ASSESSING THE IMPACT OF CONTRACT ADMINISTRATION ON THE PERFORMANCE OF ROAD CONSTRUCTION PROJECTS IN UGANDA

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ABSTRACT

Uganda's Road Construction industry has experienced growth overtime with a considerable portion of budget allocation. Although the industry has dramatically improved, projects are still experiencing performance challenges including but not limited to cost overruns, time overruns and shoddy work. This study sought to assess the impact of contract administration on the performance of road construction projects in Uganda. Contract Administration basically deals with daily project operations providing for the complete work scope composition, responsibilities of parties involved, requirements for executing the operations, work schedule, cost optimization, quality and safety considerations and grievance management. The study is limited to its objectives which were; to assess the performance of road construction projects in Uganda; to determine the extent of use of contract administration on road construction projects in Uganda; to determine whether there is an association between contract administration and project performance, and to develop a contracts administration assessment strategy to enhance road construction project performance in Uganda. The data for this study was collected from 36 running project sites and 72 stakeholders within the industry making a total of 108 samples.

Based on the research questions and the study of the literature, a qualitative correlational research design method was used to investigate the relationship between the dependent variable (performance) i.e. cost, quality, time, and the independent variables (contract administration) i.e. project governance, project personnel, communication and relationship management, quality management, monitoring and control, financial management, change control management, claims and disputes resolution management, records management and contract risk management.

The first finding indicated that the performance of road construction projects in Uganda is poor in regard to time, fair in regard to cost and very good in regard to quality. The second finding indicated that various contract administration practices have different extents of use with the highest being Monitoring and Control being used every time. Thirdly, the results from the regression analysis of this study indicated that the relationship between performance and contract administration is statistically significant, although based on the findings, some contract administration practices are more critical to performance compared to others.

The study recommendations were to minimize time overruns or slippages through contract administrators taking on a wholistic approach in controlling project activities. Monitoring and Control of all project activities and elements on a daily basis is encouraged as this enables early identification of potential time slippage areas or gaps that can be filled with in time to prevent any major damage. Also, the study identified Early contract administrator project involvement, Project governance, Communication and relationship management, Claims and dispute management and Monitoring and control as elements that have significance in regard to project performance. It is recommended that contract administrators take these contract administration practices seriously during execution of projects.

Finally, a contract administration assessment strategy tool was developed from this study. It is meant to evaluate a project's progress and plan its day-to-day activities so as to align it to its intended objectives. The strategy was developed based on the results of the literature review, survey results and best practices. The strategy will go a long way in ensuring proper projects implementation.

DECLARATION

I confirm that no part of this thesis has been submitted either in part or wholly in support of an application for another degree or qualification of this or any other university.

DEDICATION

This research is dedicated to the Almighty God for his grace and guidance throughout the research process, and my parents Mr. and Mrs. Segulani for their support, encouragement and comfort during the research duration.

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ABBREVIATIONS

B.O.Q:	Bill of Quantity
CA:	Contracts Administration
DB:	Design-Build
DBB:	Design-Bid-Build
EIB:	European Investment Bank
FIDIC:	International Federation of Consulting Engineers
GCC:	General Conditions of Contract for Construction Works
GDP:	Gross Domestic Product
GoU:	Government of Uganda
ICED:	Infrastructures & Cities for Economic Development
ILO:	International Labour Organization
ISO:	International Organization for Standardization
JBCC:	Joint Building Contracts Committee
KCCA:	Kampala Capital City Authority
LGs:	Local Governments
MAAIF:	Ministry of Agriculture, Animal Industry and Fisheries
MoEMD:	Ministry of Energy and Mineral Development
MoES:	Ministry of Education and Sports
MoLG:	Ministry of Local Government
MoLHUD:	Ministry of Land, Housing and Urban Development
MoWT:	Ministry of Works and Transport
NDP:	National Development Plan
NEC:	New Engineering Contract
NFA:	National Forestry Authority
NPA:	New Public Administration
NPM:	New Public Management
OAG:	Office of the Auditor General
OPM:	Office of the Prime Minister
PA:	Project Administrator

PAPS:	Projected Affected Persons
PMI:	Project Management Institute
PPI:	Private Participation in Infrastructure
PPPs:	Public Private Partnerships
PQP:	Project Quality Management Plan
UCICO:	Uganda Construction Industry Commission
UNBS:	Uganda National Bureau of Statistics
UNRA:	Uganda National Roads Authority
URF:	Uganda Road Fund

CHAPTER ONE: INTRODUCTION

1.1 Background

Road construction has gained recognition as an increasingly important economic driver in many countries across the globe (Muzaale, Auriacombe and Byaruhanga, 2018; Santoso and Soeng, 2016; Pooworakulchai, Kongsong and Kongbenjapuch, 2017). Due to its significance in driving economic growth, numerous resources are directed towards the transport sector for either maintenance purposes or actual construction of new roads (Oguya and Muturi, 2016; Pooworakulchai, Kongsong and Kongbenjapuch, 2017; Aluonzi, Oluka and Nduhura, 2016). These resource interventions have aroused interest from different scholars who have critically studied and researched about different aspects of road construction projects over the years. In addition, the diversity of road construction projects has had a huge influence on the type of studies conducted on road construction.

Some studies have attributed the diversity of road construction projects to the factors that arise during conception, feasibility, procurement, execution and at the close out stage (Welde and Dahl, 2021; Muhwezi, Musiime and Onyutha, 2020). The common thread between these studies is that they recognize that the actions or decisions undertaken at one stage significantly influence the performance of road construction projects in general. Along that line, these interventions can either generate positive or negative effects. Other scholars look at the distinctiveness of road construction projects as another distinguishing factor apart from diversity. These scholars opine that the uniqueness of road construction projects calls for customized approaches because a one-size-fits-all approach would render the implementation or execution of road construction projects ineffective or inefficient (Oyegoke, 2006; Pheng and Quan, 2006).

With that as a backdrop, construction contracts between parties have been substantial in harmonizing the distinctiveness of construction projects (Puil and Weele, 2014). According to Pooworakulchai, Kongsong and Kongbenjapuch (2017:2) "construction contracts are tools for specifying the rights and duties of stakeholders as well as stating the intentions of the parties during the project phases". Despite the presence of contracts as guidelines for implementing and executing road construction projects, the construction industry in many countries is grappling with negative publicity concerning quality management, customer satisfaction, unending conflicts, disputes among participating parties, cost, and the time overruns on projects (Eriksson and Westerberg, 2016). Moreover, it has been observed that many road construction projects are

constrained with unforeseen challenges that result in delayed completion, cost overruns, quality concerns and incomplete projects (Otim and Alinaitwe, 2013). Byaruhanga and Basheka (2017) record how these challenges cost the government a lot of taxpayers' money. These challenges have influenced scholars to deduce that despite the significance of contracts, on their own, they may not provide much help if there are no measures of enforcement (Gunduz and Elsherbeny, 2020). Different scholars have also taken interest to study the causes of the identified challenges impacting road construction projects with a wide perspective on the role that contracts play in the administration of road construction projects. However, issues with contracts administration and how they impact the performance of road construction projects have been overlooked. Ofori (2015) notes that contracts administration requires each party to adhere to the contract and the terms therein from the start to the end of the project. It is against that background that this research seeks to assess the impact of contracts administration on the performance of road construction projects in Uganda (Appendix 3 indicates the bibliometric analysis of the studies so far done to support this argument).

The road network is a fundamental impetus for economic development in Africa. There is evidence that sustained access to roads has a positive influence on standards of living (Benamghar and Limi, 2011). Arrows (2010) posits that society's output, safety and wellbeing are hinged on the echelon of the country’s road network. On an international scale, countries are placing a lot of emphasis on infrastructure development with a future expenditure on roads estimated between $40 trillion and $50 trillion (Byaruhanga and Basheka, 2017). However, the journey of infrastructural development is still ongoing. The European Union notes that to achieve the much needed goals for infrastructural development, approximately $2.7 trillion is needed to finance new infrastructure expenditures (Deustche Bank, 2012). On a regional scale, there is notable progress on the state of infrastructure development in Africa. Africa has continued to register progress in the roads sector although the road network still remains underdeveloped compared to the extent of that of developed economies. It has been established that road transport is the most predominant form of transport in most countries in Africa providing a means a transport for more than 80% passengers and cargo (PIARC, 2014). The extent of the influence of road transport on Africa's economy cannot be overlooked as the World Bank estimates that an equivalent of US$ 200 billion worth of trade is transported on the extensive

road network in Africa which is composed of strategic trading corridors that link deep seaports to economic hinterlands. Furthermore, most rural areas of Africa are fully dependent on roads for connectivity. However, despite the significance of roads to the growth and development of Africa, the road network density per person and per square kilometer of land area is much lower in relation to other regions (Exim Bank, 2018). The situation is further accentuated with road construction projects performance problems appearing in many aspects in developing countries. There is a growing body of evidence that many road projects in African countries fall short in performance indicators such as time and cost. The poor performance has widely been attributed to unforeseen obstacles such as material shortages, road closures, additional walks, delays in key services' delivery and amendments to designs and drawings, and bills of quantities (Wambui, Ombui and Kagiri, 2015). This has thus made the state of the existing roads in Africa to remain lugubrious by global standards.

Comparably, Uganda seems to be following a similar trajectory, with reports indicating a trend of unsatisfactory performance of the road construction projects over the recent years (Banyenzaki 2015:4). Reports published on the performance of Uganda's road sector in 2012 disclosed that shoddy works and services were costing the government billions of shillings (Inspectorate of Government, 2012). Road construction projects in the country were also associated with untimely project completion and shoddy works resulting in the loss of government funds (Bogere, 2013). This finding was not any different from that of Alinaitwe, Apolot and Tindiwensi (2013), who noted the problem of delays in the implementation of contracts pertaining to road works, thus costing taxpayers 2.5 billion monthly. The study indicated that even the road works contracts that were launched faced cost overruns and shoddiness (Alinaitwe, Apolot and Tindiwensi, 2013). In recent years, scholars have alluded to several road construction projects that have experienced delays, such as the Kampala-Jinja Expressway, Mukono-Katosi road and Kiryandongo-Kamudini road (Daily Monitor, 2019; Muzaale, Auriacombe and Byaruhanga, 2018).

As a result, a considerable number of researchers have gained a keen interest in the causes of the poor performance of road construction projects through their studies. Several studies have observed the effect of contractors' safety, variation order, contractor monitoring, contract management practices, risk management strategies, delays in land acquisition, procurement

strategies, teamwork approach, stakeholder analysis, stakeholder involvement, contractor's financial capacity on the performance of road construction projects (Matu, Gatotoh and Mushori, 2021; Chalchissa, 2021; Byaruhanga and Basheka, 2017; Banyenzaki, 2015; Kirira, 2019; Elong, Muhwezi and Acai, 2019; Dagba and Dagba, 2019; Waweru, 2018; Mandala, 2018; Akali, Sakaja and Shitsukane, 2018). However, the impact of contract administration on the performance of road construction projects has been given little attention.

As early as 1974, in his study, Scott (1974:1) opined that the application of contracts administration requires "identifying the needed function, establishing the level of effort required for each function, determining which organizational entity should provide services required for each function and developing contractual relationships between the participating entities to allow efficient and effective functioning for the entire project implementation team". In 1987, holding the notion that contracts and their administration were vital focus areas for research, the Construction Industry Institution established a contracts task force (Ibbs and Ashley, 1987). Furthermore, research was conducted on trends in contracting and the role of contracts administration and claims in reducing the overall cost of engineering projects and minimizing conflicts between parties on a given project (Al-Tubayyeb, 1989). Additionally, the recent past has registered more studies focused on the various aspects of contracts administration. Unfortunately, despite the growing body of literature on contracts administration, no study was found on contracts administration in relation to project performance in Uganda. In their study, Muzaale, Auriacombe and Byaruhanga (2018) operationalized the dimensions of performance of road construction projects as "time, cost and quality". Similarly, facets were earlier recommended for measuring the performance of road infrastructure projects by Byaruhanga and Basheka (2017). Onyait (2018) also operationalized construction project performance indicators in terms of "time, cost and quality expectations". In this study's context, the performance of road construction projects will be measured based on timelines, cost effectiveness and quality as per the recommendations of earlier studies (Muzaale, Auriacombe and Byaruhanga, 2018: Onyait, 2018: Byaruhanga and Basheka, 2017).

In that regard, this study seeks to assess the impact of contracts administration on the performance of road construction projects in Uganda through a systematic literature review. This

will facilitate the improvement of road construction project delivery and the construction industry at large.

1.2 Problem statement

Majority of road projects in Uganda have experienced cost over runs, delayed completion, quality issues and disputes (Mwelu, Davis, Ke and Watundu, 2019). This is a colossal problem given the fact that the country largely depends on road infrastructure for transportation of both goods and the population. Delays in completion of projects directly impact the economic livelihoods of citizens. The Government through its enactment of the Uganda National Roads Authority (UNRA) Act 2006 provided the body with the mandate of developing, supervising and managing the national road network and providing advisory services related to national roads (Muzaale, Auriacombe and Byaruhanga, 2018). This aimed at improving the road sector's performance and providing value for taxpayers' money. However, this has not provided the much-expected change as many projects are still experiencing delays, collapsing or exhibiting defects prematurely and others are having significant cost over runs. Completion of construction projects have substantially been delayed for some roads that include areas such as the "Kampala Northern Bypass, Kampala-Jinja Expressway, Kampala Flyover Project, Kiryandongo-Kamudini road, Kyenjojo-Kabwoya-Hoima-Bulima Road, Mubende-Kakumiro road, Kyenjojo road, Mukono-Katosi road and Kisoga-Nyenga road" (Daily monitor, 2019; Muzaale, Auriacombe and Byaruhanga, 2018).

These challenges are undermining the performance of the road sector and affecting UNRA from achieving its defined mandate. Generally, a large amount of money is set aside for road construction and if the work is substandard or shoddy, then the cost for reconstruction which could have been avoidable is borne by the government and tax payers. There is thus a need to improve the outcomes of road construction by assessing the impact of contracts administration on the performance of road construction projects. However, there is currently no study that has been conducted on the same in Uganda. This is what necessitated the need to conduct a study relating contract administration to performance of road construction projects.

1.3 Research aims and objectives

This study aimed at assessing the impact of contract administration on the performance of road construction projects in Uganda.

1.3.1 Specific objectives

The specific objectives for this study were:

1. To investigate the performance of road construction projects in Uganda.
2. To determine the extent of use of contract administration on road construction projects in Uganda.
3. To determine whether there is an association between contract administration and project performance.
4. To develop a contract administration assessment strategy to enhance road construction project performance in Uganda.

1.3.2 Research questions

This study's research questions were:

1. What is the performance of road construction projects in Uganda?
2. To what extent is contract administration used on road construction projects in Uganda?
3. Is there an association between contract administration and project performance?
4. What can best enhance the road construction project performance in Uganda?

1.4 Methodological trajectory

This research study was carried out in five (05) stages, as indicated below.

1. Stage 1: This was composed of reviewing relevant literature to identify and understand the problem under study, finding the gap in knowledge and formulating relevant research questions as per the study's context. This process was followed by drafting research objectives, determining the study scope, an in-depth review of literature as per the objectives of this study and determining how the research would be conducted by defining the research methodology.

2. Stage 2: This involved the use of primary (questionnaires) and secondary data (archival records) collection methods or techniques. The mixed method data was collated and analyzed based on Uganda's current road projects performance and Contracts Administration (CA) practices. The analysis was used to benchmark the extent of use of contract administration on projects against the literature recommendations.

3. Stage 3: The data collected from industry players such as project managers (contractors), Resident Engineers (Consultant) and Contracts Managers (Employer/UNRA) staff attached to road construction projects during the survey was used to establish a correlation between contracts administration and performance of road construction projects.

4. Stage 4: This involved the development of a contracts administration assessment strategy for road projects in Uganda.

5. Stage 5: This summarized the findings and provided the study's limitations. This stage also consisted of stating the conclusions as per the findings and recommendations, as well as areas for further study.

1.5 Significance of the study

Existing reports have disclosed numerous constraints facing Uganda's road sector, which include but are not limited to delays, health, safety, environment and quality considerations and cost overruns. These and other challenges have remained present despite numerous efforts and research undertaken aimed at improving the performance of the road sector. Despite the attention given to project performance, little has been done in line with educating the parties concerned about the role played by proper contract administration and compliance to the terms set therein. This study contributes to the existing knowledge on contract administration.

However, this study produces information that links the two variables, i.e., contracts administration and the performance of road construction projects right from inception to project closure. In addition, the study provides a contracts administration assessment strategy to enhance road construction project performance in Uganda. This study also provides relevant information

through the findings and recommendations, which can be used by policy makers as a benchmark point to base on when formulating policies with regards to the administration of construction contracts and enhancing the performance of road construction projects.

1.6 Research scope and limitations

This study is limited to evaluating the impact of contract administration on the performance of road construction projects in Uganda. It discusses the performance of road construction projects in Uganda; reports the extent to which contracts administration is used on road construction projects in Uganda; identifies if there is an association between contracts administration and projects performance; and proposes potential assessment strategies to improve contracts administration on road construction projects. The study is not intended to address challenges related to contract administration or any other aspects that are not provided for by the research objectives.

There were other limitations to the study especially that it was done at the time of the COVID-19 pandemic and therefore access to most projects was not easy or even denied at some point. This affected access to some information. Secondly, there were budget limitation that could not permit the researcher to have wider sample spaces. The focus of the study was limited to only National Road projects construction implying that the district roads, town roads and access roads were eliminated. Inclusion of such roads may provide some more information that may not have been captured in this study.

1.7 Conceptual framework

Contract administration is an emergent area of focus within the construction industry, especially in developing countries (Niraula and Kusayanagi, 2011). Contracts administration has been defined as "the process of handling daily contractual issues that arise and coping with them in accordance with the progress of the whole project" (Niraula, Goso and Kusayanagi, 2008:4). Ofori (2015) also defines it as a process that ensures that each party is adhering to the contract and the terms therein from the start to the end of the project. According to Gunduz and Elsherbeny (2020), contracts administration involves managing the procedural aspects of a contract during the delivery of a project, including the flow of required information, submitting

notices, valuations and payments evaluations, along with handling claims for extra payments and extended time frames. Chong and Rosil (2008:3) opine that contracts administration comprises the "pre-construction stage, the construction stage and the post-construction stage in the construction industry". Readon (2009:1) described contracts administration as “putting teeth in project monitoring and control.’’ Based on what studies above have reported, contracts administration basically deals with daily project operations providing for the complete work scope composition, responsibilities of parties involved, requirements for executing the operations, work schedule, cost optimization, quality and safety considerations and grievance management. A conceptual framework illustrating the relationship between contract administration and the performance of road construction projects is shown below.

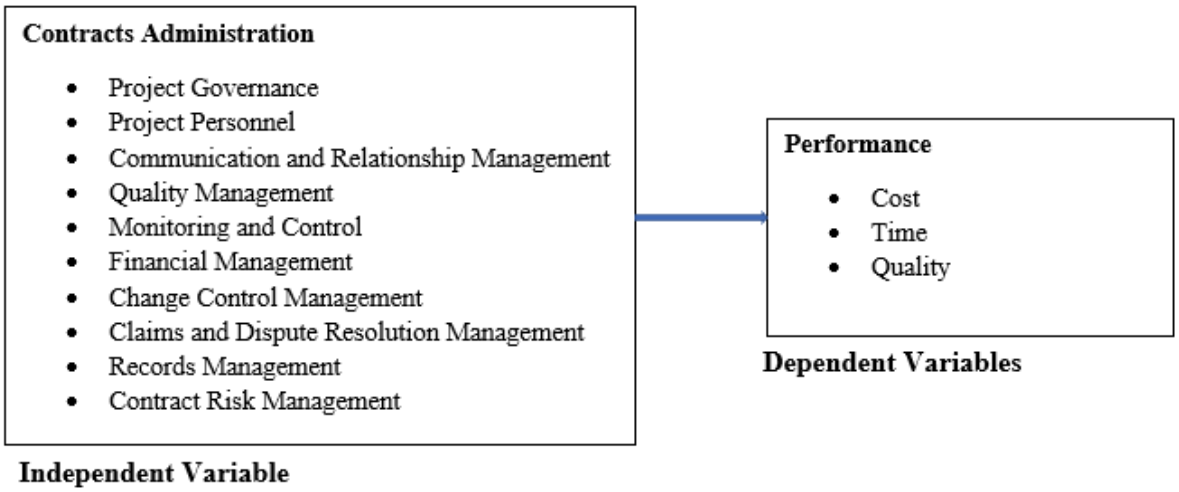


Figure 1. 1: Conceptual framework of the study

Source: Adopted from Lynch (2016), Muzaale, Auriacombe and Byaruhanga (2018), Onyait (2018), Byaruhanga and Basheka (2017) and modified by the researcher 2021

Figure 1.1 above illustrates a conceptual framework showing the relationship between contract administration and the performance of road construction projects. Contracts administration is the independent variable, and it is operationalized into the selection process.

1.8 The context of contract administration

In the construction industry, projects are fundamental, and each project is expected to have a contract that provides a framework for its execution. The successful execution of projects does

not depend on how good a contract is but on how the contract is administered. Therefore, the administration of contracts is a fundamental part of the overall management of projects in the construction industry. Ntiyakunze (2011) notes that the relevance of contracts administration in the execution of projects in the construction industry is gaining wide attention due to the increase in large volumes of contracts across borders which is attributed to globalization. However, despite the increase in the volume of contracts, existing literature exposes many loopholes in the construction industry, thus portraying that there are existing shortfalls in the administration of contracts. This calls for addressing the shortfalls in contract administration to boost the performance of projects in the construction industry.

From existing literature, "construction contracts administration" is perceived as a third-party contractual relationship related to a construction project. Construction contract administration is expected to commence as soon as a contract is signed until the project is completed. In this setting, the contract administrator is the third party, and usually, the contract administrator is identified by titles such as "Engineer, Supervisor Representative or Project Manager" as required in a given setting (Elawawy, 2020). The role of the contract administrator includes implementing the contract, monitoring and evaluating daily activities, handling claims and grievances, ensuring performance measures and standards are adhered to, collaborating and communicating with all parties involved, fulfilling and following up on payments, variations and change orders, rectifying any defects, commissioning and handing over the project (Ofori, 2014). While the contract administrator has a lot of authority in the execution of a given project, the overall success of the project depends on teamwork and therefore, project activities are expected to be executed as a team, with each team member having a defined role. For example, the project quantity surveyor manages claims and payment applications, the project planner assesses time extensions, the field inspector examines the physical work which has been executed, and the senior technical engineer manages information requests as well as requests for drawings and submittals. To attempt to control the conflicting loyalties or unintended outcomes in other areas due to activities carried out, supervision and monitoring are needed. In addition to being benchmarks for other projects, well-managed contracts can act as risk management tools for the parties involved (Joyce, 2014). It is thus imperative to evaluate how administering contracts affects the performance of road construction projects.

As earlier established, there is existing knowledge on contract administration focused on different aspects of construction projects. However, there is hardly any scientific research investigating how contract administration influences the performance of road construction projects based on the available literature reviewed. Thus, previous researchers have not been able to correlate the two variables empirically. Reviewed literature has discussed aspects related to barriers to effective contract administration and hindrances to sustained consistent performance but left out the influence of contract administration practices on project performance. However, there are available studies that have established the relationship between other practices to project performance, such as procurement, risk management and monitoring and evaluation. Other studies that have attempted to delve into contract administration have focused on the interaction of processes, language and grievance management with project performance. The limited reference to contracts administration and the absence of research correlating contracts administration and project performance presents a knowledge gap in the road construction industry, particularly in project implementation.

1.9 Gap area

There is existing knowledge on contract administration focused on different contexts; however, there is hardly any scientific research investigating how contract administration influences the performance of road construction projects based on the available literature reviewed that is linked to the New Public Administration. The NPM provided a platform for public and private sector partnership in the implementation of contract management. Thus, previous researchers have not been able to correlate the two variables empirically. Reviewed literature has discussed aspects related to barriers to effective contract administration and hindrances to sustained consistent performance but left out the influence of contract administration practices on project performance. However, available studies have established the relationship between other practices to project performance, such as procurement, risk management and monitoring and evaluation. Other studies that have attempted to delve into contract administration have focused on the interaction of processes, language and grievance management with project performance. The limited reference to contracts administration and the absence of research correlating

contracts administration and project performance presents a knowledge gap in the road construction industry, particularly in project implementation.

1.10 Chapter summary

This chapter briefly overviews the construction industry and the identified research problem. The background provided insight into the road construction industry's challenges, considering the global and local perspectives. Additionally, the purpose of the study, the research objectives and the research questions were provided. Lastly, the chapter highlighted the significance of this study, the research scope, the conceptual framework, the context of contract administration, and the knowledge gap based on the literature reviewed.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter provided an understanding of the theoretical framework, the road construction industry, its stakeholders, the projects' lifecycle and the processes involved. It further provided insight into the procurement processes, contracts and contract forms.

The study is linked to Public Administration in the sense that road projects are majorly public projects. By definition, ''Public administration is a comprehensive and peculiar field of activity, consisting of numerous activities, processes or functions performed by public officials working in public institutions, and aimed at producing goods and rendering services for the benefits of the community''Coetzee (1988: 18-20). Road projects are developed by government as a service to improve the standard of living for its citizens. Additionally, the road projects are developed using public funds for which the government is answerable. Therefore, projects have to follow, the set processes within the system for their implementation right from the inception to the end.

2.2 Theoretical framework

A series of enormous and continuous changes have been observed on different fronts across the globe. Some of these changes have occurred in the social, economic and political spheres. Many researchers have risen to the challenge by investigating the causes and extent of these changes in the functionality of government operations and processes. One of the approaches adopted in understanding these changes is the New Public Administration (NPA). The NPA approach emerged due to governments being overwhelmed and financially constrained by unprecedented internal and external changes. It thus provided a way of understanding the demands of a rapidly growing and competitive global economy and introduced the principles that govern competition and private sector management.

According to Güven (2014), the NPA approach has been dominated by public administration in numerous countries, which consider it a solution to the bureaucratic challenges that exist in public administration. The NPA approach thus directly addresses the constraints placed upon public administration due to global political trends and economic crises. While principles such as

accountability, efficiency and transparency may appear small, effective performance in public administration is built by such principles (Güven, 2014). Thus, the NPA approach is a way of fostering productivity and giving priority to key areas while striving for outstanding performance.

In the private sector, the approach also comes in handy as it provides guidelines on achieving desired profitability levels or performance-based outputs (Güven, 2014). Güven (2014, p.4) states that from a public administration perspective, "it is aimed to meet at a common ground of the public administration that considers the public interest and the business with the special interest consciousness". It has been stated that the New Public Administration approach "transfers the performance criteria and practices of the private sector to public administration" (Lapsley, 2009:1). It is thus essential in transforming the public sector. In the analysis of the NPA approach, "the work environment, strategic goals, organizational structures and processes, performance management and measurement systems, managers and management, employees, and institutional culture" are highlighted as key factors for consideration (Diefenbach, 2009:893).

Therefore, the fundamental question is how to optimally utilize resources to achieve desired results in the public sector. In general, this would call for a particular way to enhance the efficiency and effectiveness of the key elements noted above. This is what constitutes the NPA approach. On the other hand, it can be argued that the approach encompasses economics and business administration in the management of public administration (Güven, 2014). Governments are also subjected to critiques and expectations to remain functional and to improve their capacity to meet their obligations. It is thus typical and expected of them to operate efficiently, just like businesses in the private sector would operate if they wanted to survive or continue to thrive. Therefore, the NPA approach is more like a framework for capitalism which is often considered one of the best ways of transforming societies and the public sector in general (Güven, 2014).

While the NPA approach emphasizes hierarchies, policies and procedures, the New Public Management (NPM) approach focuses on the daily running or management of operations. NPM

reforms have attracted remarkable attention over the years in a bid to improve the performance of public service delivery. Previous studies have reported that reforms on the New Public Administration approach are insufficient if new ways of managing public administration are secluded, thus increasing the interest in the NPM approach. NPM is considered merely a concept or a set of beliefs and, therefore difficult to define; however, it emerged from the inefficiencies of the public sector in developed economies (Lapuente and Van de Walle, 2020). The NPM approach is thus associated with multifaceted reforms all aimed at enhancing public sector performance. These reforms cut across the different sectors of the economy, covering both micro and macro factors. The key components under NPM are "incentivization, competition and disaggregation" (Lapuente and Van de Walle, 2020:5).

The origin of NPM is traced back to the principal-agent and institutional theories whose emphasis is on "market competition business principles, managerial autonomy, customer choice and performance standards" (Rubakula, 2014:2). This implies that the public sector is perceived to operate as a business and is thus governed by similar business principles and expectations. In this essence, if the public sector is managed the same way, then redundancies and bureaucracy will be lowered, thus minimizing some of the inefficiencies that limit good public service delivery. This is the paradox that the NPM approach seeks to overcome.

This study is anchored on the Principal-Agent theory, which is associated with business orientation theories and highlights the relationship between contract interactions (Rubakula, 2014). The theory lays down obligations and expectations of different parties to a contract, even in the absence of supervision. It is recognized that the principal will not always be there to monitor the agent; however, this should not lead to underperformance or inappropriate actions because the interactions between each party are clearly defined. Regarding management, the NPM approach provides a framework for predefined performance standards and expectations for parties to a contract to ensure good performance or service delivery. Thus, the NPA and NPM approaches look at administering and managing the public sector the way the private sector is managed to enhance its effectiveness and efficiency in the public service delivery process (Rubakula, 2014). The goal is not to ensure profit maximization, like how it is the main key performance indicator in the private sector, but to ensure that there is value for money. With

regards to this study, it is perceived that contract administration is one of the various mechanisms to align the interest of the principal with those of the agent. It is further conceived that contract administrators' "Principal" through contract administration (selection process, management of risks, inspection/verification) may effectively determine, control and regulate the work being done by the agent (contractors) to deliver road construction projects in a timely,cost-effective and acceptable quality standards to the demands of the principal.

2.3 Public procurement and contracts

From a traditional perspective, most research on procurement has focused on the private sector, thus largely ignoring public procurement (Pennacchio, 2017). However, there has been increased attention on public procurement globally due to the deficiencies or gaps witnessed in the public procurement process and execution. According to World Bank (2020, p.68), "public procurement is the process by which governments purchase goods and services from private firms". The government is the principal buyer in most sectors, even transport and infrastructure. It is reported that globally, public procurement accounts for "between 10% and 25% of GDP on average, and governments cumulatively spend $10 trillion on public contracts each year" (World Bank, 2020:68). The procurement process is just the beginning of a whole lengthy process which involves contract award and ultimately the administration of the awarded contract right from inception to close out. Public administration cannot be overlooked when dealing with public contracts. Road projects are, to the greatest extent, if not all, a preserve of the government. These projects are executed by contractors through contracts with the government and they heavily rely on public procurement thus the focus on understanding the context of public procurement.

2.3.1 Contracts in public vs private sectors

Patajoki (2013:60) defines public procurement as the "means of acting on behalf of a public authority or the government to obtain goods, services, and works for the public's interest". This implies that goods procured for public use ought to serve the public's interest. On the contrary, the public and private sectors have distinct ways of procuring goods, goals for procurement and control for procurement. The public sector is under public scrutiny and thus takes on extra precaution in public procurement due to issues of transparency and accountability. The same can apply to the private sector, although in this essence, the stakeholders do not include the public

but shareholders and other key personnel within the entity (Patajoki, 2013). Furthermore, the main goal of public procurement, as indicated above, is to meet the needs of the public, while in the private sector, the goal is profit maximization and thus, even procurement is controlled by making a profit at the end (Patajoki, 2013). However, the differences in rigidity in the public and private sector often produce different results. For instance, modifying a contract that is already in force is difficult in the public sector unlike in the private sector. Therefore, in instances where a contract has been poorly drafted, poor results are expected in the public sector unlike in the private sector which has more flexibility and can easily modify contracts already in force (Patajoki, 2013). Another key distinguishing factor as highlighted by Carolina et al (2012) is the fact that procurement in the public sector is governed by the contract which provides for the relationship between the parties privy to the contract while procurement in the private sector is governed by existing or established relationships which result in the formation or drafting of a contract. There are also many instances where contracts are often awarded to the lowest bidder in public procurement unlike in the private sector where quality is of essence to ensure value for money irrespective of how high the bidders bid (Gunduz and Karacan, 2009). Figure 2.1 highlights the differences between public procurement and private procurement from the buyer's perspective as adopted from Patajoki (2013).

Criteria	Buyer Perspective	
	Public Sector	Private Sector
Objectives of buying	Support the functions of service agencies, execute social, economic policies	Profit maximization, good services, etc.
Vendor choice criteria	Based on competition, efficiency, fairness, and openness	Flexible criteria
Information disclosure	Transparency is required	No transparency is required
Procurement procedures	Rooted in legislation	More freely chosen procedures
Stakeholders	Contractual partners, citizens, politicians, etc.	Contractual partners, owners, etc.

Figure 2. 1: A figure comparing public and private procurement

Source: Patajoki (2013)

2.3.2 Public Private Partnerships (PPPs)

PPPs are commonly used in infrastructural development projects and there has been a remarkable increase in the adoption of PPPs as a way of overcoming the constraints of sole public procurement (Wang, Xiong, Wu and Zhu, 2017). Yong (2010:7) defines PPPs as "... a long-term commercial arrangement for the delivery of public services, where there is a

significant degree of risk-sharing between the public and private sectors". PPPs have become the norm in infrastructure development especially for the developing countries. These have recently emerged as a result of the NPM to raise capital for infrastructure development. Recent studies indicate that the contribution of PPPs in infrastructural development in developing economies is roughly 10% while globally, their contribution is 3% on infrastructural development (Fay et al, 2018; Engel et al, 2020).

According to Fabre (2019:3), "the World Bank Private Participation in Infrastructure (PPI) database lists over 6,600 projects in low- and middle-income countries for the 1990-2019 period, representing investments of over US$1.5 trillion". This is a significant number of projects executed through PPPs in developing countries. Similarly, the European Investment Bank (EIB) also lists "over 1,800 projects, totaling 370 billion euros, in 28 European countries since 1990". These projects have also been developed and executed through PPPs. On the contrary, while the US is the largest economy, its visibility in PPPs is considerably low as only 30 projects worth US$16.2 billion are listed in 2019 (Fabre, 2019). While these findings are evident that there is growing interest and participation of PPPs in economies worldwide, Fabre (2019) observes that there is no existing assessment of the performance of these PPPs, and therefore, it is hard to draw conclusions on their effectiveness or efficiency.

However, road construction projects have been known to be costly and can become a huge constraint for governments without the support of PPPs. Similarly, the high standards of the private sector are often carried along in PPPs thus resulting in better performance and quality of road construction projects (Singh, 2018). Regardless of the procurement method, project performance is still governed by the principles of time, cost and quality. The administration of those projects or contracts should aim to fulfill the set principles for the projects to be considered successful. In the adoption and implementation of PPPs, a number of considerations are taken into place. These include the mode of cooperation between the contracting entities, the risks that may arise during the course of implementing the projects, the enabling factors that influence the adoption of PPPs and the expected performance or output (Wang, Xiong, Wu and Zhu, 2017). It is also recognized that PPPs trigger cost reduction and create possibilities for growth at lower echelons due to reduce competition, lower taxation rates and a reasonable liability buildup

(Ahmad, Vinella and Xiao, 2018). It can thus be deduced that PPPs are important in boosting the performance of road construction projects, although this is only possible if contracts are properly administered and managed.

2.4 The components of the construction industry

Amongst the most essential segments in any given country is the construction industry (Sertyesilisik, 2007). The industry is a broadcaster for almost all other segments, for instance trade, tourism and agriculture. The industry employs quite a number of untrained, semi-skilled, and trained human labour making it a key economic earner for most of the countries worldwide. The construction industry is however regarded as one of the most multifaceted especially because of the involvement of many participants, diverse activities and a lot of ambiguity and risk (Tatarestaghi et al, 2011). This calls for strong measures to put in place proficient and effective methods that go a long way in cultivating good working relationships between the parties to the contract (Bin Zakaria et al, 2013).

Like any other industry that experiences gaps, for instance in quality, time, costs, human resources, and relationships among contracting parties, so is the construction industry (Elasawi, 2020). Furthermore, the construction industry is characterized by the unique nature of the projects, high risks involved, claims and clashes, many participants with interests and generally the usual project constrictions. In addition, the industry has over the years encountered unnatural relationships and lack of coordination among stakeholders, poor performance of projects and in some instances complete failure of projects (Barrett et al, 2008).

Other exterior factors including cut throat competition, political and economic atmosphere and environmental circumstances which have had either negative or positive impacts. A number of scholars have since conducted research on the construction industry with the intention of improving the performance of projects, especially because their performance eventually affects the performance of other segments (Smyth, 2010). However, putting a single definition or description of the construction industry is no mean feat because the industry consists of a series of activities or processes. The construction industry includes activities on-site and off-site, all which are essential for its functionality (Foulkes and Ruddock, 2003). Therefore, a clear description of the components of the construction industry is one that encompasses the entire

lifecycle of a construction project, right from the idea generation stage to when the project is handed over.

On the other hand, components of the construction industry differ from country to country due to the differences in development levels (Foulkes and Ruddock, 2003). While developed countries will put a lot of emphasis on the design of construction projects, developing countries focus more on the availability of resources and cheaper substitutes, especially for large projects. This therefore makes the entirety of the construction industry a very complex one composed of different stages in different contexts (Foulkes and Ruddock, 2003).

2.4.1 Significance of the road construction industry

The role played by the construction industry in the development of various economies world over is vital. This industry is unique in nature and diverse (Sibiya, Aigbavboa and Thwala, 2015). The construction industry is a sector that facilitates both developing and developed economies through the transformation of a number of resources into constructed facilities. This is achieved through planning, design, construction, maintenance and repair, operation, and management in general (Isa, Jimoh and Achuenu, 2013). The importance of the construction industry products in the achievement of national growth cannot be over-emphasized as construction projects act as an umbrella for all other activities of the economy. Studies have shown that the construction industry is of significance to all countries and usually holds high priority in government agendas (Foulkes and Ruddock, 2003). This is because good infrastructure facilitates other sectors thus promoting the growth of economies. In other words, an enabling environment is created which makes trade and other services thrive. Therefore, there is no doubt that the construction industry is very valuable in any country as it is a guarantee of sustainable development (Foulkes and Ruddock, 2003).

2.4.2 Stakeholders of the road construction industry

There are usually many participants in construction projects who play different roles and are instrumental in the progress of the projects being undertaken. It is observed that the level of contribution of each stakeholder depends on their position, influence, background and other

demographic factors. The construction industry may have architects, engineers, surveyors, project managers, among other key personnel who ensure that there is progress in projects being undertaken. All these participates invest resources which may include time, skills or financial backing and thus directly influence the performance of the projects they are involved in. However, other macro factors or external risks that are beyond their control also influence project performance thus having an impact on the success of a given project. According to Jin et al (2017), the list of participants in the construction industry is extensive and includes "owners, users of facilities, project managers, shareholders, legal authorities, employees, sub-contractors, suppliers, service providers, competitors, financial establishments, insurance companies, media organisations, neighbors and community representatives, the public, government establishments, visitors, regional development agencies, the natural environment, pressure groups, and civic institutions". It is evident that some of the stakeholders are internal while others are external and thus hold different power or authority levels. In general, stakeholders are expected to deal with the internal and external factors that may affect the projects they deal with, therefore, monitoring how they perform and their influence on construction projects is important. Additionally, the more a project advances through its lifecycle, participants change and the level of participation also differs (Jin et al, 2017). Some participants may complete their obligations and leave, others may just quit, some may be transferred to other areas, while others may join at advanced stages. It is also important to note that some participants will be more important compared to others in terms of their influence on the project. This is the reason why drafting and enforcing contracts in the construction industry is important because the industry itself is composed of a series of interactions or relationships of different degrees which can either harm or push the project forward depending on how the contracts are enforced (Jin et al, 2017).

2.4.3 Critical components of a project life cycle

In every essence, the ultimate outcome expected from a construction project is its completion (Al-Hajj, 2018). Despite this, there is no defined test to prove if a construction project will ultimately be successfully completed or not. However, it is agreed that every construction project has a life cycle. The life cycle constitutes the period from which the idea to embark on a construction project to the point until the completion of the construction project is realized (Đorđević, Nestić, Jovanović and Tadić, 2018). From the point where the construction project idea is birthed to when it is realized, there are a number of stages or activities which take place

and are associated with the life cycle of the construction project. It is argued that each stage is unique with its own purpose, however, there is no doubt that some stages overlap each other (Đorđević, Nestić, Jovanović and Tadić, 2018). The most important process in guaranteeing the successful completion of a construction project is by monitoring all the processes of the project's life cycle. This calls for clearly defining the stages of the construction project (Al-Hajj, 2018). A study by Radujković and Sjekavica (2017) argues that there is no clear way of defining the constructs or domains of a construction project because the project life cycle of a construction project goes along way. In this essence, a construction project may appear successful upon completion in the initial stages but wear off gradually over time due to poor materials or shoddy works which went unnoticed. Therefore, the debate of what constitutes successful construction projects is still ongoing and it is also a budding discussion in the construction industry Radujković and Sjekavica (2017). In short, it is advised to keep looking for new ways of improving the chances of having successful construction projects, or what others may call, "construction projects built to last". This therefore shows that even with good project management, there are chances of a construction project not being successful if a series of goals are not achieved or are achieved halfway Radujković and Sjekavica (2017).

According to Đorđević, Nestić, Jovanović, and Tadić (2018), construction projects can be completed in two ways: by following their life cycle or managing the project processes. The life cycle shows the phases of a particular construction project. It provides an outline of the way the project will be completed from beginning and all the steps therein (Đorđević, Nestić, Jovanović, and Tadić, 2018). On the other hand, managing construction project processes means splitting each process into stages to make monitoring and managing them easy. The difference between the two is that the life cycle method is more of a map with a compass that shows the direction you are supposed to take at a given point in time unlike just managing project processes (Đorđević, Nestić, Jovanović, and Tadić, 2018). In fact, Đorđević, Nestić, Jovanović, and Tadić (2018) affirm that with the usage of the life cycle approach, it is easier to predict the feasibility of construction projects early enough. To sum it up, the main objective of the project life cycle process is to provide a clear perspective of the most efficient way to approach a construction project and guarantee its success (Radujković and Sjekavica, 2017). The figure 2.2 shows the stages of a construction project life cycle.

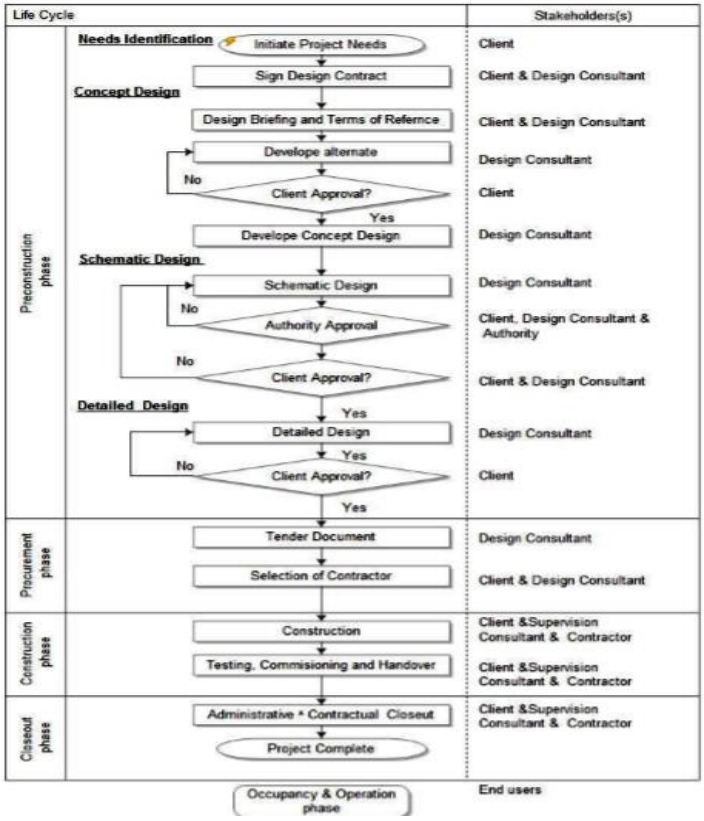


Figure 2. 2: Phases of a construction project life cycle

Source: Berry and McCarthy (2011)

2.5 Construction contracts

It is undisputable that the construction industry is a complex one which also requires a lot of resources and yet it is exposed to a lot of uncertainty. In a bid to handle all the complexities involved in developing a construction project, construction contracts are often drafted (Larasati et al, 2021). A construction contract therefore provides a framework for how work will be conducted or delivered on a given project. It is thus vital in the implementation of any construction project and can influence its chances of progress (Larasati et al, 2021). However, a key feature is to recognise that each construction project is unique and thus a one size fits all contract does not work. Contracts are drafted to capture all the distinguishing factors of each construction project (Gunduz and Elsherbeny, 2020). According to Khekale and Futane (2013:1), "construction project contracts are agreements made by construction project owners (contract issuing parties) and construction enterprises (contractors) according to basic construction

procedures in order to complete specific construction and installation projects and to define the rights and obligations of both parties". This signifies that construction project contracts are not about laying guidelines for competitors but associates of a project; in other words, those that have a role to play in the execution of the construction project. The role that contracts play in the construction industry cannot be downplayed because a vast majority of construction projects are executed with contracts in force (Bajeerao and Kanade, 2018). The contract in this case is more of an agreement stipulating the obligations or responsibilities of all parties privy to the contract. The governing rule is that the contractor ought to perform their duties as expected while the contract issuing party has to remunerate the contractor as expected (Bajeerao and Kanade, 2018). Therefore, looking at the overall significance of contracts shows that they are vital for the successful execution and completion of construction projects.

2.5.1 Construction contract administration

The construction industry is an enabler for achieving national goals and gearing countries towards being modern, however, often, construction projects are faced with a number of challenges despite being executed with contracts. The contract administration process is thus complex and if poorly administered can result in poor project performance (Gunduz and Elsherbeny, 2020). Proper contract administration is necessary to address the potential loopholes that may jeopardize the performance of construction projects and also ensure that all contracting parties meet their contractual commitments (Gunduz and Elsherbeny, 2020). This implies that the failure of parties to a contract to meet their contractual commitments is a sign of poor contract administration. On the other hand, poor construction administration results in inefficiencies in construction processes (Gunduz and Elsherbeny, 2020). Therefore, in terms of assessing the rate of return from capital invested in construction projects whose contracts are poorly administered, it is deemed to be low. Gunduz and Elsherbeny (2020) provide a number of domains that constitute poor construction contract administration. According to their study, poor construction contract administration may refer to: "poor planning; poor communication and coordination; lack of systems; misunderstanding of processes; lack of skilled personnel; unclear roles; lack of training; and lack of performance measurement metrics". Thus good construction contract administration calls for addressing the domains above. Furthermore, construction contract administration means performing a series of coordinated activities to achieve project

goals and objectives as stipulated under the contracts in force (Gunduz and Elsherbeny, 2020). Therefore, all daily activities and operational decisions are important in ensuring that contracts are properly administered. In PPPs, key performance indicators for government contract administration have to be aligned with those of the private sector to ensure that each party's objectives and goals are met (Gunduz and Elsherbeny, 2020).

Contract administration encompasses "the functions performed after a contract has been signed by the contracting parties" (Oppong, 2019, p.1). This shows that contract administration involves a plethora of activities that take place right when a contract is awarded until all parties have met their commitments. It is the way these activities are conducted that influences whether a construction project will be successful or not. All in all, each activity aims at achieving a certain goal and therefore, if any goal is not achieved then the successful completion of a project will be affected (Oppong, 2019). Oppong (2019, p.2) notes that proper construction contract administration is governed by 6 Rs. These are "right items, right place, right quantities, right qualities, right time, and the right place". This means that a successfully completed construction project meets all these criteria and the way a contract is administered has an influence on these Rs. Contract administration is often not about personal knowledge but it is facilitated by drafted contracts (Zakaria, Ismail and Yusof, 2022). This means that contracts are the governing frameworks which provide guidance on the administration of contracts. As seen earlier, each construction project is unique and thus contracts differ per project. This also signifies that the way contracts are administered is different per project. However, the overall goal of contract administration is to ensure that a construction project is successfully completed and if we are to draw from the study of Oppong (2019), the 6 Rs must be met. Therefore, contract administration means that contracts are performed as stipulated and all conditions and commitments are met (Zakaria, Ismail and Yusof, 2022). Figure 2.3 is an excerpt of the concerns contract administrators are faced with.

Management Matters (Contract Administrator)
• longer time to certify the claim • unethical employees • outstanding/extra work in maintenance period • rationalisation of rates (work price changes) • lack of communication • final account certificate issuance • person in charge is retired or transferred

Figure 2. 3: Key concerns for contract administrators

Source: Zakaria, Ismail and Yusof (2022)

The above illustration shows that contract administrators are concerned with time, ethics, the management of extra work, how rates are rationalised, communication mechanisms, issuance of final account certificates and human resources. Contracts administrators are the key personnel in charge of administering contracts and thus pay a critical role in the administration of construction contracts. In essence, not everyone can be a contract administrator. Figure 2.4 shows the criteria followed to choose a contracts administrator for a given project.

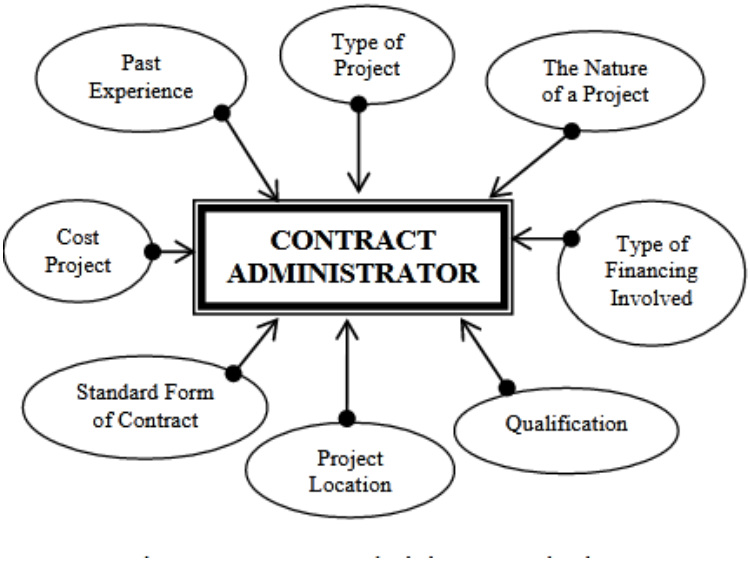


Figure 2. 4: Criteria for a contract administrator

Source: Zakaria, Ismail and Yusof (2022)

Figure 2.4 shows that contracts administrators are selected based on their past experience, qualifications, location of the construction project, terms in the contract, cost of the project, the

financing modes involved, the type of project and the nature of project (Zakaria, Ismail and Yusof, 2022).

Despite the criteria of selecting a contracts administrator, their first role is always to draft a plan for the construction project and define all the parties involves as well as prepare the necessary contract documents (Pooworakulchai, Kongsong and Kongbenjapuch, 2017). The preparation step is very essential as it determines the next steps to follow and provides the initial overview of the project expectations. Additionally, modifications can always be made and additional supplements can always be added as and when required (Pooworakulchai, Kongsong and Kongbenjapuch, 2017). Therefore, in contracts administration, there is always the preparation stage and the execution stage and the role of the contract administrator is to manage the affairs of the contract to ensure that it is successful (Oppong, 2019). Proper contracts administration aids the management of "design specifications, contractual agreements, competitive tendering, evaluations, cost controls, variations, final accounts, claims and even disputes" which improves the performance of projects (Oppong, 2019:2). Additionally, good construction contract administration covers the three essential stages in any construction project, which are: design, tender and construction (Oppong, 2019). These findings thus shows that the administration of contracts is vital for the success of any construction project. Unfortunately, in practice, most contract administrators adopt standard contracts which in the end do not meet the deliverables of their construction projects (Mugabe, Louis, Gwaya and Kivaambiti, 2019). When administered contracts are not tailored for projects, in most cases they go wrong because the conditions within those contracts do not fit the existing projects. Therefore, contract administration alone does not guarantee project success but the right contract must be administered (Mugabe, Louis, Gwaya and Kivaambiti, 2019). Figure 2.5 shows some of the key factors that influence construction contract administration.

Factors influencing the contract Administration	5	4	3	2	1	Total	Weight
Nature of the work	65	24	9	15	25	138	503
Type of contract	31	43	19	35	10	138	464
Experience of the personnel involved	33	24	35	22	24	138	434
Commitment of the personnel involved.	31	11	62	17	17	138	436
Others (if any)	12	16	32	60	18	138	358

Figure 2. 5:Factors which influence construction contract administration

Source: Mugabe, Louis, Gwaya and Kivaambiti (2019)

The illustration above shows that contract administration is influenced by the nature of project, type of contract, experience of involved parties and the commitment of the contracting parties. According to Pooworakulchai, Kongsong and Kongbenjapuch (2017), to improve contract administration, contract administrators ought to pay attention to the project design, procurement process and construction contract processes. Figure 2.6 below shows domains for improving contract administration.

Project Design and Procurement Process	Pattern and item preparations and examinations must be consistent
	Construction quality must be consistent with the construction value
	The construction technique must meet the construction principles
	The project plans must meet the construction principles
	The project values must meet the construction principles
	The payment periods must be clearly specified
	The contracts must state the size and details of the construction projects
	The contracts must be amended according to the tasks of each project
	The definitions of the specific tasks and amendments must be clearly stated
Construction Contract Processes	The additions of the duties of the taskmasters must comply with the professional scopes of the Engineering Institute
	The stakeholders of the projects must understand the inspection system according to professional standards
	Reasons to extend he construction periods must be clearly stated
	Additions of the coordination process must be considered
	Extensions of the coordination periods must be considered

Figure 2. 6: Factors to consider to improve contract administration

Source: Pooworakulchai, Kongsong and Kongbenjapuch (2017)

Lastly, it is argued that the key components for effective contract administration are people, documentation and context (Pooworakulchai, Kongsong and Kongbenjapuch, 2017). This does not differ from what other studies have stated (Oppong, 2019; Mugabe, Louis, Gwaya and Kivaambiti, 2019; Zakaria, Ismail and Yusof, 2022). People/personnel are the contracting parties and executors of the construction project. The documentation refers to the contracts which stipulates the contribution and expected commitment from each party privy to the contract. The context is the type or nature of the project and it also includes its location. According to Pooworakulchai, Kongsong and Kongbenjapuch (2017), successful contract administration means improving all these three constructs to make them fit for executing a given project. Figure 2.7 shows the relationship between these three constructs and contract administration.

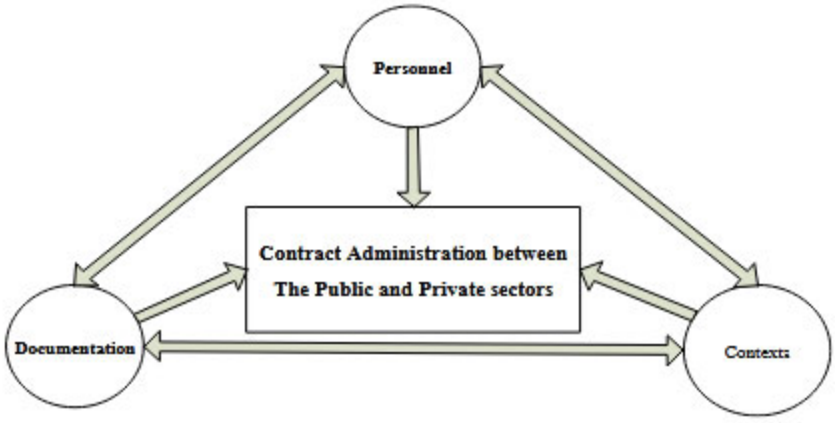


Figure 2. 7: Relationship between personnel, contexts and documentation with contract administration in PPPs

Source: Pooworakulchai, Kongsong and Kongbenjapuch (2017)

2.5.2 Difference between contract administration and contract management

Contract administration and contract management are often confused and yet they are different although they are all part of the contract process (Naughter, 2021). In short contract management comes before a contract is signed while contract administration comes after a contract is signed (Naughter, 2021). Both processes are essential in guaranteeing that expected project deliverables are met. Poor contract administration creates inefficiencies which in the end affect the execution of construction projects while poor contract management results in shoddy works and poor performance (Naughter, 2021). Contract administration ensures that each contracting party performs or delivers as stipulated in drafted contracts (Masuruli, 2021). When contracts awarded, a series of activities have to start and their effectiveness depends on how the contract is administered. Contract administration provides for monitoring and evaluation, modifications, supplements, repairs and grievance handling. It is important to note that contracts cannot enforce themselves therefore contract administration is vital because it is indispensable (Masuruli, 2021). Contract administration is focused on the planning and execution of contracts and thus involves activities such as preparing budget estimates and requests for proposals for suppliers and other contracting parties. It is also under contract administration that negotiations happen (Naughter, 2021). On the other hand, contract management ensures that contracts are efficiently and effectively executed to achieve the expected deliverables (Masuruli, 2021). This constitutes a series of activities such as: ensuring the timely delivery of raw materials, have competent and

sufficient human resources, and working according to the drafted time schedules. Thus, proper contract management is influenced by factors such as procurement and contractual obligations (Masuruli, 2021). In PPPs, contract management is essential to ensure coordination and transparency between both parties (Athumani and Bisama, 2018). Contract management encompasses ensuring that conditions provided in the contract are adhered to and that each contracting party meets their commitments as stipulated in the contract (Naughter, 2021). This does not mean that everything will run smoothly and therefore, in case of threats or emerging uncertainties, modifications can be made to ensure that construction projects are successfully completed. Therefore, both contract administrators and contract managers have to work collaboratively to ensure that project deliverables are met (Naughter, 2021).

2.5.3 Barriers to effective construction contract administration

Despite the significance of construction contract administration, certain hindrances often exist that limit the effectiveness of contract administration. From the literature reviewed, the barriers have been categorized as follows:

i. Incompetent personnel

There are many instances where contract administrators without knowledge or prior experience of contract administration are selected to occupy the role as contract administrators (Pooworakulchai, Kongsong and Kongbenjapuch, 2017). These often use standardized contracts that do not suit the projects they are going to execute or perform contract administration roles poorly due to ignorance thus jeopardizing the success of construction projects. Additionally, when contract administrators working as a team have different priorities, it leads to clashing and affects the overall process of contract administration (Pooworakulchai, Kongsong and Kongbenjapuch, 2017). Incompetent personnel also lack the knowledge of drafting proper contract documentation (Sebastian and Davison, 2010).

ii. Group dynamics

Different stakeholders are involved in the construction contract administration process and therefore if they are not in unison or have different goals, then proper contract administration is hindered (Gunduz and Elsherbeny, 2020). Similarly, in PPPs, the major priority of the

government is to serve the interests of its citizens while the major priority of the private sector is profit maximization. Without a balance on how to achieve the two without conflicting each other, the contract administration process becomes a challenge (Sebastian and Davison, 2010).

iii. Poor technology and design

In low resource-settings most especially where there is limited technology, contract administration can become a challenge as there will be gaps that cannot be resolved manually (Sebastian and Davison, 2010). On the other hand, even projects that require complex technology that cannot easily be acquired can become a challenge to implement because the integration process becomes difficult (Pooworakulchai, Kongsong and Kongbenjapuch, 2017).

iv. Physical work environment

The physical work environment is often neglected, however, challenges with site conditions, location, working conditions and weather can also affect proper construction contract administration (Sebastian and Davison, 2010). An enabling environment is needed for contract administrators to effectively perform their roles.

v. Poor leadership and management

In cases where there is poor leadership and management, there is often no direction which leads to uncoordinated efforts in executing programs (Al-Hajj, 2018). In the context of construction contract administration, each contracting party will perform as they want without any direction, guidance or coordination and thus come up with uncoordinated outputs which do not support the successful execution and completion of construction projects (Gunduz and Elsherbeny, 2020).

vi. Organizational structure and culture

A poor organizational structure and culture does not facilitate good contract administration because it acts as a key hindrance (Sebastian and Davison, 2010). To throw more light on this, an organizational structure and culture that entertains poor performance, bureaucracy, poor quality and poor governance cannot result in good contract administration because the flaws will also reflect in how contracts are administered.

vii. Unrealistic targets

When contract administrators are given unrealistic targets, it affects their performance because their focus shifts on achieving those targets than performing effectively (Gunduz and Elsherbeny, 2020). This may result in compromising the quality of some work to achieve the set targets. Unrealistic targets also put contract administrators on pressure which affects their service delivery.

viii. Absence of quality control processes

There is no doubt that if quality control processes are absent then performance is most likely to be jeopardized (Sebastian and Davison, 2010). Effective contract administration needs to follow a certain set of standards or procedures whose quality should be monitored and evaluated to ensure that contracts are efficiently administered.

2.6 Procurement strategies

The execution of a construction project is only considered effective if its completion occurs within the expected timeline and meets the set deliverables in terms of cost and quality (Tiwari, Chan and Mubarak, 2018). The achievement of these set parameters is often associated with the procurement strategies used because they have a huge influence on the success of construction projects. Procurement techniques are defined as "an organizational system that assigns specific responsibilities and authorities to people and organizations, and defines the relationships of the various elements in the construction of the project" (Tiwari, Chan and Mubarak, 2018, p.2). This implies that procurement techniques are like chains linking construction projects with the right requirements for their execution. It also acknowledges what other studies affirmed that construction projects have numerous stakeholders, all who have a role to play. Procurement constitutes the acquisition of goods required to execute a given construction project (Linnartz et al, 2021).

Good procurement strategies ensure that the right quantity of materials required are available to enhance production processes such as, "quality, quantity, delivery time and costs" (Linnartz et al, 2021). Meeting supply requirements is important for all construction projects because without them, then construction cannot be completed. In that regard, strategic procurement involves

activities geared to meet the supply needs of a given construction project. According to Linnartz et al (2021), procurement strategies encompass purchase plans, supplier selection strategies and relationships with both parties involved, that is, the buyer and the supplier. In the context of construction projects, it is obvious that they constitute temporary activities needed for completion in a limited timeframe. This means that construction projects are not meant to be executed for forever as there is always a time constraint and resource limitations as well (Ershadi, Jefferies, Davis and Mojtahedi, 2021). Due to this, the procurement process in construction projects is vital because it is the major key that projects will be delivered based on the defined parameters. Like Ogeto and Thiong'o (2020) say, in construction, performance is not limited to only efficacy but also includes meeting the desired expectations or results, and that is where procurement strategies come into play. Some of the reasons construction projects fail or collapse during the construction phase or upon handing over is because of using poor materials or the wrong materials. For contractors to prevent that, they need to adopt strategic procurement as in the end, it is even cost-efficient since the executed projects will be long-lasting (Omopariola, Idowu and Windapo (2019).

Strategic procurement decisions do not mean choosing the cheapest products or negotiating for better prices but ensuring that the procurement process is aligned to the organizational goals and objectives. This means the procurement process guidelines drafted should strictly be adhered to and strategic actions should be generated to govern product specification, supplier selection, contract management, order processes, expeditions and evaluation of the steps taken (Omopariola, Idowu and Windapo, 2019). This signifies that procurement activities should be interconnected as the outputs of one stage affect the outputs of the stages that follow (Omopariola, Idowu and Windapo, 2019).

According to Eriksson (2017), the construction industry is often associated with inefficiencies which often are a result of poor procurement strategies. If supplies are delivered on time, and they are enough, construction projects will quickly be executed; however, whenever there is a supply deficit, time is wasted, increasing the likelihood of not completing projects on time. As earlier seen, the procurement process constitutes a number of activities from pre-acquisition to supplier management (Buzzetto, Bauli and Carvalho, 2020). To guarantee the success of each

stage, careful precautions ought to be taken. Buzzetto, Bauli and Carvalho (2020, p.1) define procurement as "the process in a construction project used to create and manage contracts". However, ISO 10845-1:2020 defines procurement as "the process which creates, manages and fulfils contracts relating to the provision of goods, services and engineering and construction works or disposals, or any combination thereof" (ISO, 2020). Studies reviewed all agree that the procurement process ought to be transparent and fair so as to generate equitable outcomes, and to achieve that, strategic procurement activities are needed. According to Buzzetto, Bauli and Carvalho (2020, p.1), a procurement strategy is "one used to take a construction project from its early planning phases to completion and occupation by the users". This shows that procurement processes are based on the nature of project and construction administration by contract administrators.

2.6.1 Project procurement methods

The project delivery methods in construction projects are categorized as design-bid-build (DBB) or design-build (DB) (Eriksson, 2017). In the DBB method, design and production are separated, and the contracting parties go through detailed designs before bringing the contract manager on board for project execution (Eriksson, 2017). The assumption here is that quality can be achieved with a good design; therefore, the focus is on generating a good project design and later executing it. DBB-based contracts are recommended for clients with sufficient expertise and competence who know exactly what they want and how to achieve that. On the contrary, despite the relevance of DBB projects, they limit innovation as, in most cases, already existing formats or guidelines are adopted (Eriksson, 2017). Therefore, there is a likelihood of efficiency being reduced when challenges are faced due to the lack of creativity or innovation, which may hinder the successful implementation of the project.

For DB-based contracts, contractors are involved from the start and participate in the design process as well (Eriksson, 2017). Therefore, there is knowledge exchange between all key parties, which by all means can be advantageous in supplementing each individual's knowledge and coming out with good project designs. Additionally, contractors have the capacity to start executing the project while the designing progress is still in process and modify it as required based on how the project is implemented (Eriksson, 2017). This could be time-saving, although

in instances when the contractor does not figure all of it out on time, the whole project could be jeopardized. On the other hand, clients' interests are often neglected and thus the outcomes may not meet their expectations (Eriksson, 2017). However, Eriksson (2017) recommends DB-based contracts because they allow for innovation, and with good procurement, they are moderately cheaper to execute with a good bargain and in a limited timeframe. This study also agrees with the notion of Eriksson (2017) of adopting DB contracts, although it recommends that clients should be involved in all the stages as well so that their expectations are met. Buzzetto, Bauli and Carvalho (2020) refer to the procurement methods as general contracting, which in this case is the DBB method defined by Eriksson (2017) and then the Design and build method, which in this case is the DB method. Figure 2.8 illustrates the aims of both methods, their advantage and potential risks. It is important to note that one of the threats of using both methods is that they may become cost-intensive; however, with proper and early planning, that can be controlled.

Method	General Goals	Utilization conditions and advantages	Possible risks
General contracting	Design and construction developed separately by a design team and a contractor.	- High degree of certainty. - Quality increase. - Construction under a detail project design.	-Depends on constraints and uncertainty levels: Cost, time, omissions, extra works, quality.
Design and build	Design and construction developed by the contractor	- Maximum price guaranteed; - Scope, functionality and quality are specified. - Recommended for high level uncertainty	- Higher costs than in the competitive market; - Quality of project design; - Omissions and Project conclusion; - Initial time could delay final project,

Figure 2. 8: Project procurement methods

Source: Buzzetto, Bauli and Carvalho (2020)

2.6.2 Significance of procurement strategies

Reviewed literature shows that construction projects heavily rely on the presence of supplies, such as raw materials and equipment, which constitute the most significant portion of construction operations (Ershadi, Jefferies, Davis and Mojtahedi, 2021). Therefore, irrespective of the size of the construction project, procurement strategies come in handy to guarantee the effectiveness and efficiency of construction projects. In PPPs, procurement strategies that are aligned with the priorities of the public and private stakeholder interests are important to ensure harmony during the implementation of the project. However, it has been noted that most sustainable procurement strategies are within the public sector (Ershadi, Jefferies, Davis and Mojtahedi, 2021). While this is a concern, it ceases to be a big threat to the successful execution of construction projects in PPPs because all parties can voice their interests and expectations. It

is also observed that the more complex a particular construction project is, the more complex its procurement strategy will be because the right procurement strategy is dependent on the nature of the project (Linnartz et al., 2021). Similarly, in cases where contracted parties are actively running many projects at the same time, the procurement process becomes more complicated, and production may be slow due to competing interests. A good procurement strategy also addresses the challenge of supply risks which can greatly affect any construction project (Linnartz et al., 2021).

To throw more light on the relevance of having procurement strategies in construction projects, it is argued that the strategic approach taken towards procurement determines whether a construction project will be successful or not in the future (Saminu, 2016). This implies that a good procurement strategy is one where the procurement route chosen aligns with the goals and available resources for the execution of a given project. In instances where it fails to meet any of the above, then the construction project is most likely to be unsuccessful. This does not mean that the project will collapse or turn out to be substandard. Those are some of the possible likelihoods. The overall implication is that some performance indicators will not be met, and therefore, as per the parameters defined for performance, the project will score low. Therefore, procurement strategies facilitate contracting parties to focus on priority issues that are necessary for the nature of their projects (Saminu, 2016).

2.6.3 Factors to consider when choosing a procurement strategy

According to Saminu (2016), the best procurement strategy is one that pays attention to the clients' expectations, maintains a good relationship between the contracting parties and all relevant stakeholders, accounts for possible threats that may have to be navigated, provides for documenting the obligations of each party involved and their required commitments and provides mechanisms for grievance handling. Saminu (2016, p.2) also observes that "the procurement route should identify the method of accomplishing the objective of the project, good value for the investment and the benefit to be derived from the investment bearing in mind the risk and constrain which have direct impact to the cash floor for the project". In short, the procurement route is like a framework which provides for how procurement decisions should be undertaken for the benefit of the entire construction project. On the other hand, a distinction is

provided between a procurement route and a procurement strategy. While the procurement route lays out the path to be followed, the procurement strategy shows the procurement drivers, objectives, structure, scope, stakeholders involved and the expected responsibilities and commitments from each involved party (Saminu, 2016). Therefore, it can be deduced that the procurement route largely depends on the procurement strategy chosen. If the procurement strategy chosen is not representative of the project to be undertaken, then the procurement route will be based on wrong parameters and thus stoop low of performance expectations. This implies that attention should be given to the procurement strategy before choosing a procurement route.

Other factors to consider when choosing a procurement strategy include the objectives of the project, constraints identified and anticipated, potential threats or risks in executing the project and the project's complexity (Saminu, 2016). Project objectives differ depending on different dimensions. If a project is aimed at performing renovations, then its objectives are different from one constructing a road in a place without roads or building a bridge where there has been no bridge before. Therefore, the project objectives are derived from the nature of the project (Saminu, 2016).

It is also important to recognise that the nature of the project will influence the time spent on a particular project, its costs and potential threats. For example, constructing a road may require the displacement or relocation of some people, while repairing a road will require halting traffic in that particular section. When it comes to identified constraints, these are often associated with resources such as time, human resources and available funds. If resources are adequate then the project will flow smoothly while if they are not, constraints are likely to be faced, such as with quality and time taken to execute the project. Furthermore, potential threats may be known or unknown however; they pose a threat to project delivery (Saminu, 2016). It is thus important to account for such risks to ensure that even in their presence, project execution is able to keep running smoothly. Lastly, the complexity of the project is associated with the size of the contract, the available time provided to execute the project, the quantity of work to be done, and the mode of operation based on materials and equipment (Saminu, 2016). There is no general strategy that can be adopted for all projects; therefore, paying attention to their complexity is important

because the more complex a project is, the more needs it requires and therefore, extra attention ought to be provided to ensure that all features of the nature of the project are considered.

2.7 Management of construction contracts

Contracts are an integral part of construction projects, and thus their management is vital for the successful execution of these projects (Pillai and Adavi, 2013). The whole contract management process is interfaced with various uncertainties, which makes it risky; therefore, due diligence is required in contract management. Some of the factors that may affect the management of construction contracts include poor communication, provision of inadequate information, poor delegation, corruption behaviours, delays in decision-making and resource constraints (Pillai and Adavi, 2013). Therefore, when planning for construction projects, these factors have to be considered to enable proper management of construction works. Pillai and Adavi (2013) stress the importance of proper contract management as it is an enabler of good performance, resource optimization, cost-effectiveness, quality work and timely delivery of projects.

On the other hand, du Plessis and Oosthuizen (2018) emphasize that contract management is dependent on the nature of a project. The nature of a project defines which agreements are to be made and which decisions are to be undertaken. However, irrespective of the nature of the project, it is agreed that good management is required to facilitate the successful execution and completion of construction projects (du Plessis and Oosthuizen, 2018).

In the management of contracts, contract managers are expected to have an awareness of given parameters. These are stipulated as knowledge of the size and details of the construction projects; the correlation between the construction techniques and construction principles; relevant inspection systems as per the professional standards of operation; the correlation between quality and construction value and the extent of consistency between patterns, item preparations and examinations (Kongsong, 2017). Kongsong (2017) provides a detailed analysis of some of the issues that affect the management of construction contracts. These include:

- Legislative framework and regulations: In instances where regulations are very stringent and contractors have to go through long tedious processes to access approval to execute their projects, management of the projects becomes a challenge because a lot of time is

spent on getting things right. In other instances, the regulations are conflicting and confusing and thus hard to follow (Kongsong, 2017).

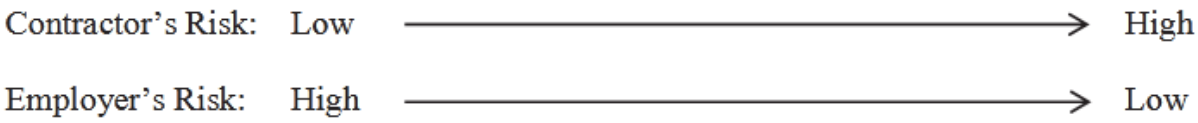
- Contract documentation: Documentation is very important for contracts; however, where there are conflicts in contract documentation or if the documentation is poor, then the management of construction projects will be affected (Kongsong, 2017).
- Incompetence: When the assigned managers are incompetent or lack the necessary qualifications, experience and credentials, then they may not be good managers and thus will not ably manage the construction projects well (Kongsong, 2017).
- Limited Resources: Managing complex projects with resource constraints is a big challenge and can hinder proper management even if all protocols are followed or even if the managers are competent enough to manage the projects (Kongsong, 2017).

2.7.1 Types of construction contracts

It is argued that the choice of a contract type involves a trade-off in terms of risk allocation and costs (Chakravarty and MacLeod, 2006). Antoniou, Aretoulis, Konstantinidis and Kalfakakou (2013) propound that selecting contract types depends on one's intuition, experience or knowledge. According to Calderón (2017), construction contracts are divided into "lump-sum contracts, target-cost contracts and cost-reimbursable/cost-plus contracts". The contract types are representative of the risk possessed by the contracting parties. In lump-sum contracts, the contractor works for the determined fixed price, and the risk is shifted to the contractor (Calderón, 2017). This implies that the profitability levels for the contracting firm depend on how well risk and costs are managed. While working for a fixed price may seem lucrative, on one end, it may foster unethical behaviours such as purchasing cheap, poor-quality supplies to increase the profit margins resulting in jeopardizing the quality of the overall construction project. For target-cost contracts, the risk is shared by all contracting parties; however, the employer reimburses the contractor for the allowed costs incurred (Calderón, 2017). In cases of disallowed costs, the contractor may have to incur them individually since they are not accounted for. Despite this, the contractor has a fixed or viable fee to which they are entitled for their services (Calderón, 2017).

The applicability of target-cost contracts depends on how fair risks are distributed and the agreed payouts to the contractors. If the sharing agreements are unfair, then contractors will be de-motivated and compromise on their performance, unlike if they are fair. Lastly, the cost-plus contracts provide for the reimbursement of allowed costs to the contractor. The risks here are borne by the employer, and therefore, the contractor may hike their expenses to claim more funds (Calderón, 2017). From these reports, it can be deduced that contractors aim at cutting costs to gain more profits in lump-sum contracts, while for cost-plus contracts, contractors are most likely to increase actual costs to gain more (Calderón, 2017).

Decisions on the type of contract choice depend on a series of parameters. For example, lump-sum contracts work best in instances where the employer has a high degree of control and would like to exert that control to achieve their objectives, while in target-cost and cost-plus contracts, all contracting parties collaborate with each other to meet mutual goals and objectives (Calderón, 2017). Additionally, lump-sum contracts are ideal in instances where designs are clear and fully documented because the contracts are not flexible, while designs in cost-plus contracts and target contracts can be altered. In fact, construction can commence under a cost-plus contract before a design is drawn (Calderón, 2017). Furthermore, due to the nature of lump-sum contracts, employers do not have to be fully involved since everything is fixed from the beginning, unlike target-cost and cost-plus contracts (Calderón, 2017). Antoniou, Aretoulis, Konstantinidis and Kalfakakou (2013) show the association or risk allocation with the type of contracts in figure 2.9 below:



Cost-Plus-Percentage of Cost (CPPC)	Cost-Plus-Fixed-Fee (CPFF)	Cost-Plus-Incentive Fee (CPIF)	Fixed-Price Incentive (FPI)	Firm-Fixed Price (FFP)
Cost-plus		*Target-cost*		*Lump-sum*

Figure 2. 9: Illustration of risk and construction contract types

Source: Antoniou, Aretoulis, Konstantinidis and Kalfakakou (2013)

From Figure 2.9, it is clear that contractors possess low risk in cost-plus contracts, moderate risk in target-cost contracts and high risk in lump-sum contracts, while employers possess high risk in cost-plus contracts, moderate risk in target-cost contracts and low risk in lump-sum contracts. For the benefit of both contracting parties, this study agrees with target-cost contracts, which have a moderate level of risk allocation so that in the presence of uncertainty, no party is severely affected compared to the other. It also fosters good relationships and harmony among the contracting parties involved.

Figure 2.9 further defines the differences between cost-plus contracts and Fixed – Price contracts.

Table 2. 1 : Comparison between cost-plus contracts and lump-sum contracts

Elements of Comparison	**Fixed – Price Contract**	**Cost-Plus Contract**
Risk Allocation inclination	Contractor	Client
Quality Incentives	Less	More
Client Administration	Less	More
The contract is good to minimise	Costs	Schedule
Effort on documentation	More	Less
Flexibility for Change	Less	More
Adversarial Relationship	More	Less

Source: Antoniou, Aretoulis, Konstantinidis and Kalfakakou (2013)

Table 2.1 shows that in fixed-price contracts, the contractor bears more risk, quality incentives are low, participation from the employer is low, costs are minimized, there is a lot of documentation, flexibility is low and the likelihood of an adversarial is high. This is true because contractors are most likely to jeopardize on quality metrics in order to earn more profits. On the other hand, in cost-plus contracts, the employer bears more risk, quality incentives are high, participation from the employer is high, costs are scheduled, there is less documentation, flexibility is possible and the likelihood of adversarial relationships is low.

Antoniou, Aretoulis, Konstantinidis and Kalfakakou (2013) further provide these definitions for contract types.

Cost plus fixed fee (CPFF) The contractor is reimbursed for all audited costs & paid a fixed amount for the his services.
Cost plus percentage fee (CPPF) The contractor is reimbursed for all audited costs & paid an additional percentage fee.
Cost plus incentive fee (CPIF) All justified costs are paid. Final fee depends on actual compared to target cost, delivery and/or performance achievements.
Incentive/ Disincentive for time reduction (ID/T) The contractor is paid in addition to the agreed payment method a bonus (incentive fee) if the project is completed earlier and pays a penalty (disincentive fee) if it is completed after.
Fixed price incentive (FPI) The contractor is paid actual costs and an agreed upon fee but guarantees a maximum total cost.
Lump sum / fixed price (LSFP) The client pays a fixed price to the contractor irrespective of the actual cost.
Unit price method (UPM) The contractor commits to fixed prices for pre-specified units of work items. Payment is the sum-product of the unit prices and the units used.

Figure 2. 10: Definitions of Contract Types

Source: Antoniou, Aretoulis, Konstantinidis and Kalfakakou (2013)

2.7.2 Standard forms of construction contracts

Contracts are standardized to facilitate contractual agreements between contracting parties (Hossain, 2017). The construction industry commonly uses standardized documents with already-made terms and conditions that are only modified to fit into the context of a given project because it takes a lot of time to develop contract agreements from scratch. Therefore, standardized contract documents are cheap and can apply to different geographical settings as well due to their standardization. Additionally, they facilitate contracting parties to use agreements they are familiar to. These agreements contain the "general obligations, provisions for instructions, payment arrangements, insurances and contract liabilities, quality control, disputes resolution, responsibilities of engineers, and delays, completion and extension of time" (Hossain, 2017, p.30). Another advantage of standardized contracts is that they can be adopted as they are without any modifications. Clients are faced with the challenge of choosing between different standardized contracts for their projects, and whichever form they choose has an impact on the execution of their construction projects. This study reviews four forms of construction contracts which are commonly used, as elaborated below:

i. International Federation of Consulting Engineers (FIDIC)

FIDIC is globally known as a producer of standard contract forms for civil construction, mechanical and electrical works (Hossain, 2017). Its contract forms constitute the: i) Red Book which can be used for any type of project where the employer is in charge of the design process.

In this case, contractors conduct works based on designs provided to them; ii) Yellow Book which is suitable for projects where the contractor is in charge of the design process; iii) Silver Book which is suitable for turnkey projects where the contractor has the responsibility for the design process; and iv) the Green Book which is suitable for small projects of short duration involving simple tasks (Hossain, 2017). FIDIC contracts are common where there are invitations for bids to tender.

ii. Joint Building Contracts Committee (JBCC)

The JBCC contracts are common in the building construction processes and aim at ensuring good practice and fair risk distribution (Hossain, 2017). It constitutes a series of documents which can only work in whole and not individually. Additionally, the Principal Building Agreement, which is the main component of the JBBC contract form, constitutes nine sections which span from basic definitions and frequently used phrases to a schedule of variables for completing the agreement (Hossain, 2017). Public sector construction projects often use the JBBC standard contract forms (Hossain, 2017).

iii. General Conditions of Contract for Construction Works (GCC)

This contract provides for time risk allowances in construction agreements on behalf of contractors (Hossain, 2017). The contracts give contractors the authority to suspend works if the contracting entity dishonours payment obligations as well. It also provides for potential inflation indices to cover future inflation risks so as not to affect the progress of construction works (Hossain, 2017).

iv. New Engineering Contract (NEC)

The NEC is a multidisciplinary set of contract standards used for construction and engineering works (Hossain, 2017). It aims at fostering good contractual relationships and can be applied to various commercial transactions across different disciplines. Additionally, it constitutes simple documents written in simple languages for easy comprehension (Hossain, 2017). The NEC standards are applicable in both the public and private sectors, as well as PPPs and can be used for works spanning from "civil works, commercial construction works, infrastructure, facility management, and purchasing and supply" (Hossain, 2017, p.33). Calderón (2017) notes that the

commonly used standards are NEC3 (New Engineering Contract, Third Edition) and FIDIC, although NEC3 is considered to be more flexible, easy to understand and clear (Calderón, 2017). Within the NEC3 framework, there are other contracts, such as the Engineering and Construction Contract, the Engineering and Construction Subcontract and the Engineering and Construction Short Contract (Calderón, 2017).

2.8 Risk management in construction projects

Construction projects are exposed to a couple of risks that impede their expected performance (Nketekete, Emuze and Smallwood, 2017). These risks may be known or unknown but have the capacity to affect expected deliveries, costs, quality and place time constraints on the project. To address these risks, a robust risk management strategy is needed. Without a sound risk management plan, construction projects are prone to fail due to risks that can be managed. In fact, it has been reported that the failure rates of construction projects in Africa have escalated to 90% in the past decade (Nketekete, Emuze and Smallwood, 2017). Thus, risk management efforts are needed to minimise construction project failure rates. Unfortunately, most of the risks that affect construction projects are known risks (Nketekete, Emuze and Smallwood, 2017). Therefore, a deliberate or ignorant approach is being taken by project or construction managers who undermine the potential impact of these risks. To throw more light on this, there is no construction project which is risk-free; therefore, by all means, risk management should be considered.

There are several strategies through which risk can be managed. Risk can be shared, transferred, rejected or accepted (Bahamid and Doh, 2017). Each decision is based on the magnitude of impact expected if the risk occurs. This constitutes analyzing each risk and developing proper strategies to mitigate the risks. Throughout the project life cycle, risk should be planned for, monitored, controlled and evaluated to be able to manage any potential threats and exploit any available opportunities. Despite the differences in the approaches that can be selected to manage risk, the goal remains the same: to mitigate risk to enhance the success rate of a given project. However, Bahamid and Doh (2017) argue that risk management is infamous in the construction industry despite its relevance. The study further proposes three risk management stages: "risk response, risk analysis and evaluation, and risk identification". The study further defines risk as

"exposure to loss/gain or the likelihood of an event of loss/gain multiplied by its corresponding magnitude". In construction, risks can either be known or unknown. Known risks are those that have already been analyzed and thus obtaining a systematic approach to manage them is possible, while for unknown risks, since they have not yet been analyzed or identified, it is impossible to have a risk management strategy for them. Thus, in construction management, having a good understanding of all possible risks is vital for the success of a given construction project (Bahamid and Doh, 2017). This does not mean that all risks can be managed; however, there is a high likelihood that vital risks with very negative effects will be mitigated earlier enough. Bahamid and Doh (2017) observe that the goal of having a risk management strategy is not to eliminate all risks entirely but to produce a framework or guidelines under which risks will be managed.

Okate and Kakade (2019) recognise that road construction projects are naturally risky due to their complexity and the parties involved. Therefore, the occurrence of risk in a road construction project may pose significant challenges, most especially those to do with delays. Thus, construction managers must understand potential risks during the planning phase to design a framework under which these risks will be managed and enhance the project's performance in meeting the agreed expectations. This means that construction managers require real-time and reliable data about their project's environment to facilitate them in early detection of risks and guide them in coming up with appropriate strategies (Gain and Mishra, 2021). This calls for a selection of appropriate standards for managing risks within the agreed conditions and desired quality of the project. Without this, there are most likely to be delays in road construction projects which may not only have an impact on the contractor and project owner, but also the society since road projects are, in most cases, associated with social impact in the society (Nurdiana, Susanti and Suwarto, 2018). In the words of Gain and Mishra (2021:6), "risk management determines the success and failure of the project". Figure 2.11 shows some of the mechanisms adopted to detect risks in construction projects in developing economies.

Techniques	Description
Checklists	Know potential points that can fail in previous projects and thus is very helpful in risk identification. This allows project managers to know the risks present and makes them to be involved in the process of risk identification, which will ultimately lead to greater acceptance of any means implemented to minimize the risks.
Interviews with experts	Historical data analysis for projects that appear similar and examine similar past or present projects, risk analysis, lessons learned or project evaluations are other methods available for getting feedback about risks involved in a project.
Past experience	Checking historical data of past projects that are similar can only be useful in a limited number of conditions. Such systems are most often restricted in terms of their usability or important data that are stored.
Brainstorming	Can be of use for projects involving new risks, new management arrangements or for developing initial checklists. This may be useful in risk management workshops.

Figure 2. 11: Ways of identifying risks in construction projects in developing economies

Source: Gain and Mishra (2021)

2.9 Project supervision, monitoring and control

Construction projects require effective supervision, monitoring and control to ensure their effectiveness and efficiency (Zhang, 2016). Through supervision, construction managers can obtain real-time information about their projects, which they can exploit to increase their efficiency. Supervision may come through ensuring that human resources execute their duties, the right duties are performed at a given time, safety measures are available and adhered to, all compliance requirements are adhered to, amongst other parameters (Zhang, 2016). In this case, supervision covers security risks, project risks and any possible deviations that may affect the likelihood of the success of a given project. It can also constitute investigating probable threats or dangers (Zhang, 2016).

Aiyetan and Das (2022) propound that high-quality supervision and monitoring are the backbone to construction productivity, efficiency and quality works. The study recognizes that one of the causes of delays in construction works and shoddy work is due to poor supervision and monitoring. With an effective strategy that provides a high level of supervision and monitoring, by all means, it is unlikely for a project to go wrong. Aiyetan and Das (2022) further emphasize

that construction productivity results from adequate supervision and supervisors' competence. On the other hand, monitoring deals with regularly and systematically collecting, analysing and reporting information about a project's inputs, outputs, outcomes and impacts (Ayebare, 2019). Monitoring is thus a tool used to improve the efficiency and effectiveness of a project as it provides managers with an overview of a project's progress. In this regard, construction managers are able to track project work, evaluate it and identify probable risks with the potential to affect the project (Ayebare, 2019).

Monitoring is perceived as an internal function which involves "establishing indicators, setting up systems to collect information, collecting and recording and analysing information, and using the information to inform day-to-day management" (Ayebare, 2019). According to Byaruhanga and Basheka (2017), "there is a positive significant relationship between contractor monitoring and performance of road infrastructure projects". This implies that in instances without monitoring or limiting monitoring activities, the performance of road infrastructure projects will be affected. This notion concurs with findings that have linked effective contract monitoring systems to quality road construction projects.

Adebayo, Eniowo and Ogunjobi (2018) observe that monitoring and control are vital in construction management and delivery. Thus, construction managers must incorporate them to meet their project objectives. This means that the core focus of monitoring and control is to ensure that all goes according to plan and in case discrepancies are identified, they are easily handled or managed. In the words of Adebayo, Eniowo and Ogunjobi (2018:2), "project monitoring and control systems work to minimize deviations from project plans". Given that the construction industry is vital in the development of societies, it is thus relevant for construction managers to ensure that they have the appropriate monitoring and control systems to ensure that their projects are a success.

2.9.1 Quality control

Quality control refers to preventive efforts to anticipate quality degradation and procedural errors (Dharsono, 2021). To assess quality, monitoring is needed since it provides a framework for analyzing the performance of a given project. On the contrary, quality control efforts are

preventive and therefore, they are conducted before quality errors arise since their purpose is to ensure that errors related to quality do not present themselves (Dharsono, 2021). This shows how significant the process of quality control is. Since construction development is usually based on time, cost and quality, the process of quality control is focused on ensuring that projects are delivered on time, within the allocated budget and with the desired quality (Dharsono, 2021). Topchiy, Shatrova and Yurgaytis (2018) posit that quality control provides mechanisms for tracking the technological sequence of construction. In some projects, quality control forms are provided for construction managers to use as benchmarks to evaluate the quality of their projects (Topchiy, Shatrova and Yurgaytis, 2018).

Under the key concepts of control, Adebayo, Eniowo and Ogunjobi (2018) recommend that under the construct of time control, Gantt charts can be used to analyze the activities on the critical path, those on free float or those with less than a specified float and monitoring actions can be taken to control these activities to avoid delay. Suppose an activity is likely to cause delay and it is on the critical path. In that case, delay can be avoided by increasing resource allocations, improving resource efficiency and employing mechanisms to reduce critical path timescales such as working overtime (Adebayo, Eniowo and Ogunjobi, 2018).

On the issue of cost control, construction managers ought to have a cost control system that guides resource allocations, ensures resources are used as required, provides responsibilities for all those in charge of handling resources and checks that the project's activities are within the approved budget (Adebayo, Eniowo and Ogunjobi, 2018). Lastly, quality control is impacted by the project life cycle and therefore it should be handled within the project's environment. However, it is important to note that dynamic changes within the project environment may likely influence the project implementation process and thus heighten risk. Therefore, alternative quality control methods have to be designed to be used in case initial quality control methods do not work (Adebayo, Eniowo and Ogunjobi, 2018). These alternative methods should consider "monitoring and forecasting key factors that generate change to ensure good results, ensure that change is beneficial, request for change to be checked by suitable people before being approved, implement change and monitor the process once approved and record all implemented changes in project documentation" (Adebayo, Eniowo and Ogunjobi, 2018).

2.10 Uganda's road construction industry

2.10.1 Summary of Uganda

Uganda's Vision 2040 aspires to transform its country from a peasant one to a modern and prosperous one with a per capita income of roughly USD 9,500 (Infrastructures & Cities for Economic Development (ICED), 2019). Among the key priorities considered by both Vision 2040 and the National Development Plan (NDPII) is the construction sector. These frameworks call for increasing the paved road network, increasing access rail freight among others. The construction sector is seen as vital to enhancing economic and human productivity and service delivery generally. ICED (2019) quotes some illustrations UNRA (2017) which illustrate the road network and electricity distribution network in Uganda as seen below.

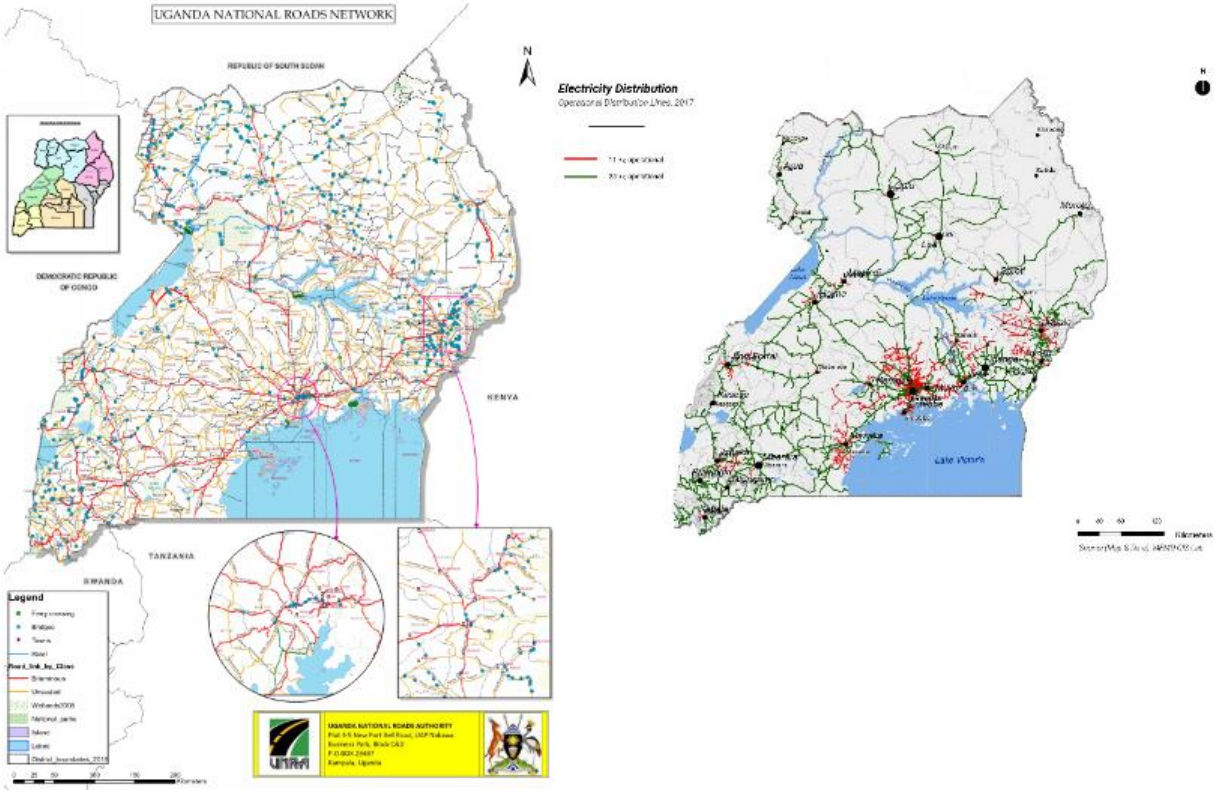


Figure 2. 12: Uganda national roads network

Source: ICED (2019)

The first figure shows the quantity of paved roads (4,500km) as of 2017 while the next shows the electricity distribution network. Under Vision 2040, there are plans to double these statistics. Efforts are already underway to ensure that this comes into existence by heavily investing in

roads, dams and the oil and gas sector. There is also a motion to enact a Uganda Construction Industry Commission (UCICO) to coordinate and monitor Uganda's construction sector, although currently, UNRA is the main implementing agency, particularly in Uganda's road sector. Figure 2.13 shows the most recent published information on Uganda's national road network published by UNRA (2022).

UGANDA NATIONAL ROADS NETWORK

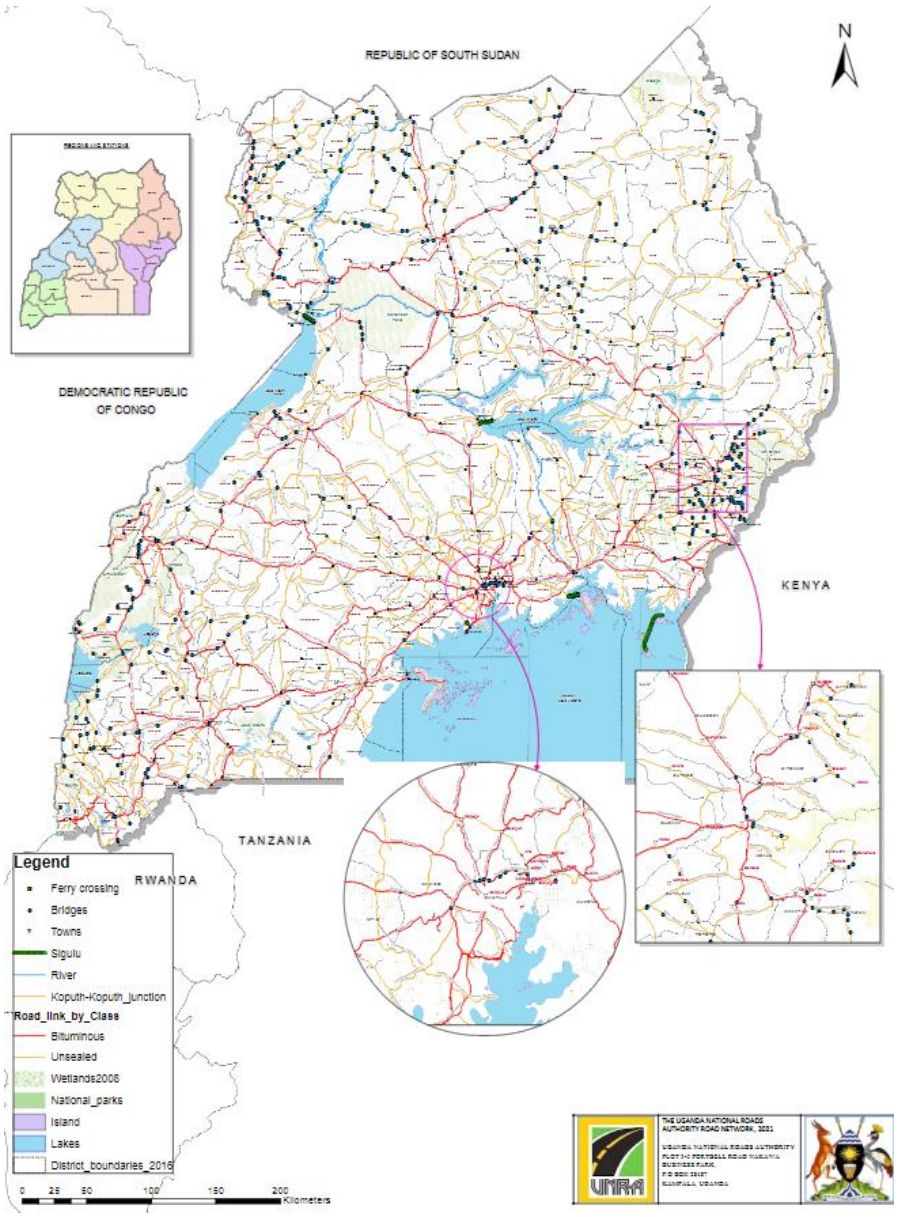


Figure 2. 13: Uganda national roads network

Source: UNRA (2022)

2.10.2 An Overview of Uganda's construction industry

On a global scale, the construction industry is one of the most influential sectors that significantly contributes to economies' GDP (International Labour Organization (ILO), 2019). Apart from that, it is also a key employer providing employment opportunities to more than 220 million around the globe (ILO, 2019). The probable employment opportunities are taken up by contractors, consultants, investors, suppliers, insurers, accountants, engineers, among other key personnel. In developing countries, it has been reported that the construction industry roughly contributes 5-9% to their GDP and it also provides both backward and forward linkages in the economy. Due to its key position in a country, it is governed by numerous laws or regulations that provide frameworks for financing, contracts, procurement, ethics, ownership, imports, licensing, and labour laws, among others (ILO, 2019). As an industry, it is set apart by the large demand for its services, variance in construction demands, duration of projects, and the numerous stakeholders involved in a given project. Figure 2.14 represents the contribution of the construction industry to GDP's of different economies. The focus of this study is Sub-Saharan Africa, which hosts Uganda.

Region	Value added in construction (% of GDP)
South Asia	6.2
Latin America and Caribbean	6.1
East Asia and Pacific (excl. China)	5.7
Sub-Saharan Africa	4.4
Europe	5.1
Total (108 countries)	5.6

Figure 2. 14: Contribution of the construction industry to the GDPs of different regions

Source: ILO (2019)

It is important to note that despite the low rate of contribution of the construction industry in Sub-Saharan Africa as seen above, the construction sector in Sub-Saharan Africa is generally still young and not comparable to other economies; however, the fact that the margin of

difference is negligible shows the untapped potential of the construction sector.

In Uganda, the construction industry is composed of civil engineering and building works, which develops or builds the country's physical infrastructure (Office of the Auditor General (OAG), 2015). The Uganda National Bureau of Statistics (UBOS) defines the construction sector as "a sector covering activities that include 'construction of buildings, civil engineering and specialized construction activities', with examples of the latter being 'plumbing, heat and air conditioning installations, plastering and glazing, activities related to clearing of building sites, demolition of wreckage of buildings and repair of buildings'" (UBOS, 2011). The government has increased its efforts to develop the country's physical infrastructure by promoting PPPs. As of the financial year ended 2012/13, Uganda's construction sector grew by 8.2% compared to 3.2% in the previous financial year, making it one of the fastest-growing sectors in the economy (OAG, 2015).

The Ministry of Works and Transport is mandated to supervise and regulate the construction sector in Uganda. Some of its duties include developing laws, policies and procedures to ensure proper coordination and monitoring of all stakeholders in the construction industry (OAG, 2015). On the other hand, the increased focus on the oil and gas sector has also resulted in an increase in infrastructure development in Uganda as the construction sector strives to respond to the demand surges (Colonnelli and Ntungire, 2018).

Given that the construction sector provides the foundation for the development of infrastructure, there is no doubt that it is a direct multiplier to all other sectors of the economy as they depend on infrastructure. UBOS (2018) estimates that the construction industry contributed 7% to Uganda's GDP in 2018 and has registered remarkable growth over the years, making it one of the fastest-growing sectors in the country (Colonnelli and Ntungire, 2018). The expectation of large revenues from the exploitation of Uganda's oil reserves has pushed the demand for public infrastructure development (Ogwang and Vanclay, 2021). These developments require substantial funding, which the Government of Uganda (GoU) does not actually have since, to meet its infrastructure development needs, the country needs over USD $1.4 billion per year. Uganda's construction projects are thus mostly based on debt financing or are delayed until

resources are acquired (Ogwang and Vanclay, 2021). Of late, international construction firms, such as the Chinese, offer partnerships in exchange for natural resources (Ogwang and Vanclay, 2021). It is undeniable that Uganda's infrastructure demand is overwhelming, and due to the urgency of infrastructure development, most of the mega projects have been left for international firms, with Chinese firms taking the lead in most of the construction activity in the country (Ogwang and Vanclay, 2021). China's Export-Import Bank of China (China Exim Bank) and the China Development Bank are now recognized as the most significant financiers of infrastructure development not only in Uganda but across Africa (Ogwang and Vanclay, 2021).

Despite the significance of the construction sector in Uganda, it is interfaced with numerous bottlenecks that limit its productivity. The challenges span from barriers to access finance, endemic corruption, among others. While several steps can be taken to change the narrative, the industry is largely opaque and provides limited information except for mega projects which makes it hard to contribute to policy conversations. Despite that, this study argues that proper contract administration is one of the strides that can be undertaken to enhance the construction industry's performance in Uganda, particularly the road sector. It seeks to provide a rich assessment of this topic. Figure 2.15 shows the trend of contribution of Uganda's construction industry to the GDP over the years.

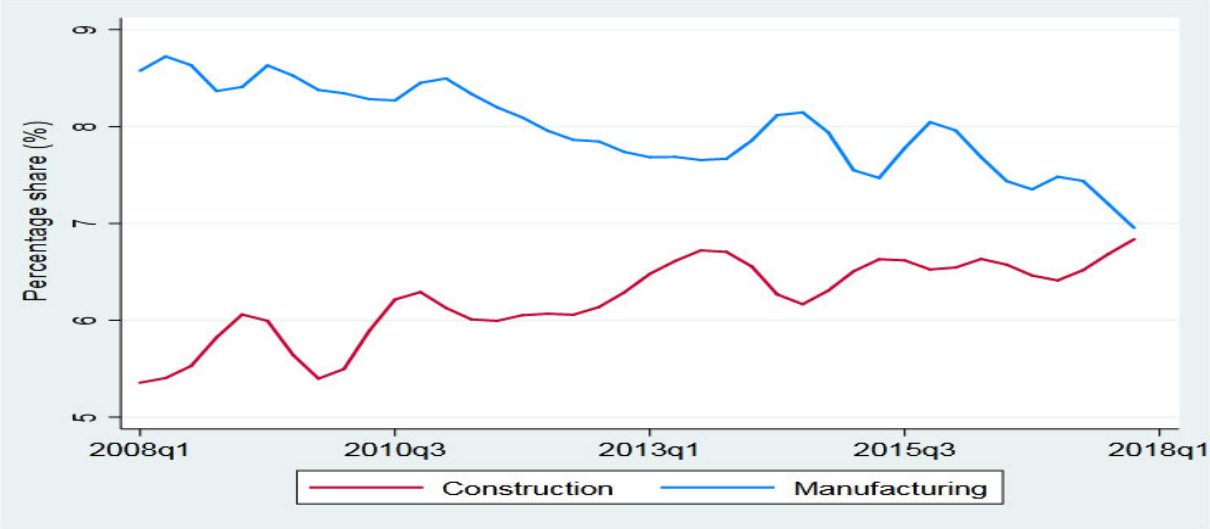


Figure 2. 15: Contribution of Uganda's construction industry to the GDP

Source: Colonnelli and Ntungire (2018)

Figure 2.16 shows the relationship between different actors in Uganda's road construction sector.

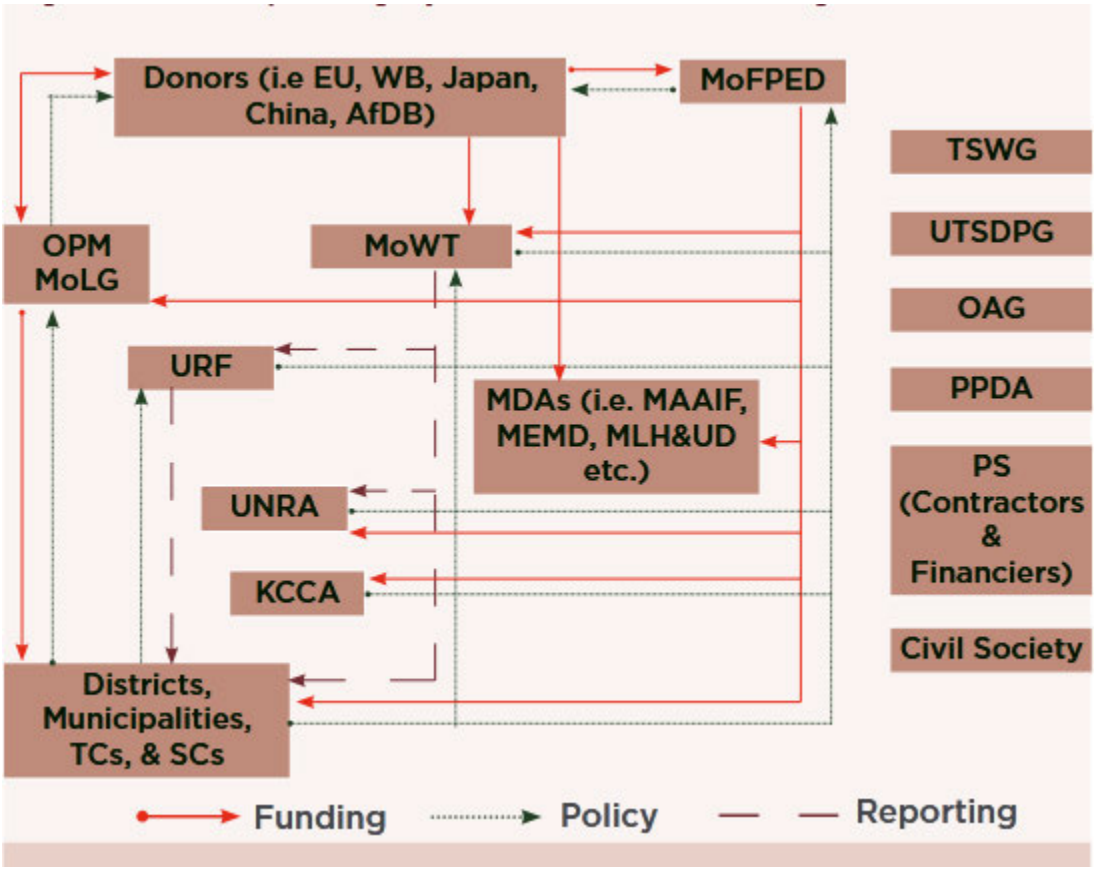


Figure 2. 16: Relationship between different actors in Uganda's road construction sector

Source: Ggoobi, Lukwago and Bogere, 2020

It is reported that Uganda's road sector falls under the "Works and Transport Sector under the Ministry of Works and Transport (MoWT), which is the body provided with the mandate of supervising and regulating Uganda's construction sector. Apart from MoWT, other key implementing plays include the Uganda National Roads Authority (UNRA), the Uganda Road Fund (URF), the Kampala Capital City Authority (KCCA) and Local Governments (LGs). Outside these institutions, other key bodies include the Office of the Prime Minister (OPM), the Ministry of Local Government (MoLG), the Ministry of Land, Housing and Urban Development (MoLHUD), the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF), the Ministry of Education and Sports, the National Forestry Authority (NFA), the Ministry of Energy and Mineral Development (MoEMD) and other Public Universities" (Ggoobi, Lukwago and Bogere,

2020). The strategic vision for the roads construction sector is captured in the regulatory framework for roads in Uganda, with the major laws and policies including the: "Roads Act 2019; UNRA Act 2008; URF Act 2010; Local Government Act 1997; Land Act 1998; Physical Planning Act 2010; KCCA Act 2010; Vision 2040; National Development Plan (NDP III); National Land Policy; and Urban Physical Plans" (Ggoobi, Lukwago and Bogere, 2020). It is reported that contradictions and ambiguities cloud these legislations and thus it is hard to differentiate the duties and obligations of the actors involved. For instance, while the Roads Act 2019 repealed some legislations, some of the other legislations still have the repealed legislations in force. The roads sector in Uganda has participants from both the private sector and public sector. Unfortunately, most mega projects are handled by international firms who are criticized for slowly edging out local firms (Ogwang and Vanclay, 2021). In fact, it is reported that the contribution of local firms in the roads sector was 30% in 2018, way below the 70% from international players (Ogwang and Vanclay, 2021). Figure 2.17 shows the current NDPII targets for the roads sub-sector.

Critical Indicators	NDPII Baseline 2012/13	NDPII Target 2019/20
Increase in the total paved national road network (Km)	3,795	6,000
Increase in proportion of paved national to total national roads (%)	16.6	25
Increase in proportion of paved urban roads to national roads (%)	3.57	4.29
Increased in paved KCCA roads to total KCCA roads (%)	38.36	46.64

Figure 2. 17: NDP II targets under the roads sub-sector

Source: Ggoobi, Lukwago and Bogere, 2020

2.10.3 Performance of Uganda's road sector

Performance refers to achieving a task based on the approved parameters set to measure performance or, in other words, performance standards (Muzaale, Auriacombe and Byaruhanga, 2018). Different indicators are used to measure project performance but in the road construction sector, time, cost and quality are the main parameters. Other projects consider client satisfaction

and investment return, among other factors. From the perspective of the road construction sector, performance measurement is looked at in the angle of the contractor, project owner and road user (Seninde, Muhwezi and Acai, 2021). This means that performance indicators may differ based on the actors involved. For example, the contractor's performance indicator may be investment return, while for the project owner, minimizing costs. On the other hand, road users will care about the quality of the road. This implies that balanced parameters have to be considered for measuring performance to fill the needs of all parties involved. Figure 2.18 below shows the annual roads construction productivity in Uganda.

Year	NDP II expected Annual Av. Rate (Km)	Actual Km Equiv. Achieved	Deficit (Km)
2015/16	520	300	-220
2016/17	520	310	-210
2017/18	520	305	-215
2018/19	521	400	-121
Average	520	329	

Figure 2. 18: Annual construction productivity in the roads construction sector in Uganda

Source: Ggoobi, Lukwago and Bogere, 2020

2.10.3.1 Factors affecting the performance of the road construction sector

A large body of knowledge reports the different challenges faced in Uganda's road sector. Seninde, Muhwezi and Acai (2021) summarize these challenges into shortages or inadequacies of resources and supplies. Other challenges highlighted include poor budget allocations, time constraints, poor designs, incompetent staff and site related challenges. Management is also considered a key issue which hampers the successful execution of road construction projects (Seninde, Muhwezi and Acai, 2021). Abarinda, Kibwami and Tutesigensi (2019) observe that the challenges faced in the roads sector in Uganda are not any different from those faced elsewhere. These challenges include high production costs, delays, shoddy works and low innovation. In some instances, there is wastage or underutilization of resources, all which negatively affect project performance. The study also reports that UNRA still faces inefficiencies in procurement and construction management, resulting in spikes in time overruns and project costs. Quality, cost and time overruns are considered as the biggest hindrances to successful construction

projects in Uganda (Abarinda, Kibwami and Tutesigensi, 2019). In terms of project financing, Muzaale, Auriacombe and Byaruhanga (2018) reported that payment delays affect road construction projects' performance because they minimize the likelihood of completing them within the designed timeframe and they also have an implication on cost and quality parameters. Some roads in Uganda have been suspended due to a shortage of funds, while others have delayed being completed. Other issues that interfere in road construction projects include delays in procurement and land acquisition which create gaps that prolong the commencement of road construction projects. Another big concern is the failure to adhere to construction schedules. This is prevalent in Uganda's construction industry and results in time overruns due to changes in project scopes.

Figure 2.19 shows factors that influence the performance of the road construction sector as illustrated by Seninde, Muhwezi and Acai (2021).

	Factors Having Impact on Performance	RII	Rank
A	Contract Management Factors	0.993	1
B	Project Stakeholder's Factors	0.886	2
C	Risk Occurrence Factors	0.727	3
D	Procurement Factors	0.624	4
E	Project Financing Factors	0.581	5

Figure 2. 19: Factors influencing the performance of the road construction sector

Source: Seninde, Muhwezi and Acai (2021)

From the illustration, the study ranks the factors as contract management factors, project stakeholder factors, risk occurrence factors, procurement factors and project financing factors. The study further shows sub-factors that influence the performance of road construction projects and ranks them as follows:

A	Procurement Factors	RII	Rank
A1	Pre bid meetings and minutes shared.	0.783	20
A2	Correct identification of the best evaluated bidder	0.883	13
A3	Contract negotiation	0.766	26
A4	Carrying out adequate due diligence	0.884	12
A5	Performance bond and insurances cover maintained.	0.783	20
A6	Administrative Reviews	0.682	34
A7	Under quoting during bidding process to win tenders	0.565	35

B	Contract Management factors	RII	Rank
B1	Inadequate estimation/ Bills of Quantities	0.489	38
B2	Change of scope of Works	0.768	25
B3	Site instructions and Quality control	0.788	19
B4	Effective approval processes/responses	0.907	5
B5	Contract specifications	0.894	10
B6	Site meetings and Management of meetings	0.907	5
B7	Effective decision making	0.900	7
B8	Effective decision making	0.893	10
B9	Design drawings/review	0.823	18
B10	Inadequate geotechnical investigations and hydrological studies	0.348	42
B11	Relocation of existing services (Electricity and water etc.)	0.773	23

Figure 2. 20: Sub-factors that influence the performance of road construction projects

Source: Seninde, Muhwezi and Acai (2021)

The procurement sub-factors are categorized as: "pre-bid meetings and minutes shared, correct identification of the best-evaluated bidder, contract negotiation, carrying out adequate due diligence, performance bond and insurances cover maintained, administrative reviews and under quoting during the bidding process to win tenders". On the other hand, contract management sub-factors are identified as: "inadequate estimation/Bills of Quantities, change of scope of works, site instructions and quality control, effective approval processes/responses, contract specifications, site meetings and management of meetings, effective decision-making, design drawings/review, inadequate geotechnical investigations and hydrological studies and relocation of existing services" (Seninde, Muhwezi and Acai, 2021).

C	Risk occurrence Factors	RII	Rank
C1	Errors in designs	0.743	27
C2	Natural /External risks (Floods/earth quake, technological changes)	0.723	28
C3	Inflation	0.527	36
C4	Government regulations and political factors	0.698	32
C5	Personnel risks (Lack of skills and experience)	0.374	40
C6	Set dates and deadline risks	0.507	37
C7	Insecurity	0.388	39
C8	Political instability	0.780	22
C9	Geopolitical instability (Regional)	0.769	24

Figure 2. 21: Sub-factors that influence the performance of road construction projects

Source: Seninde, Muhwezi and Acai (2021)

The risk occurrence sub-factors include: "errors in designs, natural/external risks, inflation, government regulations and political factors, personnel risks, set dates and deadline risks, insecurity, political instability and geopolitical instability". On the other hand, the project financing sub-factors are highlighted as: "cash flows, availability of funds, timely payment of certificates, lack of equipment, inadequate mobilization of resources, financial discipline of contractors and proper use of advance payment by contractors" (Seninde, Muhwezi and Acai, 2021).

E	Project stakeholders' factors	RII	Rank
E1	Contractors	0.950	1
E2	Consultants	0.931	3
E3	Clients/Owner	0.939	2
E4	External stakeholders	0.705	31
E5	Bankers	0.836	17
E6	Insurers	0.689	33
E7	Project Affected persons (PAPS)	0.919	4
E8	Political Leaders	0.717	29
E9	Community beneficiaries	0.879	14
	RII Base line point	**0.837**	

Figure 2. 22: Sub-factors that influence the performance of road construction projects

Source: Seninde, Muhwezi and Acai (2021)

Lastly, the project stakeholders' sub-factors are identified as: "contractors, consultants, clients/owner, external stakeholders, bankers, insurers, projected affected persons (PAPS), political leaders and community beneficiaries" (Seninde, Muhwezi and Acai, 2021). All these sub-factors fall under the main factors that can influence road construction projects' performance in Uganda. Seninde, Muhwezi and Acai (2021) further report the most significant and impactful factors on the performance of road construction projects in Uganda as shown in Figure 2.23 below. The factors are highlighted as "contractors, clients/owners, consultants, project affected persons and effective approval processes/responses". 80% of these factors lie under Project Stakeholders Factors, while 20% of these factors lie under Contract Management Factors.

S/No	Most influential and impacting factors	Category of factor	RII	Rank
E1	Contractors	Project stakeholders factors	0.950	1
E3	Clients/Owners	Project stakeholders factors	0.939	2
E2	Consultants	Project stakeholders factors	0.931	3
E7	Project affected persons (PAPs)	Project stakeholders factors	0.919	4
B6	Effective approval processes/responses	Contract management factors	0.907	5

Figure 2. 23: Five most influential factors on the performance of road construction projects in Uganda

Source: Seninde, Muhwezi and Acai (2021)

Furthermore, the report provides factors to consider to improve the performance of road construction projects as seen in Figure 2.24 below.

Procurement Factors	RII	Rank
Contract negotiation	0.766	24
Pre bid meetings and minutes shared.	0.783	19
Performance bond and insurances cover maintained.	0.783	19
Correct identification of the best evaluated bidder	**0.883**	**13**
Carrying out adequate due diligence	**0.884**	**12**
Contract Management factors	**RII**	**Rank**
Contractor's ability to Mobilize to site	**0.907**	**5**
Effective approval processes/responses	**0.906**	**6**
Contract specifications	**0.900**	**7**
Site instructions and Quality control	**0.894**	**10**
Site meetings and Management of meetings	**0.894**	**10**
Effective decision making	0.823	17
Design drawings/review	0.788	18
Relocation of existing services (Electricity and water etc.)	0.773	22
Risk occurrence Factors	**RII**	**Rank**
Political instability	0.780	21
Geopolitical instability (Regional)	0.769	23
Errors in designs	0.743	25
Errors in scope details	0.724	26
Natural /External risks (Floods/earth quake, technological changes)	0.723	27
Government regulations and political factors	0.698	29

Figure 2. 24: Factors to improve the performance of road construction projects in Uganda

Source: Seninde, Muhwezi and Acai (2021)

Project Financing factors	RII	Rank
Financial discipline of Contractors	0.717	28
Proper use of Advance payment by Contractors	**0.840**	**16**
Timely payment of certificates	**0.876**	**15**
Cash flows	**0.895**	**8**
Availability of funds	**0.895**	**8**
Project stakeholders' factors	**RII**	**Rank**
Contractors	**0.950**	**1**
Clients/Owner	**0.939**	**2**
Consultants	**0.931**	**3**
Project Affected persons (PAPS)	**0.919**	**4**
Community beneficiaries	**0.879**	**14**
RII Baseline point	**0.837**	

Figure 2. 25: Factors to improve the performance of road construction projects in Uganda

Source: Seninde, Muhwezi and Acai (2021)

Muzaale, Auriacombe and Byaruhanga (2018) look at cost, time and quality as performance indicators. In the context of cost, different factors exist that impact the execution of road construction projects. These factors include but are not limited to poor financial management, underpaid claims and bureaucracy. Table 2.2 shows the cost of some road construction projects in Uganda.

Table 2. 2: Costs of a selected road construction projects in Uganda per km for different work types, by work category (in USD)

Road Type	Mean	Minimum	Maximum
New 6 Lane Expressway	5,571,488	5,571,488	5,571,488
New 6 Lane Highway	1,990,155	1,289,094	2,691,215
New 4 Lane Expressway	2,838,562	937,499	7,810,495
New 4 Lane Highway	2,195,810	660,242	4,561,035
New 2 Lane Highway	750,396	22,403	1,985,876
New 1 Lane Road	91,788	58,151	167,702

Source: Ggoobi, Lukwago and Bogere, 2020

No.	Factors	UNRA Relative Index	Contractor Relative Index	Mean	T Test	P Value
1	Bureaucracy	55.4	43.4	2.21	−0.45	0.00
2	Evaluation of the contractor Claims	60.6	34.5	3.34	0.94	0.64
3	Taking over of the works certificate	73.4	78.4	3.04	0.55	0.53
4	Delay in submitting claims	78.6	66.6	2.85	−0.67	0.25
5	Poor financial management	80.4	89.5	3.67	0.45	0.96
6	Failure to agree to the valuation of Work	78.4	65.4	3.74	0.54	0.68
7	Frequency of exchange rate of Currencies	89.4	70.4	3.66	0.88	0.78
8	Slow processing of final accounts	55.5	53.4	3.56	0.62	0.56
9	Slow processing of variation Orders	44.6	51.3	3.33	0.33	0.54
10	Less periodical meetings to address work problems	67.4	60.4	3.45	0.38	0.02
11	Inaccurate bill of quantities	59.4	56.5	3.78	0.56	0.45
12	The quality of quantity surveyor management system	54.4	50.6	4.04	0.45	0.04
13	Underpaid claims	63.4	67.6	3.56	0.56	0.09

Figure 2. 26: Factors that influence cost in the performance of road construction projects in Uganda

Source: Muzaale, Auriacombe and Byaruhanga (2018)

In the context of time, Muzaale, Auriacombe and Byaruhanga (2018) report different factors associated with time overruns in Uganda's road construction industry. These factors include weather, delays in certification and final inspections, political interference and delays in approvals for design changes. Figure 2.27 below shows the external factors associated with time overruns that affect the performance of road construction projects in Uganda.

Ranking	External Factor Related to Time Overruns in Road Construction	Frequency	SD
1	Weather affects timely completion of road construction works	4.252	0.72
2	Weather affects sub-surface and ground conditions	4.191	0.78
3	There are delays in certification and undertaking final inspections	3.783	0.85
4	Political interference has negatively affected road project completion	4.125	0.81
5	There are delayed approvals for major changes in the scope of road works	3.669	0.61

Figure 2. 27: Factors that affect time in the performance of road construction projects in Uganda

Source: Muzaale, Auriacombe and Byaruhanga (2018)

Figure 2.28 below shows the proportion of roads in good conditions in Uganda in terms of the quality dimensions.

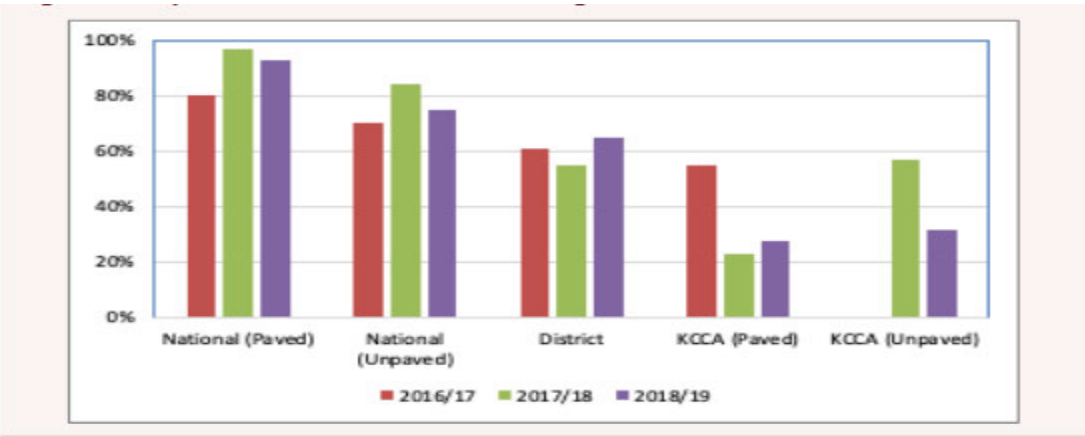


Figure 2. 28: Percentage of roads in fair to good conditions in Uganda

Source: Ggoobi, Lukwago and Bogere, 2020

Selection Attribute	Min	Max	SD	Mean
Use of poor materials affected the quality of the roads	1	5	.86	4.20
Use of inexperienced contractors has affected the quality of the roads	1	5	.84	4.04
Poor designs affected the quality of the roads	1	5	.67	4.22
Inadequate funding affected the quality of the road projects (cash flow)	1	5	.90	4.36
The road project was unplanned	1	5	.78	4.01
Use of incorrect construction methods affected the quality of roads	1	5	.79	3.97

Figure 2. 29: Factors that influence quality in the performance of road construction projects in Uganda

Source: Muzaale, Auriacombe and Byaruhanga (2018)

2.11 Contract administration of road construction projects in Uganda

A couple of researchers have gained interest in the administration of contracts of road construction projects in Uganda. A study by Aluonzi, Oluka and Nduhura (2016) deduced that there was a positive relationship between contract management and the performance of road construction projects in Uganda. This study looked at contract management in different dimensions paying attention to relationship management, grievance handling, payment mechanisms, communication channels and contract variations. The study concluded that resources were essential for contract administration of road construction projects in Uganda and thus contract administrators or managers needed to be supported to be in position to execute their works accordingly. However, in the study, it was also noted that despite the progress in road construction projects in Uganda, the performance remained poor showing constraints in contracts administration. Some of the reported highlights included project delays, shoddy works, lack of records and inadequate management of funds. In fact, it was recognised that less than a quarter of road construction projects in Uganda were completed on time (Aluonzi, Oluka and Nduhura, 2016). Much as the study mentioned aspects of CA, the general objective and focus was to establish a relationship between contracts management and performance of maintenance

projects. There is a difference between CA and CM as contract management comes before a contract is signed while contract administration comes after a contract is signed (Naughter, 2021). However, the study focus was on contract management as opposed to contract administration and particularly on road maintenance projects. This, therefore, presented a gap which is being filled by this study that is focused on the performance of road construction projects linking it to contract administration.

It is stated that successful contract administration activities have an impact on the progress of road construction projects (Byaruhanga and Basheka, 2017). This is because contractors are able to meet the needs of their clients or key stakeholders and execute the projects awarded to them under the expected boundaries. Therefore, as individuals, contractors play a significant role in the progress of road construction projects and thus hiring competent contract administrators is important for the success of any given road construction project. Byaruhanga and Basheka (2017) have reported that some of the challenges faced in contract administration are procurement challenges where contracts are awarded to incompetent contractors. The implication of this is that incompetent contractors fail to monitor and evaluate projects and face challenges in the administration of contracts. In this case, constraints are faced with appraisal systems, payments are delayed and inexperienced professionals are left to handle the projects (Byaruhanga and Basheka, 2017). The study recommends the adoption of systems that can appraise contractors and their supervisors and strict compliance mechanisms. However, the study focused on project monitoring as an independent function affecting the performance of construction projects. Additionally, it was more inclined to the contractor rather than the administrator. This also presented a gap that further justifies the need for this study research as the contract administration aspect was not captured.

Another study by Seninde, Muhwezi and Acai (2021) emphasizes that project financing factors are some of the hindrances to good contract administration. In the study, the constraints to good contract administration are classified into challenges of inadequacies, poor relationships with clients and consultants and incompetence of contractors. The study further highlights that incompetent contractors are often challenged with estimation issues and design challenges and use improper techniques and tools for site supervision and project works. Therefore, if the

contract administrator lacks the capacity to mobilize, manage funds and conduct due diligence, then there will be probable challenges with the progress of road construction projects (Seninde, Muhwezi and Acai, 2021). The aim of this study was to assess the factors influencing performance of road construction projects in Uganda of which good contract administration is one of the recommendations. The study did not directly relate contract administration with the performance of road construction projects though, a gap this study is addressing.

Muzaale and Auriacombe (2018) note that the complexity of road infrastructure projects has an influence on contract administration. Some of the challenges that can arise are with poor workmanship and in particular, road construction projects are also affected by procurement and supervision. In their study, Muzaale and Auriacombe (2018) stress how poor planning, site management, supervision and inadequacies in experience, finance, raw materials and labour can negatively influence road construction projects. It is in fact noted that entities like the Uganda National Roads Authority have been dealing with challenges such as this for a long time and are most likely to keep dealing with them unless interventions are proposed and followed through. Additionally, it is documented that delays in road construction works are in most cases associated with how contracts are administered (Muzaale and Auriacombe, 2018). This means that delays are a result of the contractor's actions. When contractors poorly do their work, then it is evident that the results will reflect poor workmanship. Their study highlighted key elements that affect project performance as its objective was to examine the performance of road infrastructure projects in Uganda. However, it was silent in regard to the relationship between contract administration practices relationship and performance of road construction projects.

In addition, Waiswa (2018) examined CA and the performance of road works projects. Specifically examined the effect of contract implementation procedures on the performance of road works projects and established the effects of contract monitoring and control on the performance of road works. The case study was done on Kampala Capital City Authority's Mud Dust Program in Kololo and Industrial Area. A review of his study reveals that Contract administration was limited to only aspects of contract Implementation procedures and contract monitoring and control. This study covers procurement management, risk management and project supervision and control under Contract Administration. Secondly, the study area covered

by the case study projects is far too narrow to represent Kampala District later on Uganda at large.

2.11.1 Monitoring and evaluation practices

Previous studies have already established that a significant positive relationship exists between contractor monitoring and the performance of road construction projects (Byaruhanga and Basheka, 2017). This implies that the role of contractor monitoring is vital to the success of construction projects and it has thus been deduced that poor contractor monitoring results in poor supervision which only produces negative outcomes in the management of road construction projects (Byaruhanga and Basheka, 2017). This study identified a number of parameters for measuring the performance of contractors, which are essential for contractor monitoring as shown below:

Component items	1	2	3	4	5
Contractors providing training to their employees	0.70				
Contractors having ability to correct deficiencies in their work	0.61				
Contractors having ability to safeguard client's facilities and assets	0.60				
Contractors having ability to identify problems and deficiencies	0.53				
Contractors having ability to keep their equipments clean	0.51				
Contractors having the ability to do the right job the first time		0.70			
Contractors having ability to provide their employees and resources		0.69			
Contractors having ability to adapt to changes and meet client needs		0.69			
Contractors having the ability to efficiently use materials			0.78		
Contractors having the ability to work as team players			0.70		
Contractors having ability to manage hazardous materials			0.56		
Contractors having ability to keep work place clean			0.54		
Contractors having ability to use high quality supplies				0.69	
Contractors having an ability to restore normal operations after an emergency				0.68	
Contractors having ability to minimize interruptions to client's operations				0.54	
Contractors being reasonable when it comes to contract changes					0.75
Contractors having ability to present correct invoices					0.55
Percentage variance	27.5%	7.8%	7.0%	6.4%	5.9%

(KMO = 0.801, Chi-Square = 636.658, sig.0.000).

Figure 2. 30: Performance measurement indicators for road construction contractors

Source: Byaruhanga and Basheka (2017)

Figure 2.30 shows different variations between different parameters; however, this study argues that all parameters are important in guaranteeing the performance of road construction projects. In this case, contractors should be able to fulfil the above conditions to exceed performance outcomes and ensure project success (Byaruhanga and Basheka, 2017). Other performance

indicators for contractor project performance are shown in the figure 2.31 below. These focus on resource utilization, handling change management in contracts, teamwork, training human resources, good performance and utilization of high-quality suppliers.

Performance measurement variables	Factor loading
Contractors' ability to use resources efficiently	0.78
Contractors being reasonable when it comes to contract changes	0.75
Contractors' ability to work as team players	0.70
Contractors providing training to their employees	0.70
Contractors having the ability to do the right job the first time	0.70
Contractors' ability to use high quality supplies	0.69

Figure 2. 31:Performance measurement variables for contractors in road construction projects in Uganda

Source: Byaruhanga and Basheka (2017)

However, given that there is a high public outcry on the outcomes of most road construction projects in Uganda, this shows that some conditions are not being fulfilled and thus resulting in negative outcomes. This could be associated with a variety of other challenges that may be influencing the performance of contractors in road construction projects. In the contractor performance framework proposed by Byaruhanga and Basheka (2017), performance is influenced by cost, capacity, environmental, quality and ethical factors. Challenges within these constructs can thus influence contractor performance and have an impact on the success of road construction projects.

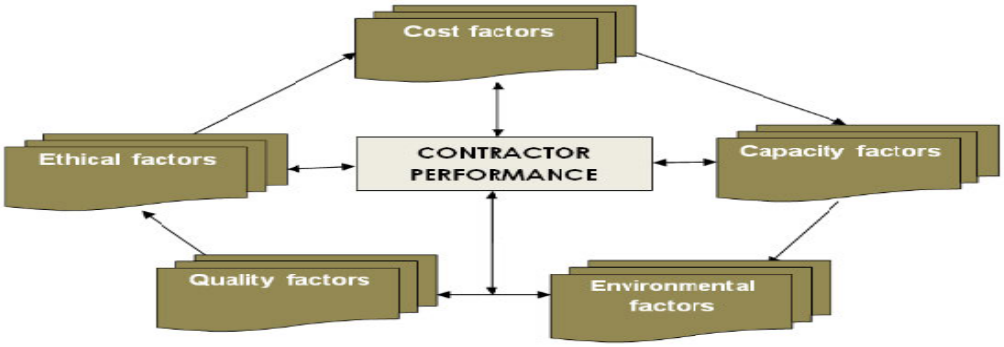


Figure 2. 32: Contractor performance framework

Source: Byaruhanga and Basheka (2017)

Traditionally, challenges are attributed with cost, time and quality, however, these three factors influence a number of aspects that determine the outcomes of projects. In this case, cost, time and quality may have an impact on equipment, human resources, client relations, procurement, capacity and finance that resulting in challenges based on these dimensions which may jeopardize the performance of road construction projects as illustrated below:

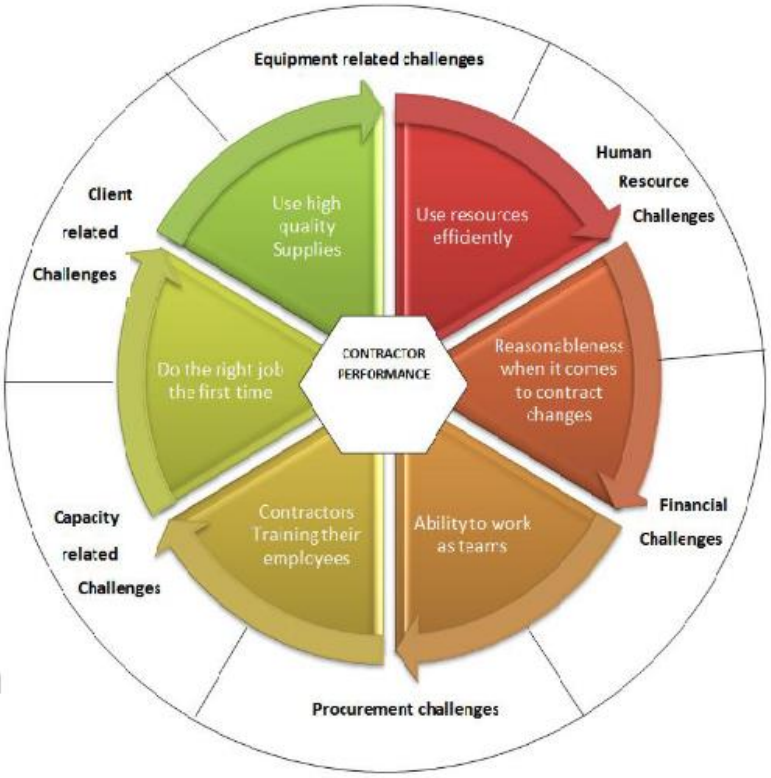


Figure 2. 33: Challenges affecting contractor performance in road construction projects

Source: Byaruhanga and Basheka (2017)

Therefore, when measuring the performance of contractors, this study argues that performance should be measured beyond cost, time and quality and extend to other performance metrics as proposed earlier by Byaruhanga and Basheka (2017). This, however, does not mean that the traditional factors of cost, time and quality are not of relevance because they are the foundation in the performance indicators for the performance of road construction projects and carry a lot of weight in contract administration. It is against that background that they were considered vital for the conceptual framework for this study.

2.12 Conclusions from Literature Review

This study aimed to access the impact of contract administration on the performance of road construction projects in Uganda.

Reviewed literature in regard to the performance of road construction projects in Uganda indicates a trend of unsatisfactory performance of the road construction projects over the recent years (Banyenzaki 2015:4). Reports published on the performance of Uganda's road sector disclosed that shoddy works and services were costing the government billions of shillings (Inspectorate of Government, 2012). The road construction industry is full of projects that were completed with significant time and cost overruns (Mulumba ,2016). Road construction projects in Uganda are also associated with untimely project completion and shoddy works resulting in the loss of government funds (Bogere, 2013). This finding was not any different from that of Alinaitwe, Apolot and Tindiwensi (2013), who noted the problem of delays in the implementation of contracts pertaining to road works, thus costing taxpayers 2.5 billion monthly. The study indicated that even the road works contracts that were launched faced cost overruns and shoddiness (Alinaitwe, Apolot and Tindiwensi, 2013). The conclusion on the performance of road construction projects in Uganda is therefore unsatisfactory from the literature. However, the findings indicated that projects were following proper quality assurance measures and control which should ultimately result into high quality products. The study was limited to the quality of the road during project implementation and not beyond that period. Regarding the delayed completion of road projects, the study agrees that the projects are generally delayed in implementation which eventually results into project cost overruns.

2.13 Chapter summary

This chapter constituted of a review of literature related to contracts administration in the construction industry with a focus on the theory on which the study was underpinned, factors influencing contracts administration such as procurement and contracts management in general. The literature reviewed was based on a global perspective and narrowed down to a local perspective, focusing on Uganda in particular. In conclusion, the chapter showed the relevance of contracts administration in the execution of road construction projects, performance metrics for road construction projects, the role of contracts administrators in the successful execution of

construction projects and potential barriers which can hamper the successful execution of road construction projects.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter commences with a recap of the purpose of the study and the research questions, and proceeds to describe the research methods which constitute the quantitative correlational method that was adopted as the research design. The agent theory was the theoretical framework applied and data collection was based on surveys administered to Resident Engineers, Project Managers (Contractor) and Contract Managers (Employer) of projects.

This chapter also studies the dependent and independent variables, and provides a description of the study population from the sample size and demographics of the participants. The chapter discusses the survey instruments and highlights the rationale for selecting the quantitative research design as well.

3.2 Purpose statement

According to Yin (2009), selecting an appropriate research strategy is dependent on the research questions that need to be answered, the control the researcher has about the situation at hand and if the situation or case is historical or modern. Another study believes that choosing an appropriate research strategy is dependent on data availability and the skills and preferences of the researcher (Gilbert, 2008). In the context of this study in particular, its purpose was to assess the impact of contract administration on the performance of road construction projects in Uganda, and along those lines, all the research questions were focused on achieving this primary purpose. This was, therefore, the driver for choosing an appropriate research strategy. The figure below represents the embedded research methodology. It portrays the research methodology into different themes, which include the world perspective/view, approach and research technique. The exterior represents the research worldview, which forms the basis of the interior, including the research approaches and techniques. The research approaches include: quantitative and qualitative, while the research techniques include questionnaire surveys, literature review, interviews, experiments, observations and workshops.

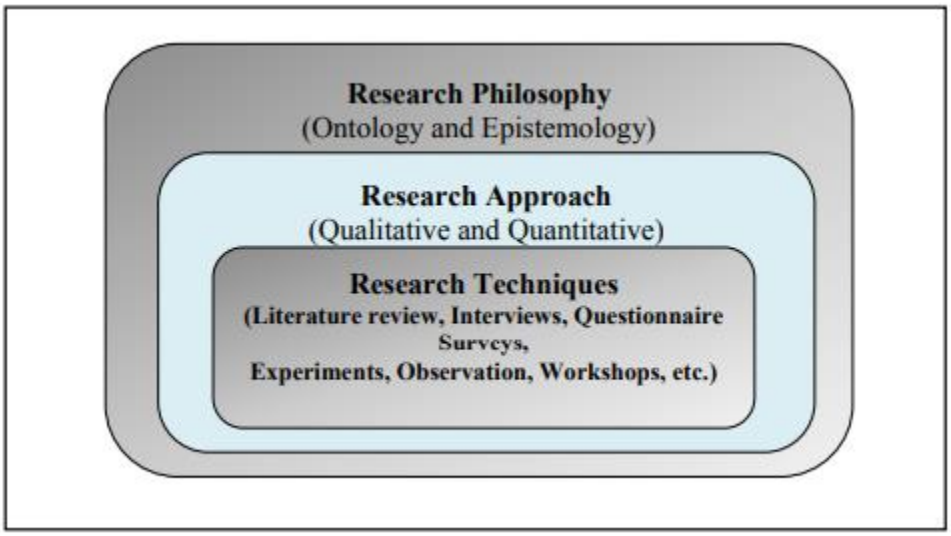


Figure 3. 1: Embedded research methodology

Source: Adopted from Kagioglou, Cooper, Aoud and Sexton (2000)

3.3 Research questions

The research questions addressed by the study included:

- What is the performance of road construction projects in Uganda?
- To what extent are contract administration practices used on road construction projects in Uganda?
- Is there an association between contract administration and project performance?
- Which contract administration assessment strategy can be developed to enhance road construction project performance in Uganda?

3.4 Research design

For the research paradigm, the epistemological philosophy was adopted for this study as it is inclined towards positivism. The philosophy can be used to obtain knowledge that is acquired through empirical research based on measurement and observation. The study also adopted a deductive approach as it was building on the already existing body of knowledge. A quantitative approach was used to address the above research questions. The strategy adopted for is study was a non-experimental strategy.

This study utilized a cross-sectional and correlational research design. Cross sectional research design enabled the researcher to collect data once at a point in time. According to Setia (2016), in a cross-sectional study, the investigator measures the outcome and the exposures in the study participants simultaneously. The advantage of a cross-sectional research design is that it can be conducted relatively fast and inexpensively. The correlational design measures a relationship between two variables (McCombes, 2019).

This study was conducted using surveys to collect data on road construction projects' performance and the extent of use of contract administration practices. This methodology was selected because of its ability to facilitate an investigation into the correlating comparison or relationship of the different independent and dependent variables (Bailey et al, 2010). For the research approach, the descriptive research approach was considered appropriate. Williams (2011:66) notes that "the descriptive research approach is a basic research method that examines the situation as it exists in its current state". The study further highlights that "descriptive research involves identifying attributes of a particular phenomenon based on an observational basis or exploring the correlation between two or more phenomena".

Regarding this study, the dependent variables included; performance, i.e. "Cost, Time and Quality" and independent variables included Contracts Administration Practices, i.e. "Project Governance, Project Personnel, Communication & Relationship Management, Quality Management, Monitoring and Control, Financial Management, Change Control Management, Claims and Disputes Resolution Management, Records Management and Contract Risk Management". Porter and Carter (2000) observe that correlation studies describe the existence of any relationship or lack of it between two or more variables.

This study adopted the quantitative research approach over the qualitative and mixed methods research approaches because of its appropriateness for the study. Russell and Russell (2012) recognize that the qualitative research approach does not offer the researcher a chance to compare their variables. On the other hand, qualitative data is not numerical and it is obtained from diverse sources (Bansal and Corley, 2011). This study was not compatible with a

qualitative research approach s because the research objectives were more inclined towards the quantitative approach than a qualitative one.

When it comes to the mixed methods research approach, it involves a combination of both qualitative and quantitative research approaches. It has been observed that the results of one data set often complement the other or are integrated together (Creswell and Creswell, 2017). This seems advantageous because more data and different opinions can be collected, however the approach requires more resources in terms of cost and time to maximize the extra data benefit. Similarly, the approach provides for subjectivity due to its qualitative component which was not ideal for this study (Simpson and Lord, 2015). This is why this approach was also not considered as appropriate for this study.

In contrast, the quantitative research approach produces numerical data which can easily be interpreted, understood and disseminated to the intended audience with minimal elaboration (Shabani, Floden and Jivadi, 2015). Additionally, since objective results are generated, they can be relied on for future studies or as references (Slater and Gleason, 2012). This is why a quantitative research approach based on a survey design was selected as the appropriate research approach for this study. Figure 3.2 below shows what a quantitative research process looks like.

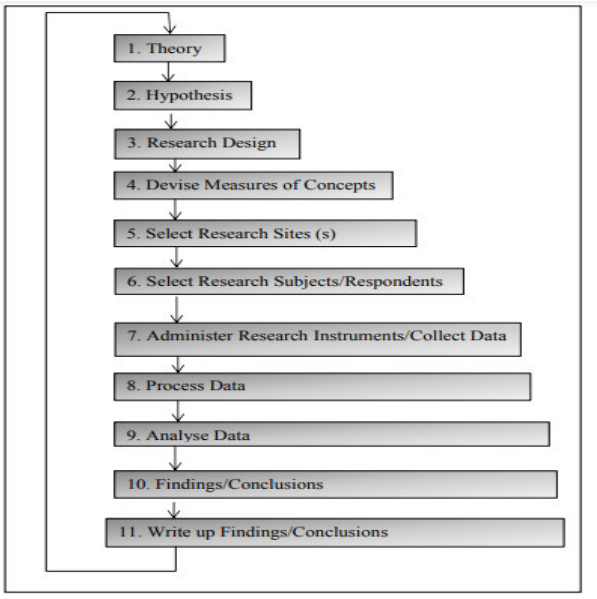


Figure 3. 2: Quantitative research process

Source: Adopted from Bryman (2008)

The data collection methods used in this study are composed of a review of existing literature and administering a self-administrated survey. There are studies which adopted similar approaches to evaluate the performance of construction projects such as: "Aje, Odusami and Ogunsemi (2009); Doloi (2009); Sing et al (2006) and Lu et al (2008)". Figure 3.3 below describes the research process.

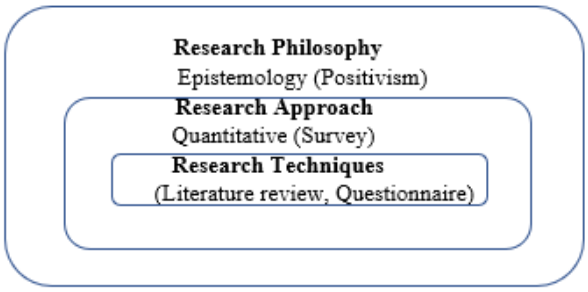


Figure 3. 3: Quantitative research process

Source: Adopted from Kagioglou, Cooper, Aoud and Sexton (2002)

3.5 Population

A population refers to a collection of individuals or cases with similar traits (Creswell, 2009). The population of interest for this study consisted of Contract Administrators (Resident Engineers), Contract Managers (Employer) and Project Managers (Contractors). Generally, the population of this study is represented by the management team of the road construction projects and stake holders within the road construction industry.

3.5.1 Target population

This constituted a set of people considered from an entire population to participate in a study. Results or findings of the target population are representative of the whole population. Target populations are precisely defined for research purposes (McMillan and Schumacher, 2010). It is almost impossible economically and time-wise for a researcher to cover the entire population, which is why this research was narrowed down to the management team, including the Project Manager (Contractor), Contracts Manager (Employer) and Resident Engineer (Contract Administrator) of ongoing national road projects in Uganda and stakeholders within the road

construction industry. Stakeholders included Officials from Ministry of Works and Transport, Kampala Capital City Authority (Roads Department), Uganda National Roads Authority and Local Government Authorities (Roads Department)

3.6 Sample

This refers to "a group of subjects or participants from which data is collected" (McMillan and Schumacher, 2010). The purpose of sampling is to select participation that is a good representation of the wider population for the study's outcomes to be generalized to a given population (Creswell and Plano, 2007). The sample selection for this study was purposive in nature to include the Project Management Teams of ongoing national road Projects that were one year and above into their implementation or execution stage and above 5 million USD as contract sum in Uganda.

The sample comprised 12 ongoing national road construction projects that were selected from a total of 19 ongoing national road construction projects. 7 out of the 19 had in-house supervision teams and therefore did not qualify for the study. This was because some were at mobilization stage, others had not made one year in implementation, and the rest were being supervised by UNRA in-house team and thus could not provide self-assessment. Thus, 12 projects were selected for this study. Of these 12 projects, only the management team of each was purposively selected to participate in the survey, mainly because they have the required information for this study. This is because they are answerable and are directly in charge of projects administration on a daily basis. Respondents included the Project Manager (Contractor), Contracts Manager (Employer) and Resident Engineer (Contract Administrator) of the projects. Three respondents from each of the 12 projects were selected for the study.

The selected projects were spread over the country's regions, i.e., Central, Northern, Eastern, Western and Southern regions. This ensured that there was inclusive country representation. The sample was significant in size relative to the total target population of the study (Creswell and Plano, 2007).

In addition to the ongoing construction project teams, the researcher went ahead to carryout surveys on other important parties within the construction industry. The respondents' sample was also selected purposively to include Officials from Ministry of Works and Transport, Kampala Capital City Authority (Roads Department), Uganda National Roads Authority and Local Government Authorities (Roads Department). These entities are all involved in road construction in some way and their views are important to back up information in this field although the focus and scope of this study is still on National Road construction projects. A target sample of 100 respondents from all these entities was considered in the study.

3.7 Instrumentation

Surveys are "tools for gathering invaluable data about attitudes, values, personal experiences and behavior. Surveys might take the form of face-to-face interaction, telephone interviews, postal questionnaires, and, most recently, online surveys" (Syed Muhammad, 2016. There has been a wide use of questionnaires especially for descriptive and analytical surveys as a way to establish facts and explore as well as evaluate perceptions. According to Bryman (2008), "overcoming low response rates enables a meaningful analysis to be carried out, which is a critical aspect of designing any questionnaire". Researchers are also expected to design questions that will enable them to obtain relevant information and therefore, their questions should be guided by the literature review and objectives of the study. Researchers need to pay close attention to the way in which questions are phrased and how they are arranged (Gilbert, 2008; Naoum, 1998).

Questionnaires as data collection tools have the following advantages as adopted from Bryman (2008) and Gilbert (2008):

- They are relatively cheap.
- Questionnaires provides quick responses.
- Give the respondents the liberty to answer them at their convenience.

Nevertheless, the data collection method also possesses some disadvantages that have been raised by Bryman (2008) and Gilbert (2008) as:

- They generate low response rates.

- Respondents may have nobody to guide them which risks the reliability and validity of the findings if the questions posed are ambiguous.
- Respondents may assign third parties who are not part of the study to answer the questions on their behalf.
- The risk of respondent fatigue is high if they are asked many questions.

However, in the context of this research, the advantages were found to outweigh the disadvantages and thus the data collection instrument was adopted for the study.

3.7.1 Format

The questionnaire was designed based on the research purpose and objectives and structured on a 5-point Likert scale, ranging from "strongly agree to strongly disagree" with 20-25 minutes allocated as the estimated time under which to complete answering the questionnaire. The questionnaire was designed with Google Forms facilitating the researcher to share the link to the study participants only directly. Other techniques employed to encourage response included:

- The questionnaire title and covering letter guaranteed strict confidentiality of the information provided by the respondents.

- Respondents only had to tick what they considered appropriate for every question apart from the questions that were open-ended.

- Google Forms facilitated the design of the questionnaire in an attractive and user-friendly way to encourage participation.

3.7.2 Content

The content of the questionnaire was organised as follows:

Section A: Background Information: This section requested for information for biographic information which included the participants' gender, experience in the construction industry, registration with professional bodies, area of expertise, forms of contract that participants were familiar with and kind of projects most were involved in.

Section B (1): The State of Performance of Road Construction Projects

This section of the questionnaire was especially designed to rank the performance of road construction projects in Uganda. Respondents were invited to rate their opinion to rate the dependent variables on their various projects using a 5-likert scale. These variables included Time, Cost and Quality. Other specific close-ended questions under each of the mentioned variables were asked as a build-up to the final rating of that particular variable. The questions included how time, cost and quality were measured on the project, how they were monitored throughout the project, personnel responsible for those particular variables and their experience.

Section B (2): Contracts Administration

This Section required respondents to rate the extent of use of the Contract Administration practices on their different projects using a 5-point Likert scale which was follows: "1=Never, 2= Almost Never, 3 = Sometimes, 4 = Almost Every time 5 = Every time", and best represented frequency/extent of use. This was done by the respondents by ticking in any one of the boxes that were provided. Lastly, two open-ended questions were asked for participants to provide answers on what are/were the challenges in the implementation of road construction project/s and how the project dealt with issues that could not be resolved within the contract provisions.

It should be noted that there were three parties involved in the survey: Employer, Resident Engineer and Contractor. All survey questions were suitable for all the intended contract parties.

3.8 Data quality control

3.8.1 Pilot study

A pilot study was conducted to consider the validity and reliability of the survey instruments selected for the study. Ten individuals participated in the pilot study, including Engineers from the Uganda National Roads Authority, Road Contractors and Consulting Engineers. These had previously been part of road construction management on past projects. The participants of the pilot study were 20% of the total population.

The pilot study intended to establish the survey instrument's suitability and the participants' capability to answer all the questions. Participants were not part of the sample group of

participants considered in the study. They had handled road projects of similar magnitude and responded based on their experience. On completion of the survey, participants provided feedback on the following;

- Length of the survey
- Clarity of the wording
- Format of the survey
- Sentence construction

3.8.2 Validity and Reliability

The surveys were also subjected to validity checks. According to Patten (2012:61). "a measure is valid to the extent to which it is designed to measure and accurately perform the function it is purported to perform". Validity is the measure of representation of the study concept. Subsequently, research instrument validity measures the extent of accuracy of data produced by using or from it. The selected instrument should be specific enough to obtain the intended results (Bernard, 2013:47). Similar studies should test the survey instrument for face value (Creswell, 2009). Results of those studies should be compared to establish similarity of results by using the same tool. Validation of a survey instrument can be carried out by using criterion, construct, content or face value validity.

Criterion validity – The instrument was intended to measure the relation between the independent variable Vs the dependent variable through correlation.

Construct validity – Questions on the variable were based on the available literature on the study subject. There was a careful definition of the items and scores provided for the proper assessment of contract administration practices.

Content validity – The instrument represented items found in the literature on contract administration and project performance. Construction professionals and academic staff also reviewed the surveys and offered their input into the survey instrument to guarantee its validity.

Face validity – Respondents saw the instrument as relevant, fair and appropriate for its assessment.

3.8.3 Reliability

Questionnaire reliability is about ensuring that the instrument can collect the same information when administered to the same population repeatedly. This looks at the same accuracy and consistency of the tool in use. The researcher provided a questionnaire guide which if followed with a similar research design can result in similar findings.

3.9 Data collection and Ethics procedure

Based on the research questions, the research approach was a quantitative non-experimental correlational research design approach. The research was conducted using surveys as data collection tools to gather data on the correlation between contracts administration and project performance on road construction projects in Uganda. This study's variables involved three dependent variables: cost, time and quality (performance), and 10 independent variables focused on contracts administration (project governance, project personnel, communication and relationship management, quality management, monitoring and control, financial management, change control management, claims and disputes resolution management, records management, records management and risk management. The main goal of the study was to assess the impact of contracts administration and the performance of road construction projects in Uganda.

Before the start of data collection, the researcher had to submit the research for approval by the faculty research committee (**Annex 1).** For the protection of the participants' rights and confidentiality, an ethics approval was also sought before data collection.

The survey instrument was a questionnaire which was generated using Google forms. An online link was developed and shared with participants via email or other means on their devices as suggested for their comfort. The researcher ensured anonymity throughout the surveys.

For Ethical consideration, prior approval or consent from participants to participate in the survey was obtained by the researcher. The researcher sent or shared the Letter of Consent (**Annex 2**)

and a Gate Keeper's letter (**Annex 3**) was provided by Uganda National Roads Authority. All information regarding the study was included in those letters. This was to give the respondents comfort that they were dealing with an authentic person and that their data would be treated with utmost care and guaranteed anonymity.

Brief instructions on how to fill out the questionnaire were provided at the beginning of each section in the questionnaire to ease the process and time for the respondents. The researcher anticipated that the survey would be completed within 30 – 45 minutes. The researcher's telephone contact and email address were provided for the participants to contact the researcher in case of questions or concerns. However, no problems were registered.

The scheduled timeframe for data collection, according to the researcher, was two weeks. However, this timeframe was not achieved because the target population is busiest when projects are ongoing. Constant reminders through phone calls, messages and emails yielded the much-needed results as the researcher acquired a 100% response rate after three and half weeks of data collection.

Since the survey was conducted on running or ongoing projects, respondents needed extra assurance of anonymity and/or confidentiality. Some requested for an embargo of 5 years before this information could be published as a means to erase the identifier aspect. The researcher agreed to have that consideration and also informed them that their responses would not be publicized.

The survey was divided into three sections. The first part of the survey was composed of questions about the background information of the respondents and their projects. These included the respondents' positions, experience in the construction industry, type of firm/organisation, procurement type and main project type in the organisation. The second part of the survey consisted of the other two sections, with the first part having questions to do with the performance of road construction projects. The respondents were expected to tick the best answer from a list of provided options and share their comments on the open-ended questions. Among the questions, some were based on a 5-point Likert scale composed of: Very Good (5),

Good (4), Fair (3), Poor (2) and Very Poor (1). The second section of this part comprised questions about the extent of use of contracts administration practices. The questions were also designed based on a 5-point Lickert scale composed of: Every time (5), Almost every time (4), Sometimes (3), Almost Never (2) and Never (1). The last two questions in this section were open-ended and required participants to provide their views about the challenges of project implementation and the ways in which the project team handled issues that could not be resolved in the existing contract. A web-based survey using Google forms was developed to increase the rate of return. Appendix A1 shows the hard copies of client/consultant and contractor surveys respectively.

3.10 Data analysis

The quantitative data was analysed after the data collection process. The survey resulted in 36 respondents who met the sample requirements for the ongoing projects teams and 72 respondents from other entities that handle construction projects including the Ministry of Works and transport, Kampala Capital City Authority, Local Government Authorities and Uganda National Roads Authority. A total of 108 responses were received. Given that Google Forms were used, the process of data analysis involved exporting the data from Google Forms to Microsoft Excel and thereafter uploading this data into Japs 0.14.1.0 software for detailed analysis. Regression analysis was used to determine the relationship between contract administration and project performance.

3.11 Chapter summary

This chapter provided in-depth insight into the study design of this research providing the rationale behind the research design, strategy and research approach chosen for this study. The chapter also provided details about the population of interest and sampling process that the study followed. Additionally, it provided information on the data collection methods and ways in which the data collection instruments were prepared, as well as the information they sought to collect. Lastly, the chapter provided details about the data quality control process which was followed, the data collection procedures and how the data was analysed.

CHAPTER FOUR: RESULTS, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter provides the outcomes of the statistical tests carried out on collected data. This study sought to address the potential links between contract administration and performance of road construction projects. Past research has shown that contract administration practices play a vital role in project implementation. This research is vital to project management because if it is established that there is a significant relationship between contracts administration and projects performance, it may be possible for the performance of projects to greatly improve by making the necessary changes in the contracts administration practices.

4.2 Sample

The sample comprised 12 ongoing national road construction projects that were selected from a total of 19 ongoing national road construction projects in Uganda. 7 out of the 19 had in-house supervision teams and therefore did not qualify for the study. Thus, 12 projects were selected for this study. Of these 12 projects, only the management team of each was purposively selected to participate in the survey, mainly because they have the required information for this study. The respondents included the Project Manager (Contractor), Contracts Manager (Employer) and Resident Engineer (Contract Administrator) of the projects. 3 respondents from each of the 12 projects were selected for the study. The selected projects were spread over the country's regions, i.e. Central, Northern, Eastern, Western and Southern regions. This ensured that there was country representation. Other 100 samples were purposively selected from the stakeholders i.e. officials from Local Governments, Uganda National Roads Authority and Kampala Capital City Authority.

4.3 Research questions

The research sought to answer the research questions below:

i. What is the performance of road construction projects in Uganda?
ii. To what extent are contract administration practices used on road construction projects in Uganda?
iii. Is there an association between contract administration and project performance?

iv. Which contract administration assessment strategy can be developed to enhance road construction project performance in Uganda?

4.4 Response rate

The survey was distributed to the three target groups (client, consultants and contractors) on ongoing projects within the regions of Uganda, namely: Central, Southern, Northern, Eastern and Western regions of the country over a one-month period. The researcher sent out soft-copy survey forms to the participants. The participants had the option of deciding whether to participate in the survey or not. Follow-up reminders for the web-based survey were sent to the participants. A total of 36 surveys were sent out to the 12 projects; 3 per project, i.e., the Resident Engineer, Contracts Manager (Employer) and the Project Manager (Contractor), while a total of 100 surveys were sent to the other stakeholders including officials from Local Governments, Kampala Capital City Authority and Uganda National Roads Authority. Wright (2005) supports the use of web-based survey research, which is considered quicker and more straightforward. In this study's context, the researcher used Google forms web-based survey software which helped in saving time and money as it facilitated contact with many respondents within the given timeframe. The researcher was able to obtain a 100% response rate given that 36 responses out of 36 targeted were received from ongoing projects and 72% response rate from the construction entities/ stakeholders i.e. 72 responses out of 100 targeted. Some of the reasons attributed to the high response rate include:

a) The way the survey was designed: The survey was designed and formatted in the most attractive way to collect accurate and valid data. The questions were structured to be precise, straightforward, and comprehendible language (English) was used for the survey participants to easily understand.

b) Use of a professional web-based survey: The researcher used Google forms to create a professional web-based survey which was sent to the participants to fill in.

c) Presence of a cover letter (gate keeper's letter): A cover letter was shared with all the pertinent information regarding the purpose of the survey, why the participants had to

participate, and the ethical consideration that would be respected to encourage participation from the prospective participants.

Figure 4.1 shows the distribution of the sampled projects around Uganda (refer to red marks). From the figure, it is clearly seen that all the regions of the country were represented to provide a valid statistical representation. It can therefore be deduced that the data for this research had good coverage of project inclusion. Projects were randomly selected from a list of ongoing national road construction provided by the Uganda National Roads Authority (UNRA).

Figure 4. 1: The distribution of sampled projects around Uganda

Source: Field research (2022)

4.6 Biographical details

Having collected the data from the online Google form which was used to collect data, it was then downloaded into a Microsoft Excel document file and analyzed using JAPS version 0.14.1.0 software for calculation of the frequency, percentage mean, and rankings. It was also used to determine the correlation between the independent and dependent variables. Data was collected from one hundred and eight participants (n = 108) as illustrated by Table 4.2. Below are findings of the biographic information of the study participants:

4.6.1 Gender

From the field survey, it was discovered that 88.89% of the respondents were male while 11.11% were female. From this finding, it was established that the construction sector was dominated by males compared to females. This finding was in agreement with the study of Shah, Shah and Pitroda (2020) who reported that the construction industry was generally a male-dominated industry because it was highly labour intensive and the site conditions were not conducive for females. Hence the low number of females engaging in construction.

4.6.2 Occupation profile

The sum of 52.8% of the sampled respondents were civil engineers by profession; 22.2% were construction managers by profession; 19.44% were quantity surveyors by profession; while 2.78% were project managers and economists by profession. Getting information about the education background of the respondents was important to ensure that they were competent and qualified personnel. Lian (2019) supports this by noting that qualifications establish the credibility and competence of individuals in the execution of their work.

4.6.3 Experience profile

The field survey revealed that 41.67% of the sampled respondents had a work experience of 11-15 years in the construction industry; 25% of the sampled respondents had a work experience of more than 25 years in the construction industry; 19.44% of the sampled respondents had a work experience of 6-10 years in the construction industry; 8.33% of the sampled respondents had a work experience of 16-20 years in the construction industry; and 5.56% of the sampled respondents had a work experience of 21-25 years in the construction industry. From the findings, it was established that most of the respondents (66.7%) had a work experience of more than 10 years in the construction industry. It was deduced that their responses were based on long history of work experience on construction projects. Lian (2019) and Syafarudin (2009) both agree that the experience a person has is a valuable asset to construction projects because it is through experience that skills, knowledge, credibility and attitudes are built.

4.6.4 Professional body profile

58.33% of the respondents were registered with professional bodies while 41.67% of the respondents were not. This finding established that a significant proportion of the sampled respondents was affiliated to a professional body, thus indicating their interest in enhancing their professional network and continuous professional development. It has been reported that professional bodies regulate the conduct of professionals; provide opportunities for continuous professional development and support their members to improve their profession as a well (Agarwal and Islam, 2014). In this study's context, the attachment to a professional body gives more credibility to the sampled respondents.

4.6.5 Sector profile

Of the sampled respondents, 61% built their work experience mostly through the public sector while 25% the private sector. The remaining 13.89% mentioned Engineering Consultancy as the other option. This finding established the fact that the respondents had different sector profiles which would justify their different perspectives. On the other hand, the road construction sector is highly dynamic and dominated by the private sector during project implementation although funded by the Government, which is often the Contracting Authority. This assertion justifies the reason why most of the sampled respondents were from the private sector.

4.6.6 Training profile

63.89% of the respondents had special training in contracts administration, while 36.11% did not have any special training in contracts administration. This result shows that a fair percentage of the respondents acquired knowledge of contract and contract administration and are aware and possess knowledge of the research area.

The table 4.1 below illustrates the findings of the respondents' biographic information as elucidated above.

Table 4. 1: Biographic information of the sampled respondents

		Options	Frequency	Percentage (%)
1	Gender	Female	12	11.11
		Male	96	88.89
2	Qualification	Civil Engineer	57	52.778
		Construction Manager	24	22.222
		Economist	3	2.78
		Project Manager	3	2.78
		Quantity Surveyor	21	19.44
3	Experience	11-15 years	45	41.67
		16 -20 years	9	8.333
		21-25 years	6	5.56
		6-10 years	21	19.44
		More than 25	27	25.00
4	Professional Body Registration	No	45	41.67
		Yes	63	58.33
5	Sector Representation	Engineering Consultancy	15	13.89
		Public	66	61.11
		Private	27	25.00
6	Special training in	No	39	36.11

	Contracts Administration	Yes	69	63.89

4.7 Descriptive statistics

4.7.1 Area of expertise profile

Under the area of expertise, the respondents ranked Project Management highest with a percentage of 75%. This was followed by Contract Management Administration with a percentage of 69.44%. Project Control ranked third with a percentage of 55.56%, while Site Execution was fourth with a percentage of 52.78%. Lastly, Engineering & Design and Quality Control ranked fifth and sixth with percentages of 41.67% and 27.78% respectively. These findings demonstrated that the respondents were experienced in different road construction fields or areas.

4.7.2 Forms of contract profile

The field survey results established that the respondents were largely familiar with FIDIC forms of contracts (80.56%), followed by the World Bank Conditions of contracts (63.89%), then the EDF contracts (27.78%), and lastly, the NEC contracts (2.78%). This showed that the respondents were familiar with both local and international contracts, and therefore, the study would be informed from different perspectives.

4.7.3 Project-handled profile

In regards to the projects the respondents were mostly involved road construction projects, road bridge construction projects and road upgrade projects were all ranked first with a percentage of 55.56%. Road rehabilitation projects ranked lowest with a percentage of 36.11%. Despite having more experience with road construction projects, road bridge construction projects and road upgrade projects, the degree of involvement in road rehabilitation projects was medium, and therefore, the respondents had a remarkable level of work experience traversing different road project types.

4.7.4 Overall respondents' profiles

Accordingly, the study covers a broad range of construction professionals with considerable expertise and experience in road construction, project management, and contract administration. The table below illustrates the findings elaborated above:

Table 4. 2: Overall respondents' profiles

		Option	Frequency	Percentage	Ranking
1	**Areas of Expertise**	Engineering & Design	15	41.67	6
		Project Management	27	75.00	1
		Project Control	20	55.56	4
		Site Execution	19	52.78	5
		Quality Control	10	27.78	7
		Contract Management/Administration	25	69.44	2
		Construction Supervision	21	58.33	3
2	**Familiar forms of contracts**	FIDIC	29	80.56	1
		JCT	2	5.56	3
		NEC	1	2.78	5
		World Bank Conditions of Contract	23	63.89	2
		EDF Contracts	10	27.78	4
3	**Projects most involved in**	Road Rehabilitation project	13	36.11	4
		Road upgrade project	20	55.56	1

	Road construction project	20	55.56	1
	Road and Bridge construction	20	55.56	1

4.7.5 Project sums of the sampled projects

The sampled projects had project sums ranging from more than Ugx 1 billion to roughly over Ugx 8 billion. The projects showed adequate representation of the government's capital investment and given the significant investment; they were of public interest. The researcher maintained alphabetical letters as codes for the different projects for confidentiality purposes. The figure below shows the project sums of the sampled projects:

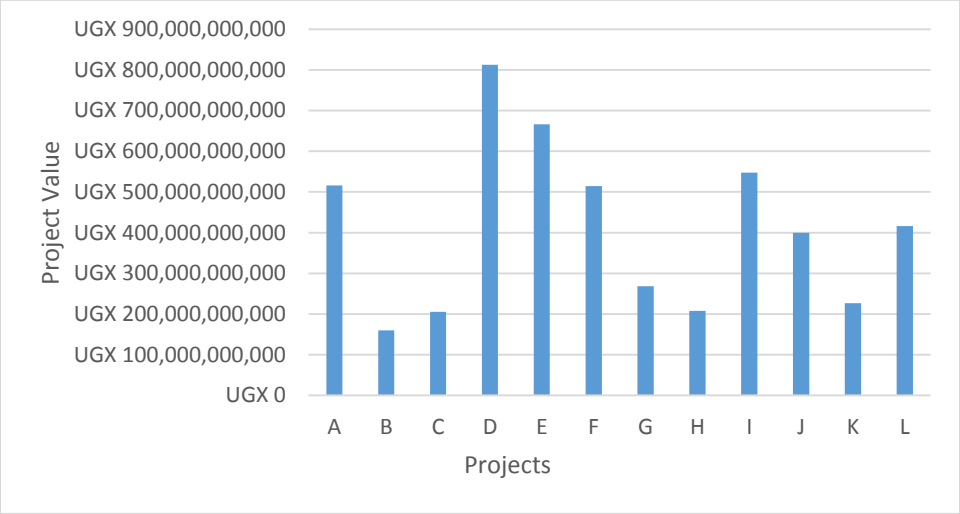


Figure 4. 2: Project sums of the sampled projects

4.7.6 Progress of the projects at the time of the survey

The progress of the projects at the time of the survey ranged from 1.1% to 97% signifying the different stages of implementation during the time of the study. On the other hand, this was important in informing the study as it gave the researcher an opportunity to understand the contracts administration practices of projects at different stages of project implementation. Projects exhibit different traits during different construction stages which therefore influences contracts administration (Trinkuniene and Trinkunas, 2014). The figure below shows the progress of the sampled projects during the time of the survey:

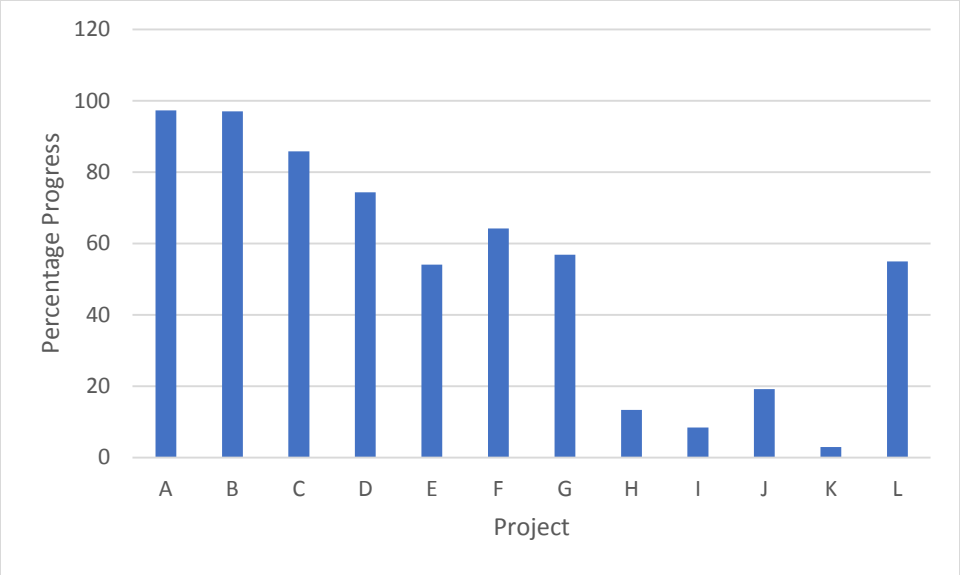


Figure 4. 3: Progress of the sampled projects during the time of the survey

PART II: Findings as per the research objectives

4.8 Performance of road construction projects in Uganda

The first objective of this study was to examine the performance of road construction projects in Uganda. The performance of road construction projects in Uganda was examined based on: time, cost and quality.

4.8.1 Project performance according to time

88.89% of the respondents determined a project duration using Microsoft project, 8.33% determined a project duration by experience, while 2.73% used Primavera to determine the duration of a project. On the other hand, 94.44% of the respondents applied time control techniques to their projects, while 5.56% of the respondents did not. Among those that applied time control techniques to their projects, 82.35% applied the Critical Path Network method and 67.65% used the Gantt Chart method. Those who applied the Milestone Date Programming and Program Evaluation & Review technique were 11.76% respectively. When asked for the frequency of application of time control techniques, 32.35% of the respondents selected *Always* and *Often* as the frequency of use; 26.47% of the respondents selected *Sometimes*, while 8.82% of the respondents selected *Rarely*. Microsoft projects ranked highest as the time control

software used for projects at 94.12%, followed by Primavera software at 5.88%. The predominant causes of time overruns were additional works and inadequate designs (76.47%), followed by poor planning (67.65%), then delayed acquisition of right of way (38.24%), followed by delayed payments and procurement of materials (32.35%), and lastly, force majeure (11.76%). However, 55.56% of the respondents reported that they possessed a dedicated scheduler on their projects, while 44.44% of the respondents did not. The table below shows the performance of road construction projects based on time.

Table 4. 3: Performance of road construction projects in Uganda based on time

1	**Project time estimation**	**Use of Primavera**	**3**	**2.78**	**3**
		Use of Microsoft Project	96	88.89	1
		By experience	9	8.33	2
2	**Application of time techniques**	Yes	102	94.44	
		No	6	5.56	
3	**Time control techniques applied**	Gantt Chart	23	67.65	2
		Critical Path Network Method (CPM)	28	82.35	1
		Milestone Date Programming Technique	4	11.76	3
		Program Evaluation & Review Technique	4	11.76	3
		Precedence Network Diagram	0	0	
4	**Frequency of application of**	Always	33	32.35	1

	time control methods	Often	33	32.35	1
		Rarely	9	8.82	4
		Sometimes	27	26.47	3
5	**Software used for time control**	Microsoft Project	102	94.12	1
		Primavera	6	5.88	2
6	**Experience of time overruns**	Yes	102		
		No	6		
7	**Cause of time overruns**	Additional works	26	76.47	1
		Delayed Payments	11	32.35	5
		Force Majeure	4	11.76	7
		Delayed Procurement of Materials	11	32.35	5
		Lack of proper planning	23	67.65	3
		Inadequate designs	26	76.47	1
		Right of way not yet fully acquired	13	38.24	4
8	**Possession of a dedicated scheduler**	Yes	60	55.56	
		No	48	44.44	

A 5-point Likert scale was used to rate the performance of the road construction projects based on time. The findings are presented below:

Table 4. 4: Assessment of performance of sampled road construction projects based on time using weighted averages.

Project Performance	Very poor (1)	Poor (2)	Fair (3)	Good (4)	Very Good (5)	Total	Mean	Decision
Project performance in relation to time	18	72	90	60	45	285	2.64	Poor

The results showed that the road construction projects had a poor performance in relation to time. This is in agreement with earlier studies, which reported that road construction projects in Uganda were barely completed in time (Otim and Alinaitwe, 2014; Muzaale, Auriacombe and Byaruhanga, 2018). Figure 4.4 below shows that almost all sampled projects were running behind schedule: As established by Denini (2010), the effects of time overruns include: cost overrun; time overrun; contractual disputes; decrease in the owner's financial commitment; acceleration; claims; reduction in quality; negative social impacts; reduction in safety; litigation; arbitration; contract termination and total project abandonment. All these are detrimental to the performance of construction projects.

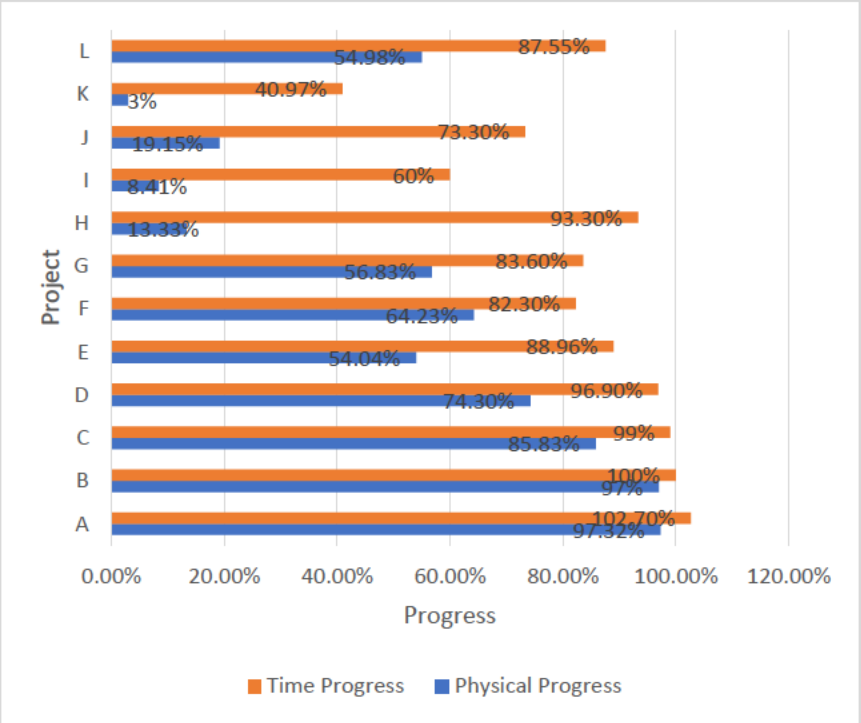


Figure 4. 4: Time elapsed vs. physical progress in percentage

4.8.2 Project performance according to cost

91.67% of the respondents determined a project's cost by the unit cost for bills of quantities, 8.33% by production function, while 5.56% by experience. Additionally, 94.44% of the respondents applied cost control techniques to their projects, while 5.56% did not. Of those that applied cost control techniques to their projects, 46.88% used Earned Value Analysis method, 18.75% the Project Cost Value Reconciliation method, 9.38% the Overall Profit and Loss and Activity-based costing, 6.25% Actual vs. Forecast and PERT, while 3.125% standard costing. When asked for the frequency of application of the cost control techniques, 50% of the respondents selected *Often*, 16.67% selected *Always* and *Sometimes*, while 2.78% selected *Never* and *Always*. In addition, the participants were asked if their projects experienced cost overruns and 5.56% agreed while 86.11% disagreed. The causes of cost overruns were selected as: additional works (70.59%); increased quantities (67.65%); delayed inadequate designs (61.76%); inadequate pre-contract planning (26.47%); under budgeting (20.59%); and claims (2.49%). In relation to whether the respondents had a dedicated Cost Manager on their projects, 72.22% agreed while 27.78% disagreed. Lastly, the field survey revealed that 50% of the Cost Managers were civil engineers by profession; 30.77% of the Cost Managers were quantity surveyors by profession, while 19.23% of the Cost Managers were construction managers by profession. The table below shows the performance of road construction projects based on time.

Table 4. 5: Performance of road construction projects in Uganda based on cost

1	**Estimation of project cost**	By experience only	6	5.56	3
		Production Function	9	8.33	2
		Empirical Cost Inference			
		Unit Cost for Bills of Quantities	99	91.67	1
		Allocation of Joint Costs			
2	**Possession of cost control techniques**	Yes	96		

		No	12		
3	**Cost control techniques used**	Activity-based costing (ABC).	9	9.38	3
		Actual Vs Forecast	6	6.25	5
		Earned Value Analysis	45	46.88	1
		Overall profit and Loss	9	9.38	3
		PERT	6	6.25	5
		Project Cost Value Reconciliation	18	18.75	2
		Standard Costing	3	3.125	7
		Missing			
4	**Frequency of application of cost control techniques**	Always	18	16.67	2
		Never	3	2.78	5
		Often	54	50.00	1
		Rarely	3	2.78	5
		Sometimes	18	16.67	2
		Missing	12	11.11	4
5	**Experience of cost overruns**	No	6	5.56	
		Yes	93	86.11	
6	**Reasons for the cost overruns**	Additional Works	66	70.59	1
		Under Budget	19	20.59	5

		Inadequate Pre-contract Planning	25	26.47	4
		Increased Quantities	63	67.65	2
		Inadequate Designs	57	61.76	3
		Claims	3	2.94	6
7	**Possession of a dedicated Cost Manager**	Yes	78	72.22	
		No	30	27.78	
8	**Qualifications of the Cost Manager**	Civil Engineer	54	50.00	1
		Construction Manager	21	19.23	3
		Quantity Surveyor	33	30.77	2

Similarly, a 5-point Likert scale was used to rank the performance of the road construction projects based on cost. The overall decision of the scale was fair. This rating is between poor and good and can therefore be classified as unsatisfactory. The results also concur with numerous scholars who have reported that many road construction projects experience cost overruns as they are persistently not completed within the set budget or contract sum (Aljohani, 2017, Heravi and Mohammadia, 2021; Muhwezi, Kirenzi and Bangi, 2020; Byaruhanga and Basheka, 2017).

Table 4. 6: Assessment of road construction projects based on cost

Project Performance	**Very poor (1)**	**Poor (2)**	**Fair (3)**	**Good (4)**	**Very Good**	**Total**	**Mean**	**Decision**

					(5)			
Project performance in regard to cost	0	36	171	60	90	357	3.31	Fair

4.8.3 Project performance according to quality

Participants were probed to rate the project performance according to quality. The findings revealed that 100% of the respondents performed quality checks on their projects during execution. It was established that 69.4% of the projects had defects identified during the quality checks, while 30.56% of the projects did not. In relation to the defects, the predominantly identified defects were structural cracks (32%); followed by pot holes (28%); then early settlement (20%); followed by rutting (12%), and then flooding (16%). These were followed by alligator cracks on earthwork fill layers (12%), defective sub-base (8%), cracks in asphalt layer (4%) and bleeding (4%). The causes of defects were: defective materials and inadequate supervision (44%); under qualified personnel (32%); and lastly, inadequate designs (16%). A large proportion of the respondents (76%) identified defects during the construction period, while 27% of the respondents identified defects during the defect's liability period. The quality control mechanisms used included a fully functional and equipped laboratory which ranked the highest (61.11%), proper records keeping (27.78%), and lastly, quality control monitoring tools (11.11%). The respondents were also asked if they had a dedicated Quality Control Manager. 88.89% of the respondents agreed, while 11.11% disagreed. Regarding the experience of the Quality Control Manager, 62.5% had work experience worth more than 10 years; 28.13% more than 5 years; while 9.38% 1-5 years. The table below shows the performance of road construction projects based on time.

Table 4. 7: Performance of road construction projects in Uganda based on quality

1	Quality Control Checks	**Yes**	**108**		
		No	0		

2	**Any defects identified on the project**	Yes	75	69.4	
		No	33	30.56	
3	**Defects Identified**	Pot Holes	7	28	2
		Structural Cracks on Concrete	8	32	1
		Rutting	4	16	4
		Flooding	3	12	5
		Early Settlement	5	20	3
		Alligator cracks on earthwork fill layers	3	12	5
		Bleeding	1	4	8
		Cracks in asphalt layer	1	4	8
		Defective sub base	2	8	7
4	**Cause of the defects**	Defective Materials	33	44	1
		Inadequate Supervision	33	44	1
		Inadequate Design	12	16	4
		Under qualified personnel	24	32	3
5	**Time for defects identification**	At Project Completion	6	8	3
		During the Construction Period	57	76	1
		During defects liability period	21	28	2
6	**Quality Control Mechanisms used**	Quality Control Monitoring tool	12	11.11	3
		Fully functional & equipped	66	61.11	1

		Laboratory			
		Proper records keeping	30	27.78	2
7	**Dedicated quality Control Manager**	Yes	96	88.89	
		No	12	11.11	
8	**Experience of the Quality Control Manager**	Above 10 years	68	62.5	1
		Above 5 years	30	28.13	2
		Between 1-5 years	10	9.38	3

The researcher used a 5-point Likert scale to rank the performance of the projects based on the quality. Based on the findings, the overall decision of the scale was good. This is illustrated in the table below:

Table 4. 8: Assessment of road construction projects based on quality

Project Performance	**Very poor (1)**	**Poor (2)**	**Fair (3)**	**Good (4)**	**Very Good (5)**	**Total**	**Mean**	**Decision**
Project performance in regard to quality	0	24	54	168	225	471	4.36	Very Good

When necessary quality control and quality assurance activities are carried out, the quality of the project becomes not only observable but verifiable during the construction until the operation phase starts or even during the defects liability period. However, the quality and long term performance of the infrastructure is subject to many external and stochastic factors such as the level of usage of infrastructure, efficiency of intended operation, weather, and frequency of planned and unplanned maintenance (Warsame,2013). This study focused on the quality control and assurance compliance during the project implementation stage which sets a foundation for the infrastructure life.

The table below represents the overall project performance of road construction projects in Uganda combining Cost, Time and Quality as evidenced by the above data. The performance level is measured using a 5-point Likert scale.

Table 4. 9: Overall weighted averages for project performance of road construction projects in Uganda

Project Performance	Very poor (1)	Poor (2)	Fair (3)	Good (4)	Very Good (5)	Total	Mean	Decision
Project performance based on time	18	72	90	60	45	285	2.63	Poor
Project performance based on cost	0	36	171	60	90	357	3.31	Fair
Project performance based on quality	0	24	54	168	225	471	4.36	Very Good

The figure 4.5 below illustrates a representation of the performance of Uganda's road construction projects:

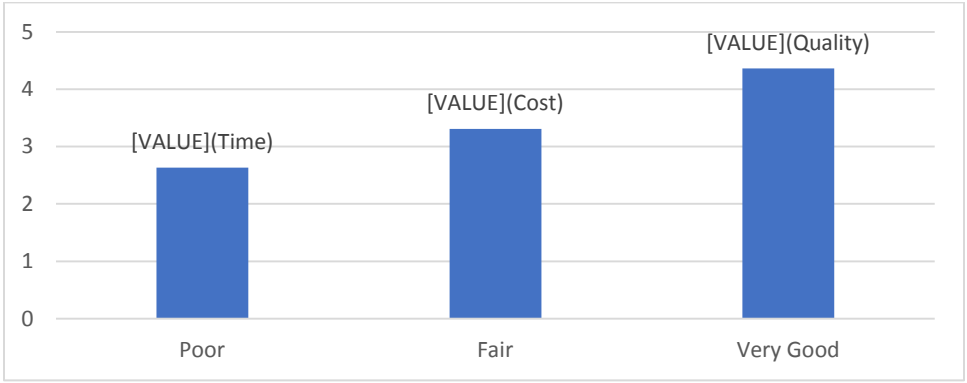


Figure 4. 5: Overall representation of the performance of Uganda's road construction projects

4.9 The extent of use of contracts administration practices

The participants were required to rate administration practices of contract administration. These involved reviewing the extent of use of contracts administration practices based on project governance, project personnel, communication and relationship management, quality management, monitoring and control, financial management, change control management, claims and disputes resolution, records management and contract risk management. The findings are presented below:

4.9.1 The extent of use of contracts administration practices based on project governance

The findings indicated that kick-off meetings conducted to discuss contracts with related parties had the highest mean of 4.36, followed by an established project management plan and the review of contract securities both having a mean of 4.11. The mean average of the three components was 3.9 implying that the overall decision for the extent of use of contracts administration practices is almost every time. According to PMI (2016), project governance provides a framework in which project activities are executed among the various stakeholders. Cunningham (2016) notes that this helps projects to run smoothly. In other words, project governance is the engine on which different projects run. The extent of use of project governance in this study is therefore rightfully justified given its level of importance. The table below rates the extent of use of the components of the project governance function of contracts administration.

Table 4. 2: The extent of use of the components of the project governance function of contracts administration

Project Governance	**Never (1)**	**Almost Never (2)**	**Sometimes (3)**	**Almost Every time (4)**	**Every time (5)**	**Total**	**Mean**	**Decision**
An established project management		2	12	84	50	148	4.11	Almost Every time

plan								
Review of the contractor's project quality plan (PQP)	1	6	33	40	55	135	3.75	Almost every time
Review of contractor's baseline programme	3		9	80	50	142	3.94	Almost Every time
Review of contractor's proposed key staff		10	15	56	60	141	3.92	Almost Every time
Kick-off meetings conducted to discuss the contract with related parties	2		15	20	120	157	4.36	Every time
PA team supported the employer in reviewing contract securities.		2	12	84	50	148	4.11	Almost Every time
Review of the contractor's	2	8	27	44	50	131	3.64	Almost Every time

logistics plan								
Project administration avoided bureaucracy and lengthy processes.		6	63	24	30	123	3.42	Sometimes
Average of the Mean value							**3.9**	

4.9.2 The extent of use of contracts administration practices based on project personnel

Under the project personnel function, it was established that the assignment of technically competent, quality and experienced personnel had the highest mean of 4.17; projects having clear identification of individual roles and responsibilities within the administration team had the second highest mean of 4.08; while the projects having regular assessments of performance teams taking due note of employer/contractor feedback had the third highest mean of 3.47. The mean average of all the components was 3.47 implying that the overall decision for the extent of use of project personnel was *Almost every time*. In reality, project personnel generally control the productivity of materials and equipment thereby influencing direct project costs. On the other hand, project activities cannot be executed without personnel. Skilled, competent and experienced personnel play a major role in project performance and this is reflected in the extent of their use as the results indicate.

Table 4. 13: The extent of use of the components of the project personnel function of contracts administration

Project Personnel	Never (1)	Almost Never (2)	Sometimes (3)	Almost Every time (4)	Every time (5)	Total	Mean	Decision
PA assigned technically competent, quality and experienced personnel	1	6	9	44	90	150	4.17	Almost Every time
PA team was involved from the beginning of the project in all relevant disciplines	7	12	18	40	35	112	3.11	Sometimes
Project has clear identificatio n of individual roles and responsibiliti es within the administrati		2	27	48	70	147	4.08	Almost Every time

on team								
Established training and development for administration team	9	16	36	20	10	91	2.53	Almost Never
Project has regular assessment of performance team taking due note of the employer/ contractor feedback		14	27	64	20	125	3.47	Sometimes
		Average of the Mean values					**3.47**	

4.9.3 The extent of use of contracts administration practices based on communication and relationship management

Under the extent of use of contracts administration practices based on communication and relationship management, regular meetings with employer and contractor had the highest mean of 4.69. This was followed by agreements between employer and contractor for any requested changes on scope, time and cost with a mean of 4.33, while effective coordination with third parties had the third highest mean of 4.144. The mean average of all components was 44.02, which implied that the overall decision for the extent of use of the components under communication and relationship management was *Almost every time*. Communication is an

essential component in all construction projects and the activities that revolve around them. Effective communication enables parties involved to understand any issues that arise, such as changes in instructions and designs thus leading to improved project performance (Oluka and Basheka, 2014). The results on the extent of use of communication and relationship management are in line with existing literature which emphasizes the need for contracting parties to utilize effective communication to ensure project success (Barakat et al, 2018; Joyce, 2014). Table 4.13 shows the findings for the extent of use of communication and relationship management under contracts administration.

Table 4. 14: The extent of use of the components of communication and relationship management of contracts administration

Communication and Relationship Management	**Never (1)**	**Almost Never (2)**	**Sometimes (3)**	**Almost Every time (4)**	**Every time (5)**	**Total**	**Mean**	**Decision**
Established communication management system	1		24	68	50	143	3.97	Almost Every time
PA team communicates the PMP requirements to all involved parties	1	6	27	32	75	141	3.92	Almost Every time
PA team advises the employer on its functions		6	27	56	50	139	3.86	Almost Every time
PA team measures the employer's satisfaction during the contract	2	22	12	36	50	122	3.39	Sometimes

lifespan								
Agreement between employer and contracts administration for any requested changes on scope, time and Cost		2	6	68	80	156	4.33	Every time
Regular meetings with employer and contractor			3	36	130	169	4.69	Every time
Effective coordination with third parties		2	24	48	75	149	4.14	Almost Every time
Prompt and accurate response to the contractor's queries in compliance with the contract provisions			45	40	55	140	3.89	Almost Every time
Effective management of operational issues at field level between the contractor and PA team		2	39	44	55	140	3.89	Almost Every time

Compliance with language of communication as stipulated in the contract		2		72	85	159	4.12	Almost Every time
Average of the Mean values							**4.02**	

4.9.3 The extent of use of contracts administration practices based on quality management

The results established that under quality management, projects having a system of controlling rejected/non-compliant works had the highest mean of 4.53; followed by projects with systematic inspection of the quality of work items on site with a mean of 4.50; and lastly, projects with a system for regular tracking of corrective actions with a mean of 44.39. The mean average of all the components was 4.24 implying that the overall decision for the extent of use of quality management in contracts administration was *Every time*. This showed how important quality work was considered during project execution. Table 4.14 below illustrates the extent of use of the components of quality management under contracts administration as elaborated above:

Table 4. 15: The extent of use of the components of quality management of contracts administration

Quality Management	**Never (1)**	**Almost Never (2)**	**Sometimes (3)**	**Almost Every time (4)**	**Every time (5)**	**Total**	**Mean**	**Decision**
Systematic auditing of the contractor's implementation of quality		8	21	52	60	141	3.92	Almost Every time

management system								
Prompt issuance of any additional information to the contractor		4	30	48	60	142	3.94	Almost Every time
Timely review of construction materials prior to use by the contractor taking due cognisance of the review cycle.		2	9	72	70	153	4.25	Almost Every time
Project has systematic inspection of quality of work items on site.				72	90	162	4.50	Every time
Project has system of controlling rejected/non-compliant works			6	52	105	163	4.53	Every time
Project has a system for regular tracking of corrective			12	56	90	158	4.39	Every time

actions								
PA team manages design and design development during construction	1	2	15	52	80	150	4.17	Almost Every time
Average of the mean values							**4.24**	

4.9.4 The extent of use of contracts administration practices based on the monitoring and control function

It was established that the project administration (PA) team providing regular progress reports to the employer had the highest mean of 4.67. This was followed by the PA team monitoring the contractor's suitability and adequacy of resources with a mean of 4.45, and lastly, the projects having an established monitoring and reporting system with a mean of 4.39. The mean average of all the components was 4.26 implying that the overall decision for the extent of use of the components under Monitoring and Control was *Almost every time*. According to Treasury (2017), monitoring and control are essential to the progress of a contractor in delivering as expected. In other words, the monitoring and control function ensures that project objectives are being met (Bartsiotas, 2014; Hidaka and Owen 2015; Joyce 2014).

Table 4. 16: The extent of use of the components of the monitoring and control function of contracts administration

Monitoring and Control	**Never (1)**	**Almost Never (2)**	**Sometimes (3)**	**Almost Every time (4)**	**Every time (5)**	**Total**	**Mean**	**Decision**

Project has an established monitoring and reporting system			15	48	95	158	4.39	Every time
PA team issues separate reports for major issues to keep the employer informed		4	9	88	45	146	4.06	Almost Every time
PA team provides regular progress reports to the employer			6	32	130	168	4.67	Every time
PA team reviews contractor's reports		2	12	52	90	156	4.33	Every time
PA team monitors the contractor's suitability and adequacy of resources		4	15	68	60	147	4.45	Every time
Timely notification of the contractor		4	36	64	30	134	3.72	Almost Every time

for recovery schedule when progress is slow in relation to approved programme								
Contractor is notified on failure to carry out any contractual obligations.		2	18	52	80	152	4.22	Almost Every time
		Average of mean values					**4.26**	

4.9.5 The extent of use of contracts administration practices based on the financial management function

Under the financial management function, it was discovered that timely notification of the employer about the contractor's due payment timelines and financial status had the highest mean of 4.50; proper issuance of instructions to spend provisional sum items had the second highest mean of 4.444; and fair, reasonable and equitable certification of due payment to the contractor had the third highest mean of 4.25. The mean average of all the components was 4.15 implying that the overall decision for the extent of use of the components under financial management was *Almost every time*. Alzara, Kashiwagi, Kashiwagi and Al-Tassan (2016) report that financial management, most especially timely payments to the contractor, is the driving force behind successful project implementation since finances are necessary to maintain a contractor's cash flows. Table 4.16 below depicts the extent of use of financial management components under contracts administration as elucidated above:

Table 4. 17: The extent of use of the components of the financial management function of contracts administration

Financial Management	Never (1)	Almost Never (2)	Sometimes (3)	Almost Every time (4)	Every time (5)	Total	Mean	Decision
Project has an established financial management system		6	33	48	50	137	3.81	Almost Every time
Proper issuance of instructions to spend provisional sum items		2	12	36	110	160	4.44	Every time
Fair, reasonable and equitable certification of due payment to the contractor		2	15	56	80	153	4.25	Almost Every time
Timely notification of the employer about the contractor's due payment timelines and financial status		2	6	44	110	162	4.50	Every time
Assessment of the contractor's compensation for delayed payment in compliance with the contract		8	18	52	65	143	3.97	Almost Every time
PA team advises the		6	15	52	75	148	4.11	Almost

employer on contingency planning/additional funds								Every time
PA team collects quotations for price estimates and contractor's price negotiations in respect of additional works/variations		2	30	56	55	143	3.97	Almost Every time
		Average of the mean averages					**4.15**	

4.9.6 The extent of use of contracts administration practices based on the change control management function

The results about the extent of use of contracts administration practices based on the change control management function revealed that the PA team proposing financially viable solutions to avoid budget increments on the side of the employer due to change requests had the highest mean of 4.03. This was followed by proper processing of the change orders on approved change requests with a mean of 3.97. Prompt evaluation of contractor's proposals for changes had the third highest mean value of 3.67. The mean average for all components was 3.8 implying that the overall decision for the extent of use of the components under the change control management function was *Almost every time*. Existing literature shows that changes in construction contracts are common, and therefore, contracts should dynamically cover anticipated changes in their original plans as projects progress (Alzara, Kashiwagi, Kashiwagi and Al-Tassan, 2016; Islam, Saiful and Skitmore, 2019). This calls for having proper change control management measures to provide a framework for managing and implementing change (Murdoch and Hughes, 2008;

Treasury, 2017). Table 4.18 below shows the extent of use of the components of the change control management function of contracts administration:

Table 4. 18: The extent of use of the components of the change control management function of contracts administration

Change Control Management	Never (1)	Almost Never (2)	Sometimes (3)	Almost Every time (4)	Every time (5)	Total	Mean	Decision
Project has an established change control system	2	12	33	20	60	127	3.53	Almost Every time
Prompt evaluation of contractor's proposals for changes		14	18	60	40	132	3.67	Almost Every time
PA team proposes financially viable solutions to avoid budget increase to the employer due to change requests.		4	21	60	60	145	4.03	Almost Every time
Proper processing of the change orders on		6	21	56	60	143	3.97	Almost Every

approved change requests								time
		Average of the mean Values					**3.8**	

4.9.7 The extent of use of contracts administration practices based on the claims and disputes resolution function

Findings revealed that the presence of claims and disputes resolution systems established by the PA had the highest mean of 4.08. Proper assessment of the contractor's entitlement to an extension of time for completion within timelines as set out in the contract and the PA team representing the employer in alternative dispute resolution proceedings had the second highest mean value of 4.00. The average mean for all the components as indicated in Table 4.18 is 3.87 implying that the overall decision for the extent of use of the components under claims and disputes resolution is *Almost every time*. It has been reported that disputes are inevitable within construction contracts, and that, the major source of the disputes is the process of administering contracts (Arcadis, 2018; El-adaway et al, 2018). Therefore, managing the contracts administration process is significant in reducing disputes hence saving time and costs that could have been incurred during the process of litigation (Abotaleb and El-adaway, 2018).

Table 4. 19: The extent of use of the components of the claims and disputes resolution function of contracts administration

Claims and Disputes Resolution Management	**Never (1)**	**Almost Never (2)**	**Sometimes (3)**	**Almost Every time (4)**	**Every time (5)**	**Total**	**Mean**	**Decision**
PA has established claims and disputes resolution		6	15	56	70	147	4.08	Almost Every time

systems								
PA team notifies the contractor about the employer's right to claim	2	2	33	60	35	132	3.67	Almost Every time
Proper assessment of the contractor's entitlement to extension of time for completion within timelines as set out in the contract		8	18	48	70	144	4.00	Almost Every time
Proper assessment of the contractor's entitlement for additional payment		14	24	24	75	137	3.81	Almost Every time
Effective negotiation of claims between the contractor and the employer.		4	42	40	50	136	3.78	Almost Every time

PA team supports the contracting parties to select alternative dispute resolution methods if not already set out in the contract		8	24	60	45	137	3.81	Almost Every time
PA team represents the employer in alternative dispute resolution proceedings		2	27	60	55	144	4.00	Almost Every time
PA team provides legal support to the employer during court cases	2	2	27	56	50	137	3.81	Almost Every time
	Average of the mean values						**3.87**	

4.9.8 The extent of use of contracts administration practices based on the records management function

The results showed that projects updating project documentation with registers had the highest mean of 4.11, followed by projects having established document management systems with a

mean of 4.06 and the PA team supporting the project stakeholder with regular statistics with a mean of 3.83. The mean average of all the components of the records management function as illustrated in the table below was 3.92 implying that the overall decision for the extent of use of the components under records management was *Almost every time*. It is stated that a proper documentation system facilitates the maintenance of obligations and substantiates claims, as well as supports compliance with provisions of contracts (Bartsiotas, 2014; Joyce, 2014; Okere, 2012; and Treasury, 2017). Treasury (2017) emphasizes the need for project records as they provide evidence for activities and transactions, thus being critical in the dispute resolution process or during litigations. Table 4.20 below depicts the extent of use of the components of the contracts administration records management function.

Table 4. 20: The extent of use of the components of the records management function of contracts administration

Records Management	**Never (1)**	**Almost Never (2)**	**Sometimes (3)**	**Almost Every time (4)**	**Every time (5)**	**Total**	**Mean**	**Decision**
Project has an established document management system	1	6	6	68	65	146	4.06	Almost Every time
PA team uses information management in administering the contract	5	6	6	56	60	133	3.69	Almost Every time
Project maintains updated project documentation	1	6	12	44	85	148	4.11	Almost Every time

with registers.								
PA team supports the project stakeholder with regular statistics.	3		27	48	60	138	3.83	Almost Every time
	Average of mean values						**3.92**	

4.9.9 The extent of use of contracts administration practices based on the contract risk management function

Under the contract risk management function, it was established that the support of the PA team towards the employer for the risk associated with design review had the highest mean of 3.94, while the PA team periodically assessing the contractual risk with the help of the contractor and assigning responsibility to the relevant party for each contractual risk expressed as a responsibility matrix had the second highest mean of 3.5. The mean average for all the components as shown in the table below was 3.41 implying that the overall decision for the extent of use of the components under contract risk management was *Sometimes*. It has been noted that there are substantial risks in construction projects due to their nature and the involvement of many stakeholders (El-Sayegh and Mansour, 2015). However, through early risk identification, strategies to mitigate risk can be proposed and implemented to reduce the occurrence and impact of risk. Table 4.21 below shows the extent of use of the components of the contract risk management function of contracts administration.

Table 4. 21: The extent of use of the components of the contract risk management function of contracts administration

Contract Risk Management	**Never (1)**	**Almost Never (2)**	**Sometimes (3)**	**Almost Every time**	**Every time**	**Total**	**Mean**	**Decision**

				(4)	**(5)**			
PA team periodically assesses the contractual risk with the help of the contractor	1	16	18	56	35	126	3.50	Almost Every time
PA team assigns responsibility to the relevant party for each contractual risk expressed as a responsibility matrix	3	10	15	68	30	126	3.50	Almost Every time
PA team supports the employer for the risk associated with design review findings		6	24	52	60	142	3.94	Almost Every time
PA team monitors the contractor's financial status and bankruptcy potential	10	20	6	36	25	97	2.69	Almost Never

	Average of mean values	**3.41**	

Overall, the extent of use of contract administration practices is represented in the figure below, with the highest extent of use (4.26) being Monitoring and Control being used *Every time*. The monitoring and control function is considered the core of contract administration as it ensures that the performance of the contractor agrees with the contract and that the employer is aware of all issues. The practice with the second highest extent of use (4.24) is Quality Management being used *Every time* as well. The quality management function is fundamental to any road project, and quality is one of the dependent variables of this study thus further justifying its importance and extent of use. The practice with the third extent of use (4.15) is Financial Management being *Almost every time*. The financial management function plays a vital role in ensuring that the contractor's cash flows are healthy enough to ensure the smooth running of the project in terms of human resources, materials and equipment.

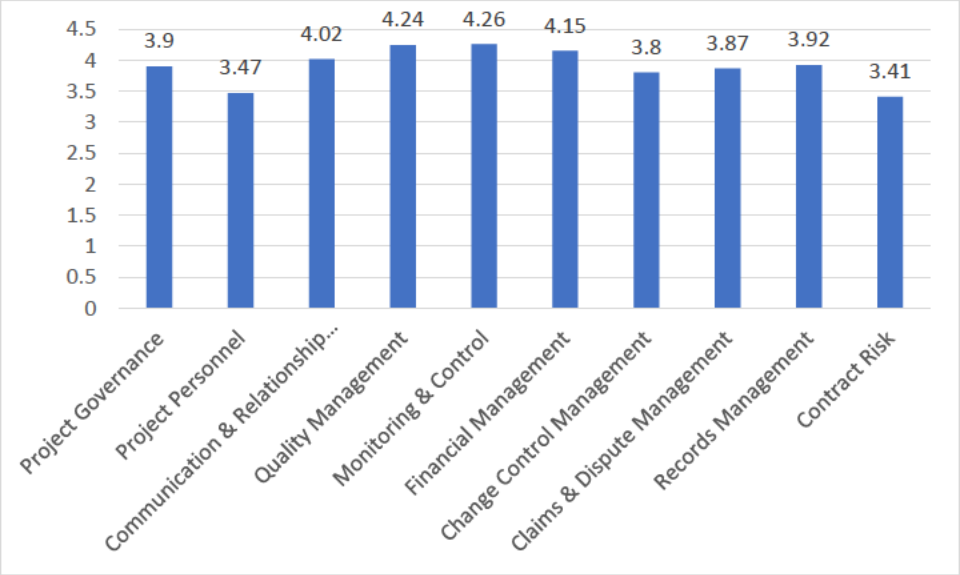


Figure 4. 6: Overall extent of use of contract administration practices

4.10 Determining the association between contract administration and projects performance

The participants were probed to rate contract administration based on the project performance. Regression analysis was used to determine whether there was a statistically significant

relationship between contract administration and project performance. The independent variables were: project governance, project personnel, communication and relationship management, quality management, monitoring and control, financial management, change control management, claims and disputes resolution management, records management and contract risk management. The dependent variables were cost, time and quality (performance). The presentation and analysis of the data as it relates to the variables was presented in the research question. The overall contribution of contract administration to the performance of road construction projects in Uganda is 66% (0.66) = $R^{2,}$ as demonstrated in the table 4.22 below:

Table 4. 22: Overall contribution of contract administration to the performance of road construction projects in Uganda

R	R^2	Adjusted R^2	Standard error of the estimate
0.87	0.75	0.66	0.05

On the other hand, the results from the regression analysis indicated that there was a generally significant positive relationship between performance and contract administration with a p-value <.001. This implied that the null hypothesis was not supported. The findings are illustrated in the table below:

Table 4. 23: Relationship between performance and contract administration

Model	df	F	p
Regression	10	7.68	<.001

Table 4. 24: Regression analyses of the independent variables

	Unstandardized Coefficients	Standardized Coefficients			
Model	B	Beta	Standard error	t	p

	Unstandardized Coefficients	Standardized Coefficients			
Model	B	Beta	Standard error	t	p
(Constant)	-0.2		0.5	-0.4	.696
Project Governance	1.16	0.75	0.31	3.72	.001
Project Personnel	0.15	0.17	0.17	0.9	.378
Communication and Relationship Management	-0.81	-0.61	0.44	-1.85	.076
Quality Management	0.27	0.19	0.24	1.11	.276
Monitoring Control	-0.73	-0.46	0.41	-1.76	.09
Financial Management	0.08	0.06	0.18	0.43	.671
Change Control Management	0.3	0.37	0.35	0.87	.394
Claims and Dispute	0.63	0.53	0.31	2.04	.052
Records Management	0.02	0.03	0.11	0.18	.857
Contract Risk Management	-0.15	-0.21	0.09	-1.59	.125

Table 4.25 provides a guide on how to interpret the values above.

Table 4. 25: Interpretation of values

From	To	Interpretation
0.00	±0.20	A negligible degree of correlation—this relationship could have occurred by chance alone, as well as from an existing relationship
±0.20	±0.40	A low degree of correlation—some relationship actually exists
±0.40	±0.70	A strong degree of correlation— a considerable relationship exists
±0.70	±0.90	A high degree of correlation—a definite, marked relationship exists
±0.90	±1.00	A very high degree of correlation—a very considerable relationship exists

Source: Goehring (1981)

According to Beers (2022), a p-value of less than 0.05 is statistically significant and thus calls for the rejection of the null hypothesis, while one greater than 0.05 calls for accepting the null hypothesis as the p-value is not statistically significant. The results from the regression analysis of this study show that the relationship between performance and contract administration is statistically significant, although based on the findings, some contract administration practices are more critical to performance compared to others.

From the results, project governance has the highest standardized coefficient of 0.75 with a p-value of 0.001 implying that it has a high positive significance and correlation with performance compared to the rest of other contract administration practices. On the other hand, communication and relationship management has a standard coefficient of -0.61 with a p-value of 0.076 denoting a strong degree of correlation with performance, however, not statistically significant. Similarly, claims and dispute resolution management has a standard coefficient of 0.53 and a p-value of 0.052 showing its strong correlation with performance although not statistically significant. In addition, monitoring and control has a standard coefficient of -0.46, denoting a strong degree of correlation with performance and a p-value of 0.09 and therefore not statistically significant; change control management has a standard coefficient of 0.37, denoting a low degree of relationship with performance and a p-value of 0.87 and therefore not

statistically significant; contract risk management has a standard coefficient of -0.21, denoting a low degree of correlation with performance and a p-value of 1.59 and therefore not statistically significant; quality control management has a standard coefficient of 0.19, denoting a negligible degree of correlation with performance and a p-value of 0.276 and therefore not statistically significant; project personnel has a standard coefficient of 0.17, denoting a negligible degree of correlation with performance and a p-value of 0.378 and therefore not statistically significant; financial management has a standard coefficient of 0.06, denoting a negligible degree of correlation and a p-value of 0.671 and therefore not statistically significant; and records management has a standard coefficient of 0.03, denoting a negligible degree of correlation and a p-value of 0.857 and therefore not statistically significant. Therefore, as earlier stated, while all the independent variables have a degree of correlation with performance, not all are statistically significant.

Table 4. 26: Regression analysis

R	R^2	Adjusted R^2	Standard error of the estimate
0.62	0.39	0.37	0.07

4.10.1 Model equation of the regression analysis

PRCP= (0.75*PG) + (0.17 * PP) + (-0.61 *CRM) + (0.19 * QM) + (-0.46 * CM) + (0.06 * FM) + (0.37 * CCM) + (0.57 * CD) + (0.03 * RM) + (-0.21 * CKM)-0.2

Where;

PRCP=performance of road construction project

PG= Project Governance

PP= Project Personnel

CRM= Communication and Relationship Management

QM= Quality Management

MC = Monitoring Control

FM = Financial Management

CCM= Change Control Management

CD = Claims and Dispute

RM = Records Management

CKM = Contract Risk Management

General Equation is as below;

$Y=B_1X_1+B_2X_2+B_nX_n +C$

Y=Dependent

X=Independent

B= Coefficient

C = Constant

As a result of the regression analysis, the above formula has been developed from the study results (All connotations have been described as they appear in the research study). This formular can always be used to establish the level of performance of a road construction project at any stage of the construction phase. This will help in the assessment of the performance of the road project as it progresses, rectify any problems that need to be addressed and have all the variables checked.

4.11 Chapter summary

The chapter looks at data interpretation, analysis and discussion of results following the objectives set out for the study in chapter one. The chapter further sought answers to the research questions 1, 2 and 3, i.e.: What is the performance of road construction projects in Uganda? To what extent is contract administration used on road construction projects in Uganda, and Is there an association between contract administration and project performance? This chapter forms the basis of the following chapter 5, which develops a construction assessment strategy for road construction projects as the last objective.

CHAPTER FIVE: CONTRACTS ADMINISTRATION ASSESSMENT STRATEGY

5.1 Introduction

This chapter comprises the contracts administration assessment strategy that has been developed based on the results of the literature review in chapter two; the survey results in chapter four, and best practices. The contracts administration assessment strategy is relevant because it contributes to the body of knowledge of contracts administration in the construction sector. While the study appreciates the contribution of different authors on the same topic, the need to develop a strategy as a guide to efficiently implement road construction projects in Uganda was found to be important. The strategy will go a long way in ensuring proper implementation of projects and ensure that nothing in the contracts administration space is overlooked. The strategy incorporates the contracts administration practices identified and those that were used in the survey.

5.2 Role of strategy in project success

Mintzberg (1987) defines a strategy as "an overall plan to achieve an objective for which it is developed". Contracts administration involves a series of activities which need to be managed strategically since construction projects are very risky. Flanagan and Norman (1993) associate the risk with their complexity and unique traits, which include extended time periods and financial intensity. An assessment strategy is a method used to evaluate a project's progress and plan its day-to-day activities so as to align it to its intended objectives. An assessment strategy is thus needed as an integral part of construction contracts. In other words, the contracts administration strategy is a solution aimed at addressing the challenges highlighted in the industry survey although it does not override the contract agreement. The contracting parties have the final say on whether to include it as part of the contract.

5.3 How the contracts administration assessment strategy is being developed.

To develop the contracts administration assessment strategy, six factors were majorly considered out of the initial ten since the survey results considered them more significant, though the first factor was considered more significant than the others. The list of the factors is shared below according to the hierarchy of significance as illustrated in the survey results:

- Early contract administrator project involvement

- Project governance
- Communication and relationship management
- Claims and dispute management
- Monitoring and control

5.3.1 Early involvement of contracts administrator in projects

Choudhry (2016) determined that "stakeholders strongly support the appointment of contract administrators from the design stage to the execution stage to ensure that the contract administrator has full knowledge about the project right from the initial stages". The study found this important as involving contract administrators in projects early enough facilitates them in getting in-depth insight about the project scope and understanding existing ambiguities within the contractor documents, which gives them a chance to rectify issues that need to be rectified and approve the execution of contracts in the shortest time possible. Since road projects are normally public projects, it is equally important that senior public officials are tasked to oversee project planning and competitiveness before contractors are appointed.

5.3.2 Project governance

The study found that project governance ranked highest in the significance of a project. According to Choudhry (2016), project governance involves setting structures which determine who the key personnel are and their scope of work. It is advisable for this to be carried out before actual work commences to ensure that guiding parameters on how the project is to be run are known from the start. This will facilitate the contracting parties to determine their project resource requirements and adopt strategies to get the project resource requirements that are not readily available. This study deduced that project governance was the driving force to project implementation and thus greatly affected performance. The study also found out that the significant components of project governance include: establishment of a project management plan, review of the contractor's project quality management plan (PQP), review of the contractor's baseline programme, review of the contractor's proposed key staff, conducting kick-off meetings to discuss the contract with related parties, administrator supporting the employer in reviewing contract securities, and review of the contractor’s logistics plan and project

administration plan for the avoidance of bureaucratic and lengthy processes. It is also important for the project governance plan to consider financial management, records management and early identification of risk and planning for mitigation.

5.3.3 Communication and relationship management

All contracts administration processes depend on communication and relationship management, and therefore, the importance of effective communication and relationship management on a project cannot be over-emphasized. It is stated that ineffective communication and poor relationship management are some of the major reasons why projects fail (Obonadhuze et al, 2021). This calls for the development of a project communication plan. A project communication plan includes details about all the contracting parties, including their scope of work; project timelines; budget ceilings; and deliverables and expertise required. The project communication plan also guidelines for resolving conflicts and handling claims, and how to work with parties who are not covered by the contract. Given that most road projects take a lot of time, the parameters of the communication plan govern all aspects of communication and relationship management, which facilitate all parties involved in the project to work together harmoniously.

5.3.4 Claims and dispute management

Disputes are bound to happen in projects, and therefore, the way disputes and claims are handled affects contracts administration. It is advisable that caution is taken in specifying each contracting party's scope of work, expected deliverables and timelines, as well as other project prerequisites like resources from the onset so that each party has an idea of their expectations. These should be properly communicated and documented to avoid misunderstandings related to the risks and responsibilities of each contracting party. On the other hand, there should be steps to minimize claims and disputes during and after the execution of the project. This calls for designing a claims and dispute management plan to guide the process of resolving claims and disputes.

5.3.5 Monitoring and control

Elements to be monitored and controlled ought to be determined at the planning stage to ensure that project objectives are met. Project administration teams should consider making use of the information gathered from the monitoring systems not only for control but also to have a system of scheduled internal project audits. Additionally, the project administrator should introduce a project monitoring system. Projects require the aid of a monitoring system. When setting it up, project objectives of performance like quality, time and cost need to be highly considered as they need to be kept in check against other project elements to keep to the intended plan. The system should include specific borders of performance control for each stage/work/activities or even tasks and subtasks that are fully broken down so as to tie them in with the entire project. Control should also be done with the highest level of detail all the way right from the activity level of each performance element for it to cause an impact. It is normally the activity plan that contains aspects of what should be done, when, how, and by whom, including resources required for a particular task. The action/activity plan guides the development of the monitoring system by providing a detailed breakdown of activities and resources that need to be controlled in order to achieve the project set goals of time cost and quality. In the absence of a strong performance measurement system, there is usually a temptation of projects to use project inputs or resources as output measures. This is a very common error as it will provide no control activities. It is normally an assumption of x% of the budget spent being equivalent to x% completed tasks. To avoid that, time must be spent at the planning stage to develop the planning, monitoring and control process.

5.5 Development of the contracts administration assessment strategy

This shows how the contracts administration assessment strategy was developed based on project governance, project personnel, communication and relationship management, quality management, monitoring and control, financial management, change control management, claims and disputes resolution management, records management and contract risk management.

5.5.1 Development of the contract administration assessment strategy based on project governance

It was determined that project governance had a strong positive and significant correlation with the performance of projects. The weights attached to project governance were extracted from the coefficients of the regression analysis. A weight of 0.75 was attached to it multiplied by the mean scores to give total scores. Project governance had several components under it including conducting kick-off meetings to discuss the contract with relevant parties scoring highest with 3.27 total score. This was followed by the establishment of a project management plan and supporting the employer in reviewing contract securities at 3.08 score, review of the contractor's baseline programme at 2.96 score, review of the contractor's proposed key staff scoring 2.94, review of the contractor's project quality plan with a score of 2.81, review of the contractor's logistics plan score at 2.73, and lastly, project administration avoiding bureaucracy and lengthy processes with a score of 2.57. The grand total of project governance was 23.44. The table below provides a summary of this information:

Table 5. 1: Rankings of project governance components

Project Governance	**Mean Scores**	**Weights**	**Total Score**
Establishment of a project management plan	4.11	0.75	3.08
Review of the contractor's project quality plan (PQP)	3.75	0.75	2.81
Review of contractor's baseline programme	3.94	0.75	2.96
Review of contractor's proposed key staff	3.92	0.75	2.94
Conducting of Kick-off meetings to discuss the contract with relevant parties	4.36	0.75	3.27
Supporting the employer in reviewing of contract securities.	4.11	0.75	3.08
Review of the contractor's logistics plan	3.64	0.75	2.73
Project administration avoided bureaucracy and lengthy processes.	3.42	0.75	2.57
Total			**23.44**

The rankings of the project governance components as described in the table 5.1.

5.5.2 Development of the contracts administration assessment strategy based on project personnel

The findings revealed that project personnel had a negligible degree of correlation with project performance. The weights attached to project personnel were extracted from the coefficients of the regression analysis. A weight of 0.17 was attached to it multiplied by the mean scores to give the total scores. Project personnel has several components under it including assigning technically competent, quality and experienced personnel scoring highest with a 0.71 total score. This was followed by the identification of individual roles and responsibilities within the administration team at a 0.69 score, regular assessment of performance team taking due note of the employer/contractor feedback with a 0.59 score, project administration team involvement from the beginning of the project in all relevant disciplines scoring 0.53 and establishment of training and development for administration team with a score of 0.43. This information is summarized in the table below:

Table 5. 2: Rankings of project personnel components

Project Personnel	**Mean Scores**	**Weights**	**Total Score**
PA assigned technically competent, quality and experienced personnel	4.17	0.17	0.71
PA team was involved from the beginning of the project in all relevant disciplines	3.11	0.17	0.53
Project has clear identification of individual roles and responsibilities within the administration team	4.08	0.17	0.69
Established training and development for administration team	2.53	0.17	0.43
Project has regular assessment of performance team taking due note of the employer/ contractor feedback	3.47	0.17	0.59
Total			**2.95**

5.5.3 Development of the contracts administration assessment strategy based on communication and relationship management

The results established that communication and relationship management had a strong degree of correlation with project performance. The weights attached to communication and relationship management were extracted from the coefficients of the regression analysis. A weight of 0.61 was attached to it multiplied by the mean scores to give total scores. Communication and relationship management had several components under it including regular meetings with the employer and contractor scoring highest with 2.86 total score. This was followed by agreement between the employer and contractor administrator for any requested changes on scope, time and cost at 2.64 score, effective coordination with third parties with a 2.55 score, compliance with language of communication as stipulated in the contract scoring 2.53, established communication management system at 2.42, PA team communicating the PMP requirements to all involved parties at 2.39, both prompt and accurate response to the contractor's queries in compliance with the contract provisions and effective management of operational issues at field level between the contractor and PA team at 2.37, PA team advising the employer on its functions at 2.35, and finally, PA team measuring the employer's satisfaction during the contract lifespan with a score of 2.07. This information is summarized in the table below:

Table 5. 3: Rankings of communication and relationship management components

Communication and Relationship Management	**Mean Scores**	**Weights**	**Total Score**
Established communication management system	3.97	-0.61	-2.42
PA team communicates the PMP requirements to all involved parties	3.92	-0.61	-2.39
PA team advises the employer on its functions	3.86	-0.61	-2.35
PA team measures the employer's satisfaction during the contract lifespan	3.39	-0.61	-2.07
Agreement between employer and contracts administration for any requested changes on scope, time and cost	4.33	-0.61	-2.64
Regular meetings with employer and contractor	4.69	-0.61	-2.86

Effective coordination with third parties	4.14	-0.61	-2.53
Prompt and accurate response to the contractor's queries in compliance with the contract provisions	3.89	-0.61	-2.37
Effective management of operational issues at field level between the contractor and PA team	3.89	-0.61	-2.37
Compliance with language of communication as stipulated in the contract	4.12	-0.61	-2.55
Total			**24.55**

5.5.4 Development of the contracts administration assessment strategy based on quality management

The results established that quality management had a negligible degree of correlation with project performance. The weights attached to quality management were extracted from the coefficients of the regression analysis. A weight of 0.19 was attached to it multiplied by the mean scores to give total scores. Quality management had several components under it including projects having a systematic inspection of quality of work items on site and projects having a system of controlling rejected/non-compliant works scoring highest with a 0.86 total score. This was followed by projects having a system for regular tracking of corrective actions with a 0.83 score, timely review of construction materials prior to use by the contractor taking due cognisance of the review cycle scoring 0.81, the PA team managing design and design development during construction at 0.79, prompt issuance of any additional information to the contractor at 0.75 and systematic auditing of the contractor's implementation of quality management system with a score of 0.74. The overall score for quality management was 5.64. This information is summarized in the table below:

Table 5. 4: Rankings of quality management components

Quality Management	**Mean Scores**	**Weights**	**Total Score**
Systematic auditing of the contractor's implementation of quality management system	3.92	0.19	0.74

Prompt issuance of any additional information to the contractor	3.94	0.19	0.75
Timely review of construction materials prior to use by the contractor taking due cognisance of the review cycle.	4.25	0.19	0.81
Project has systematic inspection of quality of work items on site.	4.5	0.19	0.86
Project has system of controlling rejected/non-compliant works	4.53	0.19	0.86
Project has a system for regular tracking of corrective actions	4.39	0.19	0.83
PA team manages design and design development during construction	4.17	0.19	0.79
Total			**5.64**

5.5.5 Development of the contracts administration assessment strategy based on monitoring and control

It was found out that monitoring and control had a strong degree of correlation with project performance. The weights attached to monitoring and control were extracted from the coefficients of the regression analysis. A weight of 0.46 was attached to it multiplied by the mean scores to give total scores. Monitoring and control had several components under it including the PA team providing regular progress reports to the employer scoring highest with a 2.15 total score. This was followed by the PA team monitoring the contractor's suitability and adequacy of resources with a 2.05 score, projects having an established monitoring and reporting system with a 2.02 score, the PA team reviewing the contractor's reports scoring 1.99, the contractor receiving notification on the failure to carry out any contractual obligations at 1.94, the PA team issuing separate reports for major issues to keep the employer informed at 1.87, and finally, timely notification of the contractor for recovery schedule when progress is slow in relation to approved programme with a score of 1.71. The overall score for monitoring and control was 13.73. These results are presented in table below:

Table 5. 5: Rankings of monitoring and control components

Monitoring and Control	Mean Scores	Weights	Total Score
Project has an established monitoring and reporting system	4.39	-0.46	-2.02
PA team issues separate reports for major issues to keep the employer informed	4.06	-0.46	-1.87
PA team provides regular progress reports to the employer	4.67	-0.46	-2.15
PA team reviews contractor's reports	4.33	-0.46	-1.99
PA team monitors the contractor's suitability and adequacy of resources	4.45	-0.46	-2.05
Timely notification of the contractor for recovery schedule when progress is slow in relation to approved programme	3.72	-0.46	-1.71
Contractor is notified on failure to carry out any contractual obligations.	4.22	-0.46	-1.94
Total			**13.73**

5.5.6 Development of the contracts administration assessment strategy based on financial management

Financial management was found to have a strong degree of correlation with project performance. The weights attached to financial management were extracted from the coefficients of the regression analysis. A weight of 0.06 was attached to it multiplied by the mean scores to give total scores. Financial management had several components under it including timely notification of the employer about the contractor's due payment timelines and financial status and proper issuance of instructions to spend provisional scoring highest with a 0.27 total score. This was followed by fair, reasonable and equitable certification of due payments to the contractor at a 0.26 score, the PA team advising the employer on contingency planning/additional funds scoring 0.25, the PA team collecting quotations for price estimates and contractor's price negotiations in respect of additional works/variations at 0.24, and finally, the project having an established financial management system with a score of 0.23. The overall score for financial management was 1.76. This information is presented in the table below:

Table 5. 6: Rankings of financial management components

Financial Management	Mean Scores	Weights	Total Score
Project has an established financial management system	3.81	0.06	0.23
Proper issuance of instructions to spend provisional sum items	4.44	0.06	0.27
Fair, reasonable and equitable certification of due payment to the contractor	4.25	0.06	0.26
Timely notification of the employer about the contractor's due payment timelines and financial status	4.5	0.06	0.27
Assessment of the contractor's compensation for delayed payment in compliance with the contract	3.97	0.06	0.24
PA team advises the employer on contingency planning/additional funds	4.11	0.06	0.25
PA team collects quotations for price estimates and contractor's price negotiations in respect of additional works/variations	3.97	0.06	0.24
Total			**1.76**

5.5.7 Development of the contracts administration assessment strategy based on change control management

Change control management was found to have a low degree of correlation with project performance. The weights attached to change control managementwere extracted from the coefficients of the regression analysis. A weight of 0.37 was attached to it multiplied by the mean scores to give total scores. Change control management had several components under it including the PA team proposing financially viable solutions to avoid budget increase to the employer due to change requests scoring highest with a 1.49 total score. This was followed by proper processing of the change orders on approved change requests at a 1.47 score, prompt evaluation of the contractor's proposals for changes at a 1.36 score, and finally, the project having an established change control system with a score of 1.31. The overall score for change control management was 5.63. These findings are presented in the table below:

Table 5. 7: Rankings of change control management components

Change Control Management	Mean Scores	Weights	Total Score
Project has an established change control system	3.53	0.37	1.31
Prompt evaluation of contractor's proposals for changes	3.67	0.37	1.36
PA team proposes financially viable solutions to avoid budget increase to the employer due to change requests.	4.03	0.37	1.49
Proper processing of the change orders on approved change requests	3.97	0.37	1.47
Total			**5.63**

5.5.8 Development of the contracts administration assessment strategy based on claims and disputes resolution management

The findings revealed that claims and disputes resolution management had a strong degree of relationship with project performance. The weights attached to claims and disputes resolution management were extracted from the coefficients of the regression analysis. A weight of 0.53 was attached to it multiplied by the mean scores to give total scores. Claims and disputes resolution management had several components under it including the PA having established claims and disputes resolution systems scoring highest with 2.14 total score. This was followed by the PA team representing the employer in alternative dispute resolution proceedings and Proper assessment of the contractor's entitlement to extension of time for completion within timelines as set out in the contract at a 2.12 score, proper assessment of the contractor's entitlement for additional payment and the PA team providing legal support to the employer during court cases at a 2.02 score, effective negotiation of claims between the contractor and the employer at a 2.00 score, and finally, thePA team notifying the contractor about the employer's right to claim with a score of 1.95. The overall score for claims and dispute resolution management was 16.39. These findings are presented in the table below:

Table 5. 8: Rankings of claims and disputes resolution management components

Claims and Disputes Resolution Management	Mean Scores	Weights	Total Score
PA has established claims and disputes resolution systems	4.08	0.53	2.14
PA team notifies the contractor about the employer's right to claim	3.67	0.53	1.95
Proper assessment of the contractor's entitlement to extension of time for completion within timelines as set out in the contract	4	0.53	2.12
Proper assessment of the contractor's entitlement for additional payment	3.81	0.53	2.02
Effective negotiation of claims between the contractor and the employer.	3.78	0.53	2.00
PA team supports the contracting parties to select alternative dispute resolution methods if not already set out in the contract	3.81	0.53	2.02
PA team represents the employer in alternative dispute resolution proceedings	4	0.53	2.12
PA team provides legal support to the employer during court cases	3.81	0.53	2.02
Total			**16.39**

5.5.9 Development of the contracts administration assessment strategy based on records management

As per the findings, records managementhad a negligible degree of correlation project performance. The weights attached to recordsmanagementwere extracted from the coefficients of the regression analysis. A weight of 0.03 was attached to it multiplied by the mean scores to give the total scores. Records management had several components under it including the project maintaining updated project documentation with registers scoring highest with 0.12 total score. This was followed by the PA team using information management in administering the contract and supporting the project stakeholder with regular statistics at a 0.11 score. The overall score for records management was 0.46. These findings are presented in the table below:

Table 5. 9: Rankings of records management components

Records Management	**Mean Scores**	**Weights**	**Total Score**
Project has an established document management system	4.06	0.03	0.12
PA team uses information management in administering the contract	3.69	0.03	0.11
Project maintains updated project documentation with registers.	4.11	0.03	0.12
PA team supports the project stakeholder with regular statistics.	3.83	0.03	0.11
Total			**0.46**

5.5.10 Development of the contracts administration assessment strategy based on contract risk management

Contract risk management had a low degree of correlation with project performance as per the findings. The weights attached to contract risk management were extracted from the coefficients of the regression analysis. A weight of 0.21 was attached to it multiplied by the mean scores to give the total scores. Contract risk management had several components under it, including the PA team supporting the employer for the risk associated with design review findings scoring highest with a 0.83 total score. This was followed by the PA team periodically assessing the contractual risk with the help of the contract and assigning responsibility to the relevant party for each contractual risk expressed as a responsibility matrix both at a 0.74 score, and finally, the PA team monitoring the contractor's financial status and bankruptcy potential at a score of 0.53. The overall score for contract risk management was 2.87. These findings are presented in the table below:

Table 5. 10: Rankings of contract risk management

Contract Risk Management	**Mean Scores**	**Weights**	**Total Score**
PA team periodically assesses the contractual risk with the help	3.5	0.21	0.74

of the contractor			
PA team assigns responsibility to the relevant party for each contractual risk expressed as a responsibility matrix	3.5	0.21	0.74
PA team supports the employer for the risk associated with design review findings	3.94	0.21	0.83
PA team monitors the contractor's financial status and bankruptcy potential	2.69	0.21	0.56
Total			**2.87**

5.6 Contracts administration assessment strategy tool

The contracts administration assessment strategy tool was developed from the above analysis of contracts administration practices taking into consideration the weights obtained from their significance. Total scores were developed for each contracts administration practice which were then translated into the grand total score for all contracts administration practices. The purpose for developing this strategy tool was to guide contract administrators on how to evaluate/measure the adherence of ongoing projects to contracts administration practices according to their priorities as established by the findings so as to enable them to make necessary adjustments where possible to improve project performance. The maximum score of 97.42 denoted excellent performance while any score below this called for checks and adjustments to be made within the contracts administration practices.

Table 5. 11: Contracts administration assessment strategy tool

Contracts administration Assessment		
	Maximum Score	**Awarded Score**
Project Governance		
Establishment of a project management plan	3.08	
Review of the contractor's project quality plan (PQP)	2.81	
Review of contractor's baseline programme	2.96	
Review of contractor's proposed key staff	2.94	

Conducting kick-off meetings to discuss the contract with relevant parties	3.27	
Supporting the employer in reviewing contract securities	3.08	
Review of the contractor's logistics plan	2.73	
Project administration team avoided bureaucracy and lengthy processes	2.57	
Sub-Total	**23.44**	
Percentage %	**24.061%**	
Project Personnel		
PA assigned technically competent, quality and experienced personnel	0.71	
PA team was involved from the beginning of the project in all relevant disciplines	0.53	
Clear identification of individual roles and responsibilities within the administration team	0.69	
Established training and development for administration team	0.43	
Regular assessment of performance team taking due note of the employer/contractor feedback	0.59	
Sub-Total	**2.95**	
Percentage %	**3.03%**	
Communication and Relationship Management		
Established communication management system	2.42	
Communicates the PMP requirements to all involved parties	2.39	
Advises the employer on its functions	2.35	
Measures the employer's satisfaction during the contract lifespan	2.07	

Agreement between employer and contracts administration for any requested changes on scope, time and cost	2.64	
Regular meetings with employer and contractor	2.86	
Effective coordination with third parties	2.53	
Prompt and accurate response to the contractor's queries in compliance with the contract provisions	2.37	
Effective management of operational issues at field level between the contractor and PA team	2.37	
Compliance with language of communication as stipulated in the contract	2.55	
Sub-Total	**24.55**	
Percentage %	**25.2%**	
Quality Management		
Systematic auditing of the contractor's implementation of quality management system	0.74	
Prompt issuance of any additional information to the contractor	0.75	
Timely review of construction materials prior to use by the contractor taking due cognisance of the review cycle.	0.81	
Systematic inspection of quality of work items on site.	0.86	
System for controlling rejected/non-compliant works	0.86	
System for regular tracking of corrective actions	0.83	
PA team manages design and design development during construction	0.79	
Sub-Total	**5.64**	
Percentage %	**5.79%**	
Monitoring and Control		

Established monitoring and reporting system	-2.02	
PA team issues separate reports for major issues to keep the employer informed	-1.87	
PA team provides regular progress reports to the employer	-2.15	
Review of contractor's reports	-1.99	
Monitors the contractor's suitability and adequacy of resources	-2.05	
Timely notification of the contractor for recovery schedule when progress is slow in relation to approved programme	-1.71	
Contractor is notified on failure to carry out any contractual obligations.	-1.94	
Sub-Total	**13.73**	
Percentage %	**14.09%**	
Financial Management		
Project has an established financial management system	0.23	
Proper issuance of instructions to spend provisional sum items	0.27	
Fair, reasonable and equitable certification of due payment to the contractor	0.26	
Timely notification of the employer about the contractor's due payment timelines and financial status	0.27	
Assessment of the contractor's compensation for delayed payment in compliance with the contract	0.24	
PA team advises the employer on contingency planning/additional funds	0.25	
PA team collects quotations for price estimates and contractor's price negotiations in respect of additional works/variations	0.24	

Sub-Total	**1.76**	
Percentage %	**1.81%**	
Change Control Management		
Project has an established change control system	1.31	
Prompt evaluation of contractor's proposals for changes	1.36	
PA team proposes financially viable solutions to avoid budget increase to the employer due to change requests.	1.49	
Proper processing of the change orders on approved change requests	1.47	
Sub-Total	**5.63**	
Percentage %	**5.78%**	
Claims and Disputes Resolution Management		
Established claims and disputes resolution systems	2.14	
Contractor is notified about the employer's right to claim	1.95	
Proper assessment of the contractor's entitlement to extension of time for completion within timelines as set out in the contract	2.12	
Proper assessment of the contractor's entitlement for additional payment	2.02	
Effective negotiation of claims between the contractor and the employer.	2	
Support to the contracting parties in selecting alternative dispute resolution methods if not already set out in the contract	2.02	
PA team represents the employer in alternative dispute resolution proceedings	2.12	
Provides legal support to the employer during court cases	2.02	

Sub-Total	**16.39**	
Percentage %	**16.82%**	
Records Management		
Established document management system	0.12	
Use of information management in administering the contract	0.11	
Project maintains updated project documentation with registers.	0.12	
PA team supports the project stakeholder with regular statistics.	0.11	
Sub-Total	**0.46**	
Percentage %	**0.47%**	
Contract Risk Management		
Periodic assessment of contractual risk with the help of the contractor	0.74	
PA team assigns responsibility to the relevant party for each contractual risk expressed as a responsibility matrix	0.74	
Support to the employer for the risk associated with design review findings	0.83	
Monitoring the contractor's financial status and bankruptcy potential	0.56	
Sub-Total	**2.87**	
Percentage %	**2.95%**	
Grand Total	**97.42**	
Total Percentage %	**100%**	

5.7 Chapter Summary

This aim of this chapter was to develop a contracts administration assessment strategy tool to be used in the assessment of contracts administration. The chapter provided reasons why being strategic was important in the success of projects and the factors that were considered in the development of the contracts administration assessment strategy. Furthermore, these factors which included but were not limited to project governance and project personnel were further elaborated drawing more insight into the significance of the different components that they are composed of. Based on these factors/contracts administration practices, a contracts administration assessment strategy tool was developed.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

This chapter concludes the study by summarizing the key research findings relating to the literature review and the research objectives of this study. It will further discuss the value and contribution of the study. Finally, it will review the research limitations and propose areas for future research.

6.1 Conclusions from Empirical Research

The results from empirical research indicate that there is indeed a relationship between performance and contract administration on Uganda's road construction projects which is statistically significant. This was established through the study findings from the specific objectives. The summary of findings for each specific objective is as below.

To assess the performance of road construction projects in Uganda.

The study findings indicated that the performance of road construction projects in Uganda is poor in regard to time, Fair in regard to cost and Very Good in regard to quality. The findings are rather divergent to the literature review information which is generic about the performance of road construction projects as being unsatisfactory. The study employed a 5 - point Likert scale [very poor (1), Poor (2), Fair (3), Good (4), Very Good (5)].

To determine the extent of use of contract administration on road construction projects in Uganda

The study findings indicated that various contract administration practices that included project governance, project personnel, communication and relationship management, quality management, monitoring and control, financial management, change control management, claims and disputes resolution management, records management and contract risk management have different extents of use. Using a 5-point Likert scale of Never (1), Almost Never (2), Sometimes (3), Almost Every time (4) and Every time (5), it was established that the highest extent of use (4.26) was Monitoring and Control being used *Every time.* The second highest extent of use (4.24) was Quality Management being used *Every time* and finally, the practice with the third extent of use (4.15) is Financial Management being *Almost every time*. Aiyetan and Das (2022) propound that high-quality supervision and monitoring are the backbone to construction productivity, efficiency and quality works. The study recognizes that one of the

causes of delays in construction works and shoddy work is due to poor supervision and monitoring. Furthermore, Oke et al., (2016) indicate that the success of a construction project largely depends on the use of appropriate financial management strategies. The study findings therefore agree with the literature in the sense that the extent of use of the three contract administration practices is high. However, this is not reflected in the projects performance. Despite the high use of these contract administration practices, the projects are still not being completed on time.

To determine whether there is an association between contract administration and project performance.

The results from the regression analysis of this study indicate that the relationship between performance and contract administration is statistically significant, although based on the findings, some contract administration practices are more critical to performance compared to others. From the results, project governance has the highest standardized coefficient of 0.75 with a p-value of 0.001 implying that it has a high positive significance and correlation with performance compared to the rest of the contract administration practices.

This study was anchored on the Principal-Agent theory which is associated with business orientation theories and highlights the relationship between contract interactions (Rubakula, 2014). The theory lays down obligations and expectations of different parties to a contract even in the absence of supervision. It is recognized that the principal will not always be there to monitor the agent, however, this should not lead to underperformance or inappropriate actions because the interactions between each party are clearly defined within the contract. The study confirms this theory to the extent that contracts and their administration play a significant role in the performance of road construction contracts.

6.2 Recommendations

The study findings indicate that project performance is at its worst when it comes to the time element with a weighted average of only 2.63 (poor). It is recommended that to minimize time overruns or slippages, contract administrators should take on a wholistic approach in controlling project activities. Monitoring and Control of all project activities and elements on a daily basis is encouraged as this enables early identification of potential time slippage areas or gaps that can be

filled with in time to prevent any major damage. Projects should have dedicated personnel to manage the project schedule and give a daily report on activities/ items that need to be fast tracked or readjusted for the project to maintain a healthy schedule. This recommendation addresses objective number one which to investigate the performance of road construction projects in Uganda.

The study identified Early contract administrator project involvement, Project governance, Communication and relationship management, Claims and dispute management and Monitoring and control as elements that have significance in regard to project performance. It is recommended that contract administrators take these contract administration practices seriously during execution of projects. This answers the question or responds to objective number two which is to determine the extent of use of contract administration on road construction projects in Uganda. These practices have also formed the basis of the contract assessment strategy (fourth objective) to which the study also recommends its frequent use for project assessment at any time during project implementation.

Lastly, since the study has established that there is indeed a positive and significant relationship between contract administration and project performance (Objective number three), it is recommended that contract administration pay extra attention to the contract administration practices that directly impact project performance as identified in this study.

6.3 Further Research

The study recommends that similar research be done to include District Road projects, Town Road projects and all other infrastructure projects to fully concretize the results from this study and to compare the performance of other aspects of infrastructure projects. In addition, since roads are public projects, the study also recommends further research into the role of Public Administration in the performance of infrastructure projects. This will deal with a bigger picture that eventually feeds into the project level of administration. Lastly, the study recommends that if resources are available, face to face interviews should be conducted with the various stakeholders for them to provide their general industry views through their experience over time.

6.4 Contribution

The study has established through its analysis that there is a positive relationship between contract administration and road construction projects performance. Laban (2018), in his study on contract administration and performance focused on mud and dust program (A project that was under KCCA). This was only representative of Kampala District and not even on National roads. This study considered national roads from all regions of the country. This study therefore presents a more wholistic approach and wider view of the National Road network. Okere (2012) established the association between contract administration practices and performance of the general contractors on governmental infrastructure projects in the United States. The author attempted to correlate the contract administration performance and management attitude towards contract risks, provisions for mitigating contract risks, the stability of scope definition, contract administration infrastructure, resource allocation strategy, and competency of contract administrators. The point of divergency therefore is that his study was specific to general contractors whereas this particular study focus was on how contract administration practices impact project performance.

The contribution of this study to the existing body of knowledge is that it farther went ahead and developed a contract administration assessment tool to be used as a check on running projects. This was done through identification of the most significant contract administration practices that significantly affect project performance and therefore more focus has to be drawn to those on any given road construction project. Areas or practices that fall below the minimum score are addressed in real time before they can negatively impact the project. This will help to track all parameters of performance including time, cost and quality in real-time thus improving project performance. This is far different from what other authors have done in the field of contract administration. For instance, Surajbali (2016), investigated the post-award contract administration key activities within the general procurement framework of South Africa. The author categorized the challenges facing contract administration and then established a framework for managing the contract with 9 dimensions. Contrary to other models/ frameworks, this study stopped at the level of the dimensions without having any statistical analysis for the impact of each dimension. The study concluded the need for a suitable contract management process flow and suitable organizational structure. Similar frameworks and models were

identified in the area of general procurement and contract administration/ management by Crampton (2010) for the Transport Agency in New Zealand, Kayastha (2014) for hydropower projects in Nepal, Moore (1996) for marine corps in the USA, Oluka and Basheka (2014) for effective procurement contract management in Uganda, Park and Kim (2018) for contract management capabilities in overseas construction projects, and Solis (2016) for the Dutch wastewater industry. The previous studies were formulated to serve a certain geographical area or a specific type of project with simple statistical techniques or stopped at the qualification of indicators.

Additionally, this research has also developed a formula that can be used to establish the performance of road construction projects at any stage of the construction phase. It is important to check the health of the project so as to find a solution to a particular point of concern. This is really important as it is also a contribution of this study to what other researchers have done in trying to find a solution to improve road construction projects performance. The study also further emphasizes the need for early stakeholder involvement and thorough planning at project inception stage to eliminate most of the would be hinderances during the implementation stage.

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APPENDICIES

APPENDIX I: Questionnaire 1

Dear respondent,

I am Namakula Barbara researching to assess the impact of contract administration on the performance of road construction projects in the central region of Uganda. You have been scientifically selected to participate in this study aimed to establish lessons to address the challenges in the performance of road construction projects. Kindly respond to the questions in the attached questionnaire. I sincerely assure you beyond reasonable doubt that the responses you will offer will be handled with utmost confidence and it is purely for academic purposes only. Your names and identity will not be used anywhere in the report for privacy. Please respond diligently as these responses will be analyzed into a report.

SECTION A: BACKGROUND INFORMATION

1. Your Gender
   - ☐ Male
   - ☐ Female

2. What is your qualification/ position in the company?
   - ☐ Civil Engineer
   - ☐ Quantity Surveyor
   - ☐ Construction Manager
   - ☐ Economist
   - ☐ Land Surveyor
   - Other, please specify……..

3. Your total number of years of work experience in construction?
   - ☐ Less than or equal to 5
   - ☐ (6-10)
   - ☐ (11-15)
   - ☐ (16 -20)
   - ☐ (21-25)
   - ☐ More than 25

4. Are you registered with a professional body?
   - ☐ Yes
   - ☐ No
5. Which sector best represents your significant work experience?
   - ☐ Public
   - ☐ Private
   - ☐ Other……
6. Have you had any special training in contract administration?
   - ☐ Yes
   - ☐ No
7. What is your area(s) of expertise? (Tick all that apply)
   - ☐ Engineering & Design
   - ☐ Project Management
   - ☐ Project Control
   - ☐ Site Execution
   - ☐ Construction Supervision
   - ☐ Quality Control
   - ☐ Contract Management/Administration
   - ☐ Other……...
8. Which form(s) of contract are you most familiar with? (Tick any that apply to a maxmum of 3)
   - ☐ FIDIC
   - ☐ JCT
   - ☐ NEC
   - ☐ World Bank Conditions of Contract
   - ☐ EDF Contracts
   - ☐ Other……
9. What best defines the kind of projects you are most involved in? (Tick all that apply)
   - ☐ Road Rehabilitation project
   - ☐ Road upgrade project
   - ☐ Road construction project
   - ☐ Road and Bridge construction
   - ☐ Bridge construction project

SECTION B: STUDY VARIABLES

1. THE STATE OF PERFORMANCE OF ROAD CONSTRUCTION PROJECTS

TIME

1.1 How was the duration of the Project determined? (Tick any that applies)

- ☐ By experience only
- ☐ Use of PRIMAVERA
- ☐ Use of MICROSOFT PROJECT
- ☐ Other Techniques different from the above ……

1.2 Did the Project use any project tool/ technique for planning, managing and controlling time on the Project? (If No, skip to Qn.16)

- ☐ Yes
- ☐ No

1.3 If yes above, which of the following time control methods were employed on the project? (Tick all that apply)

- ☐ Gantt Chart
- ☐ Critical Path Network Method (CPM)
- ☐ Milestone Date Programming Technique
- ☐ Program Evaluation and Review Technique
- ☐ Precedence Network Diagram (PND)
- ☐ Elemental Trend Analysis/Line of Balance (LOB)

Other techniques please specify ……

1.4 What is/ was the frequency of application of time control methods chosen above? (Tick one that applies)

- ☐ Always
- ☐ Often
- ☐ Sometimes
- ☐ Rarely
- ☐ Never

1.5 Which of the following software packages were used for time control on the Project? (Tick any that applies).

- ☐ Microsoft Project
- ☐ Asta Power Project
- ☐ Primavera
- ☐ Project Commander

Others that apply

1.6 Did the project experience time overruns? (If No, skip to Qn 1.8).

- ☐ Yes
- ☐ No

1.7 If Yes above, what could have resulted in the time overrun? (Tick the three most prevalent)

- ☐ Additional works
- ☐ Delayed procurement of materials
- ☐ Force Majeure
- ☐ Delayed Payments
- ☐ Lack of proper planning
- ☐ Inadequate Designs
- ☐ Right of way not yet fully acquired

Other, please specify……

1.8 Did the Project have a dedicated scheduler?

- ☐ Yes
- ☐ No

1.9 On a scale of 1- 5 (1= Very poor, 2= Poor, 3 = Fair,4= Good, 5= Very Good), rate the project performance in regard to time.

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

COST

1.10 How was the project cost estimated? (Tick any that applies)

☐ By experience only
☐ Production Function
☐ Empirical Cost Inference
☐ Unit Cost for bills of quantities
☐ Allocation of joint costs
Other techniques please specify……..

1.11 Did the Project have any cost control techniques in place? (If No, skip to Qn. 1.14)

☐ Yes
☐ No

1.12 If Yes above, which of the following cost control techniques were employed on the Project?

☐ Project Cost Value Reconciliation
☐ Earned Value Analysis
☐ Actual Vs Forecast
☐ PERT
☐ Overall profit and Loss
☐ Standard Costing
Other, please specify……..

1.13 What is the frequency of application of the cost controls techniques above?

☐ Always
☐ Often
☐ Sometimes
☐ Rarely
☐ Never

1.14 Did the project experience any cost overruns? (If No, skip to Qn 1.16)

☐ Yes
☐ No

1.15 If Yes above, in your opinion what were/ were the most prevalent reasons for the cost overrun? (Tick maximum 3)

☐ Under Budget
☐ Additional works/ New works

☐ Inadequate pre-contract planning
☐ Increased quantities
☐ Inadequate designs at the time of tender
Other, please specify ……..

1.16 Did the Project have a dedicated to cost management as key staff? (If No, skip to Qn 1.18)

☐ Yes
☐ No

1.17 If yes above,were his/her qualifications?

☐ Civil Engineer
☐ Quantity Surveyor
☐ Construction Manager
Other, please specify……..

1.18 On a scale of 1- 5 (1= Very poor, 2= Poor, 3 = Fair,4= Good, 5 = Very Good), rate the project performance in regard to cost.

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

QUALITY

1.19 Did the Project have quality control checks?

☐ Yes
☐ No

1.20 Were there any defects identified on the Project? (If No, skip to Qn. 1.24)

☐ Yes
☐ No

1.21 If Yes above, which of the following defects were identified? (Tick all that apply)

☐ Pot Holes
☐ Structural cracks on concrete
☐ Rutting
☐ Flooding
☐ Early settlement
Other, please specify……..

1.22 In your opinion, what could have caused the above defects? (Tick 3 prevalent ones)

☐ Defective materials
☐ Inadequate Supervision
☐ Inadequate design
☐ Under qualified personnel
Other, please specify……

1.23 When were the defects identified?

☐ During the construction period

☐ At project completion
☐ During the defects liability period
☐ After defects liability period

1.24 Which of the following quality control mechanisms were/are in use on the Project?

☐ Quality control monitoring tool
☐ Fully functional and equipped laboratory on site
☐ Proper record keeping of all test results and quality reports produced.
Other, please specify…….

1.25 Did the Project have a dedicated quality control manager? (If No, skip to Qn1.27).

☐ Yes
☐ No

1.26 What is the experience of the Quality Control Manager?

☐ Below I year
☐ Between 1-5years
☐ Above 5 years
☐ Above 10years

1.27 On a scale of 1- 5 (1=Poor, 2= Very poor, 3 = Fair, 4= Good, 5 = Very Good), rate the project performance in regard to quality.

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

2. CONTRACTS ADMINISTRATION

In your opinion, please rate the extent of use of the following aspects on your project contracts by ticking in any one of the boxes 1- 5 provided (1=Never, 2= Almost Never, 3 = Sometimes, 4 = Almost Everytime 5 = Everytime) use 5-point likert scale that best represents frequency/extent of use.

Qn No	**Item**	**1**	**2**	**3**	**4**	**5**
B2	**CONTRACTS ADMINISTRATION**					
	Project governance					
b2.1	There was establishment of an overall project management plan (PMP)					
b2.2	There was review of the contractor's project quality plan (PQP)					
b2.3	There was review of the contractor's baseline programme					
b2.4	There was review of the contractor's proposed key staff					

b2.5	There were project kick-off meetings conducted to discuss the contract with related parties					
b2.6	The project administration team supported the employer in reviewing contract securities					
b2.7	There was review of the contractor's logistics plan					
b2.8	The project administration avoided bureaucracy and lengthy process.					
	Project personnel					
b2.9	The project administration assigned technically competent, quality and experienced personnel					
b2.10	The administration team was involved from the beginning of the Project in all relevant disciplines					
b2.11	The Project has clear identification of individual roles and responsibilities within the administration team					
b2.12	There is establishment of training and development for administration team.					
b2.13	The Project has regular assessment of performance team taking due note of any employer or contractor feedback/comments					
	Communication and Relationship Management					
b2.14	The Project has an established communication management system					
b2.15	The Project Administration Team Communicates the PMP requirements to all involved parties					
b2.16	The Project Administration Team advises the employer on its functions					
b2.17	The Project Administration Team measures the employer's satisfaction during the contract lifespan					
b2.18	There is an agreement between employer and contracts administration for any requested changes on scope, time and					

	cost.					
b2.19	There are regular meetings with employer and contractor					
b2.20	There is effective coordination with third parties					
b2.21	There is prompt and accurate response to the contractor's queries in compliance with the contract provisions					
b2.22	There is effective management of operational issues at field level between the contractor and the administration team.					
b2.23	There is compliance with language of communication as stipulated in the contract.					
	Quality Management					
b2.24	There is systematic auditing of the contractor's implementation of quality management system					
b2.25	There is prompt issuance of any additional information to the contractor.					
b2.26	There is timely review of construction materials prior to use by the contractor taking due cognizance of the review cycle.					
b2.27	The Project has a systematic inspection of quality of work items on site					
b2.28	The Project has a system of controlling rejected/ non-compliant works					
b2.29	The Project has a system for regular tracking of corrective actions					
b2.30	The Project Administration team Manages design and design development during construction.					
	Monitoring and Control					
b2.31	The Project has an established monitoring and reporting system					
b2.32	The Project Administration Team issues separate reports for major issues to keep the employer informed					
b2.33	The Project Administration Team provides regular progress					

	report to the employer					
b2.34	The Project Administration Team reviews the contractor's reports					
b2.35	The Project Administration Team monitors the contractor's suitability and adequacy of resources including equipment, materials and personnel					
b2.36	There is timely notification of the contractor for recovery schedule when progress is slow in relation to approved programme.					
b2.37	The contractor is notified on failure to carry out any contractual obligations.					
	Financial Management					
b2.38	The Project has an established financial management system					
b2.39	There is proper issuance of instructions to spend provisional sum items					
b2.40	There is fair, reasonable and equitable certification of due payments to the contractor					
b2.41	There is timely notification of the employer about the contractor's due payment timelines and financial status					
b2.42	There is assessment of the contractor's compensation for delayed payment in compliance with the contract.					
b2.43	The Project Administration Team advises the employer on contingency planning/ additional funds.					
b2.44	The Project Administration Team collects quotations for price estimates and contractor's price negotiations in respect of additional works/ variations					
	Change control Management					
b2.45	The Project has an established change control system					
b2.46	There is prompt evaluation of contractor's proposals for					

	changes					
b2.47	The Project Administration Team proposes financially viable solutions to avoid budget increase to the employer due to change requests.					
b2.48	There is proper processing of the change orders on approved change requests.					
	Claims and Disputes Resolution Management					
b2.49	The Project has established claims and disputes resolution systems					
b2.50	The Project Administration Team notifies the contractor about the employer's rights to claim					
b2.51	There is proper assessment of the contractor's entitlement to extension of time for completion within timelines as set out in the contract					
b2.52	There is proper assessment of the contractor's entitlement for additional payment.					
b2.53	There is effective negotiation of claims between the contractor and the employer.					
b2.54	The Project Administration Team supports the contracting parties to select alternative dispute resolution methods if not already set out in the contract.					
b2.55	The Project Administration Team represents the employer in alternative dispute resolution proceedings					
b2.56	The Project Administration Team provides legal support to the employer during court cases					
	Records Management					
b2.57	The Project has an established document management system					
b2.58	The Project Administration Team uses information management in administering the contract					

b2.59	The Project maintains updated project documentation with registers					
b2.60	The Project Administration Team supports the project stakeholders with regular statistics.					
	Contract Risk Management					
b2.61	The Project Administration Team periodically assesses the contractual risk with the help of the contractor					
b2.62	The Project Administration Team assigns responsibility to the relevant party for each contractual risk expressed as a responsibility matrix					
b2.63	The Project Administration Team supports the employer for the risks associated with design review findings					
b2.64	The Project Administration Team monitors the contractor's financial status and bankruptcy potential.					

APPENDIX 2: Questionnaire 2

Dear respondent,

I am Namakula Barbara researching to assess the impact of contract administration on the performance of road construction projects in the central region of Uganda. You have been scientifically selected to participate in this study aimed to establish lessons to address the challenges in the performance of road construction projects. Kindly respond to the questions in the attached questionnaire. I sincerely assure you beyond reasonable doubt that the responses you will offer will be handled with utmost confidence and it is purely for academic purposes only. Your names and identity will not be used anywhere in the report for privacy. Please respond diligently as these responses will be analyzed into a report.

SECTION A: BACKGROUND INFORMATION

10. Your Gender
    - ☐ Male
    - ☐ Female

11. What is your qualification/ position?
    - ☐ Civil Engineer
    - ☐ Quantity Surveyor
    - ☐ Construction Manager
    - ☐ Economist
    - ☐ Land Surveyor
    - Other, please specify……..

12. Your total number of years of work experience in construction?
    - ☐ Less than or equal to 5
    - ☐ (6-10)
    - ☐ (11-15)
    - ☐ (16 -20)
    - ☐ (21-25)
    - ☐ More than 25

13. Are you registered with a professional body?
    - ☐ Yes
    - ☐

No

14. Which sector best represents your significant work experience?
    - ☐ Public
    - ☐ Private
    - ☐ Other……
15. Have you had any special training in contract administration?
    - ☐ Yes
    - ☐ No
16. What is your area(s) of expertise? (Tick all that apply)
    - ☐ Engineering & Design
    - ☐ Project Management
    - ☐ Project Control
    - ☐ Site Execution
    - ☐ Construction Supervision
    - ☐ Quality Control
    - ☐ Contract Management/Administration
    - ☐ Other……...
17. Which form(s) of contract are you most familiar with? (Tick any that apply to a maxmum of 3)
    - ☐ FIDIC
    - ☐ JCT
    - ☐ NEC
    - ☐ World Bank Conditions of Contract
    - ☐ EDF Contracts
    - ☐ Other……
18. What best defines the kind of projects you are most involved in? (Tick all that apply)
    - ☐ Road Rehabilitation project
    - ☐ Road upgrade project
    - ☐ Road construction project
    - ☐ Road and Bridge construction
    - ☐ Bridge construction project

SECTION B: STUDY VARIABLES

1. THE STATE OF PERFORMANCE OF ROAD CONSTRUCTION PROJECTS

TIME

1.1 How is the duration of projects normally determined? (Tick any that applies)

- ☐ By experience only
- ☐ Use of PRIMAVERA
- ☐ Use of MICROSOFT PROJECT
- ☐ Other Techniques different from the above ……

1.24 Do the projects use any project tool/ technique for planning, managing and controlling time? (If No, skip to Qn.16)

- ☐ Yes

☐ No

1.25 If yes above, which of the following time control methods are normally employed on projects? (Tick all that apply)

☐ Gantt Chart
☐ Critical Path Network Method (CPM)
☐ Milestone Date Programming Technique
☐ Program Evaluation and Review Technique
☐ Precedence Network Diagram (PND)
☐ Elemental Trend Analysis/Line of Balance (LOB)
Other techniques please specify ……

1.26 What is normally the frequency of application of time control methods chosen above? (Tick one that applies)

☐ Always
☐ Often
☐ Sometimes
☐ Rarely
☐ Never

1.27 Which of the following software packages are normally used for time control on projects? (Tick any that applies).

☐ Microsoft Project
☐ Asta Power Project
☐ Primavera
☐ Project Commander
Others that apply

1.28 Do projects experience time overruns? (If No, skip to Qn 1.8).

☐ Yes
☐ No

1.29 If Yes above, what usually results into the time overruns on projects? (Tick the three most prevalent)

☐ Additional works
☐ Delayed procurement of materials
☐ Force Majeure
☐ Delayed Payments
☐ Lack of proper planning
☐ Inadequate Designs
☐ Right of way not yet fully acquired
Other, please specify……

1.30 Is it a requirement for projects to have a dedicated scheduler?

☐ Yes
☐ No

1.31 On a scale of 1- 5 (1= Very poor, 2= Poor, 3 = Fair,4= Good, 5= Very Good), rate the performance of projects in regard to time.

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

COST

1.32 How are project costs normally estimated? (Tick any that applies)

☐ By experience only
☐ Production Function
☐ Empirical Cost Inference
☐ Unit Cost for bills of quantities
☐ Allocation of joint costs
Other techniques please specify……..

1.33 Do projects have any cost control techniques? (If No, skip to Qn. 1.14)

☐ Yes
☐ No

1.34 If Yes above, which of the following cost control techniques are normally employed on projects?

☐ Project Cost Value Reconciliation
☐ Earned Value Analysis
☐ Actual Vs Forecast
☐ PERT
☐ Overall profit and Loss
☐ Standard Costing
Other, please specify……..

1.35 What is the frequency of application of the cost controls techniques above?

☐ Always
☐ Often
☐ Sometimes
☐ Rarely
☐ Never

1.36 Do projects experience cost overruns? (If No, skip to Qn 1.16)

☐ Yes
☐ No

1.37 If Yes above, in your opinion what are the most prevalent reasons for the cost overruns? (Tick maximum 3)

☐ Under Budget
☐ Additional works/ New works
☐ Inadequate pre-contract planning
☐ Increased quantities
☐ Inadequate designs at the time of tender

Other, please specify ……..

1.38 Do projects have personel dedicated to cost management as key staff?(If No, skip to Qn 1.18)

- ☐ Yes
- ☐ No

1.39 If yes above, what are their qualifications?

- ☐ Civil Engineer
- ☐ Quantity Surveyor
- ☐ Construction Manager

Other, please specify……..

1.40 On a scale of 1- 5 (1= Very poor, 2= Poor, 3 = Fair,4= Good, 5 = Very Good), rate the performance of projects in regard to cost.

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

QUALITY

1.41 Do the Project have quality control checks?

- ☐ Yes
- ☐ No

1.42 Are there any defects identified on the projects? (If No, skip to Qn. 1.24)

- ☐ Yes
- ☐ No

1.43 If Yes above, which of the following defects are normally identified? (Tick all that apply)

- ☐ Pot Holes
- ☐ Structural cracks on concrete
- ☐ Rutting
- ☐ Flooding
- ☐ Early settlement

Other, please specify……..

1.44 In your opinion, what causes the above defects? (Tick 3 prevalent ones)

- ☐ Defective materials
- ☐ Inadequate Supervision
- ☐ Inadequate design
- ☐ Under qualified personnel

Other, please specify……

1.45 At what stage are the defects normally identified?

- ☐ During the construction period
- ☐ At project completion
- ☐ During the defects liability period
- ☐ After defects liability period

1.24 Which of the following quality control mechanisms are normally used on projects?

☐ Quality control monitoring tool
☐ Fully functional and equipped laboratory on site
☐ Proper record keeping of all test results and quality reports produced.
Other, please specify…….

1.28 Do the projects have a dedicated quality control manager? (If No, skip to Qn1.27).

☐ Yes
☐ No

1.29 On a scale of 1- 5 (1=Poor, 2= Very poor, 3 = Fair, 4= Good, 5 = Very Good), rate the performance of projects in regard to quality.

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

2. CONTRACTS ADMINISTRATION

In your opinion, please rate the extent of use of the following aspects on project contracts by ticking in any one of the boxes 1- 5 provided (1=Never, 2= Almost Never, 3 = Sometimes, 4 = Almost Everytime 5 = Everytime) use 5-point likert scale that best represents frequency/extent of use.

Qn No	Item	1	2	3	4	5
B2	**CONTRACTS ADMINISTRATION**					
	Project governance					
b2.1	There was establishment of an overall project management plan (PMP)					
b2.2	There was review of the contractor's project quality plan (PQP)					
b2.3	There was review of the contractor's baseline programme					
b2.4	There was review of the contractor's proposed key staff					
b2.5	There were project kick-off meetings conducted to discuss the contract with related parties					
b2.6	The project administration team supported the employer in reviewing contract securities					
b2.7	There was review of the contractor's logistics plan					
b2.8	The project administration avoided bureaucracy and lengthy process.					
	Project personel					
b2.9	The project administration assigned technically competent, quality and experienced personel					
b2.10	The administration team was involved from the beginning of the Project in all relevant disciplines					
b2.11	The Project has clear identification of individual roles and responsibilities within the administration team					
b2.12	There is establishment of training and development for administration team.					

b2.13	The Project has regular assessment of performance team taking due note of any employer or contractor feedback/comments					
	Communication and Relationship Management					
b2.14	The Project has an established communication management system					
b2.15	The Project Administration Team Communicates the PMP requirements to all involved parties					
b2.16	The Project Administration Team advises the employer on its functions					
b2.17	The Project Administration Team measures the employer's satisfaction during the contract lifespan					
b2.18	There is an agreement between employer and contracts administration for any requested changes on scope, time and cost.					
b2.19	There are regular meetings with employer and contractor					
b2.20	There is effective coordination with third parties					
b2.21	There is prompt and accurate response to the contractor's queries in compliance with the contract provisions					
b2.22	There is effective management of operational issues at field level between the contractor and the administration team.					
b2.23	There is compliance with language of communication as stipulated in the contract.					
	Quality Management					
b2.24	There is systematic auditing of the contractor's implementation of quality management system					
b2.25	There is prompt issuance of any additional information to the contractor.					
b2.26	There is timely review of construction materials prior to use by the contractor taking due cognizance of the review cycle.					
b2.27	The Project has a systematic inspection of quality of work items on site					
b2.28	The Project has a system of controlling rejected/ non-compliant works					
b2.29	The Project has a system for regular tracking of corrective actions					
b2.30	The Project Administration team Manages design and design development during construction.					
	Monitoring and Control					
b2.31	The Project has an established monitoring and reporting system					
b2.32	The Project Administration Team issues separate reports for major issues to keep the employer informed					
b2.33	The Project Administration Team provides regular progress report to the					

	employer					
b2.34	The Project Administration Team reviews the contractor's reports					
b2.35	The Project Administration Team monitors the contractor's suitability and adequacy of resources including equipment, materials and personnel					
b2.36	There is timely notification of the contractor for recovery schedule when progress is slow in relation to approved programme.					
b2.37	The contractor is notified on failure to carry out any contractual obligations.					
	Financial Management					
b2.38	The Project has an established financial management system					
b2.39	There is proper issuance of instructions to spend provisional sum items					
b2.40	There is fair, reasonable and equitable certification of due payments to the contractor					
b2.41	There is timely notification of the employer about the contractor's due payment timelines and financial status					
b2.42	There is assessment of the contractor's compensation for delayed payment in compliance with the contract.					
b2.43	The Project Administration Team advises the employer on contingency planning/ additional funds.					
b2.44	The Project Administration Team collects quotations for price estimates and contractor's price negotiations in respect of additional works/ variations					
	Change control Management					
b2.45	The Project has an established change control system					
b2.46	There is prompt evaluation of contractor's proposals for changes					
b2.47	The Project Administration Team proposes financially viable solutions to avoid budget increase to the employer due to change requests.					
b2.48	There is proper processing of the change orders on approved change requests.					
	Claims and Disputes Resolution Management					
b2.49	The Project has established claims and disputes resolution systems					
b2.50	The Project Administration Team notifies the contractor about the employer's rights to claim					
b2.51	There is proper assessment of the contractor's entitlement to extension of time for completion within timelines as set out in the contract					

b2.52	There is proper assessment of the contractor's entitlement for additional payment.					
b2.53	There is effective negotiation of claims between the contractor and the employer.					
b2.54	The Project Administration Team supports the contracting parties to select alternative dispute resolution methods if not already set out in the contract.					
b2.55	The Project Administration Team represents the employer in alternative dispute resolution proceedings					
b2.56	The Project Administartion Team provides legal support to the employer during court cases					
	Records Management					
b2.57	The Project has an established document management system					
b2.58	The Project Administration Team uses information management in administering the contract					
b2.59	The Project maintains updated project documentation with registers					
b2.60	The Project Administration Team supports the project stakeholders with regular statistics.					
	Contract Risk Management					
b2.61	The Project Administration Team periodically assesses the contractual risk with the help of the contractor					
b2.62	The Project Administration Team assigns responsibility to the relevant party for each contractual risk expressed as a responsibility matrix					
b2.63	The Project Administration Team supports the employer for the risks associated with design review findings					
b2.64	The Project Administration Team monitors the contractor's financial status and bankruptcy potential.					

Appendix 3: ***Summary literature review of contracts administration and road projects***

	Author	***Road Projects***	***Contract Administration***	***Performance***	***Results***
1	*ALUONZI, G., N. OLUKA, P. AND NDUHURA, A. 2016*	✓	*x*	✓	*Contract Management and Performance of Road Maintenance Projects: The Case of Arua Municipality*
2	*AYEBARE, A. 2019*	✓	*x*	✓	*Monitoring And Evaluation Practices And Performance Of Road Infrastructure Projects In Uganda: A Case Of Uganda National Roads Authority-Unra.*
3	*BANYENZAKI, M. 2015*	✓	*x*	✓	*Contract Management Practices And Performance Of The Road Construction Projects In Wakiso District -Uganda.*
4	*BYARUHANGA, A. & BASHEKA, B. C. 2017*	✓	*x*	✓	*Contractor Monitoring and Performance of Road Infrastructure Projects in Uganda: A Management Model*
5	*ELONG, S., MUHWEZI, L. & ACAI, J. 2019.*	✓	*x*	✓	*Assessment of the Challenges and Effects of Delays in Compulsory Land Acquisition on the Performance of Road Construction Projects in Uganda*
6	*MUHWEZI, L., MUSIIME, F. T. AND ONYUTHA, C. 2020*	*x*	*x*	✓	*Assessment of the Effects of Procurement Planning Processes on Performance of Construction Contracts in Local Governments in Uganda.*
7	*MUZAALE, T., AURIACOMBE, C. & BYARUHANGA, A. 2018*	✓	*x*	✓	*Performance of Road Infrastructure Projects in Uganda: A Procurement Approach.*
8	*MWELU, N., DAVIS, P., KE, Y. AND WATUNDU, S. 2018*	✓	*x*	*x*	*Compliance within a Regulatory Framework in Implementing Public Road Construction Projects*
9	*MWELU, N. & DAVIS, P. 2019*	✓	*x*	*x*	*Success factors for implementing Uganda's public road construction projects*
10	*Nuwatuhaire,B &Tibihikirra, P. 2020*	✓	*x*	✓	*Establishing Whether Stakeholder Participation in Planning Influences Road Transport Sector Performance Of Bushenyi District Local Government In Uganda*
11	*ONYAITI, J. S. 2018.*	✓	*x*	✓	*Contract management and road construction project performance under the municipal infrastructure development program: a case study of Soroti Municipal Council.*
12	*SENINDE, S., MUHWEZI, L. AND ACAI, J. 2021*	✓	*x*	✓	*Assessment of the Factors Influencing Performance of Road Construction Projects in Uganda: A Case Study of Ministry of Works and Transport.*
13	*LABAN, F. 2018.*	✓	✓	✓	*Contract Administration and Performance of Kampala Capital City*

					Authority's Road Works: A case of Mud and Dust Program.

ANNEXES

Annex 1 – Ethics Approval

MANAGEMENT SCIENCES: FACULTY RESEARCH ETHICS COMMITTEE (FREC)

3 March 2020

Student Name: **Ms B Namakula**
Student No: 22064689

Dear Ms B Namakula

DOCTOR OF PHILOSOPHY IN MANAGEMENT SCIENCES: PUBLIC ADMINISTRATION

TITLE: Assessing the impact of contract administration on the performance of road construction projects in Uganda

Please be advised that the FREC Committee has reviewed your proposal and the following decision was made: **Approved – Ethics Level 2**

Date of FRC Approval: 3 March 2020

Approval has been granted for a period of two years from the above FRC date, after which you are required to apply for safety monitoring and annual recertification. Please use the form located at the Faculty. This form must be submitted to the FREC at least 3 months before the ethics approval for the study expires.

Any adverse events [serious or minor] which occur in connection with this study and/or which may alter its ethical consideration must be reported to the FREC according to the FREC SOP's.
Please note that ANY amendments in the approved proposal require the approval of the FREC as outlined in the FREC SOP's.

_____

Prof JP Govender
Chairperson: Faculty Research Ethics Committee

Annex 2 - Letter of Consent and Information

8th February 2022

The Executive Director
Uganda National Roads Authority,
Plot 3-5, New Port Bell Road,
UAP Nakawa Business Park, Block C&D
P.O. Box 28487,
Kampala, Uganda.

Dear Sir/Madam,

RE: REQUEST TO CARRY OUT ACADEMIC RESEARCH ON ROAD DEVELOPMENT PROJECTS

I hereby introduce to you Ms Barbara Namakula a student, at the Faculty of Management Sciences, Durban University, South Africa: Registration number: 22064689 and staff of the Ministry of Finance, Planning and Economic Development in Uganda. As part of the fulfilment for the award, the student is required to conduct a survey on Road Construction Projects in her research titled: **Assessing the Impact of Contract Administration on the performance of Road Construction Projects in Uganda.** The study is aimed at benefitting the construction sector to better understand contracts administration and thereby improve project performance.

As part of the research methodology, she is supposed to collect data from ongoing road construction projects by the aid of structured questionnaires. I am requesting you to avail her the necessary support to enable her achieve the study objectives.

As her academic supervisor, I am kindly asking you to provide us with a gatekeeper's approval for ethical consideration purposes of the study. Your deliberate consideration will be highly appreciated.

Yours faithfully,

Prof. NS Matsiliza
Supervisor

Annex 3 – Gatekeeper's Letter

Uganda National Roads Authority
Plot 3 - 5 New Port Bell Road
Nakawa Business Park
P.O. Box 28487
Kampala Uganda
In any correspondence on this subject
Please quote No. UNRA/22/HRM/02

27th February 2022

Ms. Barbara Namakula
0782770778
University of Durban
South Africa

RE: REQUEST TO CARRY OUT DATA COLLECTION FOR STUDY RESEARCH AT THE UGAGNDA NATIONAL ROADS AUTHORITY

Reference is made to your application letter dated 8th February 2022 requesting Uganda National Roads Authority (UNRA) to allow you to conduct research in the Authority.

We are glad to inform you that Management has no objection to conducting this research in UNRA.

However, please note that release of information is guided by the principles contained in Article 41(4) of the 1995 Constitution of the Republic of Uganda and Section 5 (1) of the Access to Information Act that provides that release of information should be in public interest and non-interference with the right to privacy.

In cognizance of the above provisions of the Constitution and Access to information Act 2005, UNRA has considered and granted your request subject to the terms and conditions below;

i. **Conducting Research**
You will interface with the Directors, Heads of Departments and Managers supervising Road Construction projects in the Authority

ii. **Financing of the Research**
You will be responsible for any monetary expenses that may arise during the research.

iii. **Declaration of Conflict of Interest and Potential Conflict of Interest**
You will be expected to sign and return the attached Declaration of Conflict of Interest and or Potential Conflict of Interest Form to the Undersigned prior to the commencement of research. A scanned copy of the form is acceptable.

iv. **Intellectual Property Rights**
Intellectual property rights may arise during the course of the research with contribution from UNRA the evidence of which shall be proven/shared in accordance with the proportionate contribution.

v. **Confidentiality**
Except for your Research Supervisor(s), you shall not in any form or manner unless specifically consented to in writing by UNRA either directly

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or indirectly use, divulge or transmit or otherwise disclose or cause to be disclosed or cause to be used, divulged, transmitted or otherwise disclose to any person information received during the course of research and for a period of up to three (3) years after the end of your research.

vi. **Termination by UNRA**
UNRA reserves the right to terminate the above approval at any stage for reasons including but not limited to prevailing conditions making it impossible to continue with the research or breach of Terms and Conditions by the Student or Institution.

vii. **Final Research Report**
You will be required to submit to UNRA a final copy of your research.

If You are agreeable to the above terms and conditions, please confirm your acceptance in writing and return the signed Declaration of Conflict-of-Interest Form to the Director Human Resource. UNRA.

Jennifer B. Kaggwa
Director Human Resource

Copy to: Research file

JK/vn/psi/hr

Annex 4 -Editor's Letter

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10th October 2022

FACULTY OF MANAGEMENT SCIENCES
DURBAN UNIVERSITY OF TECHNOLOGY

To whom it may concern

DECLARATION BY LANGUAGE EDITOR

I hereby declare that I served as language editor for the doctoral thesis entitled: **ASSESSING THE IMPACT OF CONTRACT ADMINISTRATION ON THE PERFORMANCE OF ROAD CONSTRUCTION PROJECTS IN UGANDA** by **Barbara Namakula (Ms)**, submitted to Violetta Editorial Services Ltd. for review on 1st October 2022.

Should you wish to contact me for any further information, my details may be found above.

Yours faithfully,
Francis Ssekitto

Annex 5 – Statistician's Certificate

AKANDE S. OLAIDE

Olaide.akande@futminna.edu.ng

+2348124326802

CERTIFICATION OF STATISTICAL ANALYSIS

This is to certify that this research study entitled **Assessing the Impact of Contract Administration on the Performance of Road Construction Projects in Uganda** by Barbara Namakula has undergone statistician analysis.

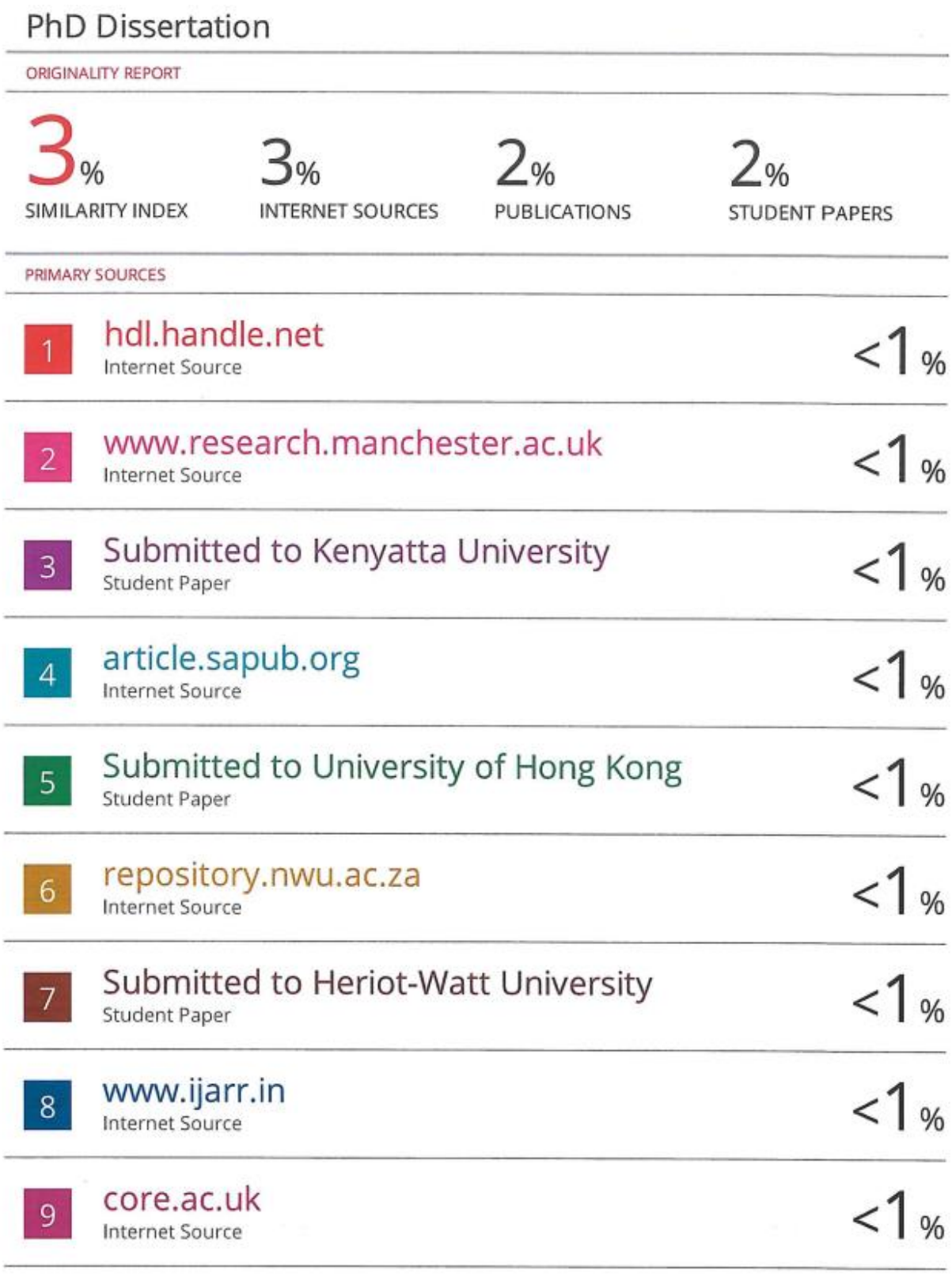
This certification is issued to confirm that the data for the study was collected, analysed, and interpreted professionally and scientifically.

Signed

Akande S.Olaide

Statistician

Annex 6 – Turnitin Report



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Annex 7 – Letter of Acceptance

RICHTMANN PUBLISHING

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Letter of Acceptance

Date: October 1, 2022

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[1]Department of Public Administration,
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[2]College of Engineering, Design, Arts and Technology,
Makerere University, Kampala, Uganda

Hereby, we would kindly inform you that your paper titled:

The Impact of Contracts Administration on the Performance of Road Construction Projects in Uganda: A Literature Gap

Submitted in the Academic Journal of Interdisciplinary Studies, after the double blinded peer review process has been accepted for publication in the Vol 11 No 6 November 2022. You can access the online journal in the link: https://www.richtmann.org/journal

With Kind Regards

Yours Sincerely

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