

**PROJECT MANAGEMENT BEST PRACTICES INFLUENCING
IMPLEMENTATION OF ROAD CONSTRUCTION PROJECTS A CASE OF
RECONSTRUCTION OF KIAMBU-NAIROBI INTERCOUNTY ROAD**

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**A Research Project Report Submitted in Partial Fulfillment of the Requirements
for the Award of the Degree of Master of Arts in Project Planning and
Management of the University of Nairobi**

2019

DECLARATION

This research project report is my original work and has never been submitted for an award of a degree in any other university.

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DEDICATION

I dedicate this work to my parents Andrew Uhuru and Naomi Nyaboke for their continued support.

ACKNOWLEDGEMENT

I am grateful to my supervisor Dr. Luketero Stephen Wanyonyi for the remarkable support, direction and assistance while carrying out the research. I wish to also thank all my lecturers who have been part of this journey with me. I also appreciate the University library staff and the alumni of Masters of Arts in Project Planning and Management class of 2017 who were part of this journey by providing good academic company.

I acknowledge my parents Andrew Uhuru and Naomi Nyaboke, my sister Linah Mong'ina and my brothers Enoc Ogora, Joash Mainye and Steve Omwoyo who have supported me financially and emotionally throughout this journey.

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ABBREVIATIONS AND ACCRONYMS

BRT – Bus Rapid Transit

GDP – Gross Domestic Product

GOK – Government of Kenya

KENHA – Kenya National Highways Authority

KURA – Kenya Urban Rural Authority

PM – Performance Measurement

PMBOK – Project Management Body of Knowledge

PMI – Project Management Institute

RBV – Resource Based View

SPSS – Statistical Package for Social Sciences

TOC – Theory of Constraints

ABSTRACT

Project Management is an interdisciplinary concept that revolves around planning, organizing, monitoring and controlling events involved delivering a project. It also includes the involvement of the stakeholders charged with achieving the set objectives within the predetermined performance metrics, time frames and budgetary restrictions and time frames. The study was focused on establishing best practices in project management that might influence road construction projects. The study's objectives were consequently geared towards establishing how much planning, scope creep, monitoring and evaluating impacted the road construction projects execution. To analyze their findings, the research adopted a combination of descriptive and explanatory research designs aligned to a survey to deduce the findings. 70 respondents were sampled to participate in the survey by administering questionnaires to collect primary data. These were dropped and collected on a later date allowing ample time for respondents to fill and complete them before handing them back. Various data analysis methods were considered and the researcher adopted descriptive statistics. Relative significance of every variable was then determined using a regression model. The pilot study that was steered at 10% level of significance hence 7 respondents participated. The pre-test intended to assess the clarity and significance of data collection instruments to replace or improve those deemed inadequate to measure variables for enhanced quality of findings. The study deduced a positive correlation between implementation of road construction projects and various project management's superlative practices (planning, administration cost; scope creep management; monitoring and evaluation). From this finding, the study recommends there is need to investigate further how planning practice might impact execution of road projects in Kenya. Besides, a study should also investigate how cost management practices affect timely completion of projects. The scope creep management practices should be investigated with regards to completion without time overruns in similar projects. Finally, these factors should be investigated against construction of houses projects in Kenya.

CHAPTER ONE; INTRODUCTION

1.1 Background to the Study

The construction industry has become an integral part of development and has been characterized with an upsurge in size, complexity, diverse customer requirement and interdependencies. The contribution of this sector towards the Gross Domestic product (GDP) indicates its prominence in the economy. Apt completion of projects has become a measure of success in these undertakings. Organizations have begun focusing on using projects as milestones for strategic growth management (Weiss & Potts, 2012). The industry generates over 50% of resources into the global map ((Economy Watch, 2010). Its significance, therefore, necessitates for prudent planning allocation and administration of resources to attain efficiency. The role of the construction industry as an integral part of every other sector makes it prevalent in any country including Kenya.

Economic growth and poverty reduction are marked with development and maintenance efforts of physical infrastructure in a country. The quality of infrastructure governs aspects of the economy like access to markets, costs of production, creation of employment and investor attraction. Road transport remains the most popular means in the world. Limitations of rail transport and water transports in terms of geographical factors and their fragmentary nature make it necessary to supplement them with road transport especially over long distances (Chai & Yusof, 2013).

Economic development in every country is squarely dependent on the construction of new roads and maintenance of current ones. A report by the World Bank released in 2009 indicated 64.94% global paved roads cover. These are surfaces covered with crushed stones (Macadam) and bituminized agents or a hydrocarbon binder mixed with cobblestones or cement measured as a percentage of the aggregate road coverage within the country (World Bank, 2013). By 1996, records indicate Africa had only 311,184 km of paved roads and approximately half were poorly maintained. Besides North African countries (Egypt, Morocco, Algeria and Tunisia) and Mauritius, The African Development Bank observed that paved roads only constituted below 50% of the total road network in the continent. These only had a 17% coverage in 1996 which was a huge lag below the average. Central Africa had 10.2%, South Africa 25% while North Africa had a 57% coverage. Generally, the road density coverage in Africa falls below Latin America and Asia in square kilometers (World Bank, 2014).

In 2010, World Bank reports indicated only 14.3% of total road network in Kenya was partly paved (World Bank, 2013). Construction, maintenance and improvement of roads in Kenya is mandated to the National government under the relevant ministry and the county governments in the national and county levels. Non-governmental organizations private entities are also in charge of several (Republic of Kenya, 2010).

The ministry of Environmental, Water and Sanitation, and the Ministry of Transport and Infrastructure are delegated the mandate to develop road infrastructure in Kenya by the Government. The Kenya Roads Board (KRB) is the chieftain of the Ministry of Transport and Infrastructure, Kenay Rural Roads Authoity, Kenya Urban Roads Authority and The

Kenya National Highways Authority are the key parastatals that are allocated funds on need basis to manage the sector by the national government (Kenya gazette, 2009).

Effective project management involves successful execution of a strategic plan and attaining the desired goals and objectives. Brown and Hyer (2010) argued the success of a project can be assessed in terms of the time spent, costs incurred and quality of outcome (the triple constraints)- Key Performance Indicators. These are assessed against the projected costs, timeframe and expected results. These are the basis for the principle of interdependency which assumes a direct correlation between the three factors. For instance, projects that take longer than anticipated tend to incur high costs than previously budgeted for (Lysons & Farrington, 2010).

Chandra (2008) observed most public projects in India are declared uneconomical having taken longer than anticipated hence incurring higher costs as a result of poor planning. The Indian economy has consequently undergone a retarded growth rate. Similar observations were made while evaluating public projects in Nigeria where poor planning, insufficient or undertrained manpower, insufficient financing and poor administration of projects were the root causes (Oladipo, 2008).

Project management involves doing what it takes to ensure that each one of those with an enthusiasm for a venture dependably have a similar clear replies on concerns about who manages what in the project, what need to be delivered by the project, at what time and within what period should the deliverable be seen, how much was invested and is the project addressing the need that it was created for (Robert, 2007). Management practices refer to a group of similar activities used in the act of making decisions about and

endeavor it could be a business or a department, there is dissimilarity of view on what capacities are attempted by directors in associations, some administration specialists arrange these capacities into four sorts and others order into five sorts and some others group them as seven things (Havinal & Veerabhadrapa, 2009).

Formulating a budget is an integral part of enhancing cost effectiveness for clients. The performance of a contractor has universal significance to the design adopted. Organizing a design process revolves around expected variations, and development of accurate design brief (Lathan, 2004). Siti & Rosli (2010) described remuneration within the building industry as a fiscal deliberation allowed to contractors having completed a project. In light of this, Kenyatta (2015) added, cash flows sustain and propel the construction industry and any hitch on this might cripple the entire system. Underpayments, delayed payments, total non-payment or interment payments force contractors to complete projects late, enter into contractual disputes or even liquidate their companies. Kenyatta (2015) was analyzing a situation where “Kundan Singh Construction International Limited bank of Africa Kenya Ltd” who had loaned on strengths of the government contracts they had won. The borrowers were forced to liquidate since their client “the government” did not pay them.

The Kenyan government is on course to implementing initiatives formulated to address traffic congestion within and around the capital, Nairobi. They intend to enhance the capacity of prime national roads to enhance road safety reduce road usage costs; travel time, and vehicle running costs. Ultimately, this will promote inter-cities trade and stimulate socio economic developments. Part of the A104 road linking the capital (Nairobi) County to “Kiambu” County is among those targeted for this expansion. 6.8 km

traverses through Nairobi County and the other 18.3 km goes through Kiambu County. Existing pavements shall be rehabilitated and carriageways widened with additional lanes. Additionally, non-motorized traffic control systems and enhanced drainage will go alongside other improvements on the road infrastructure (Wanjohi M., 2016).

1.2 Statement of the Problem

Time taken to fully complete a project is key in defining its success. Time taken is chiefly dependent on the decisions made by managers concerning budgetary allocations and desired results (Seddon, 2008). The success of any project is also impacted by the control and management exercised in the planning and orientation phases. Chovichien and Nguyen, 2013). However, success in project management is an abstract concept subject to complex metrics. Han et al. (2012) observed that lack of a predefined guidelines to approve a project as successful primary inhibits evaluation of the success in a project.

Complete road construction developments are termed successful if they pass these criterion; cost criterion- within projected budget; time criterion- was completed in time; effectiveness criterion- according to standard quality measures and client satisfaction criterion- accepted for usage by intended clients according to Nwachukwu et al (2010). These could be users within or outside the organization.

Completion of a project depends on personnel, site management, client's competence, support from top management, competence of the contractor, communication, experience of project managers among other factors (Li, 2005; Yong, 2013; Alexandrova and Ivanova, 2012; ; Gudiene, 2013; Ondari and Gekara, 2013). For instance the expansion of

the road to Kisumu international Airport in 2015 was faced by such constraints and ended up being completed eight months late which costed much more (Kenya Engineer Magazine,2015). Despite completion, however, the project cannot be termed to be successful.

Despite efforts by contractors to adopt and implement operation management strategies, desired results are still not attained (Salaheldin, 2008). Additionally, Kenya has paid minimal attention in researching and understanding the construction industry despite numerous projects being rendered unsuccessful. The James Gichuru- Rironi road is one pilot project that focused on investigating impact of implementation of best practices in project management of road building projects but the results were rendered inconclusive. There is hence a need to investigate it further for more conclusive results.

1.3 Purpose of the Study

The study purposed to establish “Project Management’s best practices that impact projects on road construction; A Case of the Reconstruction of Kiambu-Nairobi Inter-county Road.”

1.4 Objectives of the Study

The study was directed by these objectives:

- i. To asses to what extent planning impacts implementation of projects on road construction; a case of the reconstruction of Kiambu-Nairobi inter-county road.

- ii. To assess to what extent cost management influences execution of road construction projects; based on a case of the reconstruction of Kiambu-Nairobi inter-county road.
- iii. To evaluate how much scope creep management effects implementation of road construction projects; based on an example of the reconstruction of Kiambu-Nairobi inter-county road.
- iv. To assess to what extent evaluation & monitoring impacts on implementation of projects on road construction; considering the case of the reconstructing the Kiambu-Nairobi inter- county road.

1.5 Research Questions

This study was geared towards responding to these questions:

- i. What extent will planning effect road construction project implementation; a case of the reconstruction of Kiambu-Nairobi inter-county road?
- ii. What extent would cost management impact road construction projects implementation; based on the reconstruction of Kiambu-Nairobi inter-county road?
- iii. What extent might scope creep management impact road construction projects implementation; a case of the reconstruction of Kiambu-Nairobi inter-county road?

- iv. To what degree would monitoring and evaluating effect of road construction projects implementation; a case of the reconstruction of Kiambu-Nairobi inter-county road?

1.6 Significance of the Study

This project will be potentially most helpful for project management professionals on all categories to expedite road construction projects success rates by proper planning of projects. The inferences and recommendations made from the findings of this project will be useful to engineers, project managers in construction, architects, engineers, site agents and also quantity surveyors in their projects besides those in construction of roads. Findings from this study may as well be important for educational purposes for researchers as a basis for further researches. The study may provide the background information for academics and specialists who would be conducting research in the field.

1.7 Limitations of the Study

Limitations to the research stemmed from the focus on the construction from James Gichuru road junction to Rironi due to limited funds and time. The study was also limited to the amount of information which was obtained from the road construction project managers and site agents, the validity of information depended on their honest level.

1.8 Delimitations of the Study

This research was restricted to a geographic span of Nairobi and Kiambu County and therefore the information was generated from the rehabilitation and capacity

enhancement of James Gichuru – Rironi Road. Project managers and site agents from other road construction did not take part of the in the study.

1.9 Assumptions of the Study

The inferences deduced from this study were made on a supposition that each of the targeted respondents would be available, willing and ready to respond to the study questions and they would respond to the enquiries accurately and straightforwardly.

1.10 Definition of Significant Terms

Monitoring and Evaluation: Denotes mundane gathering and scrutiny of data intended to be up-to date with a project's progress.

Project cost: denotes the actual amounts required to successfully complete a project or work; any expenditures made or estimated to be made.

Project Management Practices: These are systems and structures embraced by firms to guide them towards efficient and effective completion of projects.

Project Management: Entails applying skills, techniques and understanding to attain set objectives and goals in a project.

Project Performance: Aims at completing a project on the estimated budget, projected period, or attaining specified standards.

Project Planning: critical analysis of project paired with organization of activities and resources required to achieve desired results. It revolves around developing and implementing a project implementation plan.

Project scope: refers to every work/task behind delivering a service or product with stipulated specifications in functionality and other features. It is attained by establishing and listing specific goals, deadlines, costs and the actual tasks. Rouse (2015) added that a project's scope the definition of the boundaries limiting operations.

Scope creep: when a project stretches far beyond its original vision. It is basically the minor yet constant requirements that invariably continue to extend a project further than it was anticipated.

Successful completion: successful completion of a project refers to strict adherence to budget, time frame, scope and achievement of specifications of standards and quality.

1.11 Organization of the Study

The research was structured into 5 chapters; The first focused on illustrating the context of that would be focused on (background of the study), stating the investigation focus (problem statement), defining a purpose of the research, objectives to be investigated, hypothesized research questions, implication, confines, delineations, assumptions made for the research also defining terminologies used in the study. Second Chapter- revised existing works similar to the topic under study. Chapter two also presented a theoretical and conceptual frameworks and summed up material from the literature review. The third chapter drew research procedures (Methodology). Its sub-sectors comprised of; the design of the study -research design, targeted population, "sample size", "procedures employed in sampling", "instruments used for data collection", and finally "data collection and analysis procedures". Chapter four focused on analyzing data collected from chapter 3 and its explanation. The fifth chapter discussed as a summation the results

gathered from the study, conclusions were drawn, commendations and proposals presented on additional probe on the topic.

CHAPTER TWO; LITERATURE REVIEW

2.1 Introduction

This chapter reviewed existing works developed scholars on themes outlined in the objectives of the study. It discussed best practices in project management which effect successful delivery of projects on road construction. Primary emphasis were focused on four practices in project management; planning, cost, scope creep and monitoring and evaluation. The project management best practices that influence enactment of projects on road construction were investigated under the following sub topics: planning, cost management, scope creep and monitoring and evaluation.

2.2 Review on Implementation of Road Construction Projects

Performance is assessed against the best way something can be done and several factors would be factored in determining performance and consequently successful performance of a project; costs incurred, quality desired versus quality attained, time spent over time estimated, profitability, health & safety, client fulfilment, functionality, and overall business performance (Shahrzad & Hamidreza, 2011). These metrics indicate performance and are used to quantify and evaluate execution of a project plan. A successful road construction project ends within set time frames, cost and delivers the desired quality. It was investigated and concluded that adopting advanced road construction technologies and methods facilitated Europe in faster and more efficient project execution by Mabin and Baldrestone (2015). This was evident in China where

technology helped use less resources to complete road projects with modular and fabricated construction technologies (Cheung, 2010).

According to Yeung *et al.*, (2012), scholars have conducted investigation on project performance evaluation and benchmarking in the construction management discipline heightening the need for the construction industry to pinpoint the common performance indicators in road construction at the project level. Wadugodapitiya *et al.*, (2010) noted performance measurement (PM) was an integral managerial role and defined it in terms of quantifying efficiency and effectiveness of each metric. Additionally, PM is crucial in appraising attained objectives against the hypothesized goals and assessing their competitiveness. Individual performance indicators make it easy to understand and compare units of the intricate process of construction. However, customary performance indicators like time, cost and quality do not give a balanced overall view of how a project performed on their own (Wadugodapitiya *et al.*, 2010).

Tindiwensi (2006) identified quality, environmental, economic and informal sector performance indicators as the key factors to consider when determining performance of in the construction industry. Pheng & Chuan, (2006) later suggested relating to owners, stakeholders, general public and users –a macro view of performance functionality, or developers/ contractors –micro assessors of project performance (time, safety, quality, cost and profitability).

2.3 Project Management Best Practices and Implementation of Road Construction Projects

Planning, organizing, monitoring & controlling activities surrounding the project are integral parts of project management. These should be paired with hands-on involvement of every stakeholder to ensure objects are met in time, within the budget and standards are met (Turner, 2016). Furthermore, project management is centered on applying knowledge, and techniques to define actions geared towards meeting project specifications. Success in project management is achieved through logical groupings of procedures and processes, defined requirements, concerns, expectations from customers, balancing the scarce resources. These limitations and boundaries determine the achievement of project objectives that attain the standards expected by stakeholders (PMBOK, 2013). Adeyemi observed that organizations are particularly interested in project management since it creates a harmonized approach to executing a project through control. Additionally, it is a basis on which reliable results can be attained from an ongoing project or enhance future performances.

Miller & Lessard, (2011) also confirmed adopting these management practices is key to accomplishing goals effectively and efficiently (Miller & Lessard, 2011). Skeggs (2011) then observed that is a wide range of these including involvement of users, support from management, planning, available resource mobilization, competent personnel, clear objectives and realistic goals, risk management, technology, close monitoring among others.

Arslan & Kivrak, (2014) maintained the success of a project is attained by delivering what clients specified or expect and attaining a rationale intended by the project. It requires development of a clear plan factoring in aspects like time to completion, and other determinants of its success (Chua, Kog and Loh, 2013). A plan guides all stakeholders particularly project managers to make decisions and remain on course to success. Many researchers have considered success of projects against performance factors to depict good performance. According to Chan & Chan, (2004) success of projects was also viewed to rotate around measures of time, safety cost, functionality and satisfaction to stakeholders. But Cho argued in 2009 that many studies conducted in the past on the topic have not been very comprehensive and only consisted on few characteristics.

2.4 Planning and Implementation of Road Construction Project

Successfully delivering a project requires meticulous planning since it is an integral component in the process according to Idoro, (2012). Project managers must formulate one before embarking on a project and stick to it to succeed (Dvira, Raz & Shenhar, 2002). Planning resources based on availability, stipulating the objectives and procedures propels a project through its life cycle (Cleland & Ireland, 2006). Rahrovani, Chan, & Pinsonneault, (2014) agreed planning and adopting the best execution procedures is key in successfully deliver a project. The Havard University, School of Management (2007) defined a project plan as details of specific activities intended to meet the three constrains and attain the goal of a project.

Kerzner (2003) had earlier observed that project planning involved establishing a course of action in a virtual or predicted environment. He also stressed that the process must be logical, disciplined and flexible as to accommodate the various functions/ inputs. In addition, planning should continue into the life of the project. Since each stage is virtually different, subsidiary plans at each integrated on the overall plan ease its implementation. PMI (2013) maintains the original plan should remain in charge for overall completion, observing and control of the project. A plan should explain within its subsets risks, resources, quality, and scope of management, costs and process improvement among other factors. Finally, planning should integrate a communications guidelines to stakeholders informed and up to speed with the progress of the project to encourage participation.

Project managers in most organization have multiple interactive tasks including planning, making projections, and executing plans which progress into delivery of projects (Perminova et al, 2008). Divr & Lechler (2004) noted that formalizing the planning stage reinforces its impact on the results. Thoroughly formulated plans would reduce potential risks, failure or fluctuated costs according to Lewis (2010). Delivery of results, resource planning and key stakeholder management are all detailed on the final plan. Risk management and monitoring and control procedures including metrics to be used are also detailed in the plan. The plan must also stipulate the closure process of the projected which must be countersigned by each stakeholder. The process states the procedures, documents or activities that will mark a formal conclusion or termination of the project.

2.5 Cost management and Implementation of Road Construction Project

Insurance agencies, plan owners, contractors, subcontractors, lenders, engineers and all other stakeholders are all interested in the time versus cost dynamics of a construction project. Rojas, (2009) had observed avoiding cost overruns and time extensions for projects required proper management and administration of a contract. On that note, Brown, (2008) recommended all stakeholders have basic insight on the following to increase odds of success: software used in project management, techniques used in critical scheduling of paths, scheduling specifications, delays and their causes, strengths and weaknesses of different delay methodologies, and the foundational principles of analyzing delays.

Managing time can equally become expensive, subject to uncertainty and consequently fraught with anxiety. Kerzner (2006), however presented other arguments why execution of a project might fail. For instance omissions and errors on the plan, subcontracting (brokering done by the contractor), extremely intricate scheduling projects, inadequate time for extensions, varying site conditions or user changes. But Axson (2013) felt the standards of an excusable delay were still vaguely stated and remained misunderstood by most. He noted that higher potential to enhance scheduling capabilities owing to advancements in scheduling software technology, user quality concerns continue to arise. The urgency to resolve delays and updating the schedule to reflect the actual performance and incurred delays is overlooked by the contract owners and contactors thus escalating the situation.

Melton (2008) pointed out that projects involve costs beyond those incurred in procurement of material for completing the projects. Labor for instance can incur a project significant expenses and time estimates should guide prediction of variable costs like labor required to complete the project. Schwable (2009) hence pointed out the vitality of cost accounting to factor other costs like materials and equipment to be used in the project. Cost accounting relates to managing costs in a project from prediction, allocation, accounting and control. The importance of this process was reiterated by Kihoro and Waiganjo, (2015) who asserted that attention paid to costs regarding a project's scope reflects on its success.

2.6 Scope Creep management and Implementation of Road Construction Project

Efforts and processes geared towards developing and creating products for use in a project comprise the scope of a project. Managing the scope of a project therefore revolves around defining and governing works included or excluded in the project. The goal is to bring all stakeholders to an understanding of what to expect on completion of a project and the processes that will be used. Schwalbe, (2010) further noted that managing the scope of a project facilitates a challenged project with each growing scope and a wild requirement list. Project scope management therefore describes a process of defining the required work and ensuring it is all done. This is attained through planning, creating work itemization structures and verifying control of the scope (PMBOK, 2013).

A successful project management must start by defining the scope of the project. It underpins that every task/ process critical to the completion of a project is considered and articulated even before the project is initiated. Avison and Torkzadeh, (2009) echoed this

declaration hailing scope definition as the core of the upfront process in strategizing for a project because it creates a clear and logical boundary to the project. They added that a project without these definitions is doomed for failure Avison and Torkzadeh, 2009 (Avison and Torkzadeh, 2009).

The implementation process suffers constraints from the onset when the scope is not completely defined and the entire project administration might be compromised (Fageha & Aibinu, 2013). Achieving the deliverables of the project requires clearly stated statements on the scope. These form a guideline for stakeholders and project managers for making decisions. Additionally, it creates a mental picture of expectations (Karl, 2014). Additionally, the project manager can use it to determine required resources and make genuine commitments. Knapp (2011) observed the fatality in unclearly defined scope noting it could potentially fail to manage expectations of stakeholders resulting to a scope creep and an imminent dissatisfaction of beneficiaries. Scope creep is the changes to the scope of a project that wasn't planned for.

Managing change prevents inadvertent, careless or illegal alteration of the scope of a project (Hill, 2010). These would fundamentally impact on the planned schedule and resource allocation particularly the cost of the project. Moreover, necessary or required alterations are formally examined and approved by stakeholders before implementing them. Eliminate change control and the entire project becomes a moving target risking missing any of the success factors, or all. Project managers are hence mandated to manage and control change which counts as a performance indicator for them. But Suchan, (2007) warned that changes on a project are inevitable and managers must be ready to react accordingly when this arises.

2.7 Monitoring, Evaluation and Implementation of Road Construction Project

Monitoring and evaluation are intertwined concepts and are project administration functions that facilitate monitoring the actual progress of a development. The assessment is the basis for change management. Monitoring is a continuous data collection system specific to a performance indicator in a project. When combined with evaluation, they constitute a system for harmonizing current and future decisions (United Nations Development Programme, 2002). They depict the how much progress has been attained and the expected results and progress in relation to the allocated and utilized funds (Williams, 2000). It is an additional decision making tool for stakeholders (Ballard et al., 2010).

Monitoring and evaluating a project is essential in achieving best results from a project. Short and medium runs are defined by complex project administration characterized by durability, sustainability and effectiveness (Dobrea et al., 2010). The progress of a projected becomes clear (Houston, 2008). The risks of time and cost overruns are greatly mitigated through these while maintaining required quality standards. The tool is also usable in assessing the degree of attaining the set objectives (Crawford and Bryce, 2013). While investigating how monitoring and evaluating a project, in addition to management of funds, quality performance and activity scheduling, Hwang and Lim (2013) inferred this combination of management approaches heightened the odds for success. Ika, (2012) run regression examination to identify a statistical level of significance and success factors in project performance. Considering project coordination, monitoring institutional

composition and skill sets, they inferred consistent theory and practice were the most outstanding success factors. Monitoring and design were concluded as great contributors to success.

2.8 Theoretical Framework

This section reviewed theories associated with project management. These theories included; Theory of Constraints, Project Management Competency Theory and Resource Based View Theory.

2.8.1 Theory of Constraints (TOC)

The theory was advanced by Goldratt in 1984 and it constitutes a general management philosophy. The theory was advanced to promote performance by continually achieving goals. It is built on four major constraints presumed to hinder performance in organizations –cost, time, scope and quality. The theory is formed fundamentally on the proposition that these constraints negatively affect project and firms performance. It therefore maintains project managers articulate their attention on the limitations. The prevalence of these constraints was seen to affect almost 40% of road construction projects in Europe (Klein, Debruine & Lehman, 2011). It therefore poses a challenge to managers to creatively innovate ways to mitigate these constraints. These constraints are universal and Linhares (2010) argued that they originate from the policies adopted by a firm and inadequacy of physical resources. TOC advocates for peak performance among these constraints to attain positive performance Eric, Debra and James (2015). It presents

a structure of activities that should be mandated to managers to incorporate in managing projects.

TOC can be described as concepts, and measurements that focus towards a logical tool for smoothening construction projects (William, 2013). Basically, application of the theory involves planning and managing the execution process while factoring inherent uncertainties under a limited strain of resources; human skills, managerial capacity or physical resources. Scope, time and cost are the most prevalent constrains in execution of construction projects. The theory integrates with the study in demonstrating challenges that curb implementation of road construction plans and consequently affect the performance of such projects. It has also been employed to assess factors for housing projects (Gitenya and Ngugi, 2014) and manerial constrains to managing critical activities (Guash, 2012).

2.8.2 Project Management Competency Theory

The competence philosophy advanced through McBer and Mclelland from the 80s described competence as the characteristic that enable an individual to perform exceptionally in a situation. It is a “cluster of interrelated skills, attitudes, personal traits and knowledge that propels and enables individuals to perform uniquely”. Competency is a relative skill subject to training and development yet very significant in determining performance (PMI, 2011).

TOC is centered on the impact of competence among project managers to administer a projects and control dynamics that distress success of construction projects. A technical project manager out to effectively implement knowledge techniques and skills to deliver exceptional results. Garish and Huemann (2014) also pointed out on the need to choose between a wide array of management strategies and tools that enhance performance. Further, the level of skill was observed by Edum-Fotwe, (2011) to correlate directly with the complexity of strategy the manger can administer successfully. Organizations have hence adopted a trend to match project management with manager's competence for optimal results. Skill levels of each teams is now being assessed and the human resource department taking up the course to train and develop staff to desired competence levels (Kometa, 2013).

The building industry is undergoing a key transformation as technological advancements continue to emerge. Projects managers are constantly adopting new roles and functions to perform which has further stamped the need to have further training even from the workplace. Training has become essential in adapting to the dynamic environment demanding new skill-sets (Francist & Ronald, 2010).

TOC related to this study by charting technical and contextual skills and competences project managers should possess to deliver road projects within budgeted costs, on time, of desired quality and within scope (Clist & Morrisey, 2011). Supervision and enhanced competence among project management teams in the wake of the new technological era is also insisted. Leyman (2013) employed this theory to investigate how competency and

skills impacted large Swedish organizations in administering their projects. It was also instrumental in Kometa and Jubb's (2007) study of competency profiles that are a success in the industry.

2.8.3 Resource Based View Theory (RBV)

Resource Based View theory is among strategic management approaches proposed by Wernerfelt and Rumelt from 1980s. It constitutes the framework for organizing allocation of resources in a firm to attain a sustainable competitive edge (Barney, 1986).

The theory is derived from the indication that very competitive and superior performing organizations gain their strength from a large pool of resources. As aforementioned, resources are mostly inadequate yet the project manager's performance is determined from their ability to maximize on that. In cases where this is not the case, the manager can exercise more power and do more to deliver good results without the fear of overrunning the cost of a project (William & Dettmer, 2010). Resources can range from tangible equipment like machinery to intangible ones like experience or a trademark. A contractor who can access tippers, excavators, graders or other modern equipment can complete a project more successfully, within stipulated time frames and estimated budgets (Gimeno, 2011).

Resources at the disposal of a firm squarely impact the delivery of a project. RBV theory therefore holds much relevance to this study to illustrate cost as a success determinant in construction projects. As envisaged by Rumelt (1984) and Wernerfelt (1984), the fathers

of RBV theory, technological, financial and physical resources fall into the managerial context to determine road project success. Performance is twinned with success rate of projects making it critical to construction firms. The relevance of the theory to the study relates to how it summarizes a determining factor to the road construction projects' success.

2.9 Conceptual Framework

In this study, implementation (Execution) of road construction project forms the dependent variable whereas the project management best practices: planning, cost, scope creep management and monitoring and evaluation constitute the independent variables are. Figure 1 is a depiction of the relationship between these variables:

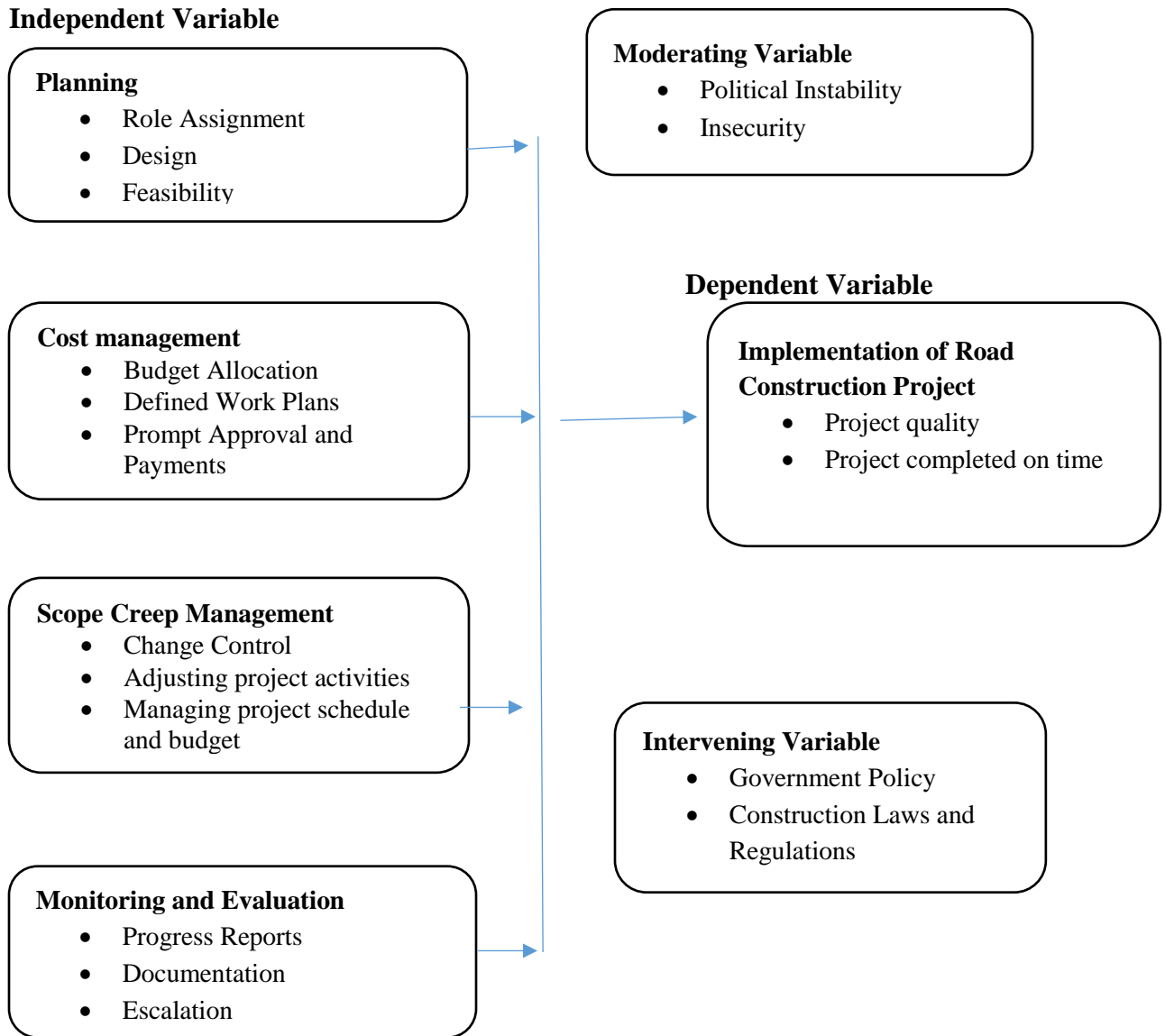


Figure 1: Conceptual Framework

2.9.1 Conceptual Framework

There exists a range of tools combined with techniques for project management and selecting a credible one is delicate to a project's success (Eriksson, 2008). But Ogunlana (2009) observed that these success factors vary between different projects. This study maintained that planning and control, personnel competence and client involvement are also vital determinants of success in a project. In addition, Kazhibekova and Jusufovic

(2010) had also identified the performance of any project was dependent on the overall project management practices –planning, monitoring, control and motivation. Lu Shan (2014) observed that these combined with agility between stakeholders (contractors, clients, engineers, designers e.t.c.) was integral in the growth of the Chinese constructions success. The collaboration saves time & ultimately costs since Ghura (2013) noted that ample and timely planning for a project prevents cost and time overruns for infrastructure projects.

Al Humaidan, (2011) termed this shortcoming as in terms of pre-project planning or inadequate definition of elements of a project. These cause unanticipated project scope revisions resulting to estimates overruns which Assaf and Al-Hejji, (2006) observed to be the cause for 70% cases of poor performance among Saudi Arabian contractors. Scope management confirms every works directed towards success are predefined (Horine, 2013). Scope management confides works only to those necessary for the desired result. Scope is what needs doing while “scope management” involves organizing these requirements (Wysocki, 2009).

The budget is formulated from the plan and it guides the monitoring and evaluating how a project is progressing. Cost incurred on this process should be included in the overall budget to affirm its importance in project execution (Gyorkos, 2003; McCoy, 2005).

2.10 Knowledge Gap

Table 2.1: Knowledge Gap

Author	Study	Findings	Gap
Omran et al., (2012)	Performance of construction projects in Sudanese industry	Despite efforts to enhance project management, most of the small and intricate projects continue to record cost and time overruns.	Project management practices are not incorporated in road construction projects
Gaba, (2013)	How project management, costs and planning effects success of construction projects	Failure to adopt project management best practices results to cost and time overruns, and ultimately unmet project objectives which means failure in many road construction projects.	Only the cost variable is used. No other variables are identified
Olatunji (2010)	Impact of time allocated to deliver/complete a project.	Client and project team don't understand road project management components from inception to completion	No project management practices were identified
Fapohunda	Optimal construction	In construction,	Only cost variable

<p>& Stephen (2010)</p>	<p>resources utilization</p>	<p>discrepancies emerge between the projected cost, time and quality as per objectives hence the need for constant monitoring and evaluation.</p>	<p>is used</p>
<p>Ogutu & Muturi (2017)</p>	<p>Factors effecting successful delivery of Kenyan road construction based on Kisumu County.</p>	<p>Poor communication between stakeholders; Corruption in public procurement procedures; Poor planning for imminent risk and insufficient funds for financing projects result to low completion rates for road construction projects</p>	<p>Planning, cost, scope creep and monitoring and evaluation practices are not identified</p>
<p>Munyoki (2014)</p>	<p>Dynamics affecting success of construction projects in Nairobi Kenya</p>	<p>*The best project execution strategy should be paired with proper time planning and resource allocation to succeed. *Adequate planning at every execution stage is paramount</p>	<p>Planning practice has been overly emphasized on study overshadowing the other factors</p>

		<p>*monitoring and evaluation of ongoing projects to mark milestones and make necessary modifications to the plan.</p> <p>*supervision and inspection of a construction sites to ensure safety</p>	
David (2013)	Why Colombian road construction projects are a success	The Colombian government invests handsomely financially towards these projects in addition to the highly competent construction technical experts result to significantly high success rates for construction projects.	Project management practices are not used in the study
Harries & Reyman (2013)	Challenges that face Monitoring and evaluation of construction projects execution and success	*Poor communication between shareholders evident in the weak culture of conferring to use results from monitoring and	Only monitoring and evaluation practice is used

	in Central Europe	evaluation *Inadequate technical competence in project management to monitor projects.	
Gitenya & Ngugi (2013)	Assessing performance of housing construction projects in Nairobi, Kenya	Inadequate finances is seen to be the main impediment towards successful performance of housing projects	The project management practices are not identified

2.11 Summary of Literature Review

Chapter two covered literature reviewed by different scholars on best practices in project management that influence successful execution and administration of projects on road construction. It covered works on planning, cost management, scope creep management and monitoring and evaluation. It has also covered the theories that relate with project management best practices.

A moderating variable was measured and wrought to investigate if modifying it affects how the independent and dependent variables relate. Government policies and construction laws are identified as intervening variables. Implementation of construction projects could be researched and examined by means of many indicators of implementation, articulated by factors such as; quality, time, client satisfaction cost, including environmental impacts, safety and health.

CHAPTER THREE; RESEARCH METHODOLOGY

3.1 Introduction

This third chapter of this study detailed how examination would be conducted to collect data for analysis. It describes what population would be targeted by the study, narrowing down to the sample and the procedure employed to determine the sample. Instruments and Data collection procedures are also discussed. These instruments are then tested for validity and their reliability illustrated. Variables to be used in the study are also defined and methods to be used in analyzing the data discussed.

3.2 Research Design

Trochin (2005) considered this section so integral that it glues the research to become one piece from different sections. The study had intended to take a quantitative data collection approach which made descriptive research the ideal design to combine with a survey. Saunders et al (2007) had noted researchers consider using a survey authoritative since it they can combine both inferential and descriptive data to make analysis. Mugenda and Mugenda (2003) were also of the opinion that a survey is a comprehensive data collection tool to get data on situations, practices and opinions from a period by interviewing respondents or administering questionnaires.

3.3 Target Population

Borg & Grall (2009) referred to this to be the overall combination of items that a researcher wishes to base their general results from. These might be events, objects or

people. This research was centered on a target of contractors from a project by China Wu Yi. The population included project managers, project team, civil engineers and structural engineers. The target population was 70 respondents as represented below:

Table 3.1: Target Population

Category	Frequency	Percentage
Project managers	5	7%
Project team	40	57%
Civil engineers	15	21%
Structural engineers	10	15%
Total	70	100%

(Source: Researcher, based on targeted population)

3.4 Sample Size and Sampling Procedures

When a number of units is selected to actively study in details from the entire population, it is considered to be sampled. Consequently, a sample the representation of a defined population. Kothari (2006) defined the sample as a fragment of a population on whom judgment is made based on. Kothari (2004) considered a sample size to be the items selected from the overall set to be scrutinized for findings. Very small sample sizes might be subject to incorrect generalization and increasing the size expands the precision and reduces the room for error as agreed by both Levin and Rubin, 2006 and echoed by Kothari, 2004).

3.4.1 Sample Size

Here, Mugenda & Mugenda (2003) considered sampling to be the procedure in selecting several characters, events or objects with the intent to establish a construct regarding the entire population. In her study, Leedeey (2005) observed from Olatunji, (2010) that while making a survey where the entire population does not exceed 100 units, the entire set should be considered to be a sample. Therefore, since this study targeted a population of 70 contractors, the entire population was assumed as the sample size of 70 respondents.

3.4.2 Sampling Procedure

Intended for research purposes, sampling is employed in cases with target populations exceeding 100 respondents (Leedeey et. al., 2005). This study used census method because the target population was less than the minimum 100 respondents for sampling method to be adopted. Therefore, 70 employees were selected.

3.5 Research Instruments

On this study, questionnaires were decided on as the primary instrument for data collection. They were then administered to collect raw data directly from the contractors who were the respondents. It is commonly preferred instrument since it has a wide scope and it saves on time Owen (2002). Additionally, it allows the researcher to allow a respondent ample time to participate in the research and hand it back once they have fully responded. Finally, respondents feel the information remains confidential and the only the researcher uses it for their study and on their consent making them more willing to

share. The questionnaire had items aimed at answering the study questions thus meeting the study objectives. The researcher consequently considered a questionnaire as the quickest and most cost effective instrument for data collection to use. Precisely, a semi-structured questionnaire was preferred in this case and hence was used.

3.5.1 Pilot Testing of the Instruments

Mugenda & Mugenda (2003) had maintained for a sample to be considered in the pilot study, it has to comprise 10% of the predetermined sample. Additionally, conducting a pre-test study exposes challenges that might arise in the main study such as vague questions and they can be rectified before the actual research. The study conducted the pre-test before survey forms were sent out to the 70 actual respondents sampled. The refined population was easy for respondents to understand and respond to. Additionally, questions that did not appear valid or reliable for use in the study were eliminated. Mugenda and Mugenda (2003) had also noted the participants of this pilot test could range from 1% to 10% depending on the size of sample under study. Since the study intended to focus on 70 respondents, 10% (7) randomly selected respondents participated in the pre-test. The pre-tested questionnaires would then be administered to the seven respondents who were requested to respond to the questionnaires then encouraged to give feedback regarding the questions in the research instrument. Any problem encountered while filling the questions, the questions was rephrased by the researcher based on the feedback and then returned to the respondents to fill again. The process of incorporating feedback from the pre-test sample was done until the questions were fine and errors in the

questionnaires were corrected to ensure effective data collection process. The participant's findings were not included in the main study.

3.5.2 Validity of the Instrument

On determining validity, Kothari (2004) considered validation to be the process of determining how much the selected instrument will actually measure the objectives. Gakuu, (2013) considered validity as the appropriateness or how useful a tool is meaningful to the researcher in data collection. It is stemmed from the aggregate evidence or nature of evidence that guides researchers in making interpretations. On this, Mugenda & Mugenda (2003) stressed that precision of inferences drawn from the results of the study depended on the validity of the instrument used. A valid instrument obtained results with accurate variables.

3.5.3 Reliability of the instrument

Instruments for data collecting according to Kothari (2004) require a test to assess if they give consistent results. According to Ngechu (2004), results from a reliable instrument are consistent in repeated trials. Cronbach's Alpha (α) is a popular reliability testing instrument generated using SPSS and was also adopted in this study. It depicted how much a number of test results could be treated to measure one dormant variable (Cronbach, 1951). 0.7 was the commended significance used as a measure for consistency during the study.

3.6 Data Collection Procedure

University of Nairobi offered the letter of identification permitting the researcher, through the “National Council of Science and Technology” to gather data. Additionally, a transmittal letter introducing the researcher was also stamped to assure respondents of absolute confidentiality in addition to privacy of the insight they offered. On the study, “drop and pick method” was used where questionnaires stayed with respondents and recalled when respondents had had ample time to interact with them and respond to their satisfaction. The process took a period of 10 days.

3.7 Data Analysis Techniques

Cooper and Schindler, (2003) stated that analysis of data is done from looking for patterns, similarities, disparities, trends and other relationships and finding out what these patterns might mean. This study used the 20.0 version of SPSS to analyze data that was obtained from the research. Quantitative data was coded and examined using version 244 of SPSS. Finally, content matter was used as basis for analysing the qualitative data. Responses that depicted a pattern or common theme were grouped into controllable sets for consistency.

3.8 Ethical considerations

A letter of identification from UON was obtained and used to acquire a study permit from NCST. Having attained permission to gather from the relevant authorities, data collection would commence. Pertinent ethical considerations stipulated by NCST and course

content were upheld. The scholar required consensus of selected participants prior to embarking on collecting data from them. Additionally, researcher was keen to ensure ethics surrounding research were upheld. Participation on the part of respondents was entirely voluntary. Information privacy and confidentiality was held on high regards. Stating and clarifying study objectives to respondents affirmed that data was strictly for academic purposes. The study adhered by the University of Nairobi plagiarism policy which defines plagiarism as “the action or practice of taking someone else work or idea and passing it off as one’s” (University of Nairobi, 2013). Finally, all works borrowed from fellow scholars and other sources was appropriately acknowledged through in-text citations and references.

3.9 Operationalization of Variables

The table below illustrates the definition of variables. It states the “research questions” explains variables advanced by the research and indicators the research intended to investigate. The table also shows the instruments for collecting information and lastly how the findings will be used in responding to research questions.

Table 3.2: Operationalization of Variables

Research Questions	Variables	Indicators	Data Collection Instruments	Measurement Scale	Tool of Data Analysis
To what extent does planning influence the execution of road	Planning	Role Assignment Design	Questionnaire	Nominal	Inferential statistics

construction projects; a case of the reconstruction of Kiambu-Nairobi inter-county road?		Feasibility			
To what extent does cost management and time influence the performance of road construction projects; a case of the reconstruction of Kiambu-Nairobi intercounty road?	Cost management	Budget Allocation Defined Work Plans Prompt Approval and Payments	Questionnaire	Nominal	Frequency and percentages
To what extent does scope creep influence on the performance of road construction projects; a case of the reconstruction of Kiambu-Nairobi intercounty road?	Scope creep	Change Control Adjusting project activities Managing project schedule and budget	Questionnaire	Nominal	Frequency and percentages
To what extent	Monitoring and	Progress	Questionnaire	Nominal	Frequency

<p>does monitoring and evaluation influence the performance of road construction projects; a case of the reconstruction of Kiambu-Nairobi inter-county road?</p>	<p>evaluation</p>	<p>Reports Documentat ion Escalation</p>			<p>and percentages</p>
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Source: Researcher, 2019

CHAPTER FOUR; DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

The fourth chapter discussed “data analysis”, the “interpretation process” also how results will be presented. Formulated research questions that guided the study will finally be responded to on this chapter. The study primarily sought to investigate the best practices in project management that influenced successful implementation of projects on road construction; basis were made from the case of the reconstruction of Kiambu-Nairobi inter-county road.

4.2 Questionnaire Response Rate

Questionnaires were prepared and pre-tested then employed to gather primary data. Seventy (70) survey forms were issued to different officers of the target population and asked to respond. Out of 70 questionnaires administered 60 (86%) responded within the estimated timeframe intended for data analysis. The response rate was significant and was pondered appropriate for use in making inferences concerning the study’s objectives. According to recommendations by Saunders et al., (2007), any response rates between 30% and 40% can always be considered sufficient to derive inferences. Table 4.1 presents the rate of response.

Table 4.1: Questionnaire Response Rate

Respondents	Frequency (F)	Percentage (%)
Filled questionnaires	60	86%
Unfilled questionnaires	10	14%
Total	70	100%

4.1.2 Reliability Test Results

Seven respondents had previously been subjected to a pilot study and questionnaires administered to them. For reliability purposes, however, the results from this test were not considered in the final data collection exercise. Table 4.2. Indicates the results that were obtained

Table 4. 1: Reliability Results

Variable	Cronbach's	No. Of
	Alpha	Item
Planning	0.7621	4
Cost management	0.7722	5
Scope creep management	0.8110	5
Monitoring and evaluation	0.7221	4

From the findings, Cronbach Alpha of planning as project management best practice was 0.7621 making question items reliable. The Cronbach Alpha of cost management was 0.7722 making items reliable. The items concerning scope creep management were reliable as they indicated read Cronbach Alpha coefficient score with 0.8110 while “monitoring and evaluation” indicated a coefficient 0.7221 indicating that the

questionnaire instrument was reliable. This clearly proved the reliability of the instruments to be used in collecting data on how project management practices influenced implementation and execution of projects on road constructions as all the Cronbach Alpha were closer to 1 and greater than 0.7. Nachmias & Nachmias, (2006), Kothari, (2004) and Sekaran, (2006) qualified a “Cronbach’s alpha” coefficient beyond 0.7 as a consistent and reliable instrument.

4.3 General Information

This segment is a detailed representation of current positions and/or titles held by the respondents.

4.3.1 Current Position or Title of the Respondents

The study intended to conclude on the current stations or titles of each respondent held.

Table 4.3. Illustrates the results

Table 4.3: Current Position or Title

Position/title	Frequency	Percentage
Project Manager	3	5
Project Team	35	60
Civil Engineer	12	21
Structural Engineer	8	14
Total	58	100
Not filled position/title	2	

Table 4.3: Current Position or Title

Position/title	Frequency	Percentage
Project Manager	3	5
Project Team	35	60
Civil Engineer	12	21
Structural Engineer	8	14
Total	58	100
Not filled position/title	2	
Total	60	100

Table 4.3 indicates the respondents' current position or title. Among the respondents a majority (60%) were parts of the project team, 21% of were civil engineers, 14% were structural engineers and 5% of the respondents were project managers. Only 2 respondents failed to indicate their position or title. The findings indicate that the respondents were from different positions thus they gave out independent opinions about the study.

4.4 Planning influence on Implementation of Road Construction Projects

The study intended to investigate the initial objective that sought to establish the extent that planning influences road development projects implementation; considering the reconstruction of Kiambu-Nairobi inter-county road. Using a "five point Likert Scale", respondents had to signpost how much "planning practices" influenced execution of road

construction developments. The scale ranged from “No extent at all” (1 point) and “Very great extent” (5 points). Marks for “No extent at all” & “Small extent” were assumed to characterize variables without mean scores ranging between 0 and 2.4 by the Likert scale; ($0 \leq S.E < 2.4$). Scores for “moderate extent” were considered to characterize variables with mean scores between 2.5 and 3.4: ($2.5 \leq M.E. < 3.4$). Scores for both “Great extent” and “Very great extent” measured variables with mean scores ranging between 3.5 and 5.0; ($3.5 \leq L.E. < 5.0$). Table 4.4 illustrates the results.

Table 4.4: Planning influence on implementation of Road Construction Projects

Statements	Mean	STD Dev.
Planning process is effective when iterated	4.5000	5.27386
Well prepared plans include subsets that explain the whole project	3.9333	.79972
Plans to detail activities to be executed to meet constraints	3.8333	.76284
Planning process be systematic, flexible disciplined	3.7288	1.03108
Prepare project plan and follow it all the way to success	3.7119	.98350
Planning to include communication with all stakeholders	3.6167	.88474

According to the results on Table 4.4: planning process is effective when iterated influence implementing projects on road building to a very “great extent” evident from the 4.5 mean score with a standard deviation (SD) of 5.2739, indicating the need to include well-formulated plans in the subsets impacting on the whole project to a great

extent evidenced by the 3.9333 mean score and SD of 0.7997. Likewise, plans to detail activities to be executed to meet constraints influence road construction project execution at “great extents” as evidenced by the mean of 3.8333 and SD of 0.7628. The need to make the planning stage systematic, malleable and meticulous was held at high regard and to a “great extent” signposted by the high mean of 3.7288 and SD of 1.031. Preparing and following a project plan strictly to success and planning to include communication with all stakeholders also influence the road construction projects at a “great extent” showed by the means of 3.7119 and 3.6167 and SDs of 0.9835 and 0.8847 respectively.

4.5 Cost Management influence on Implementation of Road Construction Projects

The research intended to evaluate a second objective; degree to which cost management effects road construction projects implementation; study based on a case of the reconstruction of Kiambu-Nairobi inter-county road. Also, the questionnaire required respondents to scale how much they thought cost management practices influenced road construction projects implementation using the Likert Scale.

These ranges were “No extent at all” (1) to “Very great extent” (5). Scores of “No extent at all” as well as “Small extent” were viewed to signify a variable with mean scores ranging between 0 and 2.4; ($0 \leq S.E < 2.4$). “Moderate extent” ratings were taken to characterize variables having mean scores between 2.5 and 3.4: ($2.5 \leq M.E. < 3.4$) while scores for “Great extent” & “Very great extent” were considered to represent variables with mean scores between 3.5 and 5.0; ($3.5 \leq L.E. < 5.0$). Table 4.5 was used to illustrate the results.

Table 4.5: Cost Management influence on implementation of Road Construction Projects

Statements	Mean	Std. Dev
Costs of project is not costs of goods procured	3.7333	.86095
Cost planning is essential	3.7000	.97945
Time management for timely completion in expensive	3.6949	1.10257
Cost management constitutes management of project costs	3.6167	.97584
Rely on time estimations to predict cost	3.6102	1.01738
Timely resolution of delays	3.5500	1.01556

The tabulations on table 4.5 indicated that: costs incurred during project execution are not limited to costs of goods procured directly but also additional costs and they influence on a “great extent” road construction project’s execution. This was evidenced by a 3.7333 mean score and 0.8609 standard deviation (SD). Planning cost is deemed influential towards implementing road construction projects to a “great extent” and was displayed by a 3.7 mean score and a 0.9794 Standard Deviation score. Likewise, time management for timely completion in expensive influence implementation of road construction projects to a “great extent” was shown by a 3.6949 mean score & SD of 1.1025 while cost management constituted management of project costs which also “greatly” influenced evidenced by the mean of 3.6167 and SD of 0.9758. Cost estimates can be done using the time estimates and anticipating delays influenced enactment of road construction projects to a significantly (“great extent”). 3.6102 and 3.55 mean scores against standard deviations of 1.0173 and 1.0155 respectively indicated these findings.

4.6 Scope Creep Management influence on Implementation of Road Construction

Projects

The third objective was to evaluate to what extent scope creep management influenced the execution of road construction projects considering the reconstruction of Kiambu-Nairobi inter-county road. The respondents were required to show the extent to which they felt scope creep management practices influenced road construction projects execution on a 5-point Likert Scale.

Ranges were defined ranging between 1 -“No extent at all” and 5 -“Very great extent”. Scores between “No extent at all” and “Small extent” were considered to represent variables with mean scores between 0 and 2.4 on the Likert scale; ($0 \leq S.E. < 2.4$). on the other hand, scores rated as “moderate extent” were taken to represent variables with mean scores ranging between 2.5 and 3.4: ($2.5 \leq M.E. < 3.4$). Score for both “Great extent” and “Very great extent” were taken to represent variables with mean scores ranging between 3.5 and 5.0; ($3.5 \leq L.E. < 5.0$). Results for this objected were tabulated on table 4.6.

Table 4.6: Scope Creep management influence on implementation of Road Construction Projects

Statements	Mean	Std. Dev
Change control is important	3.6552	.94686
All work required to achieve project objective considered	3.6441	1.18558
Deliverables and boundaries clearly defined	3.5763	.96853
Scope creep if left unchanged exhausts finances	3.5333	.96492

Scope helps assess resources needed	3.5085	1.11993
Project scope draws line to show direction to follow or not to take	3.4167	1.02992

According to the results on the above table 4.6, changing control on project management and implementation impacted on a “great extent” road construction projects and was evidenced by a mean of 3.6552 and an SD of 0.9468. Considering all the work required to achieve project objectives the influence was also to a “great extent” indicated by a mean score of 3.6441 and SD of 1.1855. Likewise, deliverables and boundaries clearly defined, scope creep if left unchanged exhausts finances and scope helps assess resources needed influence implementation of the road construction project to a “great extent” as indicated by a mean scores of 3.5763, 3.5333 and 3.5085 and standard deviations of 0.96853, 0.96492 and 1.11993 correspondingly. Project scope drew line to show direction to follow or not to take influenced execution of the road construction projects on a moderate extent which was evidenced by a mean score of 3.4167 and SD of 1.0299.

4.7 Monitoring and Evaluation influence on Implementation of Road Construction Projects

The fourth objective of the study sought to assess the extent to which continuous monitoring and evaluating influenced the success rate of projects on road construction based on a case of the reconstruction of Kiambu-Nairobi inter-county road. Respondents were to show the extent to which they felt that constant monitoring and evaluating practices influenced road construction projects implementation in the 5-point Likert Scale.

The score ranges were 1 for “No extent at all” and 5 for “Very great extent”. Scores for “No extent at all” and “Small extent” were considered to represent variables with mean scores between 0 and 2.4; ($0 \leq S.E < 2.4$). Scores for “moderate extent” on the other hand were taken to represent variables with mean scores between 2.5 and 3.4: ($2.5 \leq M.E. < 3.4$) while scores for both “Great extent” and “Very great extent” represented variables with mean scores between of 3.5 and 5.0; ($3.5 \leq L.E. < 5.0$). Finally, results for this objective were illustrated in table 4.7.

Table 4.7: Monitoring and Evaluation influence on implementation of Road Construction Projects

Statements	Mean	Std. Dev
Monitoring supports understanding whether project progress is as predetermined	4.0339	.76488
Monitoring offers background for minimizing cost overrun	3.9831	.88066
Evaluation helpful in assessing attained objectives	3.9333	.91812
Monitoring helps improve future and current management of outputs	3.8667	.76947
Monitoring provides management	3.8644	.83990
Monitoring provides real perspective on stage of financial project	3.7833	.80447

According to the findings on table 4.7 monitoring supports understanding whether project progress is as predetermined influences implementation of road projects on “very great extents” indicated by a 4.0339 mean score and a 0.7648 Standard deviation (SD).

consequently, monitoring offers background for minimizing cost overrun, evaluation helpful in assessing attained objectives, monitoring helps improve future and current management of outputs, monitoring provides management and monitoring provides real perspective on stage of financial project influence implementation of road construction projects to great extents. These scored means of 3.9831, 3.9333, 3.8667, 3.8644 and 3.7833 paired with standard deviations of 0.88066, 0.91812, 0.76947, 0.83990 and finally 0.80447 correspondingly.

4.8 Inferential Statistics

Analysis inferential regression analysis and correlation were done to decide the level of significance and strength of relationship between best practices in project management and the execution of road construction developments considering the reconstruction of Kiambu-Nairobi inter-county road.

4.8.1 Regression

Multiple regression analysis were carried out and a correlation coefficient established between best practices in project management and road construction projects implementation.

Model Summary

The model summary was illustrated on Table 4.8 and was the basis for testing whether a significant variation existed between the independent & dependent variables.

Table 4.8: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.849 ^a	.721	.700	.30852

a. Predictors: (Constant), Monitoring, Planning, Cost management, Scope creep management

b. Dependent Variable: Implementation (project quality)

From Table 4.8, the model summary R^2 is 0.721, Standard Error= 0.30852 indicating that there was a significant variation of 72.1% at confidence level of 95% between best practices in project management and road construction projects implementation.

ANOVA

Table 4.9 illustrates results from the Analysis of variance (Anova) establishing the viability and PV of the regression model.

Table 4.9: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	13.498	4	3.375	5.452	.001 ^a
Residual	5.235	55	.095		
Total	18.733	59			

a. Predictors: (Constant), Monitoring, Planning, Cost management, Scope creep management

b. Dependent Variable: Implementation (project quality)

From Table 4.9, total variance (18.733) was the variation in the variance which could be explained from the model of independent variables together with the variance which unfortunately, was'nt explained by the independent variables (Error). These results indicate that the model had an F-ratio of 5.452, $P=0.001 < 0.05$ far exceeds the F=statistic 0.1962 and $PV=0.001 < 0.05$. In regards to to findings on Table 4.9, it was ascertained that the regression model adopted by the study had a significant goodness of fit.

Coefficients Analysis

Table 4.10 provides information on coefficients of the model predictors as used in this study. The approximations of the standard errors, t-statistics, regression coefficients, of the estimations and “P” values are shown.

Table 4.10: Coefficient Analysis

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.113	.416		.271	.787
Planning	.163	.078	.169	2.074	.043

Cost management	.135	.080	.135	1.684	.098
Scope creep management	.409	.085	.453	4.823	.000
Monitoring	.291	.070	.362	4.145	.000

a. Predictors: (Constant), Monitoring, Planning, Cost management, Scope creep management

b. Dependent Variable: Implementation (project quality)

The Multiple regression analysis models for the study was.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

The resultant regression model took the form:

$$Y = 0.113 + 0.163X_1 + 0.135X_2 + 0.409X_3 + 0.291X_4 + e.$$

The regression results on Table 4.10 indicated that predictor planning has a statistically significant besides positive impact on road construction project implementation as $\beta_1 = 0.163$, $PV = 0.04 < 0.05$, $t = 2.074$. The implication was that every unit increase in planning resulted in an increment in implementation (project quality) by $\beta_1 = 0.163$ in projects on road evidenced by the case of the reconstruction of Kiambu – Nairobi inter-county road.

The regression results indicated that predictor cost management had a significant and positive influence on implementation (project quality) of road construction projects, a case of the reconstruction of Kiambu – Nairobi inter-county road as $\beta_2= 0.135$, $t=1.684$. This might mean every unit increment in cost management might result into a proportional increment in implementation (project quality) by factors $\beta_2= 0.135$.

Regression results revealed that scope creep management also had a significant positive impact on implementation (project quality) of road construction projects, a case of the reconstruction of Kiambu – Nairobi intercounty road as $\beta_3= 0.409$ and $t=4.823$. This could also be taken to mean that an increase by one unit in scope creep management would potentially increase implementation (project quality) by factor $\beta_3= 0.409$.

Finally, the regression results indicated that predictor monitoring and evaluation also had a significant, and positive impact on road construction projects implementation (project quality) as seen in the case of the reconstruction of Kiambu – Nairobi inter-county road as $\beta_4 =0.291$, and $t=4.145$. These findings implied that every unit increment in monitoring and evaluation would theoretically results into increase in road construction project implementation (project quality) by factor $\beta_4 =0.291$ of road construction projects, a case of the reconstruction of Kiambu – Nairobi inter-county road.

CHAPTER FIVE; SUMMARY, DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Introduction

Chapter five was a presentation of the summation of the findings, conclusion and recommendation advanced from the study including areas that might need additional research in road construction projects. This study intended to investigate best practices in project management that impact execution of road construction projects considering the reconstruction of Kiambu-Nairobi inter-county road. The study looked at influence of planning, cost management, scope creep management and monitoring and evaluating progress on implementation (project quality) of projects on road construction considering the reconstruction of Kiambu-Nairobi inter-county road. Tests were carried out using correlation, multiple regression, and simple regression analysis. Finally, the study advanced recommendations using the findings and the inferences made by the study.

5.2 Summary of the findings

5.2.1 Planning Practice and Implementation of Road Construction Projects

Evidence from the questionnaires revealed that predictor planning statistically and significantly inclined the execution of road construction projects positively as $\beta_1=0.163$, $PV=0.04<0.05$, $t=2.074$. The implication was that every unit increment in planning potentially resulted in one unit increment in implementation performance (project quality) by $\beta_1=0.163$ in road projects evidenced from the case of reconstruction of Kiambu – Nairobi inter-county road.

5.2.2 Cost Management Practice and Implementation of Road Construction Projects

Result from the regression investigation further showed that predicting cost management significantly and positively influenced implementation (project quality) of road construction projects positively from the reconstruction of Kiambu – Nairobi inter-county road case as $\beta_2 = 0.135$, $t = 1.684$. The implication here also was that every unit increment in cost management might result into an upsurge in implementation (project quality) by factors $\beta_2 = 0.135$.

5.2.1 Scope Creep Management Practice and Implementation of Road Construction Projects

According to the the results from the regression scrutiny, it was deduced that scope creep management also significantly and positively influenced implementation (project quality) of road construction projects from the reconstruction of Kiambu – Nairobi inter-county road case as $\beta_3 = 0.409$ and $t = 4.823$. Consequently, the implication was that every unit increment in scope creep management would result to an increment in implementation (project quality) by factor $\beta_3 = 0.409$.

5.2.1 Monitoring and Evaluation Practice and Implementation of Road Construction Projects

Evidence from the regression analysis also indicated that predictor monitoring and evaluation too significantly and positively influenced implementation (project quality) of road construction projects seen in the reconstruction of Kiambu – Nairobi inter-county

road case as $\beta_4 = 0.291$, and $t = 4.145$. This implied that a unit increase in monitoring and evaluation would result into increase in implementation (project quality) by factor $\beta_4 = 0.291$ of road construction projects, a case of the reconstruction of Kiambu – Nairobi inter-county road.

5.3 Discussion

From the study planning has a statistically significant and positive influence on road construction projects implementation. This agrees with the findings of Sang (2018) who had observed that planning had significant impacts on the success of a project. A project plan serves to communicate its objectives and strategies including intended ways of achieving them. In addition planning for a project has been viewed to increase success rate of projects without cost or time overruns. Planning also factored in risks which additionally bolstered the motivation amongst stakeholders further increasing the odds for success of a project. When involved in the time estimation and budget development stages of planning, project members also felt motivated to achieving the goals of the project.

Cost management was seen to have a direct and positive impact on the success of road construction projects. Similar inference had been made by Kihoro and Waiganjo, (2015) who had stated that planning for costs and factoring in how a project size would be affected by the budgetary estimates was critical in determining the success of the project. Scope creep management significantly and positively influences implementation (project quality) of road erection projects. Ogunberu, Akintelu, and Olaposi (2018), had made

similar remarks from a similar study stating that the applying project scope management practices would have substantial results on the success of the project. These would be marked with satisfaction of customers by meeting their expectations. In addition, resources would be allocated more effectively, time and cost overruns would be minimized significantly.

Finally, continuous monitoring and evaluating the progress of a project was deduced to positively impact on the success of road construction projects. The inference echoed similar findings made by Mugo (2014) who also added that an amount in the budgetary allocation should be set for developing systems for monitoring and evaluating projects. The strategic move would directly and positively reflect on the implementation of development projects.

5.4 Conclusion

Based on the discussed findings, the study made the deduction that planning practices greatly influence performance and success rates of road construction projects. Significantly positive impacts were observed on the performance of road construction from the study. Every unit increment in planning was implied to result in a unit increment in performance (project quality) in projects on road. It was also observed that cost management practices significantly influenced success rates of road construction projects. This was inferred from the positive correlation noted on success rate of road construction projects in this regard. A unit increment in cost management practices resulted in an equivalent increase in performance (project quality). Scope creep management was also

seen to influence at significant levels execution of road construction projects through the positive correlation observed with influence on performance. A unit increment in the scope creep management resulted into a corresponding increase in performance (project quality) in road construction projects. Finally, monitoring and evaluating project progress continuously was observed to also have a positive influence on the performance of a road construction project. This is evident from “significant and positive influence on the delivery” of road construction, that is, a unit increase in scope creep management would result in an increase in performance (project quality) in road construction projects.

5.5 Recommendation

The recommends that all projects should implement the different project management best practices (planning, cost management, scope creep management and monitoring and evaluation) to influence their performance since there is a positive correlation between project management best practices and the success rates of projects on road construction.

Recommendations from the study insisted that all projects must clearly assign role and the designs of projects set up to ensure the planning practice is well established for the project to be fully completed without any delays. The study also recommend that all organizations before the start of any projects they should set up change control measures in case of a scope creep.

Secondly, proper guidelines should be put up to clearly show how the budget of the projects is exhausted so as to ensure proper cash management practices is fully realized. Likewise, all the projects should come up with regulations to indicate the next direction a

project should follow in case the defined amount of work is not completed within the required schedule and budget.

5.6 Recommendation for further studies

This study concentrated chiefly on project management best practices and how they influence the performance of road construction projects based on a case of the reconstruction of Kiambu-Nairobi inter-county road. From the study's findings and conclusions drawn, the following key areas have been recommended for additional research:

- i. Investigate further the impact of planning practices on the success rates of road construction projects in Kenya.
- ii. Further investigation should be directed towards determining the influence cost management practices have on projects completion on time of different road projects in Kenya.
- iii. Explore further, the influence of scope creep management practice on project performance in relation to the completion time of projects on different projects in Kenya.
- iv. Finally, a study similar to this should be conducted on the house construction projects in Kenya.

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APPENDICES

Appendix I: Research Questionnaire

Dear correspondent, this questionnaire aim to collect information in relation to project management best practices influencing implementation of road construction projects; a case of the reconstruction of Kiambu-Nairobi Intercounty road. This study is being carried out for a management project paper as a requirement in partial fulfillment of the Master of Arts in Project Planning and Management, University of Nairobi. The information will be treated as confidential and used for academic purposes only. This questionnaire is for collecting relevant data for the research paper. Therefore, your input and participation will be highly appreciated.

Section A: General Information

What is your current position or title? (Tick in the box)\

- a. Project manager
- b. Project Team
- c. Civil engineer
- d. Structural engineer

Section B: Planning influence on implementation of road construction projects

To what extent does the following planning practices influence implementation of road construction projects? The scale stand for the following: 1= No extent at all; 2= Small extent; 3= Moderate extent; 4= Great extent; 5= Very great extent

Planning	1	2	3	4	5
All the project managers are required to prepare a solid project plan and follow this plan all the way to success					
Project plan is drafted detailing activities to be executed to meet constraints as well as the expected goals and benefits					
The planning process must be systematic, flexible, disciplined and capable of accommodating input from diverse functions					
The planning process is most effective when it is iterated and occurs throughout the life of the project.					
Well prepared plans include subsets that explains the management of scope, requirements, schedule, cost, quality, risk, resources, process improvement and stakeholders.					
Planning should include communication that will ensure stakeholders remain informed and updated on the project progress to facilitate their effective participation.					

Section C: Cost management influence on implementation of road construction projects

To what extent does the following cost management practices influence on implementation of road construction projects? The scale stand for the following: 1= No extent at all; 2= Small extent; 3= Moderate extent; 4= Great extent; 5= Very great extent

Cost Management	1	2	3	4	5
Time management for timely completion of a project can be expensive, fraught with pressures, and subject to much uncertainty					
Costs that are associated with projects are not just the costs of goods procured to complete the project					
The project manager must rely on time estimates to predict the cost of the labor to complete the project work					
Cost management constitutes the management of project costs, how to predict them, account for them, and then, with plan in hand, to control them.					
How costs are planned for and taken into consideration by the performing organization and how the size of the project affects the cost estimating process is essential					

for any given project					
The need for timely resolution of delays and keeping the schedule up to date by reflecting actual performance and delays as they occur is needed from the start					

Section D: Managing scope creep influences on implementation of road construction projects

To what extent does the following scope creep management practices influence on implementation of road construction projects? The scale stand for the following: 1= No extent at all; 2= Small extent; 3= Moderate extent; 4= Great extent; 5= Very great extent

Scope Creep Management	1	2	3	4	5
It is important to ensure that all the work required to achieve project objective are considered and well-articulated before project commencement					
Where the deliverables and the boundaries of a project are not clearly defined, the chance of a project success is zero					
The project scope draws a line in which project manager and stakeholders will follow to know the direction to					

take or not to take					
The scope definition helps the project manager assess the resources needed to implement the project and make realistic commitments					
Scope creep if left unchecked can quickly exhaust a project's financial, human, and technological resources and extend its schedule					
Without change control, the scope creep can become a moving target and the project at risk of missing one or more of project success factors					

Section E: Monitoring and evaluation influences on implementation of road construction projects

To what extent does the following monitoring and evaluation practices influence on implementation of road construction projects? The scale stand for the following: 1= No extent at all; 2= Small extent; 3= Moderate extent; 4= Great extent; 5= Very great extent

Monitoring and Evaluation	1	2	3	4	5
Monitoring provides management and stakeholders with indications of the extent of progress and achievement of					


expected results and progress with respect to the use of allocated funds					
The activity of monitoring supports both the project managers and staff in understanding whether the projects are progressing as predetermined					
Monitoring offers the background for minimizing time along with cost overruns, while at the same time ensuring that the required standards of quality are attained in the implementation of the project					
Evaluation helps assist project planners and developers in assessing the extent to which the projects have attained the objectives that are set forth in the documents related to the project					
Monitoring and evaluation provides a real perspective upon the stage of the financed project, in order to make all the adjustments necessary in the project implementation process.					
Monitoring and evaluation helps to improve current and future management of outputs, outcomes and impact					

Section F: Project Management best practices and implementation of Road Construction Projects

Please tick appropriately how you rate implementation of projects in your firm with regards to project management best practices listed. The scale stand for the following: 1= No extent at all; 2= Small extent; 3= Moderate extent; 4= Great extent; 5= Very great extent

Implementation of road	1	2	3	4	5
Planning					
Cost management					
Scope creep management					
Monitoring and evaluation					

Appendix 2: University Letter of Transmittal


UNIVERSITY OF NAIROBI
OPEN, DISTANCE AND e-LEARNING CAMPUS
SCHOOL OF OPEN AND DISTANCE LEARNING
DEPARTMENT OF OPEN LEARNING
NAIROBI LEARNING CAMPUS

Your Ref: _____
Our Ref: _____
Telephone: 318262 Ext. 120

Main Campus
Gandhi Wing, Ground Floor
P.O. Box 30197
N A I R O B I

REF: UON/ODeL/NLC/30/325 30th October, 2019


TO WHOM IT MAY CONCERN


RE: ROGERS SIOCHA OURU - REG NO: L50/6134/2017

This is to confirm that the above named is a student at the University of Nairobi, Open Distance and e-Learning Campus, School of Open and Distance Learning, Department of Open Learning pursuing Masters of Art in Project Planning and Management.

He is proceeding for research entitled ".Project management best practices influencing performance of road construction projects: A case of the reconstruction of Kiambu-Nairobi inter county road".

Any assistance given to him will be highly appreciated.




CAREN AWILLY
CENTRE ORGANIZER
NAIROBI LEARNING CENTRE

APPENDIX 3: Plagiarism Report

PROJECT MANAGEMENT BEST PRACTICES INFLUENCING IMPLEMENTATION OF ROAD CONSTRUCTION PROJECTS: A CASE OF THE RECONSTRUCTION OF KIAMBU-NAIROBI INTERCOUNTY ROAD

ORIGINALITY REPORT

7%

SIMILARITY INDEX

3%

INTERNET SOURCES

0%

PUBLICATIONS

6%

STUDENT PAPERS

PRIMARY SOURCES

1

Submitted to Intercollege

Student Paper

1%

2

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6

Submitted to Kwame Nkrumah University of
Science and Technology

<1%

7

Submitted to Ghana Technology University
College

Student Paper

<1%

8

Submitted to University of Leicester

<1%