directly founded on the prudent management of the established budgetary allocation. It is also notable that client satisfaction forms an important aspect of measuring project success. Client satisfaction is an important factor used in the measurement of the performance of the project (Abdel-Raheem & Ramsbottom, 2016). Ideally, projects, of whatever nature, are meant to ensure that the needs of the ultimate consumers of the project are realised by all means. It therefore follows that the satisfaction level of the client regarding the project becomes an important performance metric. Resource utilisation has equally been noted to be an important aspect of measuring project success. In assessing the ability of the project to realise the defined project aims, it is essential to review the extent to which the project has used the resources allocated to it (Tayeh *et al.*, 2019).

**Table 6.9: Project performance metrics**

Project performance metrics determinants	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loading <sup>a</sup>
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total
Operational expenditure	2.544	21.204	21.204	2.544	21.204	21.204	2.355
Client satisfaction	2.054	17.120	38.324	2.054	17.120	38.324	1.993
Resource utilisation	1.609	13.411	51.735	1.609	13.411	51.735	1.606
Capital expenditure	1.180	9.836	61.571	1.180	9.836	61.571	1.530
Percentage of phase completed	.958	7.984	69.555				
Scheduled performance index	.892	7.432	76.987				
Cost performance index	.703	5.855	82.842				
Planned hours of work versus actual situation	.563	4.690	87.532				
Return on investment	.544	4.531	92.063				
Cost variance	.391	3.258	95.322				
Budget variance	.335	2.790	98.112				
Quality	.227	1.888	100.000				

**Extraction method:** Principal component analysis

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

**Source:** Author (2020)

#### 6.4.4 Project benefits realisation

This study investigated project benefits realisation in ICT infrastructure projects in Kenya. To achieve this, the study assessed the level of importance of certain variables

related to project benefits realisation. A total of ten variables were used to evaluate the significance of project benefits realisation in Kenyan ICT infrastructure projects. The factor analysis output (see Table 6.10) indicates that three factors explain 72% of the total variance of the study. In a sense, these three factors can thus be said to be significantly important in elucidating the question of project benefits realisation in ICT infrastructure projects in Kenya. These factors are: the engagement of stakeholders throughout the project, adoption of a communication strategy for all stakeholders, and the review of outputs and outcomes of the ICT projects.

Project benefits realisation encompasses the variables that define the ability of the project to ensure that the overarching project aims have been realised. The table below suggests that the engagement of stakeholders in the project is directly linked to the ability of the project team to ensure that the defined project benefits are realised. This directly affirms the suggestions of Abdel-Raheem and Ramsbottom (2016), that when the stakeholders in the project are well engaged in all the project processes, the project is likely to realise its defined benefits. It is also notable that the adoption of a strategy of communication in these projects enhances the ability of the project to realise the anticipated benefits. Moreover, the findings in the study reveal that when the outcomes and outputs of the project are reviewed, the details of the project scope are refined in order to enhance the project outcomes (Kucharska & Kowalczyk, 2016).

**Table 6.10: Project benefits realisation – key factors**

Project benefits determinants	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loading <sup>a</sup>
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total
Engagement of stakeholders throughout the project	3.219	40.244	40.244	3.219	40.244	40.244	3.187
Adopting a communication plan for all stakeholders	1.498	18.727	58.971	1.498	18.727	58.971	1.475
Review of outputs and outcomes	1.003	12.531	71.502	1.003	12.531	71.502	1.178
Clearly defined expected outcomes	.862	10.778	82.280				
Approved business case	.564	7.054	89.334				
Clearly defined strategic objectives	.348	4.353	93.688				
Sufficient resources	.288	3.596	95.284				
Clear cost and schedule	.217	2.716	97.299				
Alignment of effort resource and investment	.202	2.203	98.190				
Clarified roles and responsibilities	.205	2.055	100.00				

**Extraction method:** Principal component analysis

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

**Source:** Author (2020)

## 6.5 Project management practices utilised in the delivery of ICT projects in Kenya

A number of key issues arose in the quantitative analysis regarding the project management practices that are utilised in the delivery of ICT projects in Kenya. In the context of ICT project complexity, the assertions documented in Table 6.11 suggest that three key practices are critical in the delivery of Kenyan ICT projects. Based on the variables in Table 6.11, the level of stakeholder integration, formulation of a project business case, application of project processes, and compliance with project processes were found to be instrumental in the delivery of ICT projects.

**Table 6.11:** Overview of project complexity factors in the ICT sector

Project complexity variables	N = sample size	Minimum	Maximum	Mean	Std deviation
Level of stakeholder integration	286	1	5	2.58	1.401
Formulation of a project business case	286	1	5	2.74	1.059
Application of project processes	286	1	5	2.33	1.288
Compliance and regulatory requirements	286	1	5	2.11	1.190
Valid N (listwise)	286				

**Source:** Author (2020)

Within the larger context of ICT project complexity, the respondents suggested the level of stakeholder integration highly influences the complexity of their projects (mean = 2.58) though a standard deviation of 1.4 indicates that the data sample of the respondents is more spread out. Moreover, the analysis indicates that the respondents considered the formulation of a project business case for ICT projects an important factor associated with ICT project complexity. Moreover, within the context of level of complexity, the findings show that the respondents rated the formulation of a project business case as “moderate” (mean = 2.74, std dev. = 1.05). A standard deviation of 1.05 indicates that the data is clustered around the mean, strengthening the findings of formulation of business case as a strong factor associated with project complexity.

The findings of the research further suggest that entities in the Kenyan ICT infrastructure sector considered the application of project processes in the ICT project delivery model as significant (mean = 2.3, std dev. = 1.2). As can be seen in Table 6.11, it was rated as “high” in terms of its complexity with regard to ICT project complexity levels. The last factor that was noted as a significant variable in the principal factor analysis (*see Table 6.11*) was compliance and regulatory requirements. As a subset of ICT project complexity, the findings of the study (*see Table 6.11*) disclose that it is “high” in terms of level of project complexity.

Further analysis focused on the key performance indicators in Kenyan ICT projects. Several project performance indicators were found to influence the progress of ICT projects both globally and specifically in Kenya. In terms of project performance indicators and performance metrics, a number of key issues emerged that are critical in project management in Kenyan ICT projects. Such factors as resource utilisation, client satisfaction, operational expenditure, and capital expenditure are ranked as “very important” factors in the assessment of project performance metrics in the ICT sector. The suggestions of Banihashemi *et al.* (2017), in terms of resource utilisation, can be used to understand the findings summarised in Table 6.12. The adherence rate of the project budget is an important aspect of project performance. The ability of the project to prudently apply the resources budgeted is an indication of successful project progress. There is also the question of client satisfaction, which was participants considered the most important driver for project implementation, especially for profit-orientated projects. Tayeh *et al.* (2019) note that the ultimate aim of these projects is to address the unique needs of the clients.

**Table 6.12:** Performance metrics in ICT projects in Kenya

Performance determinants	N = sample size	Minimum	Maximum	Mean	Std deviation
Resource utilisation	286	1	4	1.45	.746
Client satisfaction	286	1	5	1.44	.938
Operational expenditure	286	1	5	1.69	1.061
Capital expenditure	286	1	5	1.85	1.233
Valid N (listwise)	286				

**Source:** Author (2020)

With regard to project benefits realisation, the quantitative analysis focused on means and standard deviation of the variables under study. The variables with lower standard deviation indicated that the data of the respondents were clustered around the mean and the variable is very crucial in the realisation of project benefits. The findings did suggest

that three variables emerge as crucial in the realisation of project benefits in ICT projects in Kenya. These variables are: the review of outputs and outcomes (mean = 1.38, std dev. = 0.541), engagement of stakeholders throughout the project (mean = 1.7, std dev. = 0.886), and adoption of a communication plan for all the stakeholders in the project (mean = 1.91, std dev = 1.126), as shown in Table 6.13 below.

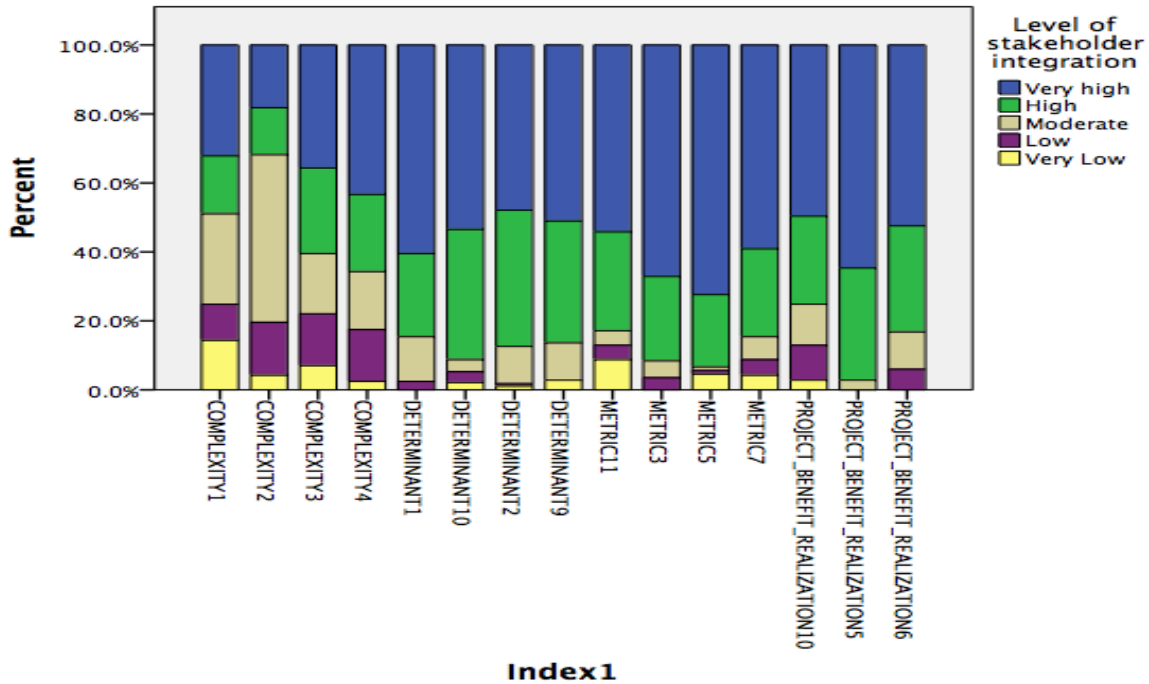
**Table 6.13:** Project benefits realisation

Benefits realisation determinants	N = sample size	Minimum	Maximum	Mean	Std. deviation
Review of outputs and outcomes	286	1	3	1.38	.541
Engagement of stakeholders throughout the project	286	1	4	1.70	.886
Adopting a communication plan for all stakeholders	286	1	5	1.91	1.126
Valid N (listwise)	286				

**Source:** Author (2020)

## 6.6 Factors associated with ICT infrastructure project delivery research themes

In an effort to evaluate some of the emergent themes in the research study, the analysis evaluated the responses from some of the main factors that were loaded in the variables according to the PCA done in the initial sections of the study. The analysis discarded the insignificant factors in the total variance of the variables in order to understand the emerging themes in the study related to stakeholder integration, project benefits realisation, performance indicators and ICT project complexity. The graph below gives a general outlook of the responses.



**Figure 6.1:** Themes in Kenyan ICT project delivery

**Source:** Author (2020)

As can be observed in Figure 6.1, a general trend is notable regarding project complexity. There is a general indication that the complexities are considered either “high” or “very high”. Moreover, within the domain of the determinants of stakeholder integration, the variables that were applied in the analysis did suggest that the respondents in the study also ranked these factors as “very high” or “high”. The same trend is notable in the remaining domains of analysis – project benefits realisation and key performance indicators. In terms of project complexity, the findings of the study suggest that the identified key factors of project management are considered to be very high in terms of project complexity within Kenyan ICT projects. The findings suggest that level of stakeholder integration, formulation of project business case, application of project processes, and compliance to regulatory requirements are significant. In terms of the level of stakeholder integration, the findings of the study correspond to the suggestions of Ramadhan and Muigai (2016) regarding the Kenyan project management environment,

where the question of stakeholder inclusion and cooperation has been considered. Indeed, the failure of the majority of Kenyan ICT projects, according to Haxby and Lekhi (2017), is largely attributable to weak stakeholder inclusion policies.

### 6.7 Exploring the relationships between variables

In order to assess some of the project management practices that are utilised in the delivery of ICT projects in Kenya, a correlation analysis was undertaken. Bonnet and Wright (2000) opine that correlation analysis entails the evaluation of the strength of the relationship that exists between two variables. The essence of the correlation analysis is to be able to not only measure the strength of the relationship but also to give an overview of the direction of the linear relationship between two variables.

In the evaluation of the correlations between two variables in any statistical analysis, the covariance of the variables is taken into account. In this study, the Spearman's correlation analysis was undertaken on several variables in the study to establish the manner in which these variables were related. The Spearman's correlation coefficient was also considered as it a non-parametric statistic that is applied when the dataset used has violated the parametric assumptions. The analysis works by ranking the data then applying Spearman's equation to the ranks that have been generated.

In instances where the ranks are not tied, the Spearman's correlation can be established:

$$\rho = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)} \dots\dots\dots \{9\}$$

In developing a stakeholder integration assessment tool, it was imperative that the correlations amongst variables were established. The adoption of the correlation analysis aimed to discover the strength of the link between a number of relevant variables related to ICT infrastructure project management. The primary aim of the study is to assess the extent to which the current stakeholder integration practices in ICT infrastructure

projects can be optimised as a way of enhancing project outcomes. This is to be achieved through the development of an assessment tool for ICT stakeholder integration and infrastructure performance improvement in Kenya. This quantitative analysis focuses on variables that directly address stakeholder integration effectiveness and relate it to other indicators of project success. In terms of ICT project complexity, four variables – level of stakeholder integration, formulation of project business case, application of project processes, and compliance requirements – were analysed in terms of their contribution to stakeholder integration effectiveness in Kenyan ICT projects. As shown in Table 6.14, a Spearman’s rank-order correlation was run in the quantitative analysis in order to establish the relationship between the level of stakeholder integration in Kenyan ICT projects and the effectiveness of stakeholder integration in the projects. In statistical terms correlation is classified as weak correlation. Conventionally, correlational coefficients range between +1 and -1. Notably, coefficients of +1 suggest that there is perfectly linear positive correlation while -1 indicates a perfect negative. When the correlation approaches zero, the association is little. As noted by Kumar (2019), correlation can either be positive or negative depending on the impact of the association of variables under study. There was a weak, positive correlation between the level of stakeholder integration and the effectiveness of stakeholder integration in ICT projects, which was statistically significant at the 0.01 level ( $r_s = .153$ ,  $p = 0.01$ ). Table 6.14 below gives the summary output.

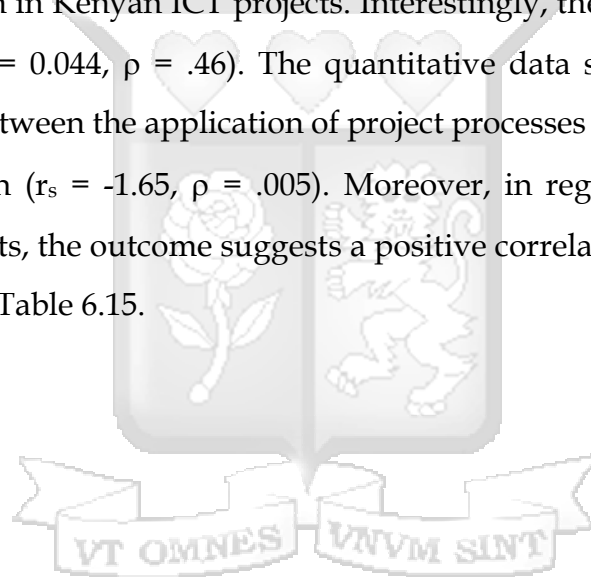
**Table 6.14:** Level of stakeholder integration and effectiveness of stakeholder integration in projects

			Level of stakeholder integration	Effectiveness of stakeholder integration in recent projects
Spearman's rho	Level of stakeholder integration	Correlation coefficient	1.000	.153**
		Sig. (2-tailed)	.	.010
		N	286	286
	Effectiveness of stakeholder integration in recent projects	Correlation coefficient	.153**	1.000
		Sig. (2-tailed)	.010	.
		N	286	286

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

Source: Author (2020)

The development of an assessment tool for stakeholder integration in ICT projects equally entailed understanding the ways in which the formulation of a project business case, application of project procedures and issues of compliance are all related to stakeholder integration. The analysis undertook a further analysis of these three variables, clustered under ICT project complexity, and the manner in which these variables correlate to the effectiveness of stakeholder integration in ICT projects. The Spearman's correlation coefficient was used to evaluate the relationships amongst the variables. The formulation of a project business case was found to positively correlate to the effectiveness of stakeholder integration in Kenyan ICT projects. Interestingly, the correlation was found to be insignificant ( $r_s = 0.044$ ,  $\rho = .46$ ). The quantitative data suggests that there is a negative correlation between the application of project processes and the effectiveness of stakeholder integration ( $r_s = -1.65$ ,  $\rho = .005$ ). Moreover, in regard to compliance and regulatory requirements, the outcome suggests a positive correlation ( $r_s = .104$ ,  $\rho = .080$ ). This is summarised in Table 6.15.



**Table 6.15:** Stakeholder integration, formulation of a business case and application of project processes

			Formulation of a project business case	Application of project processes	Compliance and regulatory requirements	Effectiveness of stakeholder integration in recent projects
Spearman's rho	Formulation of a project business case	Correlation coefficient	1.000	.000	.196**	.044
		Sig. (2-tailed)	.	.999	.001	.460
		N	286	286	286	286
	Application of project processes	Correlation coefficient	.000	1.000	-.349**	-.165**
		Sig. (2-tailed)	.999	.	.000	.005
		N	286	286	286	286
	Compliance and regulatory requirements	Correlation coefficient	.196**	-.349**	1.000	.104
		Sig. (2-tailed)	.001	.000	.	.080
		N	286	286	286	286
	Effectiveness of stakeholder integration in recent projects	Correlation coefficient	.044	-.165**	.104	1.000
		Sig. (2-tailed)	.460	.005	.080	.
		N	286	286	286	286

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

**Source:** Author (2020)

The Spearman's correlation was further used to evaluate the correlation between a number of project benefits realisation aspects as well as stakeholder integration. The outcome of the test is outlined in Table 6.16.

**Table 6.16:** Project benefits realisation and stakeholder integration

Correlation determinants of benefits realisation and stakeholder integration		Addressing stakeholder needs and expectations	Engagement of stakeholders throughout the project	Commitment to project objectives	
Spearman's rho	Addressing stakeholder needs and expectations	Correlation coefficient	1.000	.306**	-.049
		Sig. (2-tailed)	.	.000	.411
		N	286	286	286
	Engagement of stakeholders throughout the project	Correlation coefficient	.306**	1.000	-.123*
		Sig. (2-tailed)	.000	.	.038
		N	286	286	286
	Commitment to project objectives	Correlation coefficient	-.049	-.123*	1.000
		Sig. (2-tailed)	.411	.038	.
		N	286	286	286

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

**Source:** Author (2020)

Addressing stakeholder needs and expectations is positively correlated to the engagement of stakeholders in the project ( $r_s = -0.306$ ,  $\rho = .000$ ). The findings of the quantitative analysis further suggest that the engagement of stakeholders in ICT projects is negatively related to the commitment to project objectives ( $r_s = - .123$ ,  $\rho = .038$ ). Further evaluation of the relationship between stakeholder integration and the realisation of project benefits indicates that commitment to project objectives in Kenyan ICT projects is negatively correlated to addressing the needs and expectations of the stakeholders in the project. What this outcome seems to be suggesting is that stakeholder integration strategies that have been adopted in the project define stakeholders' level of diligence in implementing the project objectives. This is notable in the works of Banihashemi *et al.* (2017), to the effect that when stakeholder integration strategies in projects have been ignored, the commitment of the stakeholders to the project is diminished (Ramus & Vaccaro, 2017). In essence, therefore, the outcome of this analysis affirms that stakeholder integration in project management defines the stakeholders' commitment to the project objectives. To improve the commitment of the stakeholders to the project, it thus follows that they – stakeholders – ought to be adequately integrated in the project in all the phases of project implementation.

## 6.8 Exploration of factors associated with stakeholder integration

In proposing an assessment tool for ICT stakeholder integration and infrastructure performance improvement in the ICT sector, this research sought to assess the manner in which the stakeholder integration strategies have been met in the various ICT projects in the country. As can be seen in Table 6.17, the majority of respondents suggested that the current stakeholder integration strategies that are being applied in Kenyan ICT projects have only been “moderately” affective (128 – 44.8%). At the same time, 72 of the respondents (25.2%) suggested that stakeholder integration strategies in Kenyan ICT projects have not been “effectively met”. This is in comparison to the 50 (17.5%) who disclosed that stakeholder integration strategies in Kenyan ICT projects have been met but were “less effective”, although 36 (12.6%) admitted that these integration strategies have been met very effectively in the various ICT infrastructure projects in the country. What is evident from the study, as revealed in this survey, is that the current stakeholder management models used in the delivery of ICT projects in Kenya are not sufficiently addressing the project challenges in the sector. This suggests that there is a need to optimise existing stakeholder integration models. Thus, there is a need for policy makers and project implementation teams in the ICT sector to introduce evidence-based models of stakeholder management that will ensure stakeholder integration is achieved in an efficient and effective way

**Table 6.17:** Effectiveness of stakeholder integration in recent projects

	Levels of scale	Frequency	%	Valid %	Cumulative %
Valid	Very effective	36	12.6	12.6	12.6
	Less effective	50	17.5	17.5	30.1
	Moderately effective	128	44.8	44.8	74.8
	Not effective	72	25.2	25.2	100.0
	<b>Total</b>	<b>286</b>	<b>100</b>	<b>100</b>	

Source: Author (2020)

### 6.8.1 Determinants of stakeholder integration

Upon assessment of the determinants of stakeholder integration in Kenyan ICT projects, the study sought to evaluate the essential determinants of ICT stakeholder integration. The key factors that were found to have significant influence on ICT stakeholder integration, as illustrated in Table 6.18, were: commitment to project objectives (mean = 1.57, std dev. = 0.808), understanding of core project processes (mean = 1.67, std dev. = 0.77), stakeholder communication plan (mean = 1.8, std dev. = 0.85), addressing stakeholder needs and expectations (mean = 1.68, std dev. = 0.87) and alignment of stakeholder skills (mean = 1.63, std dev. = 0.88). See Table 6.18 for the summary of outputs. One of the most notable suggestions that can be made herein is based on the findings of the analysis on stakeholder integration determinants from a general viewpoint, that is, the key factors that define stakeholder integration in ICT infrastructure projects, i.e., the commitment to project objectives, understanding of core project processes, communication plan for the stakeholders, addressing stakeholder needs, and alignment of stakeholder skills. These findings can be compared to what Vaquero Martín *et al.* (2016) suggest are the key drivers of including stakeholders within the project delivery matrix. The work points to communication and commitment to project objectives – two factors that have been noted in this study as being critical in driving stakeholder integration in Kenyan ICT projects

**Table 6.18:** Stakeholder integration determinants

Determinants of stakeholder integration	N = sample size	Minimum	Maximum	Mean	Std. deviation
Commitment to project objectives	286	1	4	1.57	0.808
Understanding of core project processes	286	1	5	1.67	0.779
Stakeholder communication plan	286	1	5	1.80	0.858
Addressing stakeholder needs and expectations	286	1	5	1.68	0.879
Alignment of stakeholder skills	286	1	6	1.63	0.880
Valid N (listwise)	286				

Source: Author (2020)

## 6.9 Chapter summary

The findings that have been appraised in this chapter of the study suggest that in terms of ICT project complexity in Kenya, four key factors are identifiable. The four factors that were loaded in the principal component analysis as depicting the largest percentage of project complexity are: level of stakeholder integration, formulation of a project business case, application of project procedures, and compliance and regulatory requirements. Moreover, the study also suggests that one of the key challenges that ICT projects face is the development of stakeholder integration. Within the context of ICT stakeholder integration, it was found that the four main factors that significantly influence project stakeholder integration in Kenyan ICT projects are: project operational procedures, client satisfaction, resource utilisation and capital expenditure.

The addressing of stakeholder needs and expectations, alignment of stakeholder skills, understanding the core business processes of the project, and commitment to the project objectives were summarised under the ambit of stakeholder integration. In essence, the survey outputs in this chapter have provided an insight into the most significant variables that influence various aspects of stakeholder integration in Kenyan ICT infrastructure projects. In the evaluation of the correlation between various aspects of project variables in Kenyan ICT projects, there was a positive- although weak- correlation between various aspects of project management and stakeholder integration. In the next chapter, the theoretical and practical underpinnings of these findings are comprehensively discussed.

## Chapter Seven: Discussion of Findings

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### 7.1 Introduction

This chapter discusses both the qualitative and quantitative research findings. The discussions in this section of the study essentially link the findings of the study to theory. The section thus discusses the manner in which these findings fit into the theoretical framework of the study, conceived within the domains of stakeholder integration and project management in Kenya (ICT infrastructure projects). It is anticipated that the findings of the study in this section will be instrumental in the development of a framework for stakeholder integration and management in Kenyan ICT project initiatives. The qualitative findings of the study are discussed first under the five themes conceived in the data collection tool. Subsequently, the quantitative findings are examined under several sub-tasks, as related to stakeholder integration and infrastructure improvement in Kenya.

### 7.2 Qualitative findings

The research adopted two study designs in order to report the findings from the research participants. The mixed-method model combined qualitative and quantitative research approaches in evaluating the study outcomes. The qualitative findings in this discussion are effectively applied to validate the quantitative research findings. In this section of the research study, the qualitative research findings are discussed in detail. The discussion is divided into segments consistent with the developed research objectives. The qualitative findings of the study were obtained from the semi-structured interviews that were undertaken in the study. As outlined in previous chapters, the participants who were interviewed consisted of project managers, project engineers, directors and project planners. A total of forty-seven participants participated in the qualitative aspect of the research. In this section of the discussion, the trends in their responses were evaluated in the context of existing theories to make relevant inferences related to stakeholder

integration and the need to propose an assessment tool for ICT stakeholder integration and infrastructure performance improvement in Kenya.

### **7.2.1 Objective 1: Complexity of delivering ICT projects in Kenya**

Project delivery is hampered by several factors, both extrinsic and intrinsic. Cumulatively, these factors fall under the ambit of project complexity, meaning that the more complex these factors are, the harder it is to realise the defined benefits of ICT projects. This section primarily focuses on explaining the nature of these complexities within the context of Kenyan ICT infrastructure projects, i.e. the propensity to project complexity, nature of ICT project complexities in Kenya, and extent to which project complexity influences ICT project delivery.

#### **7.2.1.1 Propensity to project complexity**

Defining project complexity within any project management ecosystem is an important step in the development of the mitigation structures for the project (Dao *et al.*, 2016). It is imperative that the project delivery team understands the relevant project variables so that they are able to effectively discern the project complexities as well as their levels, as this is the initial step in advancing project goals. According to Qazi *et al.* (2016), projects have become larger and technologically more sophisticated and are organised with a higher number of partners and stakeholders (Dao *et al.*, 2016). This essentially means that the level of complexity of the projects in the current project management framework is high. In the context of this research, it is evident that project complexity is inescapable in any project implementation framework (Qazi *et al.*, 2016). Project delivery teams concur that complexities within any project define the very fabric of the project. What the findings of this study suggest, as related to the propensity of these projects to project complexities, is that, in one way or another, ICT projects in Kenya face quite a significant exposure to project complexities during their implementation.

There is evidence, from the findings of the study, that the participants are well aware of the implications of these project complexities on the general direction of the projects in the country. It is notable that the level of complexity of these projects in the country is significantly high and this elevates the difficulty of the obstacles that are faced within the ICT project delivery template in the country. In essence, it is notable from the outcome of the study, in regard to project propensity, that the ICT sector in Kenya faces immense challenges from both extrinsic and intrinsic factors. The propensity of the project delivery team to encounter these challenges is quite high; this essentially means that the framework for the implementation of ICT projects in the country could be challenging to say the least.

It was further found that the interactions between various project complexities further highlight to project implementation teams the extent to which they have to provide an easy project management environment for the delivery of the project goals. What this infers, as adduced in the work, is that more project complexities in the project equals more project management challenges. This is the assertion of Bakhshi *et al.* (2016) when they argue that the nature of the interactions of the project complexities within the project cumulatively point to the general directions of the challenges that the project is likely to face during the delivery timelines.

Luo *et al.* (2017) affirm the nature of ICT project complexities and suggest that the delivery team must integrate the complexities of ICT projects within the remedy framework. One emergent issue during the interviews was the concept of stakeholder management in Kenyan ICT infrastructure as a project complexity that limits the ability of projects to deliver defined benefits in the country. Methods of engaging and including stakeholders within the main project implementation structure essentially enhance the effectiveness of these projects in realising their objectives. These findings affirm the dispositions of Odhiambo *et al.* (2020), that the structure of stakeholder management in Kenyan ICT

projects has not been well developed. There is no well-defined template for the management of the stakeholders in the various project phases – an issue that has essentially limited the project delivery initiatives in the country.

Sticking with the question of propensity to project complexities, an emerging concept herein is that the nature of these project complexities fundamentally influences the project delivery adopted in Kenyan ICT projects. Though the findings of the study did not quantify the levels of project complexity, the assertions therein seem to suggest that within Kenyan ICT projects, there seem to be several components of project complexity – an issue that further complicates the project implementation framework within the Kenyan ICT sector. The findings thus build on the earlier suggestions by Odhiambo *et al.* (2020) that the sustainability of Kenyan projects in the ICT sector is never assured, basically because there are several complexities that face these projects and require a framework for management.

#### **7.2.1.2 Nature of ICT project complexities in Kenya**

There seems to be agreement amongst the participants in the study that stakeholder management supports project management initiatives in Kenya. In the discussion regarding project complexities in the country's ICT projects, there was significant focus on the stakeholders being one of the most important components of project complexity that affect the implementation of ICT projects in the country. What this means is that the development of a framework for the management of ICT complexity in Kenya requires that stakeholder management initiatives are taken into consideration.

It is worth noting that stakeholder management has been broadly applied in the study to indicate the level at which the stakeholders are engaged in the project. This seems to be the salient theme in the outcomes of the study insofar as project complexity and stakeholder management are concerned. The findings of this study seem to indicate that the Kenyan ICT infrastructure project delivery model still neglects to manage of the

project stakeholders. Indeed, Odhiambo *et al.* (2016) argue for the importance of the evaluation of the state of stakeholder management in the Kenyan ICT project delivery model. There seems to be an agreement that stakeholder management is such a huge challenge in the management of these projects. The ability to weave a framework to ensure that the stakeholders in these projects are identified and included in the mainstream management model of the project is a great challenge in the project implementation schedule in the Kenyan ICT sector.

These findings seem to validate the main outcome of this research study, that is, the proposal of a framework for the management of the stakeholders in the ICT sector. Specifically, the proposal of a framework for the inclusion and integration of the stakeholders in these ICT projects is validated by these findings. Two issues arise herein that can be used to describe the nature of project complexity in Kenya. First of all, stakeholder management is considered an important determinant in the ICT project delivery model. To be precise, the findings of the study agree that within the general context of stakeholder management, the question of stakeholder integration is a confounding factor in the management of the country's ICT infrastructure projects. At the same time, the outcome of the study seems to validate the propositions of Kiprono *et al.* (2019), to the effect that the country's project management framework generally lacks comprehensive inclusion of stakeholder integration. This means that the ICT infrastructure projects that are being delivered in the country will consistently face the challenge of stakeholder integration, which is an issue that is likely to adversely affect the project outcomes.

### **7.2.1.3 Extent to which project complexity influences ICT project delivery**

No quantitative studies have been able to empirically affirm the extent to which project complexities in the Kenyan ICT sector have influenced the ability of these projects to conclude as predicted in the planning phase of these projects. Nonetheless, from a general

viewpoint, when ICT complexities are high, there are difficulties in ensuring that the project delivers as planned. This is the position of Dao *et al.* (2016), which seems to resonate with the findings of this research. The respondents disclosed that the more complexities they face in the project delivery scheme, the harder it is for them to deliver these projects. Of course, this has been corroborated by a number of observations within the project delivery ecosystem in the country.

In projects where the stakeholders are many and varied, ICT project implementation teams confirm that the progress of the project becomes very difficult. What this basically means, and as revealed in the findings of the study, is that the project delivery of ICT projects is directly influenced by the various project complexity components involved in the project. In terms of project complexity and its impact on project delivery, project complexities have direct control over a number of variables within the project delivery framework. Project complexities influence the planning and control of projects. What this means is that the nature of complexity in the projects, identified during the delivery of these projects, directly impacts on the ability of the project delivery team to plan for these projects and to develop the right control measures for these projects. While this was not explicitly mentioned in the responses of the study, the admission that project complexity in ICT infrastructure projects in Kenya has limited the ability of the projects to realise the defined benefits means that there is a very strong connection between these two variables. When the implementing teams are unable to effectively handle the project complexities, it basically means that the outcomes of these projects are not assured; the ability of these projects to realise the defined project objectives is not assured.

Notably, project complexities prevent the projects from clearly identifying the project goals (Rolstadås & Schiefloe, 2017). This is perhaps why Qazi *et al.* (2016) note that the planning phase of the project is greatly affected when several types of project complexity come into play. Qazi *et al.* (2016) propose the identification of different concepts that are

associated with project complexity – the main factors behind project complexity, the attributes of the project complexities and the types of project complexities – can be of significant support in offering much-needed assistance to the project leaders in advancing project objectives. This is an admission that project complexities, of whatever nature, in Kenyan ICT infrastructure projects, are intricately intertwined with project delivery schedules. Taking this into consideration, it thus follows that to be able to address the project delivery challenges within the Kenyan ICT sector, it would be prudent that the initial step focuses on the assessment of these project complexities.

### **7.2.2 Objective 2: Nature of ICT stakeholder integration**

This research has established that stakeholder integration is a cardinal issue in the delivery of project variables in the Kenyan ICT sector. In essence, there is a very strong correlation between stakeholder management initiatives and project goals. Earlier on, the research identified stakeholder integration as a key component of project complexity in ICT infrastructure projects in the country. In this section of the discussion, the nature of stakeholder integration is discussed. This section of the study, first of all, contextualises stakeholder integration in the Kenyan ICT sector. It basically discusses what stakeholder integration in ICT sector means. Moreover, the section evaluates the methods of managing ICT project stakeholders in Kenya. In this regard, it assesses some of the proposals from the participants in the study regarding the methods that ought to be applied in the management of the stakeholders involved in these ICT infrastructure projects and the extent to which their integration influences benefits realisation. Additionally, this section evaluates stakeholder management by proposing the components of a stakeholder management template in the Kenyan ICT infrastructure delivery model.

### 7.2.2.1 Stakeholder engagement in Kenyan ICT projects

The nature of the engagement of the stakeholders in the Kenyan ICT sector involves the analysis of stakeholder interests. By getting to know the stakeholders' interests, the project delivery team is able to effectively incorporate their requirements. In essence, the stakeholder engagement platform within any project management initiative aids in the improvement of the extent to which the stakeholders are engaged in the project and thus the implementing team are able to rethink their strategies as well as the operations required in managing them during the project delivery.

The participants in the study, while painting a picture of the nature of stakeholder engagement in the Kenyan ICT sector, unequivocally stated that the level of stakeholder engagement in the Kenyan ICT sector is quite low. Indeed, the opinions of the participants were to the effect that there is no firm engagement model for the stakeholders in the sector because there is no well-defined template for engaging them. There seems to be a differentiation in terms of the nature of the projects insofar as stakeholder engagement is concerned. Notably, in the projects that involve the government, referred to in this research study as government-driven projects, there seems to be very little focus on the engagement of the stakeholders concerned with the project. There are indications from the study that the input by a number of stakeholders in these projects is largely disregarded because there is no firm framework for engaging stakeholders. The privately funded projects, however, differ in this regard.

The assertions of the participants in the study are to the effect that stakeholder integration involves collecting the views of the stakeholders regarding the project and using well-defined KPIs to monitor project progress. The participants in the study agreed that the context of stakeholder engagement in the ICT sector in Kenya involves the ability to have what is referred to as a "roundtable" with the stakeholders and ensure that the stakeholders are part of the project delivery process. What this means, within the context

of ICT infrastructure projects in Kenya, is that stakeholder integration entails calling together all the stakeholders in the project and having a platform through which these stakeholders are briefed on the progress of the project and the relevant feedback regarding the project delivery is obtained. Thus, Odhiambo *et al.* (2020) highlight that communication is a critical component of stakeholder integration in ICT projects.

#### **7.2.2.2 Stakeholder management template in Kenyan ICT project management**

There was a general agreement amongst the participants in the study regarding the model of management used in Kenyan ICT projects. What is evident in the findings of the study is that the management model adopted for the stakeholders in the Kenyan ICT sector ought to make communication the fulcrum of their engagement. The participants contended that the weakest link in the stakeholder management is the communication strategy that is adopted in the delivery model. This perhaps gives a history of the extent to which stakeholder communication in ICT projects in the country is managed. What is evident, and what was affirmed by the majority of the participants in the study, is that the stakeholders do not have a well-defined model that can be used to update or monitor the progress of ICT projects. There is no forum through which the relevant stakeholders in the sector can be adequately engaged, interrogated or even communicated with in terms of the project.

In looking at the proposal to design a model for managing stakeholders in the project, the element of communication is central. Thus, the idea that is propagated herein is that the stakeholder management template for the ICT infrastructure projects in the country needs a firm communication structure. This idea is comparable to the works of Epstein *et al.* (2017), who contend that the very basis of any stakeholder management theory ought to take into account the need to address the manner in which individuals communicate in projects. The correspondence amongst the stakeholders in the project is considered

instrumental in the advancement of the project goals. The question of communication thus becomes central to the management of stakeholders.

It was further found that the Kenyan ICT sector does not have the effective capacity to identify the stakeholders in the project and evaluate the extent of their interest in projects. One key finding of the research study is that within the Kenyan ICT sector, one is unable to clearly define the project stakeholders. Stakeholder management in the ICT sector in the country is impossible if the stakeholders cannot be identified using a predefined tool. The suggestions in the research coincide with the disclosures that stakeholder management is incomplete if the actual stakeholders are not adequately identified. In essence, therefore, what this study has suggested is that the management of the stakeholders in the project must include a framework to ensure that stakeholders can be adequately prioritised and integrated. What is evident is that the template for stakeholder integration in the Kenyan ICT sector ought to take into consideration the fact that stakeholder identification has been a major problem in the country. It ought to be cognisant of the fact that the country has not developed a standardised model that can be utilised to prioritise the relevant stakeholders in ICT projects.

What is coming out, in consideration of the findings of the research, is the need to standardise stakeholder integration strategies in ICT infrastructure projects in Kenya. The concerns raised by the participants in the study further validate the essence of this research. This is because the integration of stakeholders in projects requires that an elaborate stakeholder identification format is adopted. What is notable herein is that the participants in the study are basically admitting that it would be prudent to have a template through which they are able to prioritise stakeholder roles.

### **7.2.3 Objective 3: Key project performance metrics**

The suggestions made herein are to the effect that the planned value of Kenya's ICT infrastructure projects is likely to be realised effectively if the relevant stakeholder integration models are utilised. Looking at the assertions of the participants, one issue emerges in the sense that the stakeholder integration models adopted in these projects define the ability of these projects to perform optimally. ICT projects, just like other projects, have to be monitored to establish if the planned value, the earned value and the actual costs have been realised in light of the project objectives. Within the larger framework of project monitoring and evaluation, project performance metrics provide key variables for assessment. The Kenyan ICT sector requires a robust framework for monitoring whether the project objectives are being realised. Most importantly, though, the question of stakeholder integration in projects can be assessed effectively through the evaluation of the various project performance metrics in these projects. In this section of the study, the focus is on ICT project performance metrics and stakeholder integration strategies. This section also focuses on ICT project key performance indicators in Kenya as well as the variables that are involved in project accountability assessments.

#### **7.2.3.1 Project planning approaches and project delivery**

The interview results affirmed that no participatory approaches have been developed in the Kenyan ICT infrastructure sector to help in the planning and implementation of projects. Participants unanimously agreed that the Kenyan project delivery model has not yet internalised the need to ensure this participatory approach in the delivery of these projects. Indeed, this suggestion seems to bolster the assertions made earlier about ICT infrastructure projects in Kenya in terms of their sustainability. Yun *et al.* (2016) argues that the purpose of a participatory planning model in Kenyan ICT infrastructure projects is to create sustainable projects.

In terms of project planning approaches, a number of the participants in the study chose to concentrate on stakeholder inclusion in the project planning process within ICT infrastructure projects in the country. Notably, the findings in this research highlighted that in the government managed projects, for instance, there was little inclusion of all the relevant stakeholders in the project planning phase – an assertion that was discussed within the principles of project stakeholder inclusion. Regarding the issues in project planning approaches in Kenyan ICT infrastructure projects, the participants in the study contend that the planning phases of these projects have not been as inclusive as they ought to be. There seems to be inadequate planning engagement, especially that which consults stakeholders on the ground regarding the project. Indeed, this has been the lamentation of a number of research studies regarding ICT projects in the country (Hatakka *et al.*, 2020). The inability of the project delivery team to engage all the cadres of stakeholders in the planning phases of these projects has seen the sustainability of these projects wane. A number of ICT infrastructure projects that have been rolled out in the country have fizzled out without realising their intended objectives, partly because they lack adequate support from one important segment of stakeholders.

This research has therefore observed a very disjointed project planning model. Indeed, this the participants concluded that more is required to enhance the participation of stakeholders at all stages of the ICT project delivery cycle. The tone of the research participants was to the effect that the feeble project planning framework applied to ICT infrastructure projects has adversely affected the delivery of these projects. There seems to be a huge gap in terms of executing these projects since the planning phases of these projects do not embrace inclusive and participatory engagement. Perhaps the disclosures of Kiprono *et al.* (2019) regarding project management initiatives and problems in the country can further explain outcomes of this research. Both studies propose that a radical shift in project management initiatives in Kenya is needed to really concentrate on the question of inclusion of stakeholders.

A comparative assessment of the variations between public and private projects in terms of stakeholder inclusion reveals an interesting trend that is worth exploring. As earlier discussed, there seems to be a unanimous opinion that the project planning phase of Kenyan ICT infrastructure projects excludes some of the most important stakeholders, such as the consumers of the project. But in a more advanced analysis, it is reported that there is a significant difference between government-funded or -driven projects and private projects. Research participants, in relation to this, revealed that stakeholder inclusion initiatives in government-funded projects are much less organised. This means that such government-initiated and -run projects do not embrace the level of stakeholder inclusion during the planning phase of the projects in comparison to privately funded projects. Two explanations have been given for this. One, and this is the theme of the research by Ramadhan and Muigai (2016), is that the ICT infrastructure project development status in Kenya is more of a political process. This means that decisions are “top-down”. What this means is that political leaders decide on what forms of infrastructural investment are to be dispensed to the public and thus no elaborate need analysis is undertaken. Therefore, what happens is that the roll-out of these projects is largely seen by society as a government initiative and thus the stake of the consumers in the project is limited. This approach by the government has caused the collapse of quite a number of ICT infrastructure projects in the country.

The second explanation is based on what Kuthii *et al.* (2019) consider the value proposition of a project, especially from the point of view of the government. The commercial returns associated with these public ICT projects have never really been well developed. These infrastructure projects are not meant to offer any commercial value per se. This means that the manner in which these projects are being run does not conform to established business operational models. In this regard, these projects disregard these initiatives in the project delivery model, since they are not very keen on reaping any commercial returns. In contrast, a much improved and more inclusive model has been

developed by the private companies in Kenyan ICT infrastructure development. This has been largely attributed to the business model adopted by these private companies in the implementation of ICT infrastructure projects in the country.

### **7.2.3.2 Contingency measures in project execution plans**

With regards to project contingency plans in the Kenyan ICT sector, the study found that these projects have well-developed contingency plans. The study revealed that during the planning phase of these projects, the private and public sectors have well-developed contingency plans as a way of protecting these projects from uncertainties. There was an agreement amongst the interviewed participants that within every phase, a plan is developed to hedge these ICT infrastructure projects from unseen risks. The suggestions herein conform to the proposals of PMBOK and PRINCE 2, which notes that contingency plans in project management have to be established as back-up plans to cushion the projects from unseen risks (PMBOK, 2019). The essence of a contingency plan is to allow for an actionable strategy in case there is a project risk that is encountered during the project execution. What these findings seem to be suggesting is that the country has done well in terms of contingency measures for ICT projects. While there is no documentation to corroborate this, the participants in the study disclosed that within their projects, they have documented plans to deal with certain eventualities.

However, the study participants were also quick to suggest that the execution of these contingency plans has been a subject for discussion in the past. The majority of the participants in the study contended that the speed of execution of these contingency plans is an issue that ought to be addressed. A number of projects in the Kenyan ICT infrastructure sector have not been able to resume operations even as the restoration process continues. What the findings of the study seem to highlight is that immense bureaucracies and red tape, especially within the regulating agencies and the government as a whole, have greatly limited the ability of projects to have a quick action plan to

remedy emergent challenges and risks. A study by Kuthii *et al.* (2019) discloses that within government projects, the application of contingency measures seems to take too long, thus making the recovery of these projects after an uncertainty very difficult.

There have been discussions as reviewed in this study, centred on project contingency measures that can be applied to explain the issues in the country's ICT sector. One is that a contingency plan ought to advance project progress without any hitch. This means that whenever there is any project uncertainty, the contingency plans ought to automatically take over without necessarily impairing the project advancement lifecycle. This is, however, not witnessed in the ICT sector. The turnaround time taken to resume project operations after uncertainties is quite long within the Kenyan system.

#### **7.2.4 Objective 4: Project benefits realisation**

The concept of project benefits realisation is premised on the notion that the project benefits ought to result from the project outputs (Dupont & Eskerod, 2016). Benefits realisation management, according to Saeed *et al.* (2020), is meant to provide organisations with a framework to measure the manner in which projects can be able to add what is referred to as "true value" to the exercise. According to Kazmi *et al.* (2016), the conceptual framework of benefits realisation is based on three key planks: the identification of project benefits, the execution of these benefits, and the sustainability of these benefits. In this objective of the research, the intent was to have a discussion on project benefits realisation in the ICT sector. In this respect, the study evaluated the question of ownership and responsibility in the Kenyan ICT sector. Moreover, the achievement of the defined benefits of Kenyan ICT infrastructure projects is discussed herein.

#### 7.2.4.1 Ownership and responsibility

Project ownership, based on the assertions of the participants in the study, can be viewed from two perspectives: that of implementing teams and that of consumers. The study revealed that advancement of any project is only possible if some sense of ownership is inculcated into the consumers. In this regard, one of the issues that was noted is the question of sustainability of ICT infrastructure projects. The participants in the study confirmed that the major issue with ICT infrastructure project sustainability is project ownership but from the consumers' side of the continuum. They contended that there is a lot of indifference insofar as project ownership is concerned and this essentially limits their engagement in the projects.

In a more nuanced way, the assertion of the respondents regarding project ownership can be viewed from the main discussion point of this research – stakeholder engagement. The question that most studies would want to ask in regard to ownership and responsibility issues in the ICT sector is how well can ownership and project responsibility be achieved? The concept of stakeholder engagement and integration thus comes into play once more, giving credence to the assertions of Niemi and Pekkola (2016) that delivery of these projects cannot be adequately realised if the stakeholders are not integrated within the project.

Fundamentally, what the participants in the study advance herein is that ownership of the project, which is the feeling of being part of the project and remaining accountable to the project, is entirely an aspect of stakeholder integration. These suggestions further affirm the importance of developing a stakeholder management model for the Kenyan ICT sector. Integration of the stakeholders within the project fundamentally improves their commitment to the project objectives, and a sense of ownership is imbued in the stakeholders. But perhaps the most important observations that can be accrued from the suggestions of the participants in the study is that an ICT infrastructure project

management framework ought to have a practical model for assessing the integration of the various stakeholders in the project, as this directly impacts on project ownership and responsibility. The findings of Niemi and Pekkola (2016) further suggest that accountability in a project can only be achieved if the stakeholders in the project feel that they are entirely part of the project.

### **7.3 Summary of qualitative findings**

In view of the findings of this study, a number of themes can be discussed. One notable finding is that within the context of ICT infrastructure project delivery, the concept of stakeholder management is in its infancy phase; however, it is a critical component of ICT project delivery. The outcome of the study reveals that within the Kenyan ICT sector, there is no standard framework for the evaluation of stakeholders and ICT infrastructure delivery enhancement. The question of project benefits realisation has equally been explored with particular interest in the question of project ownership and how stakeholder integration fits into that. Moreover, the section has elucidated the concept of stakeholder integration in the Kenyan ICT sector, highlighting the ways in which the stakeholder integration model can be effective in optimising project outcomes. In the next section of the study, the quantitative findings are discussed in detail.

### **7.4 Quantitative findings**

The research study adopted a mixed study design, where the outcomes of the qualitative findings were used in the validation of the quantitative findings. This form of triangulation was meant to enhance the validity of the study outcomes. In this section of the research, the focus is on discussing the quantitative research findings reported earlier in Chapter Six. The section discusses project management applications related to ICT projects in the country and project management practices that have been utilised in the delivery of ICT projects in Kenya and also appraises factors that are associated with the

delivery of ICT infrastructure projects in the country. These entail project complexity, project benefits realisation, key performance indicators, and stakeholder integration.

#### **7.4.1 Project management application in ICT projects in Kenya**

Several components are applicable in the management of ICT projects in Kenya. Notably, the participants in the research suggested that within the framework of ICT project delivery, the focus ought to be on the complexity of these projects. The assertions of the respondents in the research revealed that the management of these projects in the sector ought to take into consideration the question of project complexity. Proposing a framework through which the complexities in these projects are taken into account means that the delivery teams have a platform through which the uncertainties and risks in the project can be effectively handled. This is the focus of the discussions of Ngundo and James (2018), which are validated by the qualitative outcomes as well. The importance of this observation in the research is that within the project planning phase of ICT infrastructure projects, it is vital that delivery teams have an overall picture of the project complexity ecosystem. Upon evaluation of past progress of ICT infrastructure projects, Kiprono *et al.* (2019) note that, to an extent, there is a need to have a clear view of the complexity factors in the project before initiation. Such project complexity factors identified by Qazi *et al.* (2016) include factors such as the inherent complexity of the project, uncertainty factors, the rigidity of the sequence, and the overlap of these phases during the project initiation phase.

Notably, this study found that physical or technical issues immensely impact upon project complexity in the ICT sector. The most notable aspects of project complexity that were identified as having the most effect on project complexity are those that are concerned with the various forms of interdependence and interactions between project stakeholders. Qazi *et al.* (2016) calls this the interaction between the various elements of the project. Again, these responses seem to be pointing towards project stakeholder

management as an important aspect of project complexity in the Kenyan ICT infrastructure framework. Another notable outcome from the study is that it appears to be critical to look at project complexity from two perspectives. One is the technical aspect of project complexity, and the other is the organisational or environmental complexity. Evidently, from what the respondents in the study suggested, project complexity issues related to the organisation or environment are the most common ones in the country's project management context. Again, this seems to be related to stakeholder management. There is a very strong link between these findings on project complexity in the Kenyan context and stakeholder management initiatives. Earlier research studies, such as Bakhshi *et al.* (2016), Dao *et al.* (2016) and Qazi *et al.* (2019), affirm these findings in the sense that project complexity is seen more as being about the management of stakeholders rather than the technical elements of the project. However, a caveat is given by Bakhshi *et al.* (2016), to the effect that the stakeholder management aspect of project complexity ought not to limit the significance of technical complexities in projects.

Another emergent finding related to ICT infrastructure projects is the issue of stakeholder integration. The research indicates that there are a number of important factors of stakeholder integration in Kenyan ICT infrastructure projects. Overall, an emergent issue in the discussion was the question of sustainability in these projects. The participants seemed to opine that the very scaffold of project stakeholder integration is the question of sustainability. What this means is that the sustainability of Kenyan ICT infrastructure projects has not been achieved, owing to the feeble stakeholder integration practices in the country. This point is suggested by the assessments undertaken by Kiprono *et al.* (2019), which describe the progress of various ICT infrastructure projects in the country. The findings suggest that the ability of projects to effectively continue operations upon completion is in doubt, in the sense that projects cannot be further advanced by the relevant stakeholders. Notably, what the research reveals is that these projects are not sufficiently inclusive of the stakeholders. The implementing agencies do not have a firm

foundation to ensure that the stakeholders in the project are adequately prepared to engage in these projects, thus limiting their ability to contribute to project progress. In concept therefore, by looking at the issue of stakeholder integration as a project management application in the Kenyan ICT sector, the participants seem to perceive it from sustainability. One could therefore suggest that project stakeholder integration in the Kenyan ICT sector reinforces project sustainability.

Current studies on the Kenyan general infrastructure management landscape, such as Kariuki *et al.* (2018), give further credence to these findings in relation to ICT infrastructure projects in the country. In their analysis of the strategies that ought to be applied in the optimisation of ICT infrastructure projects, the question of stakeholder communication has featured greatly. This research has echoed these findings by noting that stakeholder integration is incomplete if there is no well-modelled communication plan that is implemented amongst the stakeholders in the project. The Kenyan ICT infrastructure project framework seems to have no communication plan or strategy for these stakeholders to be adequately managed. A significant portion of the respondents generally disclosed that this is a problem with the consumers as stakeholders, meaning that the implementing agencies are well catered for in such plans. What is evident is that there is a way in which stakeholder management in the Kenyan ICT sector could take into account a communication model to optimise project outcomes in the sector.

As a component of project benefits management practices applicable to ICT infrastructure projects in Kenya, the participants in the study concurred that it is essential for the project management team to have a framework for managing project benefits. The respondents contended that the Kenyan ICT infrastructure ecosystem has not been keen on the management of project benefits, yet it is a critical aspect of enhancing project success. Target benefits, based on the responses in the research study, ought to be clearly formulated in Kenyan ICT infrastructure projects. One of the purposes of the project

initiation phase, contend Fridleifsson *et al.* (2016), is to ensure that the project benefits are contextualised during the initiation phase of these projects as well as in the project business case. In its findings, this research noted that a clear definition of the target benefits of the Kenyan ICT sector is vital in order to ensure that the project selection pronouncements, as well as the management of the project portfolios, are effectively pursued. These findings regarding the formulation of the project business case seem to agree with the disclosures of Hjelmbrække (2017), to the effect that a proper appraisal and formulation of the target benefits of the project would inherently enhance the project selection decisions.

The findings of this research can thus be conceived to be advancing the notion that in order to make effective project selection decisions, it is imperative that project management teams have the relevant information regarding the project, and this entails such variables as the anticipated costs of the project, the risk level involved in the project, the duration of the project, and the benefits that are expected to be realised at the completion of the project. Within Kenyan ICT infrastructure projects, the findings were to the effect that decision makers tend to want to rate the proposed projects against a set criterion. Moreover, this is scaled against the project alternatives and their overall scores – a system that has been widely applied in Australia (Helsper, 2011, p. 23). Nevertheless, the problem is that in Kenya, these criteria are not detailed. Moreover, the project management model that is largely used in the management of ICT infrastructure projects has been noted to be lacking alternatives, meaning that the quality of decision making as related to ICT infrastructure projects in the country has been poor for a long time. Again, the question of the tablet project in the country comes to fore. Many business case analysis papers on the project, such as Sakhakarmi *et al.* (2018), concur that the quality of the decisions made were largely eroded by the lack of a decision-making framework related to project benefits. In more instances than not, the ranking of alternatives does not seem to be something that has been adopted in the ICT sector.

The findings of the study equally show that the target benefits of any proposed ICT infrastructure project, especially those that are government driven, are formulated very poorly – an issue that essentially impairs their progress. In particular, Fridleifsson *et al.* (2016) highlight several errors that come up during the formulation of target benefits, which seem to correspond very well with the findings herein. To explain the failures of major projects based on project benefits formulation, Fridleifsson *et al.* (2016) list these errors as forecasting, omission, evaluation, and measurement. Incidentally, these are some of the issues that were raised regarding project benefits realisation in this research. It was found that most of the entities that implement ICT infrastructure projects do not adequately identify all the target benefits of these projects.

#### **7.4.2 Project management practices utilised in the delivery of ICT projects in Kenya**

The outcome of ICT projects is entirely dependent on the extent to which management practices have been applied. In the Kenyan ICT sector, a number of project management practices have emerged in consideration of the findings of the research study. The findings of the study seem to suggest that despite there being several standard methodologies, as well as best practices for managing projects, it is time that the Kenyan ICT sector comes up with a contextualised management practice. International processes, such as PMBOK, CMMI-DEV, ITIL and PRINCE2, 2019, despite their robust project management frameworks, cannot adequately respond to the project management context in the country. In regard to this, the study participants suggested that despite their adoption of these internationally acclaimed project management models, the uniqueness of the Kenyan ICT infrastructure environment provides many reasons as to why a standardised form of management ought to be conceived specifically for the Kenyan scenario.

In essence, the disclosures made in this study seem to suggest that within the context of the ICT infrastructure project delivery, it is important that the standardised approach adopted takes into account the concepts of coordination of persons, objects, capital, and information transfer and flexibility as well as stakeholder management. One important aspect of project delivery that seems to be seen by the respondents in the study as a critical one is the development of a platform through which the private and public sectors are able to effectively engage their stakeholders within their project implementation framework. Notably, therefore, this research considers a stakeholder management practice as a proposed project management practice in the Kenyan ICT sector. Based on a number of studies that were quoted earlier, it is clear that the management of stakeholders in the Kenyan ICT sector is an important aspect of project management. Padalkar and Gopinath (2016) note that the evolving nature of project management around the globe means that a rational strategy ought to be conceived in order to advance the course of these projects in the country.

#### **7.4.2.1 Business process management**

Another emerging issue in the study is the manner in which projects are constructed to address the needs of the clients. The concept of business process management (BPM) entails what Chang (2016) refers to as a holistic management approach in project processes. The focus of this template of project management hinges on the notion that the needs of the client in the business, or the project for that matter, ought to be the driver of the decisions that are made. The BPM model, as an aspect of project management, seeks to promote the effectiveness and efficiency of the business while at the same time seeking to develop key innovations that drive the business. It is evident from the research study that the respondents envisaged more of business process management approach towards these ICT infrastructure projects, since BPM ensures that organisations are more effective and able to transform into a business case. The focus of the discussions of Makini *et al.*

(2020) is that Kenyan ICT infrastructure projects need to have a management structure that is “commercially minded”.

The revelations made herein mean that there is a need to restructure the current management template in terms of project delivery; for example, the manner in which the central government has been undertaking its ICT infrastructure projects is ineffective. There is a need to consider a business model for these projects, as this is likely to enhance the outcomes. Vom Brocke *et al.* (2016) support these suggestions, in the sense that it is important to develop a business-minded project. The idea, which is proposed by Mendling (2017) and affirmed in the findings of this study, is that within any project management architecture, it is imperative that the implementing teams approach the project from a business perspective; this is likely to enhance the sustainability of the project. Within the Kenyan context, the respondents seemed to propose a paradigm shift in the manner in which ICT infrastructure projects are run, especially those that are connected to the government. It essentially means that if these ICT infrastructure projects are to remain sustainable in the long run, there ought to be an ambitious restructuring process, whereby they are run using a business philosophy.

#### **7.4.3 Factors associated with ICT infrastructure project delivery research themes**

Several factors associated with ICT infrastructure project delivery in Kenya were evaluated. In this section of the research discussion, the focus is on the emergent themes in terms of the factors that are associated with ICT infrastructure project delivery. These themes are considered to be critical elements in the development of an assessment tool for ICT stakeholder integration and infrastructure performance improvement. The section discusses emerging factors under the major themes outlined earlier under the project management applications in Kenyan ICT infrastructure project management.

#### **7.4.3.1 Project complexity**

Under project complexity, a number of factors are notable as critical factors influencing ICT infrastructure project delivery. The study sought to establish some of the most important factors under the ambit of ICT infrastructure project complexity. A number of project complexity variables were noted to be quite significant in the discussions of ICT project complexity in the country. Notably, the findings of the study suggest that the most important aspect of project complexity in the Kenyan ICT sector is the level of stakeholder integration in these projects. As outlined in the subsequent discussion, it emerged that within the context of ICT infrastructure project complexity, the level to which the project management team has embraced stakeholder integration is an important factor in influencing project outcomes. Moreover, the participants in the research disclosed that the formulation of the business case stands as an important aspect of project complexity within ICT infrastructure project performance in Kenya. What this means is that the need to formulate a business model for running ICT infrastructure projects is a point for discussion in the ICT sector. Third, under the facet of project complexity, the research study disclosed that the application of project processes as well as issues of compliance and regulatory requirements in the projects stand out as important factors. In the subsequent discussion, these factors emerged as important factors in the description of project complexity in the Kenyan ICT sector. Under project complexity, these factor loadings essentially suggested that the respondents considered them to be the salient issues related to project complexity in the ICT sector.

##### **7.4.3.1.1 Level of stakeholder integration**

Insufficient level of stakeholder and team management in Kenyan ICT projects constitutes a big risk factor in these projects. Specifically, stakeholder conflicts have been noted to be serious contributors to project failures. What the findings of the research study suggest is that within the Kenyan ICT infrastructure project management context, if stakeholder integration initiatives are not aligned to the project, it will impair the

project's progress. As earlier admitted by the majority of the research participants, the Kenyan ICT sector has not been able to construct a stakeholder integration scaffold and this has limited the opportunities for these projects to effectively achieve their objectives. It is evident from the findings of the study that the project integration concept is looked at within the Kenyan ICT sector as a risk. This is why in the context of project complexity, the respondents identified that the level of stakeholder management is a vital factor. The findings herein can be discussed within the general theory of stakeholder management. Andriof and Waddock (2017) suggest that stakeholder engagement and management are considered project risks in the sense that if the project delivery teams are unable to come up with a meaningful integration and management model, the project is bound to collapse.

Regarding the need to come up with a standardised approach for managing stakeholders in these projects, the findings of the study are affirmative. There were suggestions by the respondents in the research study that a format could be configured through which projects could be evaluated on their stakeholder integration levels. Indeed, these suggestions proposed by the respondents validate the main objective of this research – to develop an assessment tool for ICT stakeholder integration and infrastructure performance improvement to guide the ICT sector in Kenya.

#### **7.4.3.1.2 Formulation of project business case**

Chang (2016) views the formulation of a project business case as the justification of the business case of the project. The question of value for money is an important aspect of Kenyan ICT infrastructure projects. The study found that it is important that delivery teams in the Kenyan ICT sector consider having a comprehensive standard for examining the perceived risks as well as the benefits that are involved in the delivery of these projects. The research participants emphasised the importance of finding out the perceived risks as well as the benefits of the project. It is therefore imperative to develop

a concise methodology through which the perceived benefits of the project as well as the risks can be addressed.

One of the most notable findings of the research was the linking of the project architecture to the business case of the project. This was a major finding of the research in the sense that project delivery teams ought to take into account the need to integrate a strong business case within these projects, especially the government-driven projects. As intimated earlier, the development of these project business cases means that real options are evaluated to ensure that the projects can remain sustainable thereafter. A formulation of a business case essentially means that the project objectives are linked to the commercial locus of the project. It means that despite the scope of the project, it is given a business approach, whereby the intended objectives are pursued but within a business framework. Kenyan ICT infrastructure projects have, for a long time, suffered from this problem. Therefore, while the initial objectives of the projects are usually very noble, the philosophy of the management of these projects is entirely divorced from the business management philosophy.

#### **7.4.3.1.3 Compliance and regulatory requirements**

A major concern for the respondents in the research was compliance and regulatory requirements in the ICT sector. The respondents pointed out that in reference to the regulatory and compliance requirements in the ICT sector, the contractors and sub-contractors face a huge risk. Within the larger framework of project complexity, the meaning of this is that there seems to be no defined compliance and regulatory framework in the delivery of ICT infrastructure projects. Hatakka *et al.* (2020) consider the problem of unclear regulations and compliance requirements. Of specific interest, and pointed out in the discussions, is the fact that no clear operational framework has been developed in the ICT sector in the country, thus making the delivery of any ICT infrastructure project a huge challenge.

Systemic failures in terms of policy alignment were identified as key elements of project complexity in the Kenyan ICT sector. Compliance and regulatory functions have not been adequately configured so that even in terms of approvals, no clearly defined regulatory approaches are available. Similar findings are discussed by Huggins and Frosina (2017) regarding institutional frameworks and their capacity to handle issues of regulation and compliance in the country. Hatakka *et al.* (2020) note that some of these functions have not been well defined within the various implementing institutions. This essentially inhibits the ability to implement the right regulatory and compliance enforcements. Huggins and Frosina (2017) talk of a “duplicity of duties”, meaning that the delivery teams in these projects are unable to obtain these compliance and regulatory endorsements during their project implementations.

This research, in relation to regulations and compliance as aspects of project complexity, affirms what Hatakka *et al.* (2020) note, i.e. that the legal implications project delivery teams face when these regulatory and compliance issues are not addressed can impair the progress of the whole project. What comes out clearly is that the Kenyan ICT infrastructure project delivery ought to streamline the general regulatory and compliance ecosystems. This does away with the uncoordinated manner in which these regulations are being applied. In a number of instances, there have been entities that have faced liabilities over their inability to show proof of specific compliance endorsements; however, in a real sense, they have limited capability to successfully implement the regulatory guidelines. Perhaps it is necessary to have a comprehensive regulatory and compliance office that addresses the compliance and legal issues within the sector.

#### **7.4.3.2 Key performance indicators in projects**

Project performance indicators help in the evaluation of the progress of projects and propose ways to address project variations in terms of either objectives or budgets (Dupont *et al.*, 2016). This section of the research discusses some of the factors that are

associated with project performance indicators in the delivery of ICT infrastructure projects; these factors include operational expenditure, capital budgeting, resource utilisation and capital expenses.

#### **7.4.3.2.1 Operational expenditure**

Project operational expenses ought to be adequately aligned with the output of the project. With regards to project operational expenditure related to project performance indicators in ICT infrastructure projects, the research suggests that project stakeholders must be involved in the conceptualisation of the project expenses. However, most notably, the study affirms that in the majority of Kenyan ICT infrastructure projects, the question of budget variation has been noted to be a factor in the sense that the majority of these projects have gone well over and above the budgetary allocation earlier conceived. This has been particularly noted in the case of government-managed ICT projects.

What the findings of the study further imply is the need to ensure that ICT infrastructure projects are as inclusive as possible; one of the ways to reduce the budgetary variations in projects is to make the project planning phase as inclusive as possible. The respondents in the research contended that the budgeting process in these projects has been inadequate, if the variations are anything to go by. Most notably, the participants argued that these budgetary preparation models ought to adopt a very inclusive format during the preparation phase. This outcome is supported by Al-Tabtabai (1998), who analysed the capital budgeting options in projects and the need to widen the consultative framework in budget making. The research findings suggest that a wider input from the stakeholders offers the project delivery team a wider and broader understanding of the budget items, and this is likely to limit the project variables.

#### **7.4.3.2.2 Client satisfaction**

Perhaps considered to be the most important metric for evaluating project success, client satisfaction means that the expectations of the final consumers of the project have been adequately met. As to whether client satisfaction has been realised in ICT infrastructure projects in Kenya, the respondents averred that while there have been efforts to achieve this, the biggest failure in this regard has been the lack of feedback from secondary stakeholders (users). The study found that there is no proper framework for engaging secondary stakeholders (users) in the project in order to understand whether their expectations have been met. Participants' responses gave an impression of a much-distorted client inclusion model in the Kenyan project management environment. What has been the norm in the past, which has continued to be advanced, is a one-way information model where the relevant decisions related to the project are made from above. There is no standard client response model where the consumers, the clients can be engaged in a detailed discussion of the project progress and whether the project has been able to address the needs of the client.

As to whether the Kenyan ICT infrastructure project management framework has embraced the response of the clients as a metric for evaluating project success, the study disclosed that this has not been achieved adequately. As established from the primary data, there is no evidence to suggest that these projects take into consideration the input of the clients in the development of a monitoring schedule. As already discussed, the issue herein is the extent to which the clients are engaged in the mainstream project. This situation has been largely noted in government-funded projects where the project consumers have very little say in terms of the delivery of these projects.

#### **7.4.3.2.3 Resource utilisation**

The concept of resource utilisation in projects lays emphasis on evaluating the quantity of time and resources that are spent on various project deliverables. As an ICT infrastructure project management performance metric, project delivery teams ought to

evaluate the project in terms of the inputs of the project. Resource utilisation in ICT infrastructure projects involves the computation of the inputs in comparison to the outputs. Basically, the question of resource utilisation in a project is a concept of budgeting in the sense that, as stated by the respondents in the study, lower-than-expected resource utilisation is indicative of a problem in the project. Moreover, higher-than-expected resource utilisation is an indication that the project is consuming more than the amount allocated to drive the project objectives. The inherent goal of every project leader is the development of a structure through which the resources in the project can be optimised.

Upon admission of the importance of project resource utilisation in the monitoring of the project process, the findings of the study highlight that before the allocation of the project resources, it is vital to take a step back and develop an inventory pool, which consists of the resources available to realise the project objectives. The inventory would give project leaders an important insight into how to identify resource constraints that are likely to impact the project deadline.

#### **7.4.3.3 Stakeholder integration**

This section of the research discusses stakeholder integration within the context of ICT infrastructure project delivery in Kenya. The section evaluates some of the key factors that are associated with stakeholder integration in the country's ICT infrastructure projects. In this context, a number of factors related to stakeholder integration – such as the need to address stakeholder needs and expectation, the alignment of stakeholder skills, and understanding the core business processes – are examined. The discussion is confined to stakeholder integration in Kenya.

#### 7.4.3.3.1 Addressing stakeholder needs and expectations

The question of addressing stakeholder needs and expectations is crucial in the management of projects in the country. The findings of this study affirm that project delivery teams need to identify stakeholder profiles and develop an expectations schedule so that they are able to review the needs and expectations of these stakeholders during the project. What is clear from this study is that the sustainability of any project is partly dependent on the ability of the project to engage the stakeholders in such a manner that the stakeholders are able to freely express themselves as related to project deliverables. The participants in the project contended that it is the responsibility of the project delivery teams to have a well-designed operational model that can adequately take care of stakeholder needs. Basically, when discussing the question of addressing stakeholder needs and expectations, the salient theme herein is the way teams can create a foundation from which they are able to engage with each other, addressing stakeholders' expectations of the project and continually updating stakeholders regarding project progress.

A number of studies have discussed the concept of addressing stakeholder needs and expectations as part of project success (Andriof *et al.*, 2017). One significant factor of addressing stakeholder needs is the limitation of conflicts arising during the project implementation phase. This was discussed earlier within the context of project complexity, but it essentially means that the project delivery teams ought to consistently engage these stakeholders in terms of addressing project progress. Within the context of stakeholder communication, the findings of the study can be compared to one of the emergent trends in the management of project stakeholders. In terms of the need to address stakeholder needs and expectations, it is imperative that the stakeholders are involved in building the project implementation process. The conceptualisation of stakeholder sense-making theories, for instance, is an important aspect of stakeholder engagement that ought to be considered within the project management infrastructure in

the ICT sector in Kenya. The study findings show that in terms of addressing stakeholder needs and expectations, it is essential to have a model of engagement where the project management teams, and all other stakeholders are involved in retrospective reflection on the project progress while developing strategic methods for advancing the project.

#### **7.4.3.3.2 Alignment of stakeholder skills**

Stakeholder integration cannot just be looked at from the perspective of involving stakeholders and engaging them in the project, but it is also about ensuring that the right skills are applied in the project. In regard to skills, the research findings seem to advocate the need to develop a stakeholder profile, to evaluate stakeholders' contributions to the project, and to involve them in the areas where they bring more meaning to the project. What is evident, as discussed in this study, is that in talking about alignment of stakeholder skills to the project, the delivery team is essentially providing an enabling environment to the project stakeholders so they can apply their knowledge and skills to the project. The inclusion of stakeholders, in this context, can thus be looked at from the perspective of human resource management, in the sense that the stakeholders are more useful if their skills are applied in the advancement of these projects.

These assertions can be applied in this research in the sense that managing stakeholder skills is important in advancing project progress. Notably, project failures, especially within the Kenyan ICT infrastructure project ecosystem, can be addressed when project delivery teams are able to tap into the skills of the stakeholders in the project. What this means is that the stakeholder analysis phase of the project must include the skills that the stakeholders are likely to contribute to the project. It is important to have a skill inventory so that teams can leverage these skills as a way of advancing the project to its conclusion.

#### **7.4.3.4 Exploring relationships amongst variables**

The research explored the types of relationship that exist amongst a number of variables in order to help with the proposal of a framework for assessing stakeholder integration and infrastructure performance in Kenya. A number of variables related to stakeholder integration were assessed and the emerging themes related to stakeholder integration and project success were evaluated in detail. In this section, the findings of these correlations are evaluated within several theoretical constructs. First, the level of stakeholder integration and effectiveness of stakeholder integration in projects are explored. Second, stakeholder integration, the formulation of the business case and the application of project processes are discussed.

##### **7.4.3.4.1 Level of stakeholder integration and effectiveness of stakeholder integration in projects**

The level of stakeholder integration and the delivery of ICT projects were found to be positively correlated. In a sense, this confirms that an increased level of stakeholder integration in projects improves the general position of stakeholders in ICT projects in Kenya. The importance of this finding is that when the project scales up the activities that are related to the integration of stakeholders, it then follows that these projects are likely to have a more productive integration process. A number of studies view this correlation as a very direct relationship in the sense that applying the key stakeholder factors discussed earlier – such as addressing the needs of the stakeholders and their expectations, aligning stakeholder skills, understanding the core business processes of the project, and commitment to project objectives – directly enhances the inclusion of stakeholders in the project (Salem *et al.*, 2016, Andriof *et al.*, 2017, Epstein *et al.*, 2017 & Viglia *et al.*, 2018).

The general dimension of this finding follows what Viglia *et al.* (2018) describe as the “*determinants of stakeholder integration*”. It follows that there are specific determinants, or rather variables that can be used to describe stakeholder engagement in any project. What the outcome of the study suggests is that in the development of an effective stakeholder integration process, these three factors must be incorporated within the ICT project delivery model. The quantitative research findings regarding how these factors influence stakeholder integration have been discussed in detail in earlier sections. Most notably, what is crucial and must be considered is that when talking about stakeholder integration in ICT infrastructure projects, one has to take into consideration these three elements of stakeholder management, because the research found them to be the most critical when loaded on to the variable of stakeholder integration.

#### **7.4.3.4.2 Stakeholder integration, formulation of a business case and application of project processes**

At the same time, the research concluded that stakeholder integration, formulation of a business case and application of project processes have very strong correlations with each other. It is evident, from the assertions made by the participants in the study, that in order to enhance stakeholder integration in the Kenyan ICT sector, it is important to review the formulation of a business case for the project and the application of the project processes. In terms of the formulation of a business case, this research study showed earlier that the outputs of the project have to be evaluated against the inputs of the project delivery model. But to achieve this, the question of stakeholder engagement has to take centre stage. This is the focus of the discussions of Chang (2016), to the effect that the formulation of a project business case, first of all, means that the stakeholders involved in the project, at whatever stage, are involved in the process. However, what is important, and what is critical in this research study, is the development of clear objectives to be pursued during the project delivery process.

In summary, the relationship between these two variables can be looked at from the perspective of Salem *et al.* (2016), who argue that stakeholders would feel more integrated in the project if they are involved in the conceptualisation of the project business case. The stakeholders have to be directly involved in the visualisation of the project outputs as well as the inputs. This shows there is a very strong correlation between these two variables. It thus follows that when the stakeholders have a platform for making these contributions to a project, they feel part of the project. The inclusion of stakeholders can thus be assessed in terms of their skill sets and interests.

### **7.5 Way forward**

The study has demonstrated the significance of stakeholder integration in the ICT sector. Having examined the methods used to manage stakeholders in the ICT sector, the research study will subsequently propose a standardised model that can be used to prioritise and assess stakeholder interests. In this regard, it is notable that a model for evaluating stakeholder inclusion in the ICT sector ought to include stakeholder management variables.

Taking into consideration some of the assertions of the participants in the study, the question of the formulation of a project business case has been adequately explored. One of the findings that has been noted herein that ought to be part of future research studies is the idea that projects can be transformed and managed from a business perspective. There are concerns that the management framework that is currently being adopted lacks the wherewithal to advance these projects. The question is how the ICT infrastructure project architecture in the country can leverage this to be able to enhance the outcome of ICT projects.

## 7.6 Chapter summary

In seeking to propose an assessment tool for ICT stakeholder integration and infrastructure performance in Kenya, this chapter discussed a number of infrastructure project delivery themes. Moreover, the research outlined some of the project management applications that are relevant to the ICT sector. A number of factors were highlighted as being critical factors explaining project complexity, project benefits realisation and performance metrics in ICT projects in Kenya. The variables discussed in this chapter are important in the construction of an assessment tool for ICT stakeholder integration and infrastructure performance improvement in the country. The next chapter proposes an assessment tool that can be used to enhance stakeholder integration in the ICT sector.



## Chapter Eight: Assessment Tool Development Verification and Validation

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### 8.1 Introduction

This chapter seeks to propose an assessment tool for ICT stakeholder integration and infrastructure performance improvement in Kenya. In order to achieve this, a description of how validation and verification is provided. Verification and validation are used to evaluate the extent to which the tool can be adopted by the ICT sector. Moreover, validation and verification were used to assess the suitability of the assessment tool.

### 8.2 Purpose of stakeholder integration

The conceptualisation of a stakeholder integration tool hinges on the need to give a theoretical basis from which the practice of stakeholder integration can be affected within a project. The purpose of any framework is to provide a general scaffold from which practice can be applied. According to Jabareen (2009), framework, in theory a framework can be used to describe a “general outline” or “structure” that can be applied in guiding theory and practice. Therefore, in the context of stakeholder integration, the concept of a framework is essentially applied to mean a structure that is applicable in the integration of stakeholders within a project.

Developing a stakeholder scaffold also means that various stakeholder integration components have to be taken into consideration. This basically means applying various stakeholder components that have been contextualised within the specific project domain to establish the envisaged structure. This is supported by Baccarini (1999), who suggests that any framework for managing stakeholders in any project has to be structured in a manner that essentially takes into account the unique project delivery environment. The dispositions of Baccarini (1999) and Aaltonen and Kujala, (2016). have been the driving factor behind the development of stakeholder management theory in the Kenyan ICT sector. This is based on the idea that it is imperative to have a broader understanding of

the project management context within a jurisdiction before designing a stakeholder engagement model.

The importance of this framework is that it gives clear boundaries for managing stakeholders in ICT infrastructure projects. It describes some of the variables that directly influence the operations of the stakeholders, identifies the extent of their influence and applies this in the permutation of relevant approaches to stakeholder management that can be applied in the optimisation (Ackermann, & Eden, 2011). These variables, as depicted in Table 8.1 below, are some of the emerging factors in stakeholder management and integration within the Kenyan ICT infrastructure space.

**Table 8.1: Stakeholder integration and infrastructure performance improvement variables in Kenya**

<p><b>ICT project complexity</b></p> <ul style="list-style-type: none"> <li>• Level of stakeholder integration</li> <li>• Formulation of project business case</li> <li>• Application of project processes</li> <li>• Compliance and regulatory requirements</li> </ul>	<p><b>Stakeholder integration</b></p> <ul style="list-style-type: none"> <li>• Addressing stakeholders’ needs and expectations</li> <li>• Alignment of stakeholder skills</li> <li>• Understanding core business processes</li> <li>• Commitment to project objectives</li> </ul>
<p><b>Key performance indicators</b></p> <ul style="list-style-type: none"> <li>• Operational expenditure</li> <li>• Client satisfaction</li> <li>• Resource utilisation</li> <li>• Capital expenditure</li> </ul>	<p><b>Project benefits realisation</b></p> <ul style="list-style-type: none"> <li>• Engagement of stakeholders throughout the project</li> <li>• Adoption of communication plan for all stakeholders</li> <li>• Review of outputs and outcomes</li> </ul>

**Source:** Author (2020)

The findings and discussions in the previous chapters gave an important insight into the need to have more conversations regarding stakeholder management in Kenya’s ICT infrastructure management terrain. A critical observation in the findings of the study suggests that there is a problem in terms of stakeholder engagement in the ICT sector, and there is a need to propose a standardised approach for evaluating the level of stakeholder integration. One of the major indications in the research outcomes was the need to have a format through which the Kenyan ICT sector can adequately integrate

stakeholders in projects. The import of the concerns of the participants has led to the development of an assessment tool, the focus of which is to:

- Provide a description of ICT stakeholder project variables in Kenya;
- Furnish ICT project practitioners with guidelines that can effectively contribute to stakeholder integration in the delivery of ICT infrastructure projects in Kenya;
- Suggest how ICT infrastructure projects can leverage stakeholder integration to enhance project delivery in the country; and
- Propose how stakeholder integration permutations in the country's ICT infrastructure projects can be applied to enhance project sustainability.

From Table 8. 1 above, it is evident that the concept of stakeholder integration in the country hinges on several factors. These include the concepts of project complexity, benefits realisation, key performance indicators (KPIs) and stakeholder engagement. Therefore, the constructed assessment tool must take into account these components of project management.

### **8.3 Verification and validation process**

Two processes preceded the verification and validation process. In the first phase of the process, the participants who were involved in the research were informed of the desire that they engage in the process. This was based on the pre-set ethical provisions in the data collection. This was done through phone contact as well as e-mail. The need to abide by informed consent was a critical factor in the research participation process. Upon getting the consent of the participants, the process proceeded to the second phase, where a questionnaire was mailed to them through the e-mail addresses provided by the participants. In other instances, the participants were met in person to respond to the questionnaire tool.

In the second phase of the study, a verification questionnaire that focused on the development of an assessment tool for ICT stakeholder integration and infrastructure performance improvement was administered to the respondents. The questionnaire established the level of importance that the participants placed on a number of factors related to stakeholder integration. In the verification process, the participants in the study were meant to indicate the level of importance of a number of variables related to the project stakeholder integration factors listed in the data collection tool. The Likert scale was applied in the measurement of the levels of importance of these factors. In the scale, five levels were adopted, with 5 denoting “least important”, 4 “less important”, 3 “moderately important”, 2 “important”, and 1 “important”.

The third phase involved a focused group discussion where the merits of the proposed assessment tool were evaluated. In this session, the participants engaged in an objective discussion and critique of the tool. A total of thirty-five participants who had earlier been involved in the research process were engaged in this process through random sampling, as illustrated in Table 8.2. The discussion was guided to ensure that it was undertaken within the delimitations of the research. The whole session took three hours, during which serious deliberations about the tool were undertaken.

**Table 8.2** Participant details

<b>Code</b>	<b>Current job title</b>	<b>Gender</b>	<b>Years working in ICT sector</b>	<b>Role and responsibility</b>
A	Regional director	Female	20	Managing projects
	Project manager	Male	10	Coordination of work
B	Project manager	Female	8	Managing projects
	Network manager	Male	17	Network expansion and upgrade
C	Chief network manager	Male	7	Coordination of network expansion
	Project engineer	Male	12	Coordination of work
	Transmission engineer	Male	19	Network expansion
D	Project appraiser	Male	9	Evaluation of projects
	Network operation engineer	Male	19	Coordination of network expansion
	Project planner	Female	8	Planning projects
E	Project manager	Male	6	Managing projects
F	Regional director	Female	26	Strategy and new services
	Head of project management	Male	22	Connectivity and special projects
	Network operation engineer	Male	23	Coordination of network expansion
	Project planner	Female	10	Coordination of work
	Project leader	Female	7	Coordination of work
	Project director	Male	20	Director of corporate standards
G	Project manager	Female	12	Managing projects
	Project planner	Male	6	Coordination of work
H	Project manager	Female	15	Managing projects
I	Project manager	Male	13	Managing projects
J	Project manager	Male	11	Managing projects
K	Network operation engineer	Male	17	Coordination of network expansion
	Project manager	Female	14	Managing projects
L	Network operation engineer	Male	25	Coordination of network expansion
M	Project manager	Male	10	Managing projects
N	Project manager	Male	11	Managing projects
O	Network operation engineer	Male	22	Coordination of network expansion
P	Project manager	Female	14	Managing projects
Q	Network operation engineer	Male	18	Coordination of network expansion
	Project manager	Female	8	Managing projects
R	Project manager	Male	12	Managing projects
S	Project manager	Male	14	Managing projects
T	Project manager	Female	16	Managing projects
U	Project manager	Male	12	Managing projects

#### 8.4 Verification and validation of results

The deliberations in the focused group discussion (FGD) affirmed that improvements to project outcomes have to be founded on solid stakeholder management. Moreover, it was notable that the sustainability of projects in the ICT sector ought to be anchored by firm stakeholder management initiatives. In the context of their various roles in the selected organisations, the respondents in the study agreed that if the ICT infrastructure sector is to realise the defined benefits of its projects, it would be prudent to restructure their approach, especially in regard to stakeholder management. There seemed to be unanimous agreement amongst the participants that a standard tool for evaluating the level of stakeholder integration in these projects would be an important starting point in the debate about how to improve stakeholder management in Kenya. The respondents acknowledged that the biggest barrier to the sustainability of these projects is the level of stakeholder engagement in the public and private sectors. There seemed to be no format of engaging stakeholders and even if there was, there were no established models that could be used to assess levels of stakeholder engagement. One could therefore suggest that this effectively weakens the outcomes of these projects in general.

Table 8.3 summarises the general outcome of the ranking of the variables. To begin with, only four variables under project complexity were subjected to analysis, based on the notion that the earlier quantitative analysis had loaded these four factors and found them to be the most important factors in the description of the level of project complexity in the ICT sector. From the results, it can be seen that the majority of respondents ranked the factors as either “high” or “very high” based on the question of ranking the variables. In terms of the importance of compliance and regulatory requirements, 65% of the respondents ranked this variable as “very high”, 23% ranked it as “high”, 2% ranked it as moderate, 7% ranked it as “low”, and 5% ranked it as “very low”.

**Table 8.3: ICT project complexity**

ICT project complexity			
Project complexity variables	Level of measurement		Percentage score
Level of stakeholder integration	Very low	5	3%
	Low	4	7%
	Moderate	3	2%
	High	2	65%
	Very high	1	23%
Formulation of project business case	Very low	5	3%
	Low	4	7%
	Moderate	3	2%
	High	2	45%
	Very high	1	43%
Application of project processes	Very low	5	9%
	Low	4	7%
	Moderate	3	10%
	High	2	50%
	Very high	1	24%
Compliance and regulatory requirements	Very low	5	3%
	Low	4	7%
	Moderate	3	2%
	High	2	65%
	Very high	1	23%

**Source: Author (2020)**

As illustrated in Table 8.3, the majority of the respondents considered compliance and regulatory requirements to be “high” or “very high” in the ranking order. This is well replicated in the other three variables, as shown in Table 8.3. The conclusion is therefore that the majority of the respondents considered project complexity variables to rank either “high” or “very high”. At the same time, the quantitative results corroborated that these four factors rank highly compared to others in the context of project complexity. The outcome indicates that the tool ought to capture these four factors as some of the critical aspects of project complexity that ought to be integrated into the stakeholder integration assessment tool.

In terms of the project key performance indicators, Table 8.4 below summarises the outcome of the discussion. The variables of operational expenditure, client satisfaction, resource utilisation and capital expenditure obtained the highest rankings of “important” or “very important”. This means that in terms of the variables under the category of key performance indicators, the number of participants who ranked these variables as either “important” or “very important” was quite significant. In terms of ranking and based on the factor loadings, again only four variables were selected, and the ranking was as tabulated in Table 8.4, from the most important (operational expenditure) to the least important (capital expenditure).

**Table 8.4: Key performance indicators**

Key performance indicators			
Key performance indicators variables	Level of measurement		Percentage score
Operational expenditure	Least important	5	11%
	Less important	4	9%
	Moderate	3	1%
	Important	2	65%
	Very important	1	14%
Client satisfaction	Least important	5	3%
	Less important	4	4%
	Moderate	3	3%
	Important	2	45%
	Very important	1	45%
Resource utilisation	Least important	5	2%
	Less important	4	2%
	Moderate	3	1%
	Important	2	50%
	Very important	1	45%
Capital expenditure	Least important	5	3%
	Less important	4	7%
	Moderate	3	2%
	Important	2	65%
	Very important	1	23%

**Source:** Author (2020)

Within the stakeholder engagement theme (see Table 8.5), the majority of the respondents ranked the factors that are associated with stakeholder engagement as either “important” or “very important”. Near similar outcomes were also registered under project benefits realisation (see Table 8.6).

**Table 8.5:** Stakeholder engagement

Stakeholder engagement			
Stakeholder engagement	Level of measurement		Percentage score
Addressing stakeholders’ needs and expectations	Least important	5	10%
	Less important	4	9%
	Moderate	3	1%
	Important	2	70%
	Very important	1	10%
Alignment of stakeholder skills	Least important	5	5%
	Less important	4	5%
	Moderate	3	1%
	Important	2	45%
	Very important	1	34%
Understanding core business processes	Least important	5	2%
	Less important	4	2%
	Moderate	3	1%
	Important	2	50%
	Very important	1	45%
Commitment to project objectives	Least important	5	3%
	Less important	4	2%
	Moderate	3	1%
	Important	2	39%
	Very important	1	55%

**Source:** Author (2020)

**Table 8.6: Project benefits realisation**

Project benefits realisation variables	Level of measurement		Percentage score
Addressing stakeholders' needs and expectations	Least important	5	5%
	Less important	4	4%
	Moderate	3	1%
	Important	2	75%
	Very important	1	15%
Alignment of stakeholder skills	Least important	5	5%
	Less important	4	5%
	Moderate	3	1%
	Important	2	45%
	Very important	1	34%
Understanding core business processes	Least important	5	1%
	Less important	4	1%
	Moderate	3	3%
	Important	2	50%
	Very important	1	45%
Commitment to project objectives	Least important	5	3%
	Less important	4	-
	Moderate	3	1%
	Important	2	41%
	Very important	1	55%

Source: Author (2020)

#### 8.4.1 Theme 1: ICT project complexity

The results from the verification process view ICT project complexity as an important consideration in the development of a stakeholder integration assessment tool. The participants essentially suggested that projects that have not integrated effective stakeholder management strategies face a lot of uncertainties in terms of their sustainability. The participants did disclose that a high level of project complexity, as captured in the data collection tool, can be equated to lower stakeholder integration in the project. What this means is that when the project delivery team has not developed a framework for engaging their stakeholders adequately, they face very serious complexity issues that may limit the ability of the project to realise its defined benefits. However, as

noted in the research, a number of variables arise under ICT project complexity, which provide important discussion points regarding project complexity and stakeholder management.

One notable issue is the question of the level at which the stakeholders are integrated in the project. What this means is that in the development of the tool for ICT stakeholder integration and infrastructure performance improvement, there is a need to consider stakeholder integration as a component of project complexity. In this sense, it is important to view the level of stakeholder integration as a complexity in the project that requires addressing with various rational strategies. At the same time, the formulation of a project business case comes out as an important consideration in terms of the level of project complexity. It follows that projects that are unable to formulate a business case in their performance face the risk of not realising their objectives in the market. This is equally notable for project processes and issues of compliance and regulatory requirements. Therefore, what comes out clearly from these remarks is that during the development of a tool for stakeholder integration and infrastructure performance improvement, these four critical aspects of project complexity have to be taken into account.

#### **8.4.2 Theme 2: Key performance indicators (KPIs)**

Developing an assessment tool for stakeholder integration and infrastructure performance improvement in Kenya means that there is need to have a broader understanding of the key performance indicators (KPIs) in the project. The outcome of the validation process furthered this discussion by noting that it is vital for project delivery teams to have a broader understanding of the established project key deliverables. Under this variable, a number of factors were noted to be key in the evaluation of ICT infrastructure project KPIs and instrumental in the development of a stakeholder integration and performance improvement tool. In the context of key performance indicators in the country's ICT infrastructure, the question of the operational expenses of the project arises. This was affirmed by the verification team,

which disclosed that projects also have to keenly observe capital expenses. There is also the question of client satisfaction as well as resource utilisation. During the verification process, the emergent theme was that in the advancement of stakeholder integration mechanisms in the country's ICT infrastructure projects, the issue of resource allocation has to be taken into consideration.

#### **8.4.3 Theme 3: Project benefits realisation**

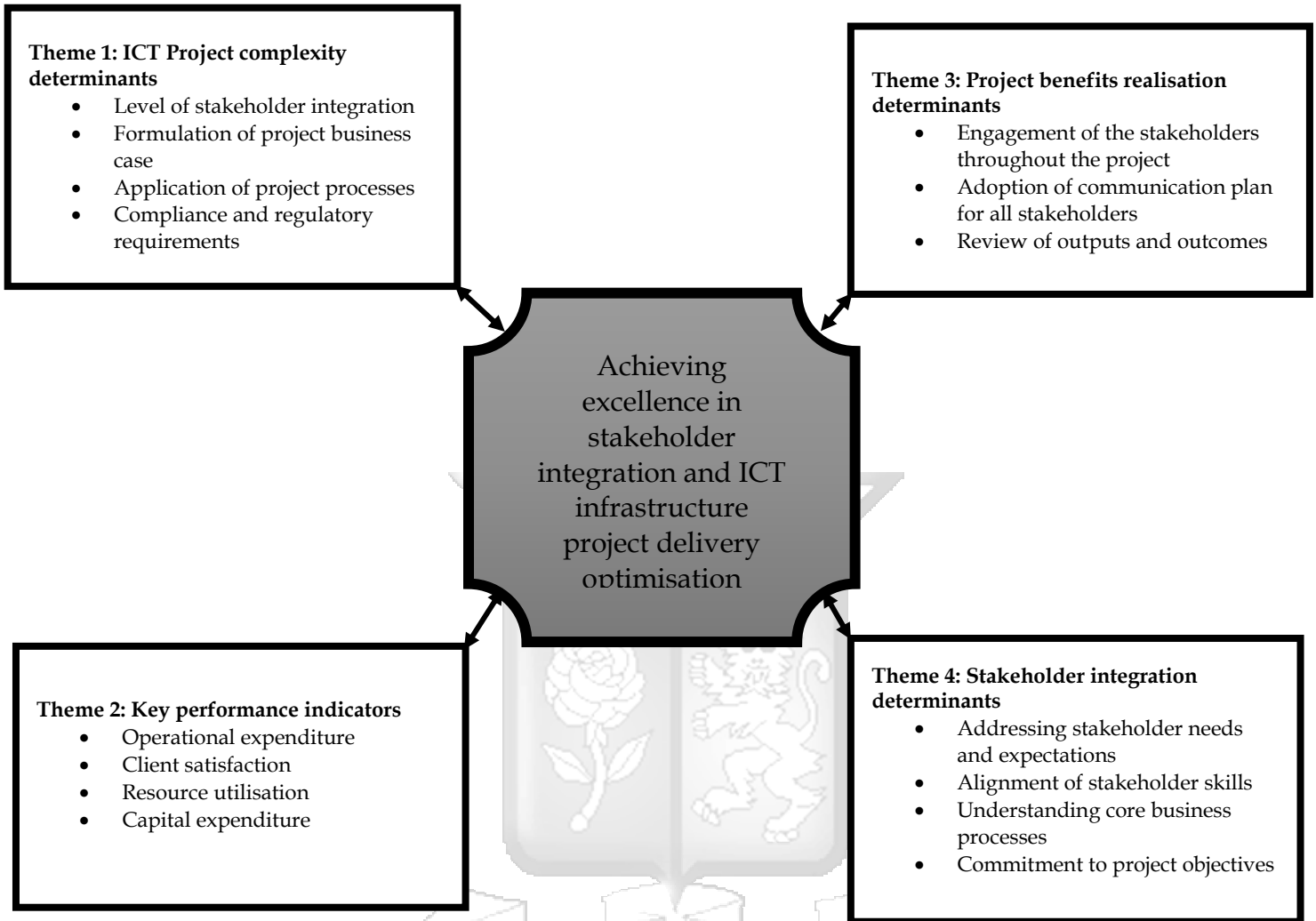
Project benefits realisation is an important determination of stakeholder management concepts in the country's ICT infrastructure projects. The verification results suggest that there needs to be more emphasis on ensuring that the inputs in the project ultimately lead to the desired outputs. In talking about project benefits realisation, the application of the relevant project inputs in order to achieve specific goals has been discussed in detail. What is important, though, is that the participants in the study recognise that the engagement of stakeholders throughout the project is an important factor in the realisation of the project benefits. At the same time, other factors, such as adoption of communication skills as well as review of project outputs, continue to dominate topics related to stakeholder integration in terms of project benefits realisation. Therefore, what the verification process seems to highlight is that the construction of a stakeholder integration and infrastructure improvement tool in the country will require that these factors are integrated in the tool.

#### **8.4.4 Theme 4: Stakeholder integration**

What is emergent from the discussions herein is that in the development of a stakeholder integration tool for ICT infrastructure projects in Kenya, there are a number of factors that ought to be given priority. The results first of all suggest that the question of project complexity has to be given prominence. Within the ambit of project complexity, there is a need for the project delivery teams to evaluate the level of stakeholder integration, the formulation of a project business case, the project processes and issues of compliance and regulation in the ICT projects. The assessment tool developed also borrows immensely

from the discussions around project performance indicators in ICT infrastructure projects (see Figure 8.1). One notable issue is that within the locus of project performance indicators, the participants opined that there is a need to monitor the operational expenditure, capital expenditure, client satisfaction deliverables and resource utilisation in these projects. Therefore, in trying to create a tool for the integration of the relevant stakeholders in a project, these four components of project KPIs must be included. Another facet of project application is benefits realisation. This was affirmed in the study as an important component of the project process and stakeholder integration. Nonetheless, the participants identified other key factors that can be applied in the development of a stakeholder integration tool under the banner of project benefits realisation. This entails the engagement of the stakeholders throughout the project, the adoption of a communication plan, and a review of outputs and outcomes. The question of stakeholder integration also considers the addressing of stakeholder needs and expectations, the alignment of stakeholder skills, understanding of project processes, and commitment to project obligations. In view of this, the illustration below of the proposed tool thus takes into account all the factors that have been identified by the participants as critical determinants of stakeholder integration.





**Figure 8.1:** Proposed assessment tool for stakeholder integration excellence and ICT infrastructure project delivery optimisation

**Source:** Author (2020)

### 8.5 Assessment tool implications

The number one development agenda of any developing country is the impact of ICT projects on their growing economy. A number of ICT projects in Kenya have been noted to be operating below optimal levels. As observed from the reviewed literature, a number of ICT-related initiatives are falling short of achieving their full potential and this has been attributed to several factors (Odhiambo *et al.*, 2020). As established from the reviewed literature, there seems to be few well-thought-out ICT project assessment,

project delivery and planning models that could be used to ensure ICT projects meet their desired objectives. Moreover, there seem to be no evaluation tools developed in the sector to aid practitioners and policy makers in the analysis and enhancement of stakeholder integration. As proposed in this study, this requires well-thought-through integration of stakeholders while taking into consideration the other factors that affect stakeholder management in projects, such as benefits realisation, project complexity and key performance metrics.

Although much can be achieved merely by integrating the stakeholders, the most successful ICT projects are likely to be those that embed stakeholder integration by considering project complexity, key performance metrics and benefits realisation as represented in the assessment tool. In applying the above, the findings show that the participants affirmed the mentioned factors as significant to the optimisation of ICT projects and the sector as a whole. The proposed assessment tool in this study has implications for policy makers in the ICT sector and project practitioners in ICT projects, who are committed to improving ICT project delivery through a multi-stakeholder engagement structured process. Moreover, the utilisation of the assessment tool will not instantly improve the delivery of ICT projects; however, it does identify four primary determinants and their secondary variables, which need to be considered. From the above, it is evident that in order to have improved ICT project delivery, it is necessary to factor in the project complexities, benefits realisation measures and key performance metrics of those projects.

## 8.6 Chapter summary

This chapter has applied the findings from the discussions in Chapter Seven to generate a framework for ICT stakeholder integration excellence and ICT infrastructure project delivery optimisation. The chapter has appraised the key determinants associated with project complexity, stakeholder integration, KPIs and benefits realisation and examined how they can be utilised to achieve stakeholder integration excellence and ICT infrastructure project delivery optimisation. Moreover, the key salient components of stakeholder integration in the Kenyan ICT sector have been proposed. The next chapter presents the conclusions derived from the findings, recommendations and further research work.



## Chapter Nine: Conclusions and Recommendations

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### 9.1 Introduction

The overarching aim of this study was to examine the manner in which integration of stakeholders delivering ICT projects in Kenya can be optimised. The objectives of the research were developed in Chapter one in order to assist in achieving the research aim. The preceding chapters have extensive discussion of the results of the research in the realm of its objectives, literature and theory. Therefore, this Chapter provides a brief highlight of the findings and draws conclusions. At the same time, this chapter outlines some of the recommendations to industry and suggests areas for further research work based on the literature, findings and discussions.

### 9.2 Conclusions

The research focused on the integration of stakeholders and infrastructure performance of ICT projects in Kenya. A number of significant issues were identified that have not previously been discussed in the literature. The evidence from this research shows that there is poor or lack of proper stakeholder integration and lack of clarity on various indicators of project performance measures that can do considerable damage to the delivery of ICT projects. Irrespective of the organisation, participants clearly indicated that lack of or poor stakeholder integration as a major contributor to project complexity and poor or lack of optimal benefit realisation. These threats manifest themselves differently depending on project context.

This research further established that with the rising demand for project success, the participants showed that various aspects of project complexity are paramount and must be looked into at the inception of the project: i.e. formulation of business case, application of the project success, compliance and regulatory requirements and the level of stakeholder integration and communication as highlighted in the finding Chapter six

Table 6.7. The researcher noted that effective identification of some of the key performance metrics that are specific, measurable and relevant to the achievement of stakeholder integration and ICT infrastructure planning in Kenya, would have a positive effect on project success. For example, it emerged that having a clear plan around operational expenditure, client satisfaction, resource allocation and capital expenditure as the highly identified indicators of project performance in Chapter six Table 6.9; will allow early identification of problems in delivery of the ICT projects in Kenya.

Concerning factors of project benefit realisations, the research identified the main categories that are central for project leaders, their teams and policy makers to appreciate and understand. These are engagement of stakeholders throughout the project, adoption of communication plan for all stakeholders and review of output and outcomes of the projects. Project leaders face considerable challenges in meeting the listed factors to their optimal levels. As discussed in the validation exercise, if a proper communication plan is drawn and every client is engaged during project delivery the outputs and outcomes of the ICT projects will have a tremendous improvement. The accruing benefits will extend to all the stakeholders involved in the project.

In relation to stakeholder integration determinants, it was established that it would be beneficial to have a robust and flexible mechanism in place to address the stakeholders' needs, alignment of their skills, their commitment to project objectives while understanding the core business process of the ICT projects. The survey results as discussed in Chapter six Table 6.8 showed that it is essential to have the listed determinants in place in order to achieve the project success. The findings related to level of stakeholder integration showed that insufficient level of stakeholders' integration and team management in Kenyan ICT projects constitutes a big risk factor in these projects. Even though there were some differences between participants across different organisations, the findings showed that ICT project performance in Kenya needs a more

defined level of stakeholder management when dealing with delivery of the projects. The findings also demonstrated aligning of stakeholder skills while delivering the ICT projects. This process needs to develop a stakeholder profile, to evaluate stakeholders' contributions to the project, and to involve them in the areas where they bring more meaning to the project. In order to address any issues, which might arise, the project manager and team should ensure that all stakeholders are integrated effectively during the project delivery process and its visible to all the project teams.

There is evidence in the study to conclude that the concept of stakeholder management and integration has implications for the sustainability of ICT projects. One of the issues that predominantly featured in the research was the input of stakeholder integration in terms of project sustainability. What is evident is that the stakeholder management initiatives developed within any project management framework have a direct implication on project sustainability. Actually, one of the salient outcomes of this research is that having a model of stakeholder inclusion and integration within any project management framework can adequately anchor the project on a scaffold of sustainability.

There is an interesting link between stakeholder integration principles and project management theories. The outcome of the research gives a very clear link between stakeholder integration principles and project management theories. The study has affirmed in detail that project management as a domain cannot be discussed adequately if stakeholder integration is not mentioned. This link has formed the theme of a number of research studies, such Plaza-Úbeda *et al.* (2009) and Sánchez (2015), which have been keen to suggest that no proper project management initiative is possible if the various aspects of stakeholder integration have been ignored. But within the context of the research objectives proposed in this study, a number of issues have been noted that directly contribute to knowledge. The study linked project complexity to project delivery but within the larger concept of stakeholder integration. The suggestions made herein are

that stakeholder integration can be viewed from a broader perspective of project complexity. This has formed a significant portion of recent research on project complexity. Essentially, the issue is that failure to adopt a stakeholder integration model in any ICT infrastructure project poses a huge risk to project delivery. Therefore, stakeholder integration is widely seen as a complex issue in ICT projects. The findings of this study thus affirm the dispositions of Heugens *et al.* (2002), to the effect that the management of stakeholders is a critical component of project progress. Within the context of ICT infrastructure projects in Kenya, the outcome of this study gives an insight into the state of project management initiatives in the country. In terms of theory, the outcome of the study contributes to the development of a project management schema in the country within the realms of stakeholder integration. The outcome of the study thus helps in advancing a stakeholder management theory for ICT infrastructure projects in the country.

A number of issues arose in the study that provide an avenue for the improvement of project management initiatives in ICT infrastructure projects in the country. One notable and important objective of the research was the proposal and validation of an assessment tool for ICT infrastructure project delivery that can be used by infrastructure policy makers and senior project practitioners in Kenya. In practice, this means that through the research, the industry will be able to come up with a validation tool to assess stakeholder integration practices in the ICT sector. This is likely to enhance project delivery and initiatives in the ICT sector.

The implication of this study in the monitoring and evaluation of ICT projects in practice is evident. By understanding the various features of ICT project performance, the study has laid a foundation for developing key performance metrics that can be utilised to monitor and evaluate the performance of ICT infrastructure projects in developing countries. Through theory elaboration, the study has structured sequence relations of

infrastructure variables that can be used to assess and optimise the delivery of ICT infrastructure projects. Thus, the implications of this study in terms of theory can be discussed within the general area of infrastructure project performance assessment tools.

### **9.3 Contribution to research**

The research has achieved its overarching aim of proposing an assessment tool for stakeholder integration and infrastructure delivery optimisation. Although the findings and the assessment tool have universal applicability, it is important that research is conducted to understand the extent to which project management initiatives, such as stakeholder integration, impact on project outcomes. This would not only show the impact but also give a very clear picture of this relationship, thus strengthening the findings that have been presented in this study.

This section gives a number of insights into the manner in which the research will contribute to knowledge. The study discussed some of the main issues related to stakeholder integration in the delivery of ICT infrastructure projects. The inferences made herein are critical in contributing to knowledge regarding the ICT infrastructure project management terrain in the country.

### **9.4 Recommendations from research**

#### **9.4.1 Recommendations for the ICT sector**

In consideration of the discussion and findings of the research, there are a number of recommendations that may be critical to the advancement of the ICT sector. This section of the research offers certain recommendations for the ICT sector based on the outcome of the theories and research themes appraised in this study. These recommendations are summarised below:

- There is a need to strengthen the format of communication amongst the various stakeholders in ICT infrastructure projects. The study noted that one of the ways to enhance stakeholder integration strategies is the formulation of an effective communication model in the sector; in this context, it is imperative for

the sector to develop a well-defined communication engagement framework to steer the stakeholder integration process.

- The realisation of the defined benefits of any project is based on the need to formulate a very clear business case for the project. This was noted in the research to be a key factor in project benefits realisation; it is a limiting factor in the progression of the project objectives. In consideration of this, one issue that the sector ought to address is the question of putting up a business case for ICT infrastructure projects. One of the emerging issues in the study was the inability of the government-initiated ICT projects to be able to perform optimally – a factor that was noted to be largely because of the inability of these projects to embrace a business mind-set, in which outputs are strongly measured against inputs. The sector thus needs to align its project objectives with a more commercially minded platform. A very practical and clear business case is necessary in order to have a broader view of the project objectives. Perhaps the industry ought to consider viewing these projects from a more of a business perspective in order to advance the project outcomes.
- More planned stakeholder inclusion strategies are helpful in enhancing the level of stakeholder engagement in ICT infrastructure projects. Through this research, it was affirmed that stakeholder integration is critical in project delivery, but then again, how does the industry translate this into practice? The proposal herein is that the industry ought to come up with an elaborate plan for the identification, profiling and engagement of key stakeholders in projects.
- Upon profiling stakeholders after identification, there is a need for the players in the industry to align the skills of these stakeholders with the skills required by the project itself. In this regard, this research proposes that both public and private sector senior managers remain consistent in interrogating the various stakeholders so that they have an inventory of their skills, which they can apply in advancing project delivery and benefits realisation.

#### 9.4.2 Recommendations for ICT policy makers in Kenya

This study not only contributes to the practice of project management in Kenya but also gives a very important insight into the policy implications of the study findings. The suggestions made herein are critical in terms of both the policy dimension of project management and the practice of project management in the country. A number of recommendations for the policy makers are offered:

- In consideration of the suggestion that one of the critical aspects of stakeholder integration is an effective communication strategy, it thus follows that the policy makers in the sector ought to come up with a communication tool to enhance the stakeholder integration process. The application of these study findings will be incomplete if a rational communication model among the stakeholders is not developed to aid in the stakeholder integration process.
- Policy makers ought to develop policy guidelines not only for the engagement of the stakeholders but also for their identification and profiling as well as their inclusion in the project. Ideally, just as this study has conceptualised a model for stakeholder integration, policy makers ought to consider the proposal to conceive stakeholder identification and profiling. This is anticipated to be critical in the improvement of the integration of stakeholders in projects.
- In order to realise and enhance the concept of project management in Kenya, policy makers and project practitioners need to come up with a practical and holistic commitment to realise the defined benefits of ICT infrastructure projects in the country. This can be affected through an independent project management body called the Information and Communication Technology Authority (ICTA).

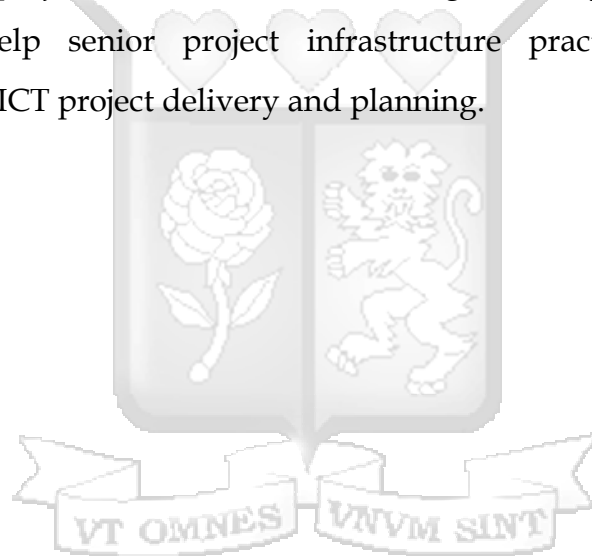
### 9.4.3 Recommendations for future research

The study has achieved its overarching aim of proposing an assessment tool for stakeholder integration and infrastructure delivery optimisation. Although the findings and the assessment tool have universal applicability, it is important that research is conducted to understand the extent to which project management initiatives, such as stakeholder integration, impact on project outcomes. This would not only show the impact but also give a very clear picture of this relationship, thus strengthening the findings that have been presented in this study. There are some issues affecting stakeholder integration that were not covered in depth. They have therefore been highlighted below as themes for subsequent research in this area:

- One of the indications of Muller (2017) is that there are major differences in terms of project management schedules for governments and the private sector. These assumptions further suggest that the management model for public projects differs from that of private projects. Indeed, the veracity of this disclosure can be seen in the manner in which these projects are handled – an issue that would mean that future studies on stakeholder integration in the ICT sector ought to take into account the nature of these projects. Therefore, this research proposes that future studies consider developing a distinct tool just for government-sponsored projects, as this is likely to give a broader perspective of the issue.
- There is a need for the ICT sector to further develop its appreciation of digitisation as an important component of stakeholder integration. This calls for comprehensive research into aspects of digitisation, including the uniqueness of project processes and issues of cultural difference and their effect on stakeholder integration.
- It was established that the ICT sector is heavily male dominated. To address this challenge, considerations need to be taken into account in further research focusing on why there are so few females in the ICT sector. Recommendations

about how to address this issue can then be adopted by the ICT sector and policy makers.

- Since it has been confirmed that stakeholder integration, benefits realisation, project complexity and key performance metrics are collectively needed within the ICT sector, it would be valuable to have further research focusing on the mentioned variables independently towards the ICT project performance.
- There is a growing demand for models and project tools to help infrastructure project practitioners and policy makers to establish well-thought-out project delivery and planning models that could ensure the desired short- and long-term benefits of ICT projects are achieved in an integrated way. Further study in this area would help senior project infrastructure practitioners enhance the performance of ICT project delivery and planning.



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# Appendices

## Appendix A- Interview Questions

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RESEARCH TITLE: AN ASSESSMENT TOOL FOR ICT STAKEHOLDER INTEGRATION AND INFRASTRUCTURE PERFORMANCE IMPROVEMENT: CASE KENYA

### INTERVIEW QUESTIONS

#### **Background:**

This research forms part of a PhD study that seeks to propose an assessment tool that can be used to enhance a mind-set of accountability and structured approach to ICT project planning by infrastructure policy makers and senior project practitioners in Kenya. The assessment tool will comprise of stakeholder integration determinants and key performance metrics.

#### **Brief background**

- i. What is your role and responsibility in the organization?
- ii. For how long have you been working for the organization?

#### **Theme 1: ICT PROJECT COMPLEXITY**

- What does project complexity mean to you?
- Has any of your projects faced and sort of complexity? Please describe the nature of these complexities.
- If you were to quantify these complexities, how would you describe them? Are they major complexities that pose a very serious barrier to the delivery of your ICT projects?
- In consideration of the projects you have been engaged, how do you rate the Kenyan environment in terms of ICT project delivery?

#### **Theme 2: NATURE OF ICT STAKEHOLDER INTERGRATION**

- What is your interpretation of stakeholder integration?

- In your project execution, do you have a pre-defined stakeholder integration template or it is situational?
- Does the management method of your stakeholders have any effect on the project outcome? If yes, please explain in detail how this happens.

### **Theme 3: ICT PROJECT PERFORMANCE METRICS AND STAKEHOLDER INTEGRATION**

- In your project delivery model, do you have standard key performance indicators used to measure the progress of ICT projects? Please describe them.

### **Theme 4: PLANNING AND DELIVERY**

- Does your project planning approach take into account the extrinsic factors likely to influence project delivery? How do you deal with contingencies in the project execution plan?
- Does your delivery guidelines play a crucial role in enabling your project teams execute your projects strategically?

### **Theme 5: ACCOUNTABILITY AND DELIVERY**

- In view of your experiences in project delivery, please comment on the variables involved in project accountability. What are your considerations when proposing an accountability assessment tool for any ICT project?

## Appendix B- Questionnaire

### RESEARCH TITLE: AN ASSESSMENT TOOL FOR ICT STAKEHOLDER INTEGRATION AND INFRASTRUCTURE PERFORMANCE IMPROVEMENT: CASE KENYA

#### QUESTIONNAIRE

##### Notes about the questionnaire

As is the case with many questionnaire surveys there may be some questions which appear, irrelevant or impertinent. However, it is necessary in this study that all questions are answered, as the questionnaire is designed to achieve particular research objectives, and it is hoped not to offend participants in any way. If there are any questions, which you are unwilling or unable to answer, then it is my wish that you continue to answer the remainder of the questionnaire. **Remember that both your identity and that of the company you work for will remain strictly confidential.**

**Research aim:** The overarching aim of the proposed research will be to examine how the integration of stakeholders delivering ICT projects in Kenya can be improved. The research forms part of a PhD study that seeks to propose an assessment tool that can be used to enhance a mind-set of accountability and structured approach to ICT project planning by infrastructure policy makers and senior project practitioners in Kenya. The assessment tool will comprise of stakeholder integration determinants and key ICT project delivery performance metrics.

**Stakeholder integration:** Integration of stakeholders strengthens the multidisciplinary perspective of ICT project teams and helps in taking non-technical aspects (e.g. stakeholder perceptions) into account in decision making processes. Please indicate to what extent you agree or disagree with that statement by circling (0) the appropriate number.

**Strongly Agree**                      **Agree**                      **Disagree**                      **Strongly Disagree**  
 1    2    3    4

##### SECTION A: GENERAL INFORMATION: In each of question 1-6 Please tick (√) one of the box only.

- i. **Gender**  
 Male [ ]                      Female [ ]
- ii. **Please state your current job title?**  
 Project director [ ]    Project manager [ ]    Project planner [ ]    Other [ ]    Please specify
- iii. **How long have you worked within the sector that you are currently engaged?**  
 Less than a year [ ]    1 - 4 years [ ]    5- 7 years [ ]    8- 10 years [ ]    Above 10 years [ ]
- iv. **How long have you been involved with managing of projects?**  
 Less than a year [ ]    1 - 4 years [ ]    5- 7 years [ ]    Above 8 years [ ]
- v. **How effective has stakeholder integration been met in your most recent projects?**  
 Very effective [ ]    Less effectively [ ]    Not effectively at all [ ]
- vi. **Describe your role and responsibility in the organization. Please rank them in order of your responsibility**

Roles	Responsibility
Forecasting	
Control	
Planning	
Managing	
Co-ordination of work	
Co-ordination of resource	

Other ( Please specify)	
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**SECTION B: ICT INFRASTRUCTURE PROJECT DELIVERY RESEARCH THEMES**

**SECTION B 1:** The following is a list of factors which are associated with **ICT project complexity**. Please indicate (i.e. tick (√)) the extent of level of **complexity** on each factor using a scale from **1** to **5** where: **1** indicates ‘very high’ (**VH**); **2** ‘high’ (**H**); **3** ‘moderate’ (**M**); **4** ‘low’ (**L**) and **5** ‘very low’ (**VI**).

Level of complexity	VH	H	M	L	VI	From the list please rank the variables in order of level of complexity
<b>Project complexity variables</b>						
Level of stakeholder integration						
Formulation of project business case						
Application of project processes						
Compliance and regulatory requirements						
Communication						
Scope uncertainty						
Alignment of project phases						
Management of project teams						
Political influence						
Project scheduling						
Lack of country cultural awareness						
Technological complexity						
Coordination of resources						
Any other ( specify)						

**SECTION B 2:** The following is a list of factors which are associated with **stakeholder integration**. Please indicate (i.e. tick (√)) the extent of level of **importance** on each factor using a scale from **1** to **5** where: **1** indicates 'very important (**VI**)'; **2** 'important' (**I**); **3** 'moderate (**M**)'; **4** 'less important (**LIM**)' and **5** 'least important (**LI**)'.

Essential determinants of ICT stakeholder integration	VI	I	Moderate	LIM	LI	From the list please tick (√) only 5 most important
Commitment to project objectives						
Understanding of core project processes						
Competence of key stakeholders						
Readiness to project changes						
Data sharing						
Stakeholders' cultural orientation						
Evaluation of stakeholder needs						
Stakeholder communication plan						
Addressing stakeholder needs and expectations						
Alignment of stakeholder skills						
Any other ( specify)						

**SECTION B 3:** The following is a list of **key performance indicators** which are associated with ICT projects. Please indicate (i.e. tick (√)) the extent of level of **importance** on each factor using a scale from **1** to **5** where: **1** indicates 'very important (**VI**)'; **2** 'important' (**I**); **3** 'moderate (**M**)'; **4** 'less important (**LIM**)' and **5** 'least important (**LI**)'.

Key performance metrics	VI	I	Moderate	LIM	LI	From the list tick (√) only 5 most important
Budget variance						
Cost performance index						
Resource utilization						
Percentage of phase completed						
Client satisfaction						
Scheduled performance index						

Operational expenditure						
Planned hours of work verses actual situations						
Return on investment						
Project's cost variance						
Capital expenditure						
Quality						
Any other ( specify)						

**SECTION B 4:** The following is a list of **project benefit realization** variables which are associated with ICT projects. Please indicate (i.e. tick (√)) the extent of level of **importance** on each factor using a scale from **1** to **5** where: **1** indicates 'very important (**VI**)'; **2** 'important (**I**)'; **3** 'moderate' (**M**); **4** 'less important (**LIM**)' and **5** 'least important (**LI**)'.

<b>Project benefits realization</b>	<b>VI</b>	<b>I</b>	<b>M</b>	<b>LIM'</b>	<b>LI</b>	<b>From the list please tick (√) only 5 most important</b>
Clearly defined expected outcomes						
Approved business case						
Clearly defined strategic objectives						
Sufficient resources						
Review outputs and outcomes						
Engagement of stakeholders throughout the project						
Clear cost and schedule						
Alignment of effort, resources and investment						
Clarified roles and responsibilities						
Adopting a communication plan for all the stakeholders						
Any other ( specify)						

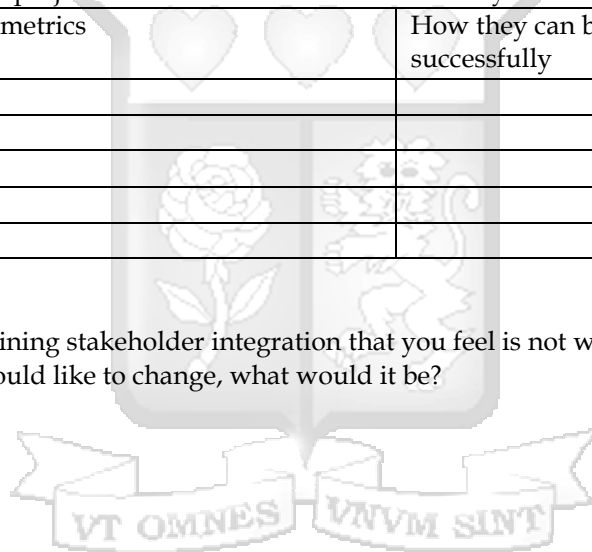
**SECTION B 5:** From the list of **project complexity** in question **B 1**, please select the most difficult factors and indicate how you consider them to be improved. With 1 assigned to the most difficult, rank 2 to the next most difficult, etc.

Rank	Project Complexity factor	How I consider the factors to be improved
1		
2		
3		
4		
5		
6		
7		
8		
9		

**SECTION B 6:** From the list of **key performance metrics** in question **B 3**, please indicate how they can be effectively achieved on your projects or has been achieved successfully.

Rank	Key performance metrics	How they can be achieved or been achieved successfully
1		
2		
3		
4		
5		

If there was one thing pertaining stakeholder integration that you feel is not working properly in your project delivery and you would like to change, what would it be?



Thank you very much for taking part in this survey. If you would like a summary of the results, please enter your name and contact address below.

Name:

Contact details

# Appendix C - Ethical Approval Certificate

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## Appendix D- Turnitin Report

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