SCHOOL OF POSTGRADUATE STUDIES

THE RELATIONSHIP BETWEEN FIVE PROJECT MANAGEMENT KNOWLEDGE AREAS AND CONTRACT PERFORMANCE

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Submitted to the school of postgraduate studies in partial fulfillment of the requirements for the award of the Degree of Master of Science in Project Management.

2022

DECLARATION

I, **THANDIWE NGOMA** do hereby declare that the contents of this study are my original work and that to the best of my knowledge have not been previously presented for any award in any other University. All the sources of information used in this piece of work have been duly acknowledged

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DEDICATION

This work is dedicated to my wonderful parents Anderson and Tamala Ngoma who have endlessly loved, supported and believed in me.

ACKNOWLEDGEMENTS

My appreciation firstly goes to the Almighty God for his grace and mercy, for according me the strength and knowledge to undertake this research project.

A compilation of this nature would never have been possible without referring to the work of others. In the preparation of this report, I had to constantly consult several books and journals; as such, I hereby acknowledge my indebtedness to them all. My appreciation also goes to all who helped in providing the necessary information required in the preparation of this report.

My deep-seated appreciation also goes to my highly proficient supervisor Dr. Eng. Michael Kalumbu Nsefu for his invaluable guidance, mentorship, advice and encouragement during the course of this study.

I am equally grateful to my friends and family who made suggestions for the clarifying of parts of the text and additions they felt were of importance.

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ACRONYMS AND ABBREVIATION

CIDB	Construction Industry Development Board
EIZ	Engineering Institution of Zambia
EVM	Earned Value Management
GDP	Gross Domestic Products
KA	Knowledge Area
KPI	Key Performance Indicators
MANOVA	Multi-Variate Analysis of Variation
MGT	Management
NCA	National Construction Authority (Kenya)
NCC	National Construction Council
PMBOK	Project Management Body of Knowledge
PMKA	Project Management Knowledge Area
PMI	Project Management Institute
PPI	Project Performance Indicators
QMS	Quality Management System
RMP	Risk Management Plan
SPSS	Statistical Package for Social Sciences
TOC	Theory of Constraints
TQM	Total Quality Management
USD	United States Dollar
WBS	Work Breakdown Structure
ZAR	South African Rand

ABSTRACT

The construction industry plays a significant role in the socio-economic growth of a nation as it improves the nation's overall Gross Domestic Product. In Zambia as of 2017, the construction industry had contributed to 10.3 percent of the country's total GDP. Despite its importance, the construction industry in Zambia is facing major performance challenges. Several reports have shown that many construction projects particularly in Lusaka District have recorded poor performance in that they are mostly characterised by time and cost overruns, quality shortfalls and fail to meet the clients' satisfaction. The resultant poor performance in the delivery of construction projects in terms of cost, time and quality has far-reaching effects on the economy which if left unchecked could retard national development.

This research was therefore aimed at assessing the relationship between five project management knowledge areas and the performance of public construction contracts in Lusaka District. The project management knowledge areas of focus were Integration Management, Scope Management, Cost Management, Quality Management and Risk Management. To meet this objective, the study attempted to determine the relationship between the five knowledge areas and contract performance in terms of cost, quality, client satisfaction and time.

The study applied a sequential mixed-methods approach for data collection. Survey questionnaires were administered and semi-structured interviews were conducted with professionals with previous experience working on public construction contracts. The study further employed descriptive statistics to analyse the collected research data. The study through correlation analysis established the relationship between each of the five project management knowledge areas and the performance of public construction contracts. Thereafter, the study developed a framework by integrating the five project management knowledge areas with contract performance indicators to help enhance contract performance in the construction industry.

Keywords: *Knowledge Area, Contract, Performance, construction industry*

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Introduction

The (Project Management Institute, 2017) defines project management as the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. The appropriate integration and application of project management processes that have been identified for each project, leads to the successful accomplishment of project management to enable them execute projects efficiently and effectively.

Project management is about the setting and achieving of time, cost, and quality targets. It is the application of processes, methods, skills, knowledge, and experience to achieve specific project objectives according to the project acceptance criteria within agreed parameters. Project management has final deliverables that are constrained to a finite timescale and budget (APM Body of Knowledge, 2018)

Since the Egyptian era thousands of years ago, there has been a notable practice of project management; however, organisations began to apply systematic project management tools and techniques to complex projects about a century ago (Hoon Kwak, 2003). Project management plays a role in the identification of requirements, balancing competing demands among scope, time, cost and quality; as well as meeting and exceeding the needs and expectations of various stakeholders (Project Management Institute, 1996).

The PMBOK Guide (Project Management Institute, 2017) states that projects comprise of several key components which when managed effectively result in successful project completion. One of the components, as identified by the guide, are project management knowledge areas.

A Project Management Knowledge Area, is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools and techniques (Project Management Institute, 2017). These knowledge areas coincide with the five process groups which are another key component. These knowledge areas can take place during any process group and are the core technical subject

matter that is essential for effective project management. According to (Project Management Institute, 2017) there are ten (10) project management knowledge areas; these include:

Project integration management, scope management, schedule management, cost management, quality management, resource management, communications management, risk management, procurement management, and stakeholder management.

All the knowledge area components can be integrated to accomplish successful project implementation and execution. The knowledge areas give a description of the key competencies that project managers are to develop. Most of the knowledge required to manage projects is unique or nearly unique to project management. Nonetheless, the project management body of knowledge does overlap with other areas or disciplines; one of these disciplines is contract management (Project Management Institute, 1996).

The management of projects typically includes planning, awarding and administering contracts for the performance of project-related efforts (Rendon G. Rene, 2010). A contract is a promise or a set of promises for the breach of which the law gives a remedy, or the performance of which the law in some way recognises as a duty; in other words, a contract is the total legal obligation which results from the parties' agreement as affected by any applicable rule of law; it is an agreement which the law will hold the parties to (Mayer *et al.*, 2012). Simply put, (Mayer *et al.*, 2012) define a contract as a legally enforceable promise. Contracts are made to be performed; when parties enter into a contract, they generally do so in the expectation that it will be performed according to its terms (McKendrick, 1997). The term 'performance' means that the parties to the contract have fulfilled or carried out their respective obligations arising out of the contract (Indira Gandhi Open University, 2017). Contracts place legal obligations upon the contracting parties to perform their mutual promises and they continue or carry on until the termination or discharge of the contract; a party that performs a contract in line with its terms will be discharged from any further obligations and as a rule is entitled to receive performance from the other party (Money Matters, 2017). Contract performance should match contractual obligations; meaning both parties (the promisor and the promisee) must fulfil the respective obligations which were placed upon them by the contract.

Contracts are the central element of all project activities (Kibuuka Ssempebwa *et al.*, 2014) they help to protect the interests of the parties that have entered into the agreement. Ernesto Henriod and Jason Le Masuier (2002), state that the key objective of any contract is to achieve the required output, at the agreed time and within budget; the failure to achieve one or more of

these objectives is a basic contract risk. Contracts are important for ensuring that there is the proper allocation of risk between the parties, effective agreement between the parties for payment and performance and serve as a guide for decision making and dispute management between the parties (Ernesto Henriod and Jason Le Masuier, 2002); Davison and McCue (2018), state that the purpose of any contractual agreement is to define the parties' responsibilities with respect to a desired outcome, as well as to define the detail necessary for project success. Therefore, the management of contracts is of at most importance as it offers benefits to the parties such as effective management of risks, obtaining value for money and maximizing end-user benefits (Southern Cross University, 2017). However, the benefits of contracts cannot be realized if the performance of the parties involved is not assessed and monitored (Smirnova, Yusuf and Leland, 2016). Kanchana *et al.*, (2018), states that the silent features of any contract including delivery schedule, quality specifications, regulations and standards are to be monitored.

Brian (2018) defines contract management as a process that enables both parties to a contract to meet their obligations in order to deliver the objectives required by the contract, it encompasses the management of all dealings between the client and contractor from the time the contract is awarded until the work has been completed and accepted or the contract is terminated, payment has been made and the disputes have been resolved. Contract management is becoming an integral part of project management and business in general. Many commercial and project managers are more and more facing contract management issues. For projects of all types, different contracts will be structured, negotiated, concluded and fulfilled. On one side we deal with the management of contractual relationships on the other with the contracts and their management (Kibuuka Ssempebwa *et al.*, 2014).

Kibuuka Ssempebwa *et al.*, (2014) states that businesses need to know if their contractual obligations are being followed and deadlines are being met. Contract leakage is a real concern that occurs if individuals obligated to act upon the detailed obligations in a contract are unaware of the specifics of their agreement. While a manager may fully understand a contract's detail at the time of execution, remembering obligations months later is another matter entirely. Without a structured way to identify contract events and tie them to a calendar or reminders that prompt action, missed deadlines, potential penalties and missed incremental revenue opportunities become the norm.

The study uses contract performance to mean construction projects completed within the stipulated budget, time, specified quality and meeting customer satisfaction. In order to determine the influence that the knowledge areas have on the successful accomplishment of project objectives in construction projects, it will be necessary to find a relationship between project management knowledge areas as defined by the Project Management Institute (PMI) and the performance of contracts in the construction industry. The study, therefore, was aimed at assessing the relationship between five project management knowledge areas and the performance of contracts in the construction industry in Lusaka. To meet this objective, the study attempted to determine the relationship between the five knowledge areas and contract performance in terms of cost, quality, client satisfaction and time.

1.2 Background to the Study

The construction industry is very important in the socio-economic growth of a nation as it improves the overall Gross Domestic Product of a nation (Dorcas *et al*., 2019). Navon (2005), states that it contributes to about 10% of the Gross National Product in industrialised countries. The construction industry impacts the rate of Gross Domestic Product and employment of many countries; for this reason, the construction industry is considered to be vital for the economic growth of a country(Raj Kapur Shah, 2016) as it plays a significant role in the development and achievement of goals in the society (Babalola *et al*., 2015). Raj Kapur Shah (2016), further states that construction activities have become a significant market indicator since the industry produces more products and consumes more materials than other industries. It promotes growth, accumulates capital formation, contributes a source of employment, and provides critical backbone and forward linkages to the rest of the economy (Chia *et al.*, 2014).

Globally, the construction industry is responsible for between 3 to 10 percent of Gross Domestic Products if only the raw site-based construction activity is considered, but most importantly between 10 to 30 percent of a country's Gross Domestic Products if the broader construction supply network definition is used (Hampson *et al.*, 2014). An estimate of annual global construction output is probably closer to $4.5 trillion U.S dollars (Khan, 2008). Khan (2008) further states that the construction industry is a prime source of employment generation, offering job opportunities to millions of unskilled, semi-skilled and skilled workforce. According to the World Economic Forum, the construction industry as a whole employs more than 100 million people worldwide and accounts for 6 percent of the global Gross Domestic Products (GDP) in developed countries and 8 percent of Gross Domestic Products in

developing countries (Deloitte, 2019). Deloitte (2019) further states that the global economy was forecast to expand between 2.5 percent and 3 percent per year in the period 2018 to 2022, while the pace of expansion in the construction industry was set to average 3.6 percent a year over the same period with an estimated revenue of USD 15trillion by 2025.

The construction industry not only has a direct impact on the global economy but also has important linkages with other sectors which means its impact on Gross Domestic Products and economic development goes far beyond the direct contribution of construction activities. The completion of infrastructure boosts Gross Domestic Products (GDP) while its availability increases productivity and promotes both competition and cooperation (Deloitte, 2019).

As of 2018, the construction industry had contributed 117 billion British Pounds to the UK economy, 6 percent of the total economic output. There were 2.4 million jobs in the construction sector as of 2019 which were 6.6 percent of all jobs in the UK. The sector was cited as unusual because a high proportion of the people working in the sector were self-employed and many of the jobs were in the form of contracts to work on specific projects. Self-employed jobs in the sector had accounted for 37 percent of all jobs, almost three times the proportion in the whole economy (13%). In the service sectors as a whole, self-employed jobs accounted for only 11 percent of jobs (Rhodes, 2019).

A study by (Zeraibi, 2019) describes China as one large construction site stating that currently the annual output of the construction industry in China is about USD 93 billion and employs nearly 24 million people (more than 5 percent of the total workforce); it accounts for more than 6 percent of the GDP and has been growing at an average annual rate of nearly 10 percent since 1979.

The Indian construction industry consists of 200 firms in the corporate sector and provides employment to more than 35 million people; in the financial year 2014, the Indian construction industry was valued at approximately USD 157 billion (Singh *et al.*, 2018).

In Malaysia, the construction industry accounts for about 8 percent for the past several years to the total contribution to GDP; between the period 2011-2015, the Malaysian construction industry grew at the rate of 10 percent which was supported by the 10th Malaysian plan (Omar, 2017).

In South Africa, the construction industry is valued at approximately ZAR 145 billion and provides job opportunities to approximately 429 000 individuals (Bowmans, 2016). Haupt

(2016) shows that in 2012, the construction industry in South Africa had accounted for 3.5 percent of the nation's GDP and employed an estimated 433 000 employees, roughly 5.1 percent of South Africa's workforce; as of 2018, the construction industry in South Africa accounted for 4 percent of the GDP (Construction Industry Development Board, 2019).

The Kenyan construction industry contributed 7 percent to the Gross Domestic Product in 2015, making it clear that Kenya has a well-developed construction industry (Competition Authority Kenya, 2017).

In 2014, the construction industry in Zambia accounted for 182,806 workers, approximately 3.1 percent of the total workforce and as of 2017, it had contributed to 10.3 percent of the country's total GDP (Cheelo and Liebenthal, 2018).

Despite its importance, several reports have demonstrated poor performance of construction projects and underachievement, projects are notorious for failing to achieve cost and time budgets despite the considerable effort over the years toward improving project management for successful performance (Bello, 2017). The construction industry is complex in nature because it contains a large number of project parties as clients, consultants, contractors, stakeholders, shareholders and regulators (Enshassi, Mohamed and Abushaban, 2009). The complexity and fragmented nature of the industry and its highly casual employment of labour makes it sensitive to poor contract performance (Ifedolapo Helen *et al.*, 2015).

Generally, performance in construction projects is considered to be the indicator for project management success or failure; the four determinates used to measure performance in the construction industry are i) the quality of work ii) the delivery of project on time iii) project completion within estimated budget and iv) level of client's satisfaction (Mahamid, 2019). According to (Ifedolapo *et al.*, 2015) successful building construction projects are those projects finished on time, within budget, in accordance with specifications and to stakeholders' satisfaction. However, the history of the construction industry is filled with construction projects completed with cost overrun, time overrun and poor quality (Mahamid, 2019). Nearly one-third of clients have complained about their projects exceeding their allocated budget (Shibani and Arumugam, 2015). Abdul Rahman *et al.*, (2012) showed that 92% of construction projects in Malaysia were overrun and only 8% of projects could achieve completion within contract duration. Abdul Rahman *et al.*, (2012) further shows that only 46.8 percent of the public sector and 37.2 percent of private-sector projects were found to be completed within the stipulated budget while only 20.5 percent of the public sector projects and 33.35 percent of the

private sector projects were completed within time. Many of the public projects in Malaysia were reported as not being completed on time, overrunning cost and not meeting specifications (Jatarona and Ismail, 2016). Delays in construction projects may lead to losses or have a negative effect on some or all of the parties to a project; Aibinu and Jagboro (2002) define project delay as a situation where the contractor and project owner jointly or severely contribute to the non-completion of the project within the original or agreed contract period. Ifedolapo Helen *et al.*, (2015), states that the choice of contractor(s) is a critical factor for the project manager and usually has a significant impact on the success or failure of a project; the performance of the contractor will certainly correlate with the performance of the contract. Performance according to (Chilongo Sylvia, 2017) is related to many topics and factors such as time, cost, quality, client satisfaction and safety.

The Nigerian construction industry as investigated by (Odediran, Adeyinka and Frank, 2015) showed almost all projects were completed after duration much longer than initially planned, the industry experienced an average delay of 51 percent of the planned duration for most projects and construction costs were about 40 percent more expensive than the same type of construction projects in Kenya and Brazil, 35 percent more than Britain and 30 percent more compared with the United States of America.

An investigation by (Mbatha, 1986) showed that the majority of government building contracts in Kenya had registered poor performance with the majority of them suffering cost and time overruns; of which the two measures contributed to yet another performance measure-client satisfaction. He established that out of hundred(100) public building projects, seventy-three (73) experienced time over compared to thirty-eight (38) out of hundred (100) which suffered cost overruns. There is evidence that the construction projects performance in Kenya is inadequate; time and cost performance in Kenya are poor to the extent that 70 percent of projects initiated are likely to escalate in time with a magnitude of over 50 percent, further, over 50 percent of projects are likely to escalate in cost with a magnitude of over 20 percent (Gwaya, Masu and Wanyona, 2014).

Construction project delays in the form of cost and time overruns have been a major challenge for the sector in South Africa (Osunsanmi, Aigbavboa and Oke, 2018). Adugna (2015) reported that most projects in the city of Durban were delayed well beyond the expected time for completion and also required a budget more than envisaged during the commencement of the projects.

Like many other sub-Saharan African countries, the construction industry in Zambia is facing major performance challenges. Zulu and Chileshe (2008) state that in Zambia many construction projects fail in performance and in addition performance measurement systems are not effective or efficient enough to overcome this problem. They further state that there are many constructed projects which fail in time performance, others in cost performance and others in quality performance. Having shown that contractor performance in Zambia was found to be below expectations, arguing that nothing can be learned from local ongoing projects that have been completed or have been delayed. They concluded that contractors' performance has a huge implication on competitiveness. Chilongo Sylvia (2017) states that the construction industry being a key sector to the development and economic growth of Zambia has not escaped the challenges facing other countries Worldwide in terms of delivering construction projects on time as stipulated in the contracts.

A statistical abstract from the Ministry of Works and Supply (2020) for the performance of approximately 198 construction contracts that were signed between the Zambian government and local contractors for the construction of infrastructure in newly created districts in 2014 showed that 40 % of the contractors had failed to meet their contractual obligations and as such had failed to perform; and termination procedures were instituted.

Table 1.1: The Year 2020 table showing Infrastructure Project performance in newly created Districts in Zambia

No.	Contract Type	Number Contracted	Percent	Actual Performance	Performance percentage (%)
1	Administration Office	33	100	14	42
2	Post Office	33	100	12	36
3	Police Stations	33	100	15	45
4	Civic Centres	33	100	13	39
5	Housing Units	1400	100	510	36

Source: Ministry of Works and Supply, 2020.

The table above shows that by the year 2020, 14 district administration offices out of 33 recording 42 percent performance, 12 post offices out of 33 recording 36 percent performance, 15 police stations out of 33 indicating 45 percent performance, 13 civic centres out of 33

showing 39 percent performance and 510 housing units out of 1400 showing 36 percent performance in these districts had been completed which were all below 50 percent completion rate and way below the projected 80 percent completion rate by the year 2020 hence, indicating poor contract performance.

Over a five year period between 2014 and 2020, 45 contracts had been terminated for poor performance, 54 contracts were not completed within the stipulated contract duration period due to erratic payment and failure to adjust contract prices in view of escalating material costs; and also poor project management and semi-skilled supervisory staff.

A National Council for Construction 2018 annual report shows that compliance monitoring inspections carried out on 1991 projects found various project sites wanting with common issues that were related to the quality of work, health and safety of workers and the sites.122 contractors were given warning letters, 94 penalized and 25 sites were closed for various offences. Further, the NCC, found 234 sites were either closed or abandoned during the inspection (National Council for Construction, 2018).

In a more recent development, the Engineering Institution of Zambia (EIZ) recommended the closure of the imposing Society Business Park on Cairo Road because 1,200 out of 1,600 columns were failing. This was following a 2019 report which showed that one of the columns on the building had developed cracks. A technical audit done on the building also revealed that the foundation had many cracks. Zambian President H.E Dr. Edgar C. Lungu expressed displeasure with the performance of Engineers in the country because the costing of projects tends to be higher as a result of variations. He cited the leaving out of power substation in the bill of quantities at the Kenneth Kaunda International Airport, poor works at the Kafue bulk water project and Ndola Lime (where Government lost USD100 million) as an embarrassment and indictment on the Engineering Institution of Zambia (Mvula Zambia Daily Mail,16th October 2020)

Kanchana *et a*l., (2018) state that contract management procedures on their own are followed by almost all organisations but still shortfall in fulfilling contractual obligations at the prescribed time and acceptable level of quality are prevalent.

Every country's government regulates some sectors of its economy at any given time; regulation is a means of accomplishing objectives that go beyond pure competition goals such as the implementation of universal policies to ensure access to basic services and subsequently contributing to economic growth that may otherwise not be achieved (Competition Authority Kenya, 2017).

In Malaysia, all construction projects are regulated by The Construction Industry Development Board (CIDB) of Malaysia, which was established under the ACT 520 (Lembaga Pembangunan Malaysia/LPIPM) on 24th July 1994, as a governing body entrusted with the responsibility to provide effective leadership and coordination to the industry's players in Malaysia. The CIDB is a statutory body under the Ministry of Works, Malaysia and has been given the authority to lead and develop the construction works, value for money and responsive to consumers' sentiments over construction performance (Dwikojuliardi, 2016).

The construction industry in China is regulated by a number of regulations issued over time by the Ministry of Construction and other line ministries; these regulations are available from the China Construction Regulations Compilation published by the Ministry of Construction every two years. The country has not had a unified construction law in the past but one was under preparation and was soon expected to be issued (Zeraibi, 2019).

In Kenya, the construction industry is regulated by the National Construction Authority (NCA); the NCA was established under Act 41 of 2011 Laws of Kenya. The NCA's mandate is to regulate, streamline and build capacity in the construction industry; NCA is also responsible for registering and regulating the performance of local and foreign contractors and accredits skilled construction workers and site supervisors. It has segregated construction firms into categories based on the contract, the value they are allocated to undertake as well as the academic requirement for the owner of the company (Competition Authority Kenya, 2017).

In South Africa, the Construction Industry Development Board of South Africa (CIDB) is the regulatory body created in terms of the CIDB Act to regulate the construction industry. The CIDB Act 38 of 2000 (CIDB Act) authorizes the CIDB to establish a national register of contractor and construction projects to regulate, monitor and promote industry performance, promote improved delivery management capacity, promote improved performance and best practice for public and private clients as well as to promote continued and consistent participation of the emerging construction sector (Bowmans, 2016).

In Zambia, the construction industry is regulated by the National Council for Construction (NCC). The NCC was established under the National Council Act No. 13 of 2003. The NCC has the responsibility to promote, develop, train and regulate the construction industry in Zambia. As a regulatory body for all contractors, the NCC is responsible for issuing annual practicing certificates to contractors, providing for the registration of contractors and training of persons engaged in construction activities. The council’s main mandate is to enhance delivery of projects, improve the construction industry stability and performance, human resource development and promote contractor capacities through training.

Alotaibi (2019) states that there are several notable project management standards and guides that have been developed to help project managers and practitioners successfully undertake and manage projects; he cites that in the same manner, numerous tools and techniques have been developed covering all phases or aspects of managing projects from initiation to completion. He further states that there are ten project management practices (knowledge areas) as defined by the Project Management Institute (PMI) and that the successful completion of construction projects apparently is dependent to a large extent on the effective use of these project management practices. Therefore, a project management framework for the entire construction sector could be helpful to validate the impact of the appropriate or inappropriate use of project management tools, techniques and practices on project performance (Alotaibi, 2019).

Based on this background, this research developed a framework that integrates five project management knowledge areas with contract performance indicators in the construction industry. The framework was expected to help key players in the construction sector identify the appropriate use of the knowledge areas to improve and enhance the performance of construction projects around Lusaka District.

1.3 Statement Of The Problem

Undesirable project performance is one of the main problems affecting the construction industries everywhere and mostly in developing countries (Gyadu-asiedu, 2009). According to (Takim and Akintoye, 2002; & Ali and Chileshe, 2009), a construction project is acknowledged as successful when it is completed on time, within budget, in accordance with specifications, and in accordance with stakeholder's satisfaction. However, many construction projects in Lusaka are mostly characterised by time, cost overruns and quality shortfalls (Muya *et al.*, 2013). This phenomenon poses a debilitating effect on the parties to a contract i.e. the owner, contractor and consultant in terms of adversarial growth, distrust, ligation, arbitration, cash-flow problems and a general feeling of apprehension toward each other (Ahmed *et al.*, 2002). The public and various stakeholders have bemoaned the delayed handover of projects and prevalent substandard quality of work on construction projects in Lusaka (Kaliba, 2010). Ngomi, (2017) revealed that most construction projects undertaken by local contractors in Lusaka district were either abandoned, delayed or of poor quality. The resultant poor performance in the delivery of construction projects in terms of cost, time and quality has far-

reaching effects on the economy which if left unchecked could retard national development (Kaliba, 2010).

Despite recommendations from the World Bank (2018) for construction firms to ensure that works are done systematically and according to specifications at first attempt to avoid double handling which ultimately increases the costs, leads to schedule overruns and compromised quality of work; construction facilities still deliver late and above budget (Ohiomah, 2019). In spite of, the ever-growing literature on construction and Project Management, few studies are known to have actually explained the relationship between Project Management Knowledge areas and project success (Ibrahim, 2019; Chou *et al*, 2013; Demirkesen and Ozorhon, 2017 & Vajão, 2016).

Therefore, this researcher strives to establish a relationship that exists between five project management knowledge areas and the performance of construction contracts. Thereafter, a framework is developed to integrate the five knowledge areas with contract performance to help enhance contract performance in the construction industry.

1.4 Main Objective

To assess the relationship between five project management knowledge areas and contract performance.

1.4.1 Specific Objectives

To achieve the main objective of the study, the specific objectives have been identified as follows:

1. To explore the five most effective project management knowledge areas
2. To examine the relationship between the five project management knowledge areas and contract performance
3. To develop a framework for the integration of the five project management knowledge area techniques to enhance contract performance.

1.5 Research Questions

To investigate the identified research problem, the following research questions were formulated:

1. What are the five most effective project management knowledge areas?

2. What is the relationship between the five project management knowledge areas and contract performance?
3. How can the five project management knowledge areas be integrated with contract performance?

1.6 Significance of the study

The findings of this study are expected to benefit project sponsors and developers, project managers, contractors, consultants and all stakeholders. They are to provide an understanding of the relationship that exists between some project management knowledge areas and the performance of contracts in the construction industry and other various industries. The findings are to further reveal how integrating these knowledge areas into contract performance management will enhance the performance of contracts hence leading to maximisation of end-user outcomes and improved service delivery as parties to contracts will effectively carry out their contractual obligations.

The study is also expected to equip policymakers with the weaknesses existing in the contract performance management process to facilitate the formulation of feasible policies to address the loopholes and improve the process.

Finally, the study acts as a reference for future researchers in similar studies and is expected to add to the existing body of knowledge. The study will help researchers identify potential areas of research hence allowing researchers to fill in the gap.

1.7 Scope of the study

The study was focused on assessing the relationship that exists between five project management knowledge areas and the performance of construction contracts in Lusaka. The study sought to find out how developing a framework that integrates the five project management knowledge areas of project integration management, scope management, cost management, risk management and quality management helps to enhance the performance of contracts among contractors in the construction industry within Lusaka District.

The study was narrowed down to the performance of construction contracts between the government of Zambia and local contractors in infrastructure projects within Lusaka. The selection of government projects as opposed to private ones was due to the fact that data and information are more readily available in the government sector than in the private sector and

because government projects are more prone to mismanagement. The key stakeholders involved in this study are Lusaka City Council, Ministry of Housing and Infrastructure Development, Ministry of Works and Supply, Road Development Agency, National Council for Construction and the Association of Building and Civil Engineering Contractors in Zambia.

1.8 Research Variables

The present research study intends to assess the relationship that exists between five project management knowledge areas; project integration management, scope management, cost management, quality management and risk management and the performance of contracts in the construction industry. The five identified project knowledge areas will serve as the independent variables that may have a relationship with contract performance which is the dependent variable.

1.9 Outline of the Research

The outline of the study research was organised as follows:

Chapter One: Introduction and Background- chapter one sets the tone and gives an introduction to the research topic. This chapter gives a background to the study, outlines and defines the research problem, identifies the main and specific objective (s) of the study, identifies the research questions, the significance and scope of the study and gives a description of the research variables.

Chapter Two: Literature Review- gives a review of the various literature on project management knowledge areas and contract performance. It highlights the various theories that relate to the research topic.

Chapter three: Theoretical and Conceptual Framework- postulates the theoretical and conceptual framework relevant to the study.

Chapter Four: Research Methodology- identifies the research methodology to be used in the study and defines the method to be applied in the research process. It highlights the research approach, research design, philosophy of the study, Epistemology, Ontology, study population, sample size, data collection tools, data analysis, reliability, validity and ethical considerations.

Chapter Five: Data Finding and Presentation- gives a presentation of the findings to the study based on the questionnaires to be collected from eligible respondents. Response analysis

would be based on the relationships of the identified variables; and facilitated through the application of statistical package of social sciences (SPSS).

Chapter Six: Discussion and Analysis - discusses the significance of the research finding in light of what is already known about the research problem under investigation and gives an in-depth analysis and interpretation of the study findings; it will explain any new understanding about the research problem after taking the research findings into consideration. This chapter will connect the introduction using the research questions to the reviewed literature. In other words, the discussion was directed towards answering the research questions

Chapter Seven: Conclusion and Recommendation- is the final chapter and it presents the conclusion and recommendation based on the research findings.

1.10 Conclusion

This introductory chapter gives the foundation for undertaking a study on the relationship between five Project Management Knowledge areas and the performance of construction contracts in Lusaka District. It has highlighted the background, statement of the problem, the main objective, specific objectives, research questions, significance of the study, the scope of the study and an outline of the organisation of the research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter gives an overview of the performance of construction projects using past studies from various researchers. It gives a comprehensive review of literature on the five project management knowledge areas; Integration management, Scope management, Cost management, Quality management and Risk management. It further focuses on the concepts and theories regarding the relationship between each of the five knowledge areas and the performance contracts in the construction industry; and highlights the fundamental

requirements needed to lay a foundation for the development of a performance enhancement framework as well as give a theoretical analysis of the Gap Knowledge between documented research and this study.

2.2 Overview of the Performance of projects in the Construction Industry

According to (Sweis et al, 2014) construction is considered one of the industries on which national prosperity depends; usually based on monetary exchanges, building contracts impose both contractual and legal obligations on both parties that are difficult or impossible to change. The extent to which contractual targets or obligations are met is frequently seen as a major criterion of project success (Odeyinka and Yusif, 1997). The performance of the construction industry is considered a source of concern to both public and private sector clients (Kazadi, 2020). There had been lamentations on the performance of projects among countries as evidenced by the number of failures being reported on construction project performance (Bello, 2017). Omran, et.al., (2012), state that the success of a construction project is dependent on its performance; this performance is measured on timely completion, expected quality standards, within cost estimates and client satisfaction. They further highlight that successful construction project performance is achieved when stakeholders meet their requirements individually and collectively. (Navon, 2005) states that project success is when a project is completed with the lowest possible cost as quickly as can be achieved, with the highest quality, with no accidents, etc.; in other words, success means bringing each of the project performance indicators (PPI) such as cost, schedule, quality, safety, labour productivity, materials consumption or waste etc. to an optimum. However, failure to fulfil project objectives within budget and on time is quite common (Bello, 2017). The inability to complete projects on time and within budget continues to be a chronic problem worldwide and is worsening, overruns on construction projects are a universal phenomenon (Alinaitwe *et al*., 2013). Worldwide, construction organisations have been struggling with delivering services on time, on budget and with higher customer satisfaction; contrary to popular belief that modern countries have an advantage over third world countries due to their larger budget and higher levels of technology, poor performance was found to be the same in every country examined (Rivera *et al.*, 2016).

There are many reasons and factors which attribute to performance problems in the construction industry (Kazadi, 2020). According to (Kim *et al.*, 2009) international construction project performance is affected by more complex and dynamic factors than domestic projects, frequently being exposed to serious external uncertainties such as political,

economic, social and cultural risks as well as internal risks from within the project. Long *et al.*,(2004), attribute performance problems arising in large construction projects to incompetent designers/contractors, poor estimation and change management, social and technological issues, site-related issues and improper techniques and tools. Navon (2005), divided the main performance problems into two groups; (i) unrealistic target setting (i.e. planning) and (ii) causes originating from the actual construction (in many cases the causes for deviation originate from both sources). Ogunlana *et al*.,(1996), remarked that in developing economies, performance problems in the construction industry can be nested into three layers (i) problems of shortages or inadequacies in industry infrastructure (mostly supply of resources) (ii) problems caused by clients and consultants (failure to meet obligations) and (iii) those caused by contractor incompetence/ inadequacies.

Literature indicates that various studies by several authors have been done on the performance of construction projects in different countries across the globe:

For instance, (Egan, 1998) noted that one of the most critical problems the construction industry in the UK was facing was end-user dissatisfaction with the built forms. He stated that "the construction industry as a whole is under-achieving; it has low profitability and invests too little capital, research, development and training. Too many of the industry clients are dissatisfied with its overall performance". (Olawale and Sun, 2010) performed a study on construction project organisations in the UK and stated that despite the availability of various control techniques and project control software, many construction projects in the UK failed to achieve their cost and time objectives. They found 21 major things that could factor for the poor cost and schedule performance, among them were; changes in design, risk and uncertainty that come with projects, lack of proper assessment of time, poor act of contractors and selected dealers, high difficulty of work, different interpretation of contracts, conflict among project parties, improper regulation and control, etc. Shibani and Arumugam (2015), remark that nearly one-third of all clients in the UK complained that their projects had exceeded their allocated budget.

A study by (Jatarona *et a*l, 2016) showed that many public construction projects in Malaysia were not being completed on time, had overrunning costs, did not meet specifications of the contract, were not functionally suitable and not within the expected quality. The major contributors to this poor performance were design and documentation issues, financial resource management, project management and contract administration issues (Abdul Rahman *et al.*,

2012). In a separate study (Sambasivan and Soon, 2007) attribute poor performance to contractor's improper planning, contractor's poor site management, inadequate contractor experience, inadequate client's finance and payments for completed work, problems with subcontractors, shortage in material, labour supply, equipment availability and failure, lack of communication between parties and mistakes during the construction stage.

Durdyev *et al*, (2017) remark that two major challenges were limiting the performance of the construction industry in Cambodia, these were poor cost and schedule performance of construction projects. The Kuwaiti construction projects are facing several problems and issues that cause project delays, cost overruns and poor quality (Alshammari *et al*., 2020).

According to (Tunji-olayeni *et al.*, 2016; Oke and Abiola-Falemu, 2009; Omoregie and Radford, 2006 and Aibinu and Jagboro, 2002) poor performance in terms of cost overruns, time overruns, poor quality of work, low productivity among other problems are common in the Nigerian construction industry.

Alinaitwe *et al*., (2013) remark that most construction projects in Uganda have had problems with delays in completion and cost overruns, which has caused considerable concerns. There is strong evidence of inconsistent performance of construction projects by both international firms and local construction contractors and the trend is growing rapidly, projects are reportedly failing across all key performance measures of cost, time and quality (Muhwezi *et al*,2014).

Zambia has not escaped the challenges facing other countries in terms of poor construction project performance. Reports of projects failing to meet key performance criteria are not uncommon (Zulu, 2015). He further remarks that one of the major concerns in the Zambian construction industry has been the significant number of projects which fail to meet time, cost and quality performance criteria. A separate study by (Zulu and Chileshe, 2010) shows that the construction industry in Zambia is characterised by poor project performance as many projects are completed late, over budget and are of poor quality. Muya *et al.*, (2013), in their study confirmed the prevalence of cost escalation, schedule overruns and sub-standard quality of work on construction projects in Zambia. This poor performance was attributed to insufficient initial analysis of costs and change orders, financial difficulties on the part of the contractor, poor financial management, poor subcontractor performance, long lapse between feasibility study and project implementation, inadequate supervision, incompetence by

contractors, changes to specifications, inflation and knowledge gap in project managers in construction management (Kaliba, 2010 and Muya *et al.*, 2013).

2.3 Literature Based on Research Objectives

The relevant literature related to the research objectives is outlined below.

2.3.1 Project Management Knowledge Areas

Advances in the management sciences have made the concept of project management to evolve into a whole system of knowledge thus making it essential for effective management of projects especially in the construction industry (Unegbu *et al.*, 2020). Project management in construction requires a variety of knowledge, skills, techniques and applications (Nguyen *et al*., 2015). To best manage projects, the PMBOK Guide is one of the foremost literature of the project management profession which is quite comprehensive, it encompasses the project management process groups, knowledge areas and their corresponding processes and the concept of project success (Ibrahim *et al.*, 2019) it also contains the methods, techniques, tools and skills required for effective project management (Unegbu *et al*., 2020). According to the PMBOK, a Project Management Knowledge Area (PMKA) is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools and techniques (Project Management Institute, 2017). It represents a complete set of concepts, terms and activities that make up a professional field, project management field or area of specialization (Project Management Institute, 2013). Although the knowledge areas are interrelated, they are defined separately from the project management perspective and each knowledge area contains processes that need to be accomplished within its discipline to achieve an effective project management program and produce the required outcome (Hwang and Ng, 2013). There are ten knowledge areas as identified by the PMBOK (PMI, 2017), these include; Integration management, Scope management, Schedule management, Quality management, Resource management, Communications management, Risk management, Procurement management and Stakeholder management. The knowledge areas with their corresponding processes are described by the PMBOK (PMI, 2017) as follows:

Table 2. 1: Descriptions of the Ten Project Management Knowledge Areas and their Corresponding Processes

	Knowledge Area	**Description**	**Corresponding Processes**
1	Integration Management	-includes the processes and activities to identify, define, combine, unify and coordinate the various processes and project management activities within the project management process groups.	Develop Project Charter, Develop Project Management Plan, Direct and Manage Project Work, Manage Project Knowledge, Monitor and Control Project Work, Perform Integrated Change Control, Close Project or Phase
2	Scope Management	- includes the processes required to ensure the project includes all the work required and only the work required to complete the project successfully.	Plan Scope Management, Collect Requirements, Define Scope, Create WBS, Validate Scope, Control Scope

3	Schedule (Time) Management	-the process required to manage the timely completion of the project.	Plan Schedule Management, Define Activities, Sequence Activities, Estimate Activity Durations, Develop Schedule, Control Schedule
4	Cost Management	- includes the processes involved in planning, estimating, budgeting, financing, funding, managing and controlling costs so the project can be completed within the approved budget.	Plan Cost Management, Estimate Costs, Determine Budget, Control Costs
5	Quality Management	-includes the processes for incorporating the organisation's quality policy regarding planning, managing and controlling project	Plan Quality Management, Manage Quality, Control Quality.

		and product quality requirements in order to meet stakeholder's expectations.	
6	Resource Management	- includes the processes to identify, acquire and manage the resources needed for the successful completion of the project.	Plan Resource Management, Estimate Activity Resources, Acquire Resources, Develop Team, Manage Team, Control Resources
7	Communications Management	- includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring and ultimate disposition of project information.	Plan Communications Management, Manage Communications, Monitor Communications
		- includes the processes of conducting risk management	Plan Risk Management,

8	Risk Management	planning, identification, analysis, response planning, response implementation and monitoring risk on a project.	Identify Risks, Perform Qualitative Risk Analysis, Perform Quantitative Risk Analysis, Plan Risk Responses, Implement Risk Responses, Monitor Risks
9	Procurement Management	- includes the processes necessary to purchase or acquire products, services or results needed from outside the project team.	Plan Procurement Management, Conduct Procurements, Control Procurements
10	Stakeholder Management	- includes the processes required to identify the people, groups or organisations that could impact or be impacted by the project to analyse stakeholder expectations and their impact on the project and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and executions.	Identify Stakeholders, Plan Stakeholder Engagement, Manage Stakeholder Engagement, Monitor Stakeholder Engagement

These knowledge areas are used as a reference to review projects and project management execution; identification of weakly executed knowledge areas allows focusing on improvement activities (Muller and Turner, 2001).Several scholars have explored the influence and application of the project management knowledge areas in different industries and contexts (Mahmoudi et al, 2020). Zwikael (2009) explored the importance of the PMBOK guide's nine knowledge areas during project planning, the study was aimed at showing the impact of the nine knowledge areas on project success; the results showed that the most influential knowledge areas on project success are schedule, risk, scope and human resources respectively. Javed *et al* (2015) examined the project managers' perception of the comparative importance of the ten knowledge areas for project success in the product-based and service-based organizations in Pakistan; the study revealed that quality, time, communication and scope management were the most influential KAs in manufacturing projects while cost and time were the most influential KAs for service-based projects. They further remarked that in general project management practitioners consider quality, time, communication, cost and scope management to be the most effective KAs in ensuring project success. Chauhan and Srivastava (2014) explored the important project management knowledge areas for the successful delivery of projects in the Indian pharmaceutical industry; the researcher aimed at identifying the PMBOK's knowledge areas that were important for successful delivery of pharmaceutical projects. The results showed that time, cost and quality were the three most important knowledge areas for the success of pharmaceutical projects and that the other knowledge areas (KAs) i.e. human resource, risk, integration and procurement management made a very poor contribution to project success hence demanding more attention during project execution. In a similar study, (Dumrak *et al*, 2017) made an investigation of the relationship between PMKAs and sustainable outcomes in the Reproductive Health Department (RHD) in Thailand, the research attempted to explore the association between sustainable outcomes and project management with particular emphasis on PMKAs as developed in the PMBOK Guide. The study revealed that the nine project KAs contributed to at least one sustainable outcome targeted by the RHD projects with moderate to high association. Auman, (no date) cited communication, time, quality, scope, cost and risk as the most effective KAs in life sciences projects. Ibrahim and Yong (2019) investigated the influence of project management knowledge of academics on the success of academic research projects; the results showed that there exists a positive significant relationship between all PMKAs and project success although integration, cost, quality and stakeholder management had the most impact on project success. Nguyen *et al*, (2015) also investigated PMKAs in the academic context by exploring the

knowledge areas offered in project management programs in construction. The study aimed to explore the extent to which different KAs were taught in project management programs with emphasis on the construction industry. The findings of the study indicated that time, risk, procurement and cost management were frequently the top focus whilst scope, quality and stakeholder management had the list teaching priorities among the project management knowledge areas. In the information technology sector, (Eastham *et al.*, 2014) developed a hierarchical decision modelling tool in their study on Product Lifecycle Management (PLM) software selection model based on the nine PMKAs by ranking them. Arafeh and Mufid (2015) proposed a Soft computing Knowledge Areas Model (SKAM) based on the ten PMKAs, their study was aimed at applying the soft computing modelling techniques to describe the relations between the 47 processes and the knowledge areas. In the construction industry, (Ling *et al.*, 2008b) used the nine PMKAs for measuring purposes in their study to examine international projects and predict project performance, the study results revealed that the knowledge areas significantly influenced the performance of international construction projects in China. Chou and Yang (2012) investigated the effects of PMKAs on the success of engineering and infrastructure construction projects. The results of the study showed that procurement and communications management had a statistically significant effect on project success whilst the rest of the KAs had a moderate correlation with project success. Chou et al, (2013) using eight of the PMKAs carried out a multinational study of the contribution of the PMBOK to the success of Construction Engineering projects. The study proposed a model where the effects of scope, time, quality, human resource, communication, risk and procurement management on project success and interrelations among the KAs were investigated. Rocha *et al.*, (2015) carried out a study on the PMKAs according to their relevance to project success in the Portuguese construction sector, citing cost and time management as the most critical KAs, they recommended improvement in paying critical attention to other KAs such as risk management as they were mostly overlooked. Demirkesen and Ozorhon, (2017) developed a performance measurement model specifically for the construction industry using the PMBOK Guide's KAs as the main determinants of performance; the study investigated the interrelations among the KAs and their influence on construction project performance. Dogbegah *et al*, (2011) identified human resource, communication, financial resource, risk, quality; and procurement management as the key KAs forming the basis for lateral project management training requirements in the Ghanaian construction industry. Hwang and Ng, (2013) identified scheduling and planning management as the most significant knowledge for construction projects while cost, quality, human resource and communication management were the second

most significant knowledge areas. Alshami, (2018) remarks that integration management is one of the most effective KAs in construction projects as it incorporates all the other knowledge areas. Durdyev et al., (2017) show that cost, quality and schedule management are considered to be the most significant aspect of construction management and some of the main drivers of construction project success. A study by (Tembo-Silungwe and Khatleli, 2017) indicates that the KAs that account for over 50 percent of performance in the Zambian construction industry are cost, procurement, scope and integration management. Although the knowledge areas are all equally important, in practice a project manager might determine the key areas which are of significance and that will have the greatest effect/impact on the outcome of the project (Banaitiene and Banaitis, 2012). All cited works indicate that a careful application of the knowledge areas to projects enhance the achievement of the project outcome (Zwikael, 2009) and the scope of effective knowledge areas required for managing projects are influenced by the context of the industry in which the project manager works as well as the requirements of the regulatory (engineering) institute (Edum-Fotwe and McCaffer, 2000).

2.3.2 Relationship between Project Management Knowledge Areas and Contract Performance

According to (Unegbu *et al*., 2020) poor performance of construction projects could be traced to poor utilization of project management best practices, project performance measures and critical success factors that constitute the multivariate that influences construction projects. Construction project performance relies on different dimensions of project management, among those project management knowledge areas are of paramount importance (Demirkesen and Ozorhon, 2017). Each KA has the potential to contribute to project success while at the same time interacting with each other (Ibrahim and Yong, 2019). These variables are somewhat interconnected and influence each other making it imperative for the dynamics of these relationships to be understood for effective management, resource allocation and control of construction projects (Chen *et al.*, 2012). Therefore, this research sought to understand the relationship between each knowledge area and the performance of construction contracts and further evaluate how they collectively contribute to the success of construction projects. The knowledge areas of focus were project integration management, scope management, cost management, quality management and risk management.

2.3.2.1 Relationship between Integration Management and Contract Performance

Project management is an integrative undertaking requiring each process to be appropriately aligned and connected with the other processes to facilitate coordination; project integration management is the practice of project management which makes certain that every part of the project is coordinated (Facilities Development Manual, 2014). Project Integration according to the (PMI, 2017) includes the processes and activities to identify, define, combine, unify and coordinate the various processes and project management activities within the project management groups; it includes characteristics of unification, consolidation, communication and interrelationship. It also involves making trade-offs among competing objectives and alternatives to meet or exceed stakeholder needs and expectations (PMI, 2000) as well as making decisions about resource allocation and managing the interdependencies among the PMKAs (PMI, 2017). Seven processes are entailed in project integration, these include:

i. **Develop Project Charter** – the process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organisational resources to project activities.
ii. **Develop Project Management Plan –** the process of defining, preparing and coordinating all plan components and consolidating them into an integrated project management plan.
iii. **Direct and Manage Project Work –** the process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.
iv. **Manage Project Knowledge** – the process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organisational learning.
v. **Monitor and Control Project Work** – the process of tracking, reviewing and reporting overall progress to meet the performance objectives defined in the project management plan.
vi. **Perform Integrated Change Control** – the process of reviewing all change requests, approving changes and managing changes to deliverables, organisational process assets, project documents and the project management plan and communicating the decisions.
vii. **Close Project or Phase** – the process of finalizing all activities for the project, phase or contract.

Integration management is highly recommended in construction projects to present considerations for originating, planning, implementing, monitoring, controlling and finalising construction projects (Ndandani, 2020). The fragmentation of the construction industry creates increased demand for coordination and integration of project participants(Mitropoulos and Tatum, 2000). According to (Iqbal *et al.*, 2014 and Zwikael, 2009) integration management is the most important knowledge area because it ensures the proper coordination among project activities. Therefore, the impact of integration management on project performance should be well understood so that project managers benefit from the positive aspects of properly coordinated project activities (Demirkesen and Ozorhon, 2017). Mitropoulos and Tatum, (2000) in their investigation provided practitioners in construction with an increased understanding of the importance of integration for project and company performance and the integration mechanism and barriers; they showed that the degree of project integration affects the performance of construction projects. O'Connor and Yang, (2004) showed that construction firms attempt to improve project performance by adopting integration and automation technology; their study revealed that utilizing integration technology may make a significant contribution to a project's cost and schedule success. Crawford, (2005) remarks that project directors who use high level of integration and scope practices are more likely to be top performers. According to (Baiden and Price, 2011) integration has been suggested as providing a demonstrable means of improving the effectiveness of teamwork and project delivery team performance. Chou *et al*, (2013) state that to complete a project that successfully meets customer and stakeholder requirements and expectations, project managers must effectively integrate unifying, consolidating, articulating and integrating actions. Berteaux and Javernick-Will, (2015) investigated the challenges of local adaptation and organisational integration processes in the Architectural, Engineering and Construction industry by relating to project performance; they concluded that projects having high integration result in richer information exchange than projects having low integration. Ospina-Alvarado, *et al* (2016) developed s framework for construction project integration by defining several attributes depending on their critical importance; they remarked that the framework was a useful tool for construction practitioners to be able to wisely use resources to achieve a more integrated project. They further state that moving the construction industry towards a more integrated approach to project delivery could improve its overall performance. Demirkesen and Ozorhon, (2017) and Nguyen *et al.*, (2020) reveal that there is a strong interaction between integration and performance, i.e. integration management has a strong effect on project performance, they state that integration is one of the most important components of successful project execution; this

implies that integration management must be emphasised in order to enhance construction project performance. The above-cited examples indicate that integration has a strong link to the core areas and elements of project management; therefore, it can be concluded that integration management has a direct effect on the performance of construction projects and ultimately successful execution of the construction contract.

2.3.2.2 Relationship between Scope Management and Contract Performance

A major contribution to unsuccessful construction projects is the lack of understanding or defining of project and product scope at the start of the project; a properly defined and managed scope leads to delivering a quality product, in agreed cost and within specified schedules to the stakeholders (Mirza *et al*., 2013). Olawale and Sun, (2010) remark that problems in defining and managing project scope are among the main causes of poor project performance in the construction industry. According to (PMI, 2017) project scope management includes the processes required to ensure that the project includes all the work required and only the work required to complete the project successfully. Alwaly and Alawi, (2020) define scope management as the processes that include function delegation and development of scope data to define boundaries and divide work into small manageable components and verify that the planned work has been accomplished. It is primarily concerned with defining and controlling what is and is not included in the project. Project scope management processes are divided into six main steps, these include:

i. **Plan Scope Management**- the process of creating a scope management plan that documents how the project and product scope will be defined, validated and controlled.
ii. **Collect Requirements**- the process of determining, documenting and managing stakeholder needs and requirements to meet project objectives.
iii. **Define Project Scope**- the process of developing a detailed description of the construction project and product. Defining scope is the first step in successfully managing a project, it is perhaps the most important part of the upfront process of defining a project as it helps to clearly describe the logical boundaries of the project; where the deliverables and the boundaries of a project are not clearly defined, the chance of project success is zero (Ogunberu *et al*., 2018). It provides adequate information needed to identify the work to be performed to avoid major changes that may negatively affect project performance (Gibson Jr *et al.*, 2006)

iv. **Create Work Breakdown Structure (WBS)** – the process of sub-dividing construction project deliverables and project work into smaller, more manageable components.

v. **Validate Scope** – the process of formalizing acceptance of the completed construction project deliverables.

vi. **Control Scope** – the process of monitoring the status of the project and product scope, and managing changes to the scope baseline.

In essence, effective project scope management ensures the successful management of other key project management areas, including time, cost and quality (Khan, 2006); hence, when the scope is not well defined, it causes inconsistencies and many failures may happen throughout the project (Lampa *et al.*, 2017). Accordingly, a failure or uncertainty in the project scope is directly reflected in the cost, time and quality of the project (Al-rubaiei *et al.*, 2016). They further state that if there is any shortfall in shaping and determining the scope in the early stage of the project or any failure in managing it, it will result in scope creep, which will ultimately cause time and cost overruns and eventually termination of the project. Chritamara *et al*., (2001) remark that the level of initial scope establishment by the client affects the time and cost performance of construction projects. Zwikael, (2009) states that accurately defining the project scope early in the lifecycle of the project strongly influences the overall performance of the project. A discrete scope helps stakeholders involved in a project to stay on the same page throughout the project lifespan, when project scope is clearly defined, effectively managed and communicated to project stakeholders, it safeguards the project from potential performance issues (Abdilahi *et al*., 2020). Dumont et al., (1997) state that poor scope definition is one of the leading causes of project failure in the U.S construction industry. Ling *et al.,* (2009) investigated project management practices adopted by Singaporean Architectural, Engineering and Construction (AEC) firms in China. The findings of their study reveal that certain project management practices affect project performance; the most important of these practices were those relating to scope management such as controlling the quality of the contract document, quality of response of perceived variations and extent of changes to the contract. Certain scope management practices can be used to predict owner satisfaction, profit margin and cost and quality performance of the construction project (Ling *et al.*, 2008a). According to (Hussain, 2012) a very common reason for project failure in the Qatar construction industry is the poor management and control of project scope. Fageha and Aibinu, (2013) state that adequate and accurate project scope definition in the pre-project planning stages of the project could remedy the problem of project abandonment in the Saudi Arabian

construction industry. Collins et al, (2017) in their study to develop a project scope definition and assessment tool for small industrial construction projects determined that projects with better scope definition had significantly improved cost and schedule performance than projects with lesser scope definition. Corvello et al, (2017) in their study on routine project scope management in small construction enterprises showed that project scope management had a positive impact on project performance; hence, project scope management processes affect project performance. Baig and Kureshi, (2018) identify scope creep as one of the major causes of cost escalation and schedule slippage on Pakistanis hydropower construction projects. Unegbu *et a*l., (2020) in their investigation on the relationship between project performance measures and project management practices of construction projects in Nigeria showed that scope management positively influences project performance and customer satisfaction, implying that improving scope management will improve project performance and customer satisfaction. Ngure, (2019) indicates that project scope management practices have a positive effect on the project performance of liquefied petroleum gas (LPG) in Kenya. According to (Alinaitwe *et al*., 2013) changes to the scope of work was found to be one of the most important causes of delays and cost overruns in the Ugandan construction industry; they further state that there is a relationship between the schedule, the scope of work and project conditions. Banda and Pretorius, (2016) concluded that there was a significant direct correlation between scope definition and the corresponding performance of sampled infrastructure projects in Malawi. They further state that projects that were well-defined further tended to exhibit good project performance indicators whilst those that were poorly-defined tended to exhibit poor project performance indicators. Kaliba, (2010) and Muya *et al.*, (2013) identified scope changes to be one of the major causes of cost escalations in Zambian construction projects. All the cited works indicate that scope management has a significant positive impact on the performance of construction contracts. Loo, (2002) identified scope management as one of the four important practices in his study on the relative importance of project management practices for professional project managers; therefore its implementation to manage projects goes a long way to improve project performance and delivery success (Abdilahi *et al*., 2020)

2.3.2.3 Relationship between Cost Management and Contract Performance

Project cost plays an important role in a project's success and is an aspect of great concern to the project stakeholders (Zhao *et al*., 2017). According to (Memon *et al*., 2012) cost is among the major considerations throughout a project management life cycle and is considered a prime factor of success. However, improving cost performance remains a chronic challenge facing

the construction industry as most projects are delivered over budget (Chigara *et al*., 2013). Once a construction project fails in achieving effective cost performance, it will result in cost overruns (Rahman *et al*., 2013). Cost overruns are very common in the construction industry; hardly a few construction projects are completed within the original budget (Subramani *et al*., 2014). Cost overruns problems significantly affect the cost of construction projects and have become the world's concern (Simanjuntak and Agung, 2018). Because of the complex nature of the construction industry, building project costs need to be effectively managed and controlled so that projects are completed within budget (Pilcher, 1994). Not effectively controlling or monitoring a project cost often leads to increased construction cost, decreased investment confidence and adversely impacts the overall performance of a project (Zhao *et al*., 2017). It is important to have control over the cost performance of projects to ensure that the construction cost is within budget; therefore, project cost management is needed to keep the project within its defined budget (Ali and Kamaruzzaman, 2010). According to the PMBOK Guide (PMI, 2017) project cost management includes the processes involved in planning, estimating, budgeting, financing, funding, managing and controlling costs so that the construction project can be completed within the approved budget. Project cost management is primarily concerned with the cost of the resources needed to complete construction project activities. The four project cost management processes include:

i. **Plan Cost Management** – this is the process of defining how the construction costs will be estimated, budgeted, managed, monitored and controlled; it provides guidance and direction on how the construction costs will be managed throughout the project.
ii. **Estimate Costs** – this is the process of developing an approximation of the cost of resources needed to complete project work. This process determines the monetary resources required for the project.
iii. **Determine Budget** – this is the process of aggregating the estimated costs of individual construction activities or work packages to establish an authorized cost baseline. This process determines the cost baseline against which project performance can be monitored and controlled.
iv. **Control Costs** – this is the process of monitoring the status of the construction project to update the project costs and managing changes to the cost baseline; the cost baseline is maintained throughout the construction project.

According to (Avraham, 2001) these processes are designed to provide an estimate of the cost required to complete the construction project scope, develop a budget based on the availability

of funds, management policies and strategy; and ensure that the construction project is completed within the approved budget. According to (Miri and Khaksefidi, 2015) project cost management performance when understood tangibly that due to improper management of early cost appears on all components of the project. Earned Value Management (EVM) is a cost control technique used in cost management to compare the performance measurement baseline to the actual schedule and cost performance throughout the project lifecycle; it integrates the scope baseline with the cost baseline and schedule baseline to form the performance measurement baseline (Project Management Institute, 2017). It gives the construction project team opportunities to be visible to the cost and schedule issues, to be specific, to predict the delivery time and the actual cost compared to the schedule and cost in the contract, in order to reduce uncertainty (Yang, 2018). In his study, (Yang, 2018) used EVM to measure contract performance, he states that the use of EVM helps the project team highlight schedule and cost issues early, predict future trends, ensure that the project team has sufficient time to take corrective action on identified issues as well as make more accurate budgets and schedules; it also enables the construction project team make a more accurate scope and compare key factors in the contract which has a great influence on construction contract performance. According to (Janeska *et al*, 2016) EVM is a key component for assessing the actual performance of the project and a simple way to simultaneously consider indicators related to the scope, time, cost, quality and risk of the construction project. (Lee, 2008) conducted a study on cost overrun and causes in Korean social overhead capital projects (roads, rails, airports and ports); he cites that cost overruns in these projects are usually due to inefficient budget usage, unreasonable estimation and adjustment to project costs and no practical use of the earned value management system. Ali and Kamaruzzaman, (2010) identified poor estimation of original project cost and underestimation of construction costs as the major causes of cost overruns in the Klang Valley construction projects of Malaysia; they further cited proper project costing and financing, proper cost control and realistic cost estimation as some of the measures to control construction cost overruns in the Klang Valley construction projects. Subramani *et al*, (2014) state that wrong methods of cost estimation are one of the major causes of cost overruns in the Indian construction industry. Simanjuntak and Agung, (2018) in their study show that poor cost estimation is one of the main causes of cost overrun in the Indonesian construction industry, they further state that increasing project cost management practices is expected to reduce potential cost overrun. Syamil, (2021) revealed that for Indonesian Project Management practitioner's cost management performance was one of the factors which significantly impacted customer satisfaction. Further, (Alshihre *et al.*, 2020) conducted a study on improving

client's satisfaction in the construction industry in Saudi Arabia; they stated that when projects are completed within budget, clients tend to be satisfied. Oyebode, (2019); and Anyanwu, (2013) remark that effective cost management and control is one of the solutions to project abandonment and construction contract failure in the Nigerian construction industry. They further state that the rising cost of materials and the ultimate astronomical increase in the cost of construction projects calls for adequate application of cost management principles to reduce the cost of construction projects. Mansfield *et al*., (1994) indicated that inaccurate project cost estimation was one of the major causes of delays on most construction projects in Nigeria. According to (Cheng and Proverbs, 2004) the use of an effective cost management approach during the construction contract phase has a significant effect towards client satisfaction.

Alabi and Fapohunda, (2021) argued that unrealistic and inadequate budgets are often finance-driven in construction projects, wherein cheaper options are preferred to better alternatives. He further indicated that low-quality building materials intensify the cost of construction above the actual projected cost due to the loss of materials during the project implementation stage. Oni *et al.*, (2019) opined that unrealistic project cost was one of the major factors causing poor quality performance on most construction sites in Nigeria. Tan and Lu, (1995) also stated that errors in cost estimates and lack of project budget was one of the main causes of poor quality performance on construction projects.

Frimpong *et al*., (2003) state that effective cost and schedule planning, controlling and monitoring should be established to enhance project performance in order to minimise and/or avoid delay and cost problems in groundwater construction projects in Ghana. Fugar and Agyakwah-Baah, (2010) in their study on delays in building construction projects, identified underestimation of costs as one of the major factors causing delays on construction projects in Ghana. They further, recommended that clients should ensure that they have sufficient project funds to prevent project delays. Otim *et al*., (2011) show that poor cost performance in the Ugandan construction industry is largely due to insufficient knowledge on cost control techniques as well as poor management of cost control methodologies and the general poor site organisation and inadequate supervision. Nyoni, (2019) identified poor estimation of the original cost and lack of timeous cost reports during the construction stage as some of the top causes of cost overrun in the Zimbabwean construction industry, he further indicates that carrying out adequate cost studies to pave way for realistic cost estimates and proper project costing and financing are some of the measures that could minimize these cost overruns. In the Zambian construction industry, (Kaliba, 2010; and Muya *et al.*, 2013) identified insufficient

initial cost analysis, change orders, inflation and schedule overruns as some of the causes of cost overruns on Zambian construction projects. (Zulu, 2015) states that the improvement in cost performance of construction projects in Zambia significantly depends on clients resolving their project financing planning and appropriate use of project cost management practices. The above-cited works demonstrate that project cost management has a direct impact on the performance of construction projects (Demirkesen and Ozorhon, 2017). In a separate study (Eduardo *et al*., 2014) showed that cost management knowledge has a positive influence on the performance of managers; therefore, the effective application of cost management practices has an impact on decreasing the potential of the poor performance of construction project contracts (Simanjuntak and Agung, 2018).

2.3.2.4 Relationship between Quality Management and Contract Performance

According to (Kanji and Wong, 1998**;** and Loushine *et al.*, 2006) the construction industry is often criticised for its poor quality performance and productivity in relation to other industries. Much of the criticism has been directed towards the poor workmanship of the end product and not worth the money's value (Nyomek, 2010). Poor construction quality breeds several undesirable effects throughout the entire construction project supply chain; when poor quality activities made during the construction process are discovered, they necessitate costly rework and if undetected may lead to geotechnical or structural failures which can have terrible consequences such as delay, cost overruns, severe injuries and even fatalities (Abbasnejad, 2013). He further states that poor quality issues can also negatively influence the profitability, performance and reputation of the organisations involved in the construction project hence ruining their social outlook. Quality management is increasingly been adopted by construction firms as an initiative to solve quality problems and to meet the needs of the final customer (Kanji and Wong, 1998) as well as to continually improve their effectiveness and efficiency of their performance (Nyomek, 2010). Quality has remained in the forefront amongst factors used to determine the degree of success or failure (Agbenyega, 2014), as such, it is imperative for all parties involved in construction projects to consistently endeavour to accomplish acceptable quality standards (Oni *et al.*, 2019). Quality of construction projects can be regarded as the fulfilment of expectations (i.e. the satisfaction) of the project participants (Mane and Patil, 2015). Mashwama *et al*, (2017) define quality as conformance with requirements; and construction project quality as the fulfilment of the owner's needs per defined scope of works within a budget and schedule to satisfy the owner's/user's requirements. Therefore, quality management is a major focus for construction project managers as the whole project must be

undertaken towards meeting the customer's requirements as well as producing a financially viable and functional project (Oyebamiji, 2019). Failure to meet requirements not only affects the customer but can have serious negative consequences for any or all of the project's stakeholders (PMI, 2017). According to the PMBOK Guide (PMI, 2017), project quality management includes the processes for incorporating the organisation's quality policy regarding planning, managing and controlling project and product quality requirements in order to meet stakeholders' objectives. Project quality management also supports continuous process improvement activities as undertaken on behalf of the performing organisation and addresses the management of the project and deliverables of the project. The three quality management processes include:

i. **Plan Quality Management**- this is the process of identifying quality requirements and/or standards for the project and its deliverables and documenting how the construction project will demonstrate compliance with quality requirements and/or standards. It provides guidance and direction on how quality will be managed and verified throughout the construction project.

ii. **Manage Quality** - this is the process of translating the quality management plan into executable quality activities that incorporate the organisation's quality policies into the construction project. This process increases the probability of meeting the quality objectives as well as identifying ineffective processes and causes of poor quality. Manage quality uses data and results from the control quality process to reflect the overall quality status of the construction project to the stakeholders and is performed throughout the construction project.

iii. **Control Quality** – this is the process of monitoring results of executing the quality management activities in order to assess performance and ensure the construction project outputs are complete and meet customer requirements. This process verifies that the construction project deliverables and construction work meet the requirements specified by the key stakeholders for final acceptance. It also determines if the construction project outputs do what they were intended to do; the outputs need to comply with all applicable construction standards, requirements, regulations and specifications.

Oni *et al.*, (2019); and Gumo *et al.*, (2018) remark that the effect of quality management cannot be overlooked as it helps to reduce maintenance cost, ensure client satisfaction, improves the built environment, reduce excessive human resource waste, reduce project completion time, improve quality awareness and consciousness, improve organisational

performance among others. Studies by (Chowdhury *et al.,* 2007) and (Hoonakker *et al.,* 2010) revealed that some of the most important factors impacting the successful implementation and improvement of quality management on construction projects include employee involvement and top management commitment. Grayson *et al*., (2016) opined that management acts as the main driver for quality management implementation, creating values, goals and systems to satisfy customer expectations and to improve performance. Several scholars have explored the relationship between quality management practices and project performance. Sadikoglu and Olcay, (2014) in their study on the effects of total quality management practices in Turkey indicated that different TQM practices significantly affect different performance outcomes. Jong *et al*, (2019) examined the relationship between Total Quality Management (TQM) practices and project performance in the Malaysian construction industry; the findings of their study revealed that TQM practices have a significant impact on Malaysian construction project performance. Leong *et al.*,(2014) in their correlation and regression test on project performance and effectiveness of quality management systems in the Malaysian construction projects indicate that client satisfaction and time variance have a positive and significant relationship with quality management systems. In a similar study, (Saeed and Hasan, 2012) examined the extent to which TQM and project performance are correlated and the effects of TQM on project performance in the Yemen construction industry. The results showed that TQM practices can increase the performance of construction projects by reducing time and cost and increasing the quality of project implementation hence having a positive effect on construction project performance; further, the results showed that TQM has a positive effect on teamwork satisfaction, quality of construction project implementation and client satisfaction. Panuwatwanich and Nguyen, (2017) examined the relationship between organisational culture and TQM and the influence of TQM implementation on the performance of Vietnamese construction firms. The findings of the study showed that there is a significant and positive relationship between TQM implementation and performance improvement of Vietnamese construction firms. Khan, (2014) showed that there is a strong relationship between total quality management and the performance of construction firms in Pakistan. Elhamid and Ghareeb, (2011) explored the influence of implementing quality management systems (QMS) in Egyptian construction firms on measuring performance. Correlation tests revealed that there is a strong positive relationship between QMS implementation and the performance of construction firms.

Olatunji et al., (2012) examined the effect of quality management practices used on construction project performance in Nigeria. The results of their study revealed that a significant positive relationship exists between the extent to which construction firms implement quality management practices on-site and the performance of construction projects in terms of customer satisfaction, reduction in costs of defects and rework. Gumo et al, (2018) explored the effects of total quality management practices on the performance of construction projects in Kenya's Trans Nzoia County. The results of the study showed a positive correlation between TQM practices and the performance of construction projects in Trans Nzoia County. Dilawo and Salimi, (2019) remark that the poor performance in the construction industry in Southern Africa (Zambia inclusive) can be attributed to a lack of adequate research and quality management initiatives undertaken in this part of the world. Zulu and Chileshe, (2010) in their study on service quality of building maintenance contractors in Zambia concluded that there exists a correlation between service quality and customer satisfaction in projects undertaken by the contractors. Chilongo, (2017) in her investigation into the factors affecting project performance among contractors in Lusaka district in Zambia cites that contractors should be more interested with conformance to project specifications to overcome disputes, time and cost performance problems; and equally pay more attention to the quality of materials to improve cost, time and quality performance in Lusaka's construction projects. All cited works indicate that quality management has a very significant bearing on a construction project's contract performance with regard to its time, cost, scope and client satisfaction (Dilawo and Salimi, 2019).

2.3.2.5 Relationship between Risk Management and Contract Performance

Construction projects are exposed to a high degree of risk from the start of the project until the end of the project (Al-ajmi and Makinde, 2018). According to (Banaitiene and Banaitis, 2012) construction projects can be extremely complex and fraught with uncertainty, it is these risks and uncertainty that can potentially have damaging consequences for construction projects. Poor construction project performance is often the result of unmanaged or unmitigated risks that are inherent in the project-oriented nature of the construction industry (Perrenoud *et al.*, 2017). When risks eventuate, they make it difficult for a project to be delivered within time, budgeted cost and to the expected quality (Tembo, 2018). Risk management is one of the most vital management tools to cope with construction project risk and uncertainties; it is important

to create value to a project and improve project performance in terms of cost, time and quality (Siang and Ali, 2012). Goh *et al*, (2013) remark that risk management can help reduce the likelihood of potential threats and their possible effects; they further state that effective risk management application can turn downside risk to upside risk thus enhancing the performance of the project and the construction firm. Risk management in the construction project management context is a comprehensive and systematic way of identifying, analysing and responding to risks to achieve the project objectives (Banaitiene and Banaitis, 2012). According to the PMBOK Guide (PMI, 2017) project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation and monitoring risk on a project. The overall objectives of risk management are to increase the probability and/or impact of positive risks and to decrease the probability and/or impact of negative risks in order to optimise the chances of project success. The risk management processes include the following:

i. **Plan Risk Management** – this is the process of defining how to conduct risk management activities for a project; it ensures that the degree, type and visibility of risk management are proportionate to both risks and the importance of the project to the organisation and other stakeholders.
ii. **Identify Risks** – this is the process of identifying individual project risks as well as sources of overall construction project risk and documenting their characteristics. It ensures the documentation of existing individual construction project risks and the sources of overall project risk; it equally brings together information so the construction project team can respond appropriately to identified risks. This is an iterative process.
iii. **Perform Qualitative Risk Analysis** – this is the process of prioritizing individual construction project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics.
iv. **Perform Quantitative Risk Analysis** - this is the process of numerically analysing the combined effect of identified individual construction project risks and other sources of uncertainty on overall project objectives. This process quantifies overall construction project risk exposure and can also provide additional quantitative risk information to support risk response planning.
v. **Plan Risk Responses** – this is the process of developing options, selecting strategies and agreeing on actions to address overall project risk exposure as well as to treat individual construction project risks.

vi. **Implement Risk Responses** – this is the process of implementing agreed-upon risk response plans. It ensures that agreed-upon risk responses are executed as planned in order to address overall construction project risk exposure, minimize individual project threats and maximize individual project opportunities.

vii. **Monitor Risks** – this is the process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analysing new risks and evaluating risk process effectiveness throughout the construction project. The process enables project decisions to be based on current information about overall project risk exposure and individual project risks.

Kinyua *et al*., (2015) state that achieving project performance forms the basis to adopt and implement effective risk management practices; given the importance of project risk management in project management functioning, the efficiency of risk management is expected to significantly influence project performance. Perrenoud *et al.*, (2017) carried out a study on using best-value procurement to measure the impact of initial risk-management capability on qualitative construction performance in the United States (US). The study aimed to determine whether the selection of contractors with stronger risk management abilities as identified through a best-value selection process is correlated with win percentage and construction project performance; contractors' in the study completed a risk management plan (RMP) in which they identified the major risks of prospective projects and ways to manage them, the completed RMPs were scored and the score for each contractor averaged and used within the best value selection model. At the completion of each project, a close-out survey was used to gather data on many aspects of the contractors' project performance. A Pearson correlation and linear regression analysis revealed that there exists a positive correlation between the average RMP scores and performance metrics assessed in the survey; it was thus observed that contractors with high average RMP scores had achieved high levels in the performance metrics of quality, professionalism, risk communication and overall customer satisfaction. In a separate study, (Perrenoud *et al.*, 2016) investigated the distribution of risks during the construction of small building projects. Their findings established that early identification and communication of risks throughout the construction stage allows project teams to manage and minimise cost increase and schedule delays while increasing customer satisfaction. Park *et al.*, (2019) investigated the project risk factors been faced by Korean construction management firms. Their findings revealed that by establishing more robust risk management practices, construction management firms would enhance the firms' profitability, project performance and customer satisfaction. Rabechini *et al*., (2013) in their study aimed at comprehending the

impact of risk management on project performance in the construction industry in Brazil showed that adopting risk management practices has a significant positive impact on project performance. Hwang *et al*., (2014) report that there exists a positive correlation between risk management implementation and improvement in quality, cost and schedule performance of small construction projects in Singapore. Ali *et al.*, (2018) and Siang and Ali, (2012) show that the adoption of effective risk management practices has a positive impact on the performance of construction projects in Malaysia. Al-Shibly *et al*., (2013) in their study on the impact of project risk management on construction project success in the Hashemite Kingdom of Jordan revealed that risk response has an impact on project success and meeting the scope of work, scheduled time and achieving the quality standards. Gitau, (2015) in his study on the effects of risk management at planning phase on the performance of construction projects in Rwanda showed that risk management practices at planning stage had a significant effect on project performance. He further states that construction projects done by qualified engineers and consultants who possessed risk management knowledge and applied formal risk management practices yielded better performance in terms of communication, functionality, cost and time. Ijigah et al., (2015) revealed that there is a direct and significant relationship between risk allocation and project performance on building infrastructure projects in Nigeria. In a similar study, the regression analysis result of project risk management issues in the Nigerian construction projects showed that risk management issues have a positive relationship with construction project performance i.e. if not well addressed; risk management issues can hinder the attainment of predefined construction project objectives of time, cost, quality and scope (Ubani *et al.*, 2015). Chileshe and Berko, (2010) found that lack of utilization and effective implementation of modern-day practices such as risk management are one of the major causes of cost overrun within the Ghanaian road construction sector. Kyalo and Senelwa, (2018) examined the effect of risk management practices on the performance of infrastructure projects in Kenya's Kitui county; their findings showed that risk identification has the highest positive influence on the performance of infrastructure projects followed by risk mitigation. The study concluded that risk monitoring and risk assessment also had a significant and positive effect on project performance in Kitui County. Fischer, (2015) carried out a study on the barriers of effective risk management on small construction projects in South Africa; the respondents to the administered questionnaire rated the identified barriers to effective risk management, the perception that risk management implementation will impact on project performance and gave feedback on contractual and attitudinal issues pertaining to risk management implementation. The participants reached a consensus that implementing risk management would positively

impact the performance of small construction projects in South Africa, especially quality performance. This study was conducted after a study by (Shunmugam and Rwelamila, 2014) revealed that risk management was not widely used in the South African construction environment and that there was a lack of actual adoption and implementation of risk management policies in the industry. Silungwe *et al*., (2015) remark that the construction industry in Zambia has repeatedly suffered the consequences of failure to manage risks such as design failure, cost overruns and delayed completion. In a similar study (Silungwe and Khatleli, 2018) state that the construction industry in Zambia is characterised by a myriad of runway claims, quality shortfalls, time and cost over-spillage due to uncontrolled risks and drafting of one-sided contracts which result in unbalanced risk allocation; as well as incomplete contracts and poor risk management in the implementation stage (Tembo and Khatleli, 2016). Mañelele and Muya, (2008) found that Zambian community projects are underperforming due to poor risk identification. Shimwambwa, (2020) shows that there is a strong relationship between project abandonment and risk management suggesting that a strengthened and holistic use of risk management techniques in managing construction projects would reduce project abandonment in Zambia by 89 percent. Tembo-silungwe and Khatleli, (2020) state that for an increase in quality, reduction in time and cost to be actualised in the Zambian construction industry, there has to be particular consideration managing risk in projects; in addition, the poor performance of the construction sector in Zambia could be improved by appropriate allocation of risks and risk management in general. All cited examples indicate that with increasing contractual obligations on construction projects, incorporating risk management into a construction project plays a significant role in improving the performance of construction project contracts (Carr and Tah, 2001).

2.3.3 Fundamentals of a Contract Performance Enhancement Framework

The improvement of performance has become ever more critical to the success of construction projects and has been the subject of extensive research and attention over the past few decades (Al-otaibi *et al*., 2013). The complicated nature of construction projects has challenged researchers in the construction industry to research, design and develop models (frameworks) and mechanisms to ameliorate the situation and to solving the complexity associated with construction works (Bello, 2017). For instance, in response to Latham's (1994) and Egan's (1998) reports on the need for improvement, the construction industry in the UK has resorted to utilising several performance measures to address improvement concerns of the many aspects of the industry (Beatham *et al.*, 2004). One of which was the introduction of the key

performance indicators (KPIs) after the Eagan (1998) report (Tunji-olayeni *et al.*, 2016). In China, (Ling *et al.*, 2008b) developed a model for predicting project performance in the construction industry, the model was based on the project management practices adopted by construction companies in China; the findings to the study revealed that certain scope management practices can be used to predict project performance in terms of the 'triple constraint', customer satisfaction and profit margin. Kagioglou et al., (2001) developed a performance measurement framework that can be implemented to form a performance management system that construction firms can adopt to measure construction project performance in Malaysia. Unegbu *et al*., (2020) developed a Structural equation model to investigate the relationship between project performance measures and the utilization of project management practices to improve performance in the Nigerian construction industry. Ngacho and Das, (2014) developed a multidimensional performance evaluation framework of development construction projects by considering all relevant measures of performance in Kenya. In Zambia, (Kaliba, 2010) developed a client satisfaction enhancement flowchart model that could be used to improve project delivery and satisfaction enhancement factors in terms of their relative importance. Shimwambwa, (2020) in his study to examine the relationship between project abandonment and risk management, developed a generic risk management framework for stakeholders to predict the risk exposure on construction projects and eventual improvement of construction project performance. According to (Ankrah and Proverbs, 2005) the poor performance of the construction industry necessitates a performance measurement framework that is supposed to help construction firms assess not just how they have done retrospectively but more importantly how they are currently doing and will be doing prospectively so that through benchmarking they can identify areas in which they are underperforming and take corrective action. They further remark that performance is the evaluation of how well individuals, groups of individuals, organisations or systems have done in pursuit of specific objectives. Simply put, performance is the degree of achievement of a planned target; a successful project is therefore one that has maintained its schedule, remained within budgeted costs and accomplished other objectives (Ohiomah, 2019). According to (Tunji-olayeni *et al.*, 2016) performance measurement is the process of determining how successful construction organisations or individuals have been in attaining their objectives; its main purpose is to provide accurate and timely feedback on the efficiency and effectiveness of operations and to focus attention on continuous improvement. A performance measurement framework as defined by (Bassioni, 2004) is a general theoretical framework developed in research that can act as the basis for companies performance measurement system. A project

performance framework, therefore, provides a formal approach to help in the elicitation and development of project objectives and measures that represent the values of the multiple project stakeholders (Barclay and Osei-Bryson, 2010). Project performance can be measured and evaluated using a large number of performance indicators that could be related to various dimensions such as time, cost, quality, client satisfaction, client changes, business performance, health and safety (Sibiya et al., 2015). Key performance indicators (KPIs) are one of the factors that constitute the project success criteria; and are widely used within the construction industry to measure performance and drive improvement (Swan and Kyng, 2004). In other words, KPIs are intended for use as benchmarking indicators for the whole industry whereby an organisation can benchmark itself against the national performance of the industry and identify areas for improvement (Kagioglou *et al*., 2001). KPIs represent the set of measures focusing on those aspects of organisational performance that are the most critical for the current and future success of the organisation; they tell you what to do to increase performance dramatically (Niedritis *et al*, 2011). The success of a construction project using the KPI approach is determined by how well construction projects fare against the aforementioned indicators especially cost, time and quality (Bello, 2017). Ankrah and Proverbs, (2005) state that for performance measurement frameworks and their associated measures to fulfil their functions, they must have particular characteristics; the fundamental characteristics identified were as follows:

- ✓ Be composed of both financial and non-financial measures
- ✓ Be intelligible to a majority of stakeholders
- ✓ Provide timely and accurate feedback
- ✓ Be based on a few but essential indicators
- ✓ Provide visibility
- ✓ Concentrate on the core activities critical to the firm's strategy
- ✓ Facilitate understanding of cause and effect relationships regarding performance
- ✓ Founded on easy to collect data
- ✓ Be dynamic; and
- ✓ Allow performance to be compared against competitive benchmarks

The consideration of the characteristics of performance measurement frameworks shows that they demonstrate the need to measure results and the drivers of them so that the performance measurement system can provide data for monitoring past performance and planning future performance; they also demonstrate how measures contribute to an organisation's planning

(feed forward) and control (feedback) system (Muhammad, 2016). A performance measurement framework is required to reflect the needs and expectations of all project stakeholders (Takim and Akintoye, 2002b) and understand the intra relationships between different project factors (Muhammad, 2016). To complete a project that successfully meets customer and stakeholder requirements and expectations, project managers must effectively integrate unifying, consolidating, articulating and integrating actions (Chou and Pham, 2013). This research proposed a consolidated framework that sought to determine the relationship between PMKAs i.e. integration, scope, cost, quality and risk management with the chosen indicators of cost, time, quality and client satisfaction as performance measures; and the influence of these KAs on the overall performance of construction projects.

2.4 Summary of the Literature

The performance of the construction industry has been a source of concern to both the public and private sectors worldwide. World reports have revealed that many construction organisations have been struggling with the delivery of services on time, on budget, with acceptable quality standards and high customer satisfaction. The Zambian construction industry has not been exempted from this phenomenon as is evidenced by the number of construction projects that have exhibited poor performance through cost overruns, delayed schedule, poor quality of works and in some cases abandonment. The performance of construction projects relies on different dimensions of project management among which the project management knowledge areas are of great importance. These KAs act as references to review projects and project management execution; the identification of weakly executed knowledge areas helps the project manager to focus on project improvement activities. The reviewed literature showed that each of the knowledge areas has the potential to contribute to the success of construction projects while at the same time interacting with each other; hence, a careful application of each of the knowledge areas to projects enhances the achievement of the project outcomes. The improvement of performance has become more critical to the success of construction projects and in an effort to improve its performance, researchers in the construction industry have been challenged to research, design and develop frameworks and mechanisms to ameliorate the issue of poor project performance and delivery. In Zambia, extensive research has been done on the factors that affect the performance of contractors and the construction industry as a whole but not much research has been conducted on the influence that the knowledge areas have on the performance of construction project contracts. A similar study was conducted by (Unegbu et al., 2020) in their study, they investigated the relationship

between project performance measures and the utilization of project management practices (knowledge areas) in Nigerian construction projects. However, the study lacked an in-depth analysis of the project knowledge areas and was limited the construction industry in Nigeria; It was from this perspective that the researcher was motivated to undertake this study so as to investigate the relationship between five PMKAs and the performance of construction contracts in Zambia, the study aimed at investigating how the KAs influence construction project performance. A framework was developed so as to enhance the performance of construction projects in Zambia by enabling project managers to relate their projects to PMKAs and the associated components thereby encouraging them to utilize the concepts and areas of the PMBOK Guide to enable them develop better solutions through the use of a project management framework (Demirkesen and Ozorhon, 2017).

2.5 Research Knowledge Gap

The table below gives a presentation of the evidence of the research gaps that form a basis for further investigations in this study.

Table 2. 2: Knowledge Gap

No.	Author and Year of Publication	Research Topic	Methodology	Findings	ResearchGap
1	Ling, Low, Wang and Egbelakin (2008)	Models for predicting project performance in China using Project Management practices Adopted by Foreign AEC Firms	Survey, Questionnaire	The models developed show that certain scope management practices can be used to predict owner satisfaction, profit margin and cost and quality performance of projects.	Only 33 project data sets were used to construct the models which appeared to be small.
2	Chou, Irwan and Pham (2013)	Project Management Knowledge of Construction Professionals: Cross-Country Study of Effects on Project Success	Survey, Questionnaire	The study confirmed that the effective use of PMBOK Techniques/Tools/Skills (TTSs) substantially enhances project performance and increases the probability of project success.	The constructs and indicators were developed by applying PMBOK TTSs, there is need to evaluate novel indicators in assessing project success. A sample size of 200 was used which was small and there is need to expand the number of indicators used.

3	Demirkesen and Ozorhon (2017)	Measuring Project Management Performance: A Case of Construction Industry	Questionnaires, Interviews	The findings to the study show that project integration, human resource, financial and risk management contribute both directly and indirectly to improved performance.	Data collected from Turkish contractors and therefore reflects their experiences and opinions
4	Chou and Yang (2012)	Project Management Knowledge and Effects on Construction Project Outcomes: An Empirical Study	Survey, Questionnaire	The findings indicate the appropriateness of prioritizing the practice of the PMBOK Guide in the Construction industry	Although the study prioritised the significance of the PMBOK Guide to the general construction business, the conclusions were based on the sample collected in Taiwan
5	Ling, Low, Wang and Lim (2009)	Key Project Management Practices affecting Singaporean firms' project performance in China	Survey, Questionnaire	The study finds that certain project management practices do indeed affect project performance	the conclusion to the study was based on data collect from Singaporean AEC firms in China

2.6 Conclusion

This chapter presents a review of literature on the subject of the relationship between project management knowledge areas of integration, scope, cost, quality and risk management and performance of construction project contracts. The chapter explores the most effective knowledge areas in the performance of construction projects. It also highlights how each of the knowledge areas relates to project performance based on the parameters of cost, time, quality and customer satisfaction. Lastly, the chapter looks at the fundamentals of a performance enhancement framework.

The next chapter postulates the theoretical and conceptual frameworks; theses will give an elaboration of the relationship between the dependent and independent variables.

CHAPTER THREE

CONCEPTUAL AND THEORETICAL FRAMEWORK

3.1 Introduction

This chapter focuses on the theoretical and conceptual frameworks used to guide the understanding of the study investigations. It identifies and explores three theories in literature surrounding the topic of construction contract performance i.e. the General systems theory, Theory of constraints and the Agency theory. It also outlines and identifies two conceptual frameworks from previous studies that relate to the subject under study. The chapter further proposes a conceptual framework aimed at addressing the research problem by depicting and operationalizing the independent, moderating and dependent variables. The chapter ends with a summary conclusion of the theories and concepts discussed.

3.2 Theories of the Study

A theory is a set of interrelated constructs, definitions and propositions that present a systematic view of phenomena by specifying relations among variables, to explain and predict the phenomena (Kerlinger and Lee, 2000). Leedy and Ormrod, (2010) define a theory as an organised body of concepts and principles intended to explain a particular phenomenon. Theories consist of plausible relationships produced among concepts and sets of concepts, that provide both a framework for critically understanding a phenomenon and a basis for considering how what is known can be organised (Kawulich, 2016). They are the logical tools that are used for understanding, clarifying and making estimates about a given subject matter (Banda, 2019). A theoretical framework can thus be defined as a model of how one makes logical sense of the relationships that exist among the various factors that have been identified as of valuable importance to the existing problem (Oluwatoyin and Oluseun, 2008). According to (Adom et al., 2018) a theoretical framework is the specific theory or theories about aspects of human endeavour that can be useful to the study of events; it is the structure that holds or supports a theory of a research study (Kivunja, 2018). Various theoretical underpinnings have been adopted to study performance in the construction industry, this research utilizes the following:

3.2.1 General Systems Theory

The General systems theory traces its origin from the works of the Austrian biologist and philosopher Ludwig Von Bertalanffy in the 1940s. The fundamental notion of the general systems theory is its focus on interactions (Mele *et al*., 2010). Francis, (2015) remarks that the systems theory focuses on the interactions and relationships between parts to understand an entity's organisation, functioning and outcomes. According to (Kreitner, 2009) the General systems theory is an interdisciplinary area of study that is based on the premise that everything is part of a larger interdependent arrangement.

A system is thus defined as an entity which is a coherent whole, this entity which is considered as a 'whole' has sub-systems and is part of a wider whole (Ng, Maull and Yip, 2009); it is a set of an assemblage of parts or entities interrelated and interdependent yet identifiable that operate or interact together to accomplish a stated function or objective (Cook, 1980). Ackoff, (1971) states that a system is a set of interrelated elements, he remarks that a system is an entity that is composed of at least two elements and a relation that holds between each of its elements and at least one other element in the set. Each of a system's elements is connected to every other element either directly or indirectly. A system is any group of interacting, interrelated or interdependent parts that form a complex and unified 'whole' that has a particular purpose (Sheffield *et al*., 2012). Kreitner, (2009) simply defines a system as a collection of parts operating interdependently to achieve a common goal. According to (Francis, 2015) systems are a set of interrelated parts that turn inputs into outputs through processing. A system uses inputs that get transformed into outputs through processes, tools or techniques to produce outputs, these outputs then often act as inputs to other components within the system or to other systems entirely (Sherrer, 2010). Systems are either closed, those that do not interact with the environment; or open, those that interact with the environment. Based on these definitions, a project can thus be viewed as a management system that includes several sub-systems (elements) (Kolltveit *et al*., 2007). The figure below represents the ten (10) sub-systems that a project is comprised of according to the PMBOK standard and the complex systems that they are part of:

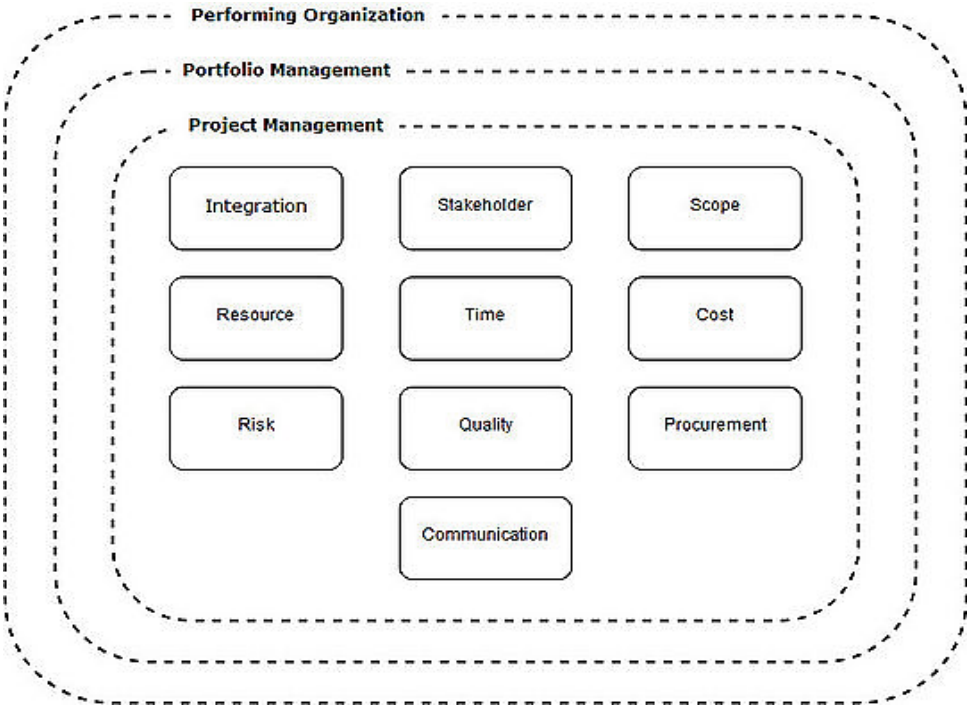

Figure 3.1: Theoretical Framework of the General Systems Theory in Project Management

Source: (Sherrer, 2010) A Project Manager's Guide to Systems Thinking Part 1

The management of construction projects viewed in their systems context would include a project management system which essentially contains a set of subsystems that make up the larger system (Cleland, 1977). He further remarks that this larger system depends on the effectiveness of the supporting sub-systems individually and also how these sub-systems are synergized into the larger system as it functions as an entity. The elements (sub-systems) within a project are all dependent on each other and each of them have their own special needs or characteristics; each element has its own complete properties that are unique and would need to be properly understood (Row, 2010). According to (Goede, 2005) systems are made up of sets of components (parts/elements) that work together for the overall objective of the whole; if the performance of these components can be identified, then it is possible to improve the performance of the whole system.

Applied to this study, this theory holds that construction projects are open complex systems that interact with their surrounding environment and that achieving the overall objective of the project .i.e. completing the project within the estimated cost, contract period (time) and specified quality requires viewing the project (system) as a whole as well as understanding and interpreting the interrelationships between the sub-systems (elements) in the system. The sub-

systems in this case being the knowledge areas; there is need to understand the interdependency and interactions between the various PMKAs and how these KAs influence each other and ultimately impact the outcome and overall performance of construction contracts. The systems approach emphasises the contribution of the interactions and interrelationships between the knowledge areas towards the project achieving its objective and improving its overall performance by first identifying the performance of the KAs then that of the project as a whole. The theory takes a holistic view of the problem of poor performance in the construction industry; it recognises that the solution towards achieving better performance is through the interactions of many forces in the construction project's environment (Kithinji, 1988).

3.2.2 Theory of Constraints

The Theory of Constraints was developed by the Israeli Physicist Dr. Eliyahu M. Goldratt and first presented in his 1984 publication titled The Goal. Pacheco, (2014) defines the theory of constraints (TOC) as a management philosophy that provides a focus for continuous improvement that results in enhanced organisational performance. According to (Hales, 2016) the theory of constraints is a method for optimizing project success to improve overall project performance. She remarks that the theory is based on the premise that every system has a constraint or bottleneck which hinders the system's performance and the only way to improve the system performance is by enhancing the capacity of that constraint (Ghaffari and Emsley, 2015). The core concept behind the theory is to identify and manage that constraint and evaluate performance with improvements in place. The theory of constraints postulates that a project or organisation must be understood as a system with a goal, therefore, every action taken by any part of the system must be judged by its impact on that goal (Aluonzi *et al*., 2016; and Panizzolo, 2016).

A constraint is a constraining condition, agency or force that limits the system's performance in a given environment or context (Lau and Kong, 2004). It is nothing but the point where the project or task fails to perform as is expected (Bhagdewani *et al*., 2017). A constraint as defined by (Mirzaei and Mabin, 2014) is anything that limits a system from achieving higher performance towards its goal. It is a barrier or limitation that is either already present and visible or will emerge during the life span of the project (Udeh *et a*l., 2018). Every construction project will have at least one constraint and these constraints will affect construction productivity (Chua *et al*., 2003). The successful completion of construction project objectives could be constrained by several factors such as scope, schedule, quality,

resources, budget, risks, customers' satisfaction and stakeholders' support (Hassan *et al*., 2019). It is the existence of these constraints in project management practices that compromise project performance (Aluonzi *et a*l, 2016) and result in failure of construction projects (Mishra, 2020). Panizzolo, (2016) remarks that constraints determine the performance of a system; therefore, a gradual elevation of the system's constraints will improve its performance. For a system to attain any significant performance improvement; constraints must be identified and the whole system managed with those constraints in mind (Lee and Chang, 2012). It is not enough to identify the system's constraints; the system's goal and measurements towards that goal have to be understood in terms of the performance measurements (Zachmeier, 1991). The performance measurements must direct decisions and actions towards the attainment of the system's goal. These measurements must prompt the system's parts to do what is good for the whole; they should guide the project manager to those parts or subsystems that need attention (Elton and Roe, 1998). The project's performance is thus measured by the degree to which constraints are overcome to meet project objectives.

The theory of constraints has been applied to construction projects to address typical issues that led to construction project delays and failures frequently experienced by project managers (Pittman, 1994). The theory strives to bring the project to substantial performance improvement through an ongoing process improvement based on five focusing steps (Scherschel, 2002). These five focusing steps are (i) Identify the system's constraints, (ii) Decide how to exploit the system's constraints, (iii) Subordinate everything else to this decision, (iv) Elevate the system's constraint, and (v) Repeat the process (Mirzaei and Mabin, 2018). The process of identifying the constraint (s), addressing the issue and finally testing the project performance is carried out repeatedly until no constraints exist to further impede the project (Hales, 2016). According to (Omondi, 2017) the processes and procedures of the theory of constraints focus on eliminating barriers that deter each part from functioning together as an integrated system. Hence, controlling the project constraints is a pre-condition for high performance of construction projects (Rithe and Thakare, 2020).

The theory of constraints applied to this study is justified in that construction projects in practice experience several constraints which limit the performance of the project and in many cases lead to project failure. The ultimate failure being the failure to deliver the contracted outcome (Smith, 2012). The TOC approach helped the researcher to understand that before making improvements to any part of the system, the goal of the system and measurements that will be used to judge the influence of any subsystem on the system's goal must be defined. By

identifying and dealing with the constraints that impede the achievement of the project's objectives (goal), the overall performance of the project could be improved. Identifying and removing constraints from the main project activities could help in reducing uncertainties in construction processes which in turn increases the transparency of project management (Zakaria *et al*., 2020). The theory of constraints can prove to be an effective mechanism which prioritises construction project improvement (Fadnavis, 2020); it not only helps in controlling the limiting factors but also helps in continuously approaching new techniques to overcome delay and cost overrun (Rithe and Thakare, 2020).

3.2.3 Agency Theory

The agency theory also known as the principal-agent relationship is a theory in which a contract allows one or more persons (the principal (s)) to engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent (Shamsuddin and Ismail, 2013; and Mitzkus, 2013). The theory applies to most relationship situations in which one party (the principal) assigns authority of control and decision-making about certain tasks to another party (the agent) (Parker *et al.*, 2018). It is concerned with the potentially opportunistic behaviours of agents at the expense of the principal and how the principal might manage them (Alsabban, 2017). The theory is based on the assumption that performance problems are a likely result when one actor delegates authority to another because the two sides have different interests (Gutner, 2005).

According to (Osipova, 2015) through construction contracts, clients and contractors are involved in principal-agent relationships; these relationships are said to be adversarial and characterised by the two main features of contracting parties i.e. different goals and different risk attitudes. Periodically, diverse subjective interests give rise to conflicts of interest between contracting parties, these conflicts may result in either one or both of the contracting parties undertaking an action that may be against the interest of the other contracting party (Al-Fadhali and Zainal, 2017). These divergences of interests result in projects that consume more time and money and meet fewer requirements than expected (Keil, 2005). Alsabban, (2017) remarks that principal-agent problems are a potential explanation for failure in several business sectors where projects have taken place. The agency theory looks at how to ensure that agents act in the best interest of the principal of an organisation; a 'mismatch' in this regard often occurs because there is a separation of control and ownership which results from information asymmetry (Tembo, 2018). Information asymmetry is the situation in which one of the two co-

operation partners is better informed than the other one (Schieg, 2008). It is this asymmetric information that leads to opportunistic behaviour, which is the primary cause of loss and risk in the construction industry (Xiang *et al*., 2015).

While construction agencies are not always able to achieve the desired outcomes, smooth and effective project management processes can improve interpersonal relationships and as a result improve the quality of the agent-client relationship (Levin *et al*., 2018). Ling and Tran, (2012) remark that better interpersonal relations between principal and agent in construction contracts improve project performance. According to (Bryde *et al*., 2019) contracts, project management policies and procedures serve as formal mechanisms that attempt to control project outputs and behaviours. Thus, the agency theory's main concern is how to write contracts in which an agent's performance can be measured and incentivized so that they act with the principal's interests in mind (Cunliffe and Luhman, 2012).

The Agency theory applied to this study holds in that it helped the researcher understand the influence that the contractor's (agent's) attitude or behaviour has on the performance of the construction projects. It also helped the researcher understand that project management practices and contracts have a role to play in improving the relationship between principal and agent in construction projects and that the relationship which exists between contractor and client (agent and principal) equally has a bearing on the outcome of a project. The theory shows that an improved relationship between principal and agent is likely to align the two party's interests hence causing them to perform to the best of their abilities.

3.3 Conceptual Framework

A conceptual framework is the total, logical orientation and associations of anything and everything that forms the underlying thinking, structures, plans and practices and implementation of an entire research project (Kivunja, 2018). It is a system of concepts, assumptions, expectations, beliefs and theories that support and inform research (Robson, 2011; and Maxwell, 2012). A conceptual framework is a structure that the researcher believes can best explain the natural progression of the phenomenon under study (Adom *et al*., 2018). It is used to organize the exploration of the problem at hand, therefore, providing the researcher with the 'logical instrument' for connecting the problem and outcomes (Kumar and Antonenko, 2014). A conceptual framework aims to categorize and describe concepts relevant to the study and map relationships among them (Rocco and Plakhotnik, 2009).

A conceptual framework is based on ideas that may be formulated from the researcher's own perception or with a few references to support them (Musau, 2020). The frameworks below developed by two different authors who undertook similar studies served as references in the formulation of a conceptual framework for the study at hand.

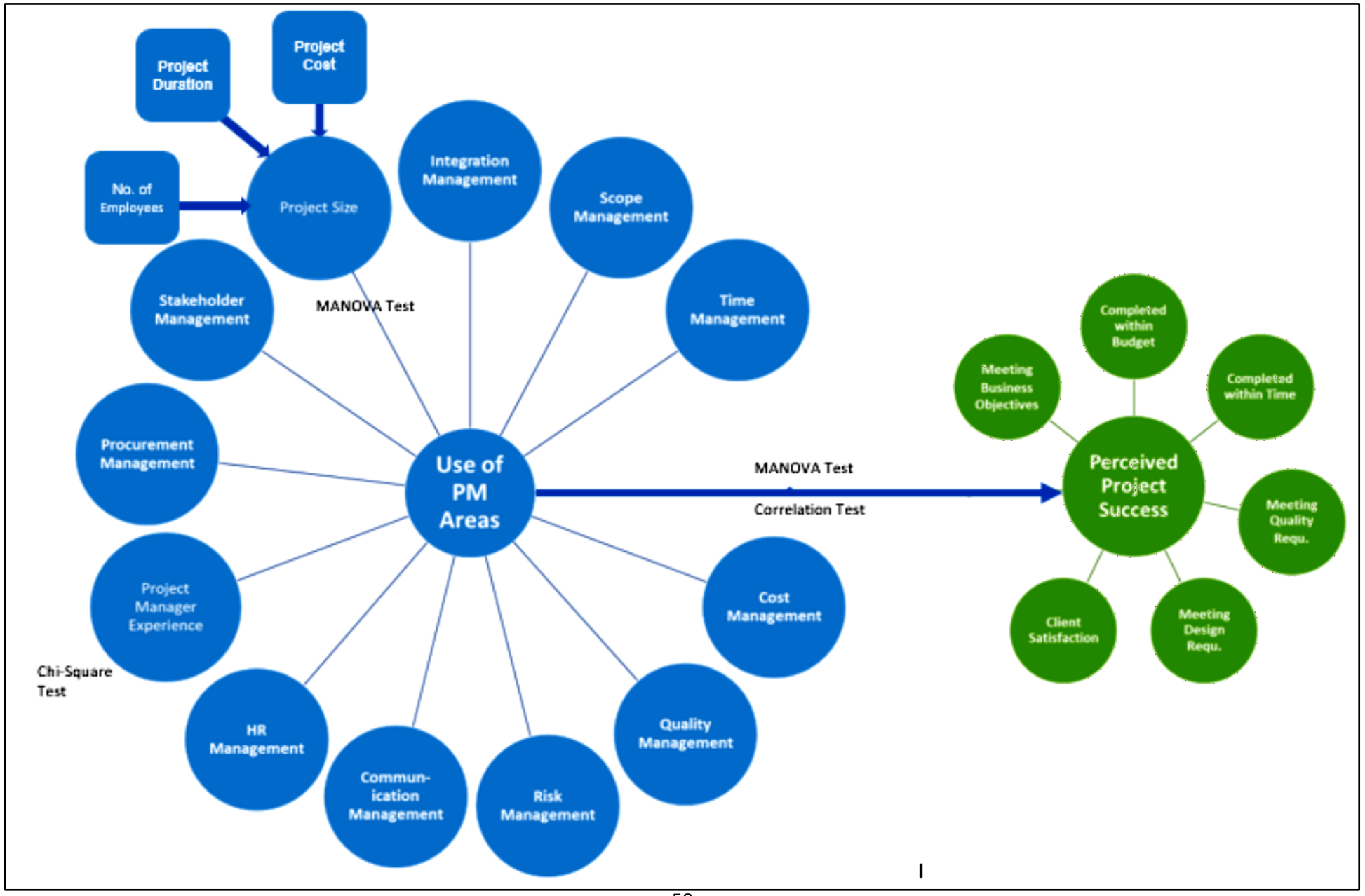
Project Duration
Project Cost
No. of Employees
Project Size
Integration Management
Scope Management
Time Management
Stakeholder Management
MANOVA Test
Procurement Management
Use of PM Areas
Project Manager Experience
Chi-Square Test
Cost Management
HR Management
Commun-ication Management
Risk Management
Quality Management
MANOVA Test
Correlation Test
Completed within Budget
Meeting Business Objectives
Completed within Time
Perceived Project Success
Meeting Quality Requ.
Client Satisfaction
Meeting Design Requ.

Figure 3.2: Conceptual Framework for Examining the Relationship between Project Management Practices and Project Success

Source: Alotaibi (2019)

Figure 3.2 above shows a conceptual framework that was developed to provide direction on the study involving 'The Implication of Project Management Practices on Project Success in Saudi Arabia'. The study sought to examine the relationship between the use of project management practices and the perceived success of construction projects in Saudi Arabia. The project management practices i.e. the PMKAs and the project size represent the independent variables whilst the perceived project success and project success dimensions i.e. completing the project within time and budget, meeting quality requirements, design requirements, business objectives and client satisfaction as the dependent variables. The framework highlights the use of the Pearson's correlation test to examine the relationship between the use of project management practices and project success dimensions and the Multi-variate Analysis of Variation (MANOVA) to examine the relationship between the use of project management practices and project success. It also highlights the use of the MANOVA test to examine the relationship between project size and the use of project management practices as well as the Chi-Square test to examine the impact of the project manager's experience on the use of project management practices. According to (Alotaibi, 2019) the effective use of project management practices such as those included in the PMBOK can lead to better project outputs as it contains standard practices, processes to follow, techniques and tools to adopt diverse knowledge and required methods for different business operations for effective results.

Independent Variable **Intervening Variable** **Dependent Variable**

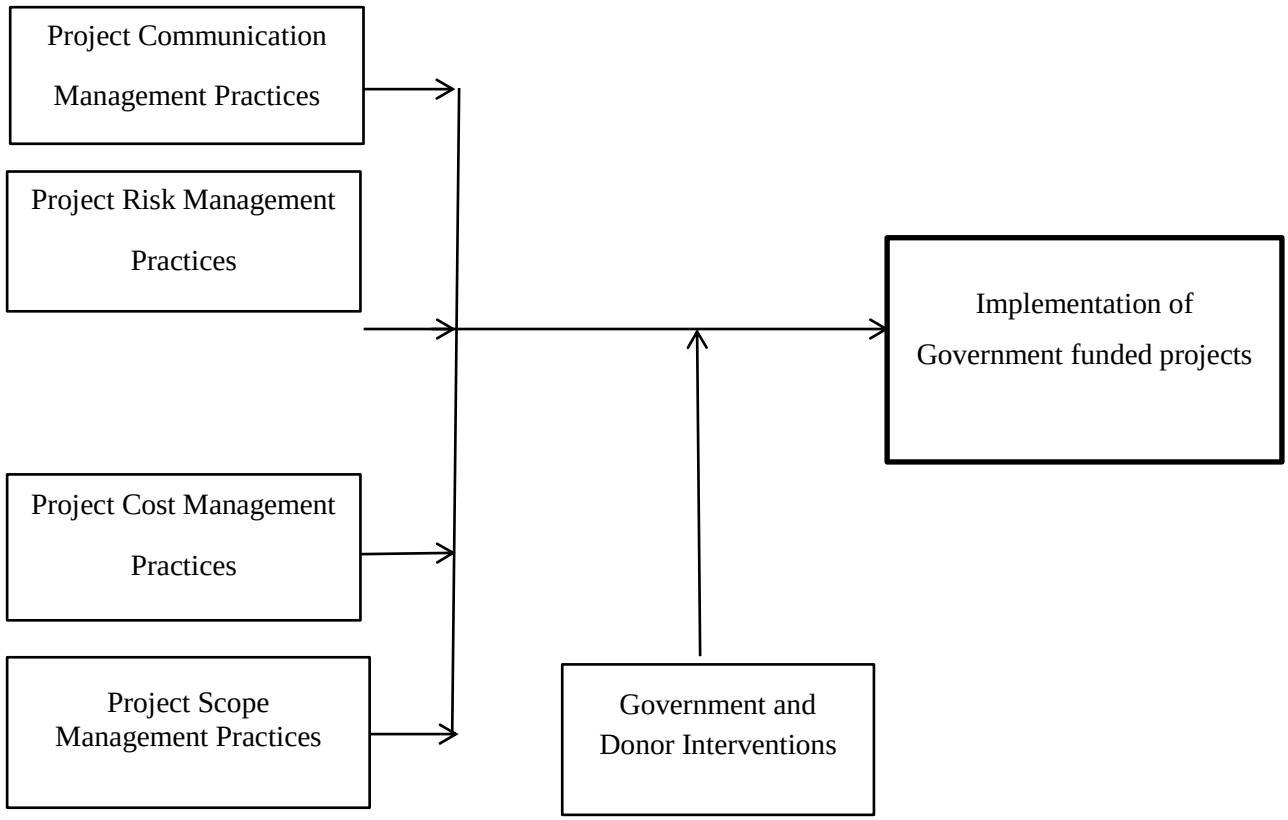

Figure 3. 3: Conceptual Framework for the Influence of Project Management Practices on Completion of Government Funded Projects

Source: (Mangaria, 2018)

Figure 3.3 above was developed to provide direction on the study involving the 'Role of Project Management Practices on Completion of Government Projects in Kenya's Nakuru West Constituency'. The study sought to examine the influence of project management practices on the completion of government-funded projects in Nakuru constituency in Kenya. The framework highlights four PMKAs i.e. Project Communication Management, Risk Management, Cost Management and Scope Management and how these project management practices influence the completion of government-funded projects. The four PMKAs represent the framework's independent variables whilst the dependent variable is represented by the completion/implementation of government projects; and Government and Donor interventions as the intervening variables. According to (Mangaria, 2018) the proposed framework shows that project management practices i.e. PMKAs are carried out to effectively manage projects to accomplish the completion of government-funded projects through better time, cost and

quality performance which results in improved completion of projects. He further remarks that through the adoption of these practices, an environment is created where every individual on the project understands what should be delivered and how performance will be measured.

3.3.1 Conceptual Framework for Enhancing Construction Contract Performance

Figure 3.4 below shows a conceptualised relationship between five project management knowledge areas and the performance of construction contracts.

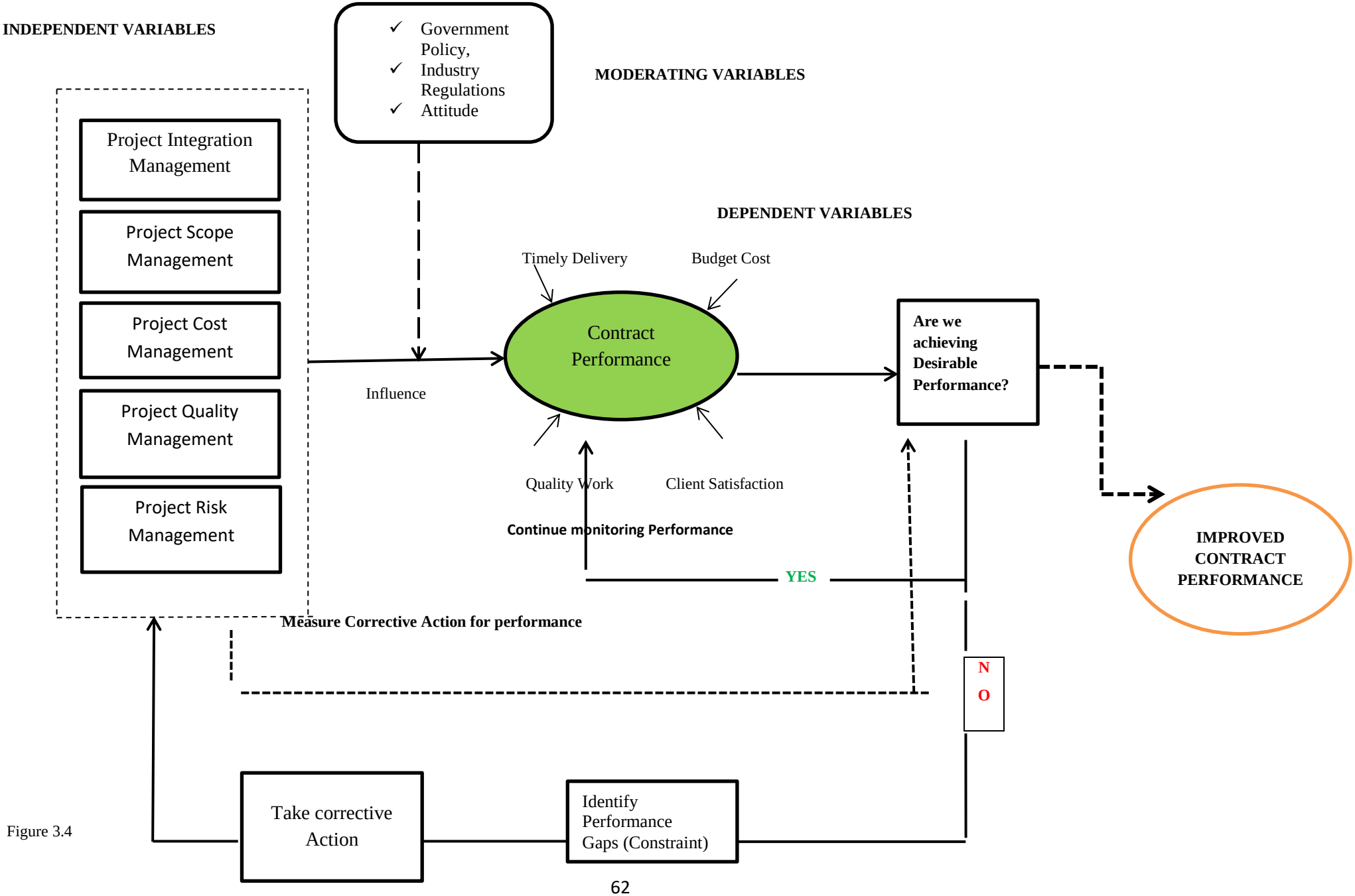
INDEPENDENT VARIABLES
✓ Government Policy,
✓ Industry Regulations
✓ Attitude
MODERATING VARIABLES
Project Integration Management
Project Scope Management
Project Cost Management
Project Quality Management
Project Risk Management
DEPENDENT VARIABLES
Timely Delivery
Budget Cost
Contract Performance
Influence
Quality Work
Client Satisfaction
Are we achieving Desirable Performance?
IMPROVED CONTRACT PERFORMANCE
Continue monitoring Performance
YES
NO
Measure Corrective Action for performance
Take corrective Action
Identify Performance Gaps (Constraint)

Figure 3.4

Figure 3.4 Conceptual Framework for the study

Source: Author (2021)

3.3.2 Explanation of the Variables

The proposed conceptual framework of this study shows how contract performance was conceptualised as the dependent variable whose main indicators were timely delivery, quality work, budget cost and client satisfaction being influenced by the five project management knowledge areas (practices) i.e. project integration management, scope management, cost management, quality management and risk management and moderated by Government policy, industry regulations and client-contractor attitude. The framework sought to establish the level of influence that the Knowledge areas have on achieving good performance of construction contracts and ultimately their influence on improving poor performance. The framework's variables were analysed in detail as follows:

3.3.2.1 Independent Variables

Project Integration Management

Due to the fragmented nature of construction projects, project integration management practices play a critical role in ensuring that there is coordination of various project processes and activities. Integration management allows for the making of trade-offs among competing objectives and alternatives to meet the needs and expectations of the project's stakeholders and decision-making regarding the allocation of resources.

Project Scope Management

Project scope management ensures that all construction works required to successfully complete the project are performed. It allows for the full detailed description of the project's deliverables and boundaries as well as an analysis of the client's (stakeholder's) requirements and specifications. The processes under this KA ensured that there was a breakdown of the construction works into smaller more manageable components and a formalised way of the client accepting the project's completed deliverables.

Project Cost Management

Construction projects are complex in nature and due to this phenomenon; there is need for building contract costs to be managed and controlled effectively to ensure completion of the

project within the contracted budget. Cost management processes allowed the project team to make more accurate estimate costs of the resources required to complete the project and develop a comprehensive budget for the contract works.

Project Quality Management

Quality management was assessed based on the three elements of plan quality management, manage quality and control quality. This variable ensured that the project team identified all the quality requirements or standards for the construction contract and its deliverables; it also documents how the project will demonstrate compliance with quality requirements or standards. It also ensured that the outputs to the project were correct, meeting the client's/customer's expectations and were complete.

Project Risk Management

Construction projects are exposed to numerous risks and uncertainties during the various stages of the construction process; therefore, the project risk management variable was necessary because it ensured that there was effective identification, analysis and response to risks during the building process. Risk management processes played a critical role in ensuring proper risk allocation between the parties to the contract.

3.3.2.2 Moderating Variables

Government policy, construction industry regulations and attitudes of both client and contractor were used as the moderating variables because policies and regulations are some of the external environmental factors that may have an impact on the contract's schedule, cost and quality through government and industry compliance requirements, new levies and fees; and long approvals. The attitudes of both client and contractor were considered since there exists a conflict of interests between the contracting parties which would impact their attitude towards carrying out their contractual obligations.

3.3.2.3 Dependent Variables

The performance of construction contracts was this study's main variable; the variable consists of four latent variables which are timely delivery, budget cost, quality work and client satisfaction. The performance of construction contracts was measured in terms of the timely delivery of works, cost within contract budget, quality of works and satisfaction of the client with works delivered. The timely delivery of works looked at how works were to be performed

and delivered within the stipulated contract period and the client was to ensure that payment was made to the contractor as of the agreed payment date. Cost within contract budget looked at how a good performing contract increases cost efficiency and effectiveness by delivering construction works within the estimated budget; the contract must deliver works at a lower cost without compromising on the quality. The quality of works considered how the final construction works (product) had to be to the required specifications of the client and posed no safety risks to the end-user(s). Client satisfaction looked at how the final works should comply with the set quality standards to meet the customer's needs, requirements and expectations. The works must be fit for use to ensure they have commercial value and are of relevance to the end-users. Finally, improved contract performance looked at how poor performance of construction contracts could be improved by the effective use of project management practices.

3.4 Conclusion

This chapter presented the theoretical and conceptual frameworks for this study. The chapter utilised three theories that were applicable to the study i.e. the general systems theory, theory of constraints and the agency theory which were discussed within their frameworks. However, the general systems theory was the primary theory that this research was anchored on. A conceptual framework was then developed based on the theories used in the study and ideas from conceptual frames developed by two other researchers who undertook similar studies. The conceptual framework showed the relationship between the five PMKAs as the dependent variables, contract performance as the dependent variable and government policy, industry regulation and client and contractor attitudes as the moderating variables.

The next chapter gives a presentation of the research methodology used in this research.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This chapter outlines the research methodology that was used in the study. It particularly begins with describing the research approach, research design, philosophy of the study, epistemology and ontology. It further describes the study population, sampling techniques and sample size; and subsequently discusses the validity, reliability and ethical considerations of the study. Finally, it ends with a conclusion of the chapter.

4.2 Research Approach

A research approach is the plans and procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis and interpretation (Creswell, 2014). It is a plan of action that gives direction to conduct research systematically and efficiently (Mohajan, 2017a). According to (Creswell, 2014) there are three types of research approaches namely (i) Qualitative (ii) Quantitative and (iii) Mixed Methods Approach. A qualitative approach to research is concerned with the subjective assessment of attitudes, opinions and behaviour (Kothari, 2004). It is an interpretative approach that aims to gain insight into the specific meanings and behaviours experienced in certain social phenomena through the subjective experiences of the participants (Palmer and Bolderston, 2006). Qualitative research is associated with an inductive approach to generating theory usually using an interpretivist model allowing for the existence of multiple subjective perspectives and constructing knowledge rather than seeking to find it in reality (Greener, 2008). A quantitative approach works with statistics or numbers that allow the researcher to quantify the world; using statistics allows the researcher to numerically describe phenomena as well as to determine relationships between two or more variables (Stockemer, 2018). This approach is associated with a deductive approach to testing theory, usually using numbers or facts, a positivist model and an objective view of the object under study (Greener, 2008). A mixed-methods approach to research is a procedure for collecting, analysing and mixing both qualitative and quantitative research approaches in a single study to understand a research problem (Bhawna and Gobind, 2015). According to (Creswell and Clark, 2011) a mixed-methods approach is a type of research in which a researcher or team of researchers combine elements of qualitative and quantitative research approaches for the purpose of breadth and depth of understanding and

corroboration. This approach provides researchers with opportunities to compensate for inherent method weaknesses on inherent method strengths and offset inevitable method biases (Almalki, 2016). The use of qualitative and quantitative approaches in combination provides a better understanding of research problems and complex phenomena than either approach alone (Molina-Azorin, 2016).

Creswell, (2009) classified mixed methods designs into three major categories i.e. *Sequential, Concurrent* and *Transformative*. In the *Sequential designs,* either quantitative or qualitative data are collected in the initial stage followed by the collection of the other type of data in the second stage; whilst in the *concurrent designs,* both qualitative and quantitative data are collected during the same stage (Castro *et al.*, 2010). In contrast, *transformative designs* are those that are guided by theoretical perspectives (Kroll and Neri, 2009). Hence, a sequential mixed-methods approach to research was used in this study to gain an in-depth understanding and to draw inferences from the findings on the relationship between PMKAs and the performance of construction contracts in Lusaka.

4.3 Research Design

Research design is a strategic framework for action that serves as a bridge between research questions and the execution or implementation of research (Durrheim, 2006). It is an arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Akhtar, 2016). According to (Sekaran and Bougie, 2013) it is a 'blueprint' for the actions involved in research, which include collection of data, measurement and data analysis directed by the research questions (Ndandani, 2020). This study adopted a sequential explanatory research design. According to (Dulock, 1993) descriptive research refers to the systematic and accurate description of the facts and characteristics of a given population or area of interest. It provides a picture of a situation, person or event or shows how things are related to each other and as it naturally occurs (Blumberg *et al*., 2005). Therefore, a descriptive survey research strategy was appropriate for this explanatory study because it shows the effect that one variable has on another (Omondi, 2017). It also seeks to find out the what, where and how of a phenomenon and assists the researcher to gather information, summarize, present and interpret them for the purpose of clarification (Mangaria, 2018). The descriptive survey design was useful in establishing the extent of influence of five PMKAs on the performance of construction contracts in Lusaka District. The study then utilised the correlational research design to

measure the relationship between the five PMKAs which were the independent variables and the performance of construction contracts in Lusaka district which was the dependent variable. The rationale for adopting an explanatory research design was that the quantitative data and their subsequent analysis provided a general understanding of the research problem; whilst the qualitative data and their analysis refined and explained the statistical results by exploring participant's views in more depth (Ivankova *et al*., 2006).

To achieve the objectives of the study, data was collected from both primary and secondary sources. Primary data was collected using both structured questionnaires and interview guides. The questionnaire consisted of closed ended-questions to enhance objectivity and the interviews were conducted with key informants (project managers and construction consultants) using semi-structured interview guide templates. The questionnaires were distributed to sampled project managers, contractors, consultants and site supervisors. Secondary data was collected through books, reports, articles, newspapers and journals.

4.4 Research Philosophy

According to (Žukauskas *et al*., 2018) research philosophy is the development of assumption, its knowledge and nature. It is a system of beliefs and assumptions about the development of knowledge; these include assumptions about human knowledge (epistemological assumptions), the realities encountered in research (ontological assumptions) and the ways the researcher's values influence the research process (axiological assumptions) (Saunders *et al*., 2015). Research philosophy mostly focuses on epistemology and ontology and is a way to bring meaning and perspective to the research (Alotaibi, 2019). Research philosophy involves examining the nature of knowledge itself, how it comes into being and is transmitted through language (Hürlimann, 2019).

This study adopted the positivism philosophy. Positivism advocates for the use of quantitative research methods as the bedrock for the researcher's ability to be precise in the description of the parameters and coefficients in the data gathered, analysed and interpreted so as to understand the relationships embedded in the data analysed (Kivunja and Kuyini, 2017). Positivists claim that there is a single objective reality that can be observed and measured without bias using standardized instruments (Rubin and Rubin, 2012).

4.4.1 Epistemology

Epistemology is a philosophical belief system about how research proceeds and what counts as knowledge (Leavy, 2017). Generally, epistemology is the assumptions we make about the kind or nature of knowledge; or how it is possible to find out about the world (Al-Saadi, 2014). Eriksson and Kovalainen, (2008) simply describe epistemology as what knowledge is and what its sources and limits are. It is concerned with providing a philosophical grounding for deciding what kind of knowledge are possible and how we can ensure that they are adequate and legitimate(Ahmed, 2008). Epistemological assumptions are also concerned with how knowledge can be created, acquired and communicated (Amakiri and Juliet, 2018). The two broad epistemological positions are positivism and interpretivism-constructivism (Antwi and Hamza, 2015). The positivist's underlying view is that the world has an objective reality that can be captured by measurable properties which are independent of the observer and his instruments (Leimeister, 2010). On the other hand, interpretivism states that humans construct knowledge as they interpret their experience of and in the world; interpretivists view all knowledge as being grounded in our particular experiences, is subjective and bound to the natural contexts in which we enact our lives (Hiller, 2016). The researcher adopted a positivism epistemological stance for this study because it allowed for the researcher to objectively examine the relationship between PMKAs and the performance of construction contracts in Lusaka.

4.4.2 Ontology

According to (Gray, 2013) ontology is the study of being, that is, the nature of existence and what constitutes reality. It is concerned with what kind of world we are investigating, the nature of existence and the structure of reality as such (Ahmed, 2008). In broad terms, there are two ontological positions namely realism and relativism (Moon and Blackman, 2017). Realism according to (Hiller, 2016) holds that a reality exists outside of our consciousness of it and that certain fixed laws of nature are permanent fixtures of that reality. Maxwell, (2012) describes realism as the belief that there is a world that exists independently of the researcher’s beliefs and constructions. Relativism on the other hand is the belief that reality is a finite subjective experience and nothing exists outside of our thoughts(Levers, 2013). This study adopted a realist ontological stance.

4.5 Study Population

The population of a study is that group about whom the researcher wants to draw conclusions (Babbie, 2020). It is a subset of the target population from which the sample is selected (Hu, 2014). The study population for this research consisted of construction project managers, construction site supervisors, contractors and consultants. The population of the study targeted eighty-five (85) respondents all of whom were involved in public construction contracts within Lusaka District.

Table 4. 1: Study Population

S/n	Study Population	Respondents
1	Project Managers	15
2	Contractors	40
3	Consultants	15
4	Site Supervisors	15
	Total	**85**

4.6 Sampling Techniques

The study employed the purposive sampling technique to determine the study population. It then utilized the stratified random sampling technique to determine the study sample size and respondents from whom a representation of the entire population was drawn. Purposive or judgement sampling is a strategy in which particular settings, persons or events are selected deliberately to provide important information that cannot be obtained from other choices (Taherdoost, 2016). The study utilized the purposive sampling technique because it allowed the researcher to choose participants who were knowledgeable about the use of PMKAs on construction projects. The target population were project managers with three or more years of experience in the construction industry and have worked on at least five public construction projects within Lusaka district. Contractors registered with the National Council for Construction in Grades 1-3. Construction Consultants who have worked on at least five public construction projects; and construction site supervisors with three years minimum experience. All respondents were chosen because they are familiar with the construction activities that relate to time, cost and quality as well as the use of project management practices. Purposive sampling techniques allow the researcher to deliberately select their participants based on the

participant's ability to provide essential information related to answering research questions (Alotaibi, 2019). Whilst stratified sampling reduces error, increases precision and eliminates bias.

4.7 Sample Size

A sample is a subgroup of the population that the researcher is interested in (Kumar, 2010). The sample size for this research was determined using Slovin's formula as shown below:

$$\mathbf{n=N/\ [1 + N\ (e)\ ^2]}$$

Where n = Sample size, N= Population size and e = Margin of error

The population size (N) for this study was 75; the margin of error (e) was 5% with a confidence level of 95%. Hence, the sample size of the study using Slovin's formula was as shown below:

$$n = \frac{85}{[1 + 85\ (0.05^2)]}$$

$$n = \frac{85}{[1 + 85(0.0025)]}$$

$$\underline{\mathbf{n = 70}}$$

Stratified random sampling is a modification of random sampling were the population of the study is divided into two or more relevant and significant strata based on one or several attributes; in effect, the sampling frame is divided into a number of subsets (Saunders *et al*., 2003). A method of proportional allocation was employed where sample sizes from each stratum were kept proportional to the sizes of the strata (Kothari, 2004). The population of the study was divided into four main strata as illustrated below:

Table 4. 2: Sample Size

S/n	Study Population	Sample Proportion	Sample Size
1	Project Managers	0.176	12
2	Contractors	0.47	33
3	Consultants	0.176	12
4	Site Supervisors	0.18	13
	Total	**1.0**	**70**

The questionnaires were therefore distributed according to the numbers reflected in table 4.2 above.

4.8 Validity of the Research

Validity is the extent to which a concept is accurately measured in a study (Heale and Twycross, 2015). The validity of a research instrument assesses the extent to which the instrument measures what it is designed to measure (Mohajan, 2017b). It is the appropriateness, meaningfulness and usefulness of inferences made by the researcher (Nyakundi, 2015). In other words, a valid research instrument is one in which the individual scores on such an instrument are meaningful and allows the researcher to draw stable and reliable conclusions from the sample population under study (Ohiomah, 2019). With the help of the supervisor, the validity of the research instrument was ensured by reviewing and updating the research instrument based on his recommendations after the questionnaire was forwarded to him to rate the extent to which it measured what was intended to be measured.

4.9 Reliability of the Research

Reliability is a measure of stability or internal consistency of an instrument in measuring certain concepts (Ghazali, 2016). According to (Kumar, 2010) reliability is the degree of accuracy or precision in the measurements made by a research instrument. It is concerned with the consistency, stability and repeatability of the informant's accounts as well as the researchers' ability to collect and record information accurately (Mohajan, 2017a). This study employed Cronbach's coefficient alpha test of reliability to test the reliability of the research instrument. A Cronbach's alpha test coefficient measure of 0.7 or higher is considered acceptable (Nyakundi, 2015).

4.10 Ethical Considerations

The researcher took necessary caution when administering the data collection instrument to the respondents so as to uphold their rights and privacy. Before administering the instruments to the respondents, an introduction of the research was given to state its aim and purpose; consent was sought from each respondent before administering the instrument on their willingness to participate in the research and their names withheld for confidentiality. The research was strictly carried out according to the University of Lusaka's ethical code of practice in research.

4.11 Conclusions

In summary, this chapter described the appropriate research approach and research design used to carry out the study. The chapter also highlighted the research philosophy which included the epistemological and ontological assumptions of the study. Later it described the population of the study and the appropriate sampling techniques used for the study. The chapter then gave the specific sample size of the research which was computed using Slovin's formula. Finally, the chapter described the validity and reliability of the data collection instrument as well as the ethical considerations taken during the research.

CHAPTER FIVE

PRESENTATION AND ANALYSIS OF FINDINGS

5.1 Introduction

This Chapter presents the findings of the study and explains the findings of the study aiming at exploring the relationship that exists between five project management knowledge areas (i.e. Integration, Scope, Cost, Quality and Risk Management) and the performance of construction contracts in Lusaka district. The study targeted consultants, project managers, supervisors as well as contractors.

5.2 Response Rate Analysis

The study issued a total of 80 questionnaires which were administered to project managers, contractors, consultants and site supervisors. The study targeted respondents who had been involved in public construction contracts around Lusaka District. Of the 80 survey questionnaires distributed, 70 were returned hence representing an 87.5 percent response rate. Figure 5.1 below shows a summary of the questionnaire response rate.

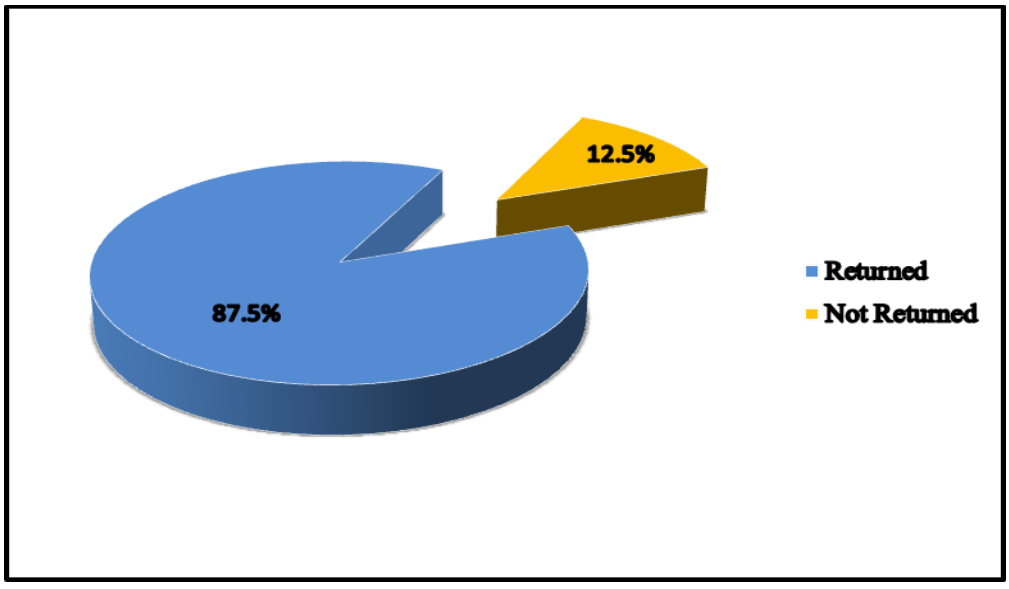

Figure 5.1: Questionnaire Response Rate

Further, qualitative data was collected using an interview guide; the researcher conducted interviews with eight (8) respondents. The interviewees were mostly project managers and consultants with vast experience in the construction industry. The information gathered through

the interviews was reported in the narrative and was used to reinforce the data collected through the questionnaires.

5.3 Respondent's General Information

The study sought to determine the respondent's background characteristics based on gender, level of education, respondent's position, experience in the construction industry and types of construction contracts undertaken.

5.3.1 Gender of Respondents

The researcher sought to investigate the gender representation of the study respondents, the outcomes of the investigation are shown in Table 5.1 below.

Table 5. 1: Distribution of Respondents by Gender

S/n	GENDER	FREQUENCY	PERCENTAGE
1	Male	46	65.7
2	Female	24	34.3
	Total	**70**	**100**

Source: Author (2021)

From the results obtained, it was evident that majority of the study respondents were male representing 65.7 % whilst female respondents constituted 34.3 % of the study sample.

5.3.2 Respondent's Level of Education

The researcher sought to assess the distribution of the respondents by their highest level of education attained and the outcome is depicted in Figure 5.2 below.

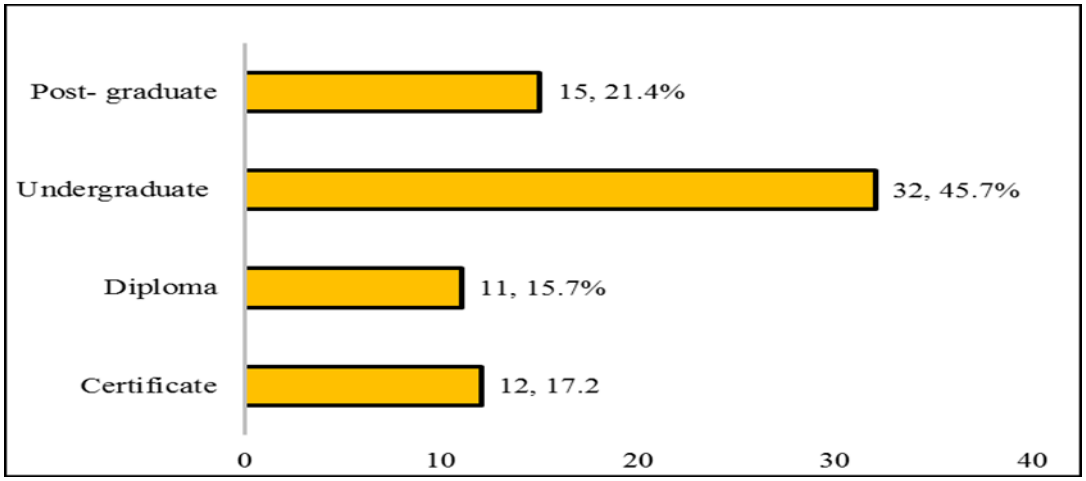

Figure 5. 2: Distribution of Respondents by Level of Education

The findings indicate that 45.7% of the respondents had attained an under-graduate degree as their highest level of education, 21.4 % had post-graduate degrees followed by 17.2% and 15.7% who had attained diplomas and certificates respectively. This implies that the respondents engaged in the study were literate and proficient enough to interpret the research questions presented to them.

5.3.3Respondent's Occupational Position

The study requested the respondents to indicate the occupational positions that they were holding in their respective organisations and the outcomes were as shown below.

Table 5. 2: Occupational Position of Respondents

S/n	Details	Frequency	Percent	Cumulative Percent
1	Project Manager	12	17.1	17.1
2	Contractor	33	47.1	64.2
3	Consultant	12	17.1	81.3
4	Site Supervisor	13	18.7	100.0
	Total	**70**	**100.0**	

Source: Author (2021)

The findings reveal that the largest numbers of respondents were contractors at 47.1%, followed by site supervisors 18.7%, 17.1% were project managers and another 17.1% were consultants.

5.3.4 Years of Work Experience

The study also requested the respondents to state their years of experience in the construction industry. This was presented in the table below.

Table 5. 3: Respondent's Years of Experience in the Construction Industry

S/n	Details	Frequency	Percent	Cumulative Percent
1	Less than 5 years	9	12.9	12.9
2	5 - 10 years	21	30.0	42.9
3	10 -15 years	22	31.4	74.3
4	More than 15 years	18	25.7	100.0
	Total	**70**	**100.0**	

The findings in Table 5.3 indicate that 31.4% of the respondents had worked in the construction industry for at least 10-15 years whilst 30.0 % had a work experience of more than 10 years. This implies that majority of the respondents had worked in the construction sector long enough to be aware of the role and influence that project management knowledge areas have on the performance of construction contracts.

5.3.5 Respondent's Involvement in Public Construction Contracts

Respondents were requested to state if they have been involved in a public construction contract before. In this regard, this survey **only** considered respondents who had been participants in a public construction contract.

5.3.6 Type of Construction Contract

The researcher wanted to ascertain the type of construction contracts undertaken by those respondents who stated that they have been involved in public construction contracts before and most of them stated that they have been more involved in building and civil construction as shown in figure 5.3 below.

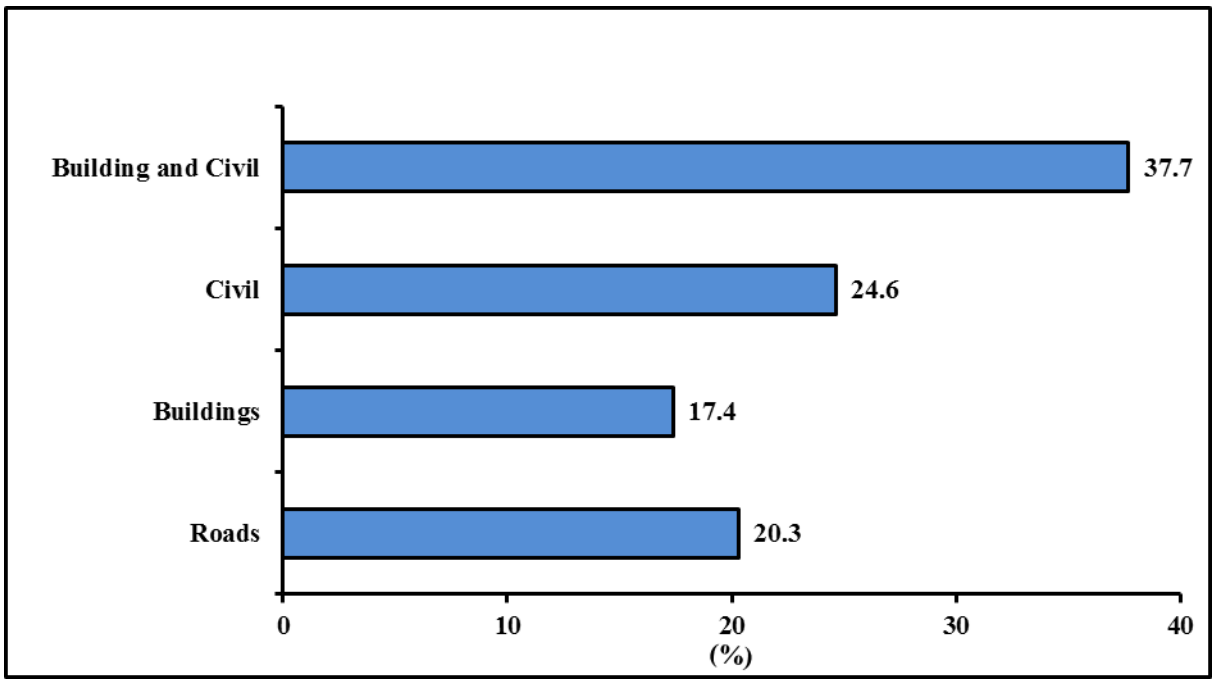

Figure 5. 3: Type of Construction Contract

Source: Author (2021)

5.4 Descriptive Statistics Data Analysis for Quantitative Variables

According to (Abdulsamad, 2011) the descriptive aspect of statistics allows for researchers to summarize large quantities of data using measures that are easily understood by an observer. Descriptive analysis is viewed as a better technique for collecting information that describes relationships and exhibits the world as it exists (Baha, 2016). As such, this section of the study deals with the descriptive analysis of the research variables. From the questionnaire designed, respondents were required to rate their degree of agreement or disagreement by indicating the appropriate option on a five (5) point Likert scale. The options as indicated on the scale were (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Stronlgy Agree).

In some instances, the respondents were requested to indicate the extent to which they felt one variable influenced the other as follows: 1-No extent, 2-Low extent, 3- Moderate extent, 4-Great extent and 5-Very great extent. This implied that for a mean response above 3, the respondents agreed that one variable influenced the other to a great and very great extent. On the other hand, a mean response below 3 indicated the respondents agreed that one variable influenced another to no or low extent.

5.4.1 To Explore the Five Most Effective Project Management Knowledge Areas

5.4.1.1The role PMKAs play in achieving desired construction contract outcomes

The researcher wanted to find out the role Project Management Knowledge Areas play in achieving desired construction contract outcomes. Out of 70 participants, 12(17.1%) strongly agreed, 28(40%) agreed, 29(41.4%) were neutral and only 1(1.4%) strongly disagreed. Details are shown below.

Table 5. 4: The role Project Management Knowledge Areas play in achieving desired construction contract outcomes

S/n	Details	Frequency	Percent	Cumulative Percent
1	Strongly Disagree	1	1.4	1.4
2	Disagree	0	0	0
3	Neutral	29	41.4	42.9
4	Agree	28	40	82.9
5	Strongly Agree	12	17.1	100
	Total	**70**	**100**	

Source: Author (2021)

5.4.1.2 Appropriate application of PMKAs and improvement of contract performance

The researcher wanted to find out if the appropriate application of project knowledge areas improves contract performance, majority of the respondents agreed with 27(38.6%) agreeing, 9(12.9%) strongly agreeing as indicated in the table below. On the other hand, 3(4.3%) strongly disagreed, 9(12.9%) disagreed and 22 (31.4%) were neither agreeing nor disagreeing. Cumulatively, 17.1% of the participants disagreed and about 51.5% agreed that appropriate application of project knowledge areas improves contract performance.

Table 5. 5: Appropriate application of project knowledge areas and improvement of contract performance

S/n	Details	Frequency	Percent	Cumulative Percent
1	Strongly Disagree	3	4.3	4.3
2	Disagree	9	12.9	17.1
3	Neutral	22	31.4	48.6
4	Agree	27	38.6	87.1
5	Strongly Agree	9	12.9	100
	Total	**70**	**100**	

5.4.1.3 Individual knowledge areas effectiveness in achieving desired performance

The study wanted to assess if some knowledge areas were more effective in achieving desired performance outcomes than others. 3(4.3%) strongly disagreed, 10 (14.3%) disagreed, 26(37.1%) were neutral, 19(27.1%) and 12(17.1%) agreed and strongly disagreed respectively. Cumulatively, 18.6% of the participants disagreed and about 44.2% agreed that some knowledge areas are more effective in achieving the desired performance of the project.

Table 5. 6: Individual knowledge areas effectiveness in achieving desired performance

S/n	Details	Frequency	Percent	Cumulative Percent
1	Strongly Disagree	3	4.3	4.3
2	Disagree	10	14.3	18.6
3	Neutral	26	37.1	55.7
4	Agree	19	27.1	82.9
5	Strongly Agree	12	17.1	100
	Total	**70**	**100**	

5.4.1.4 Five most effective PMKAs in achieving desired construction contract outcomes

The respondents were asked to state which five Project Management Knowledge Areas they felt were most effective in attaining desired construction contract outcomes. From figure 5.4 below the project management knowledge areas indicated to be most effective in achieving desired construction contract outcomes were; Scope management (83.9%), Cost management (77.4%), Integration management (58.1%), Quality management (54.8%) as well as Schedule and Resource management both represented by (45.2%) respectively.

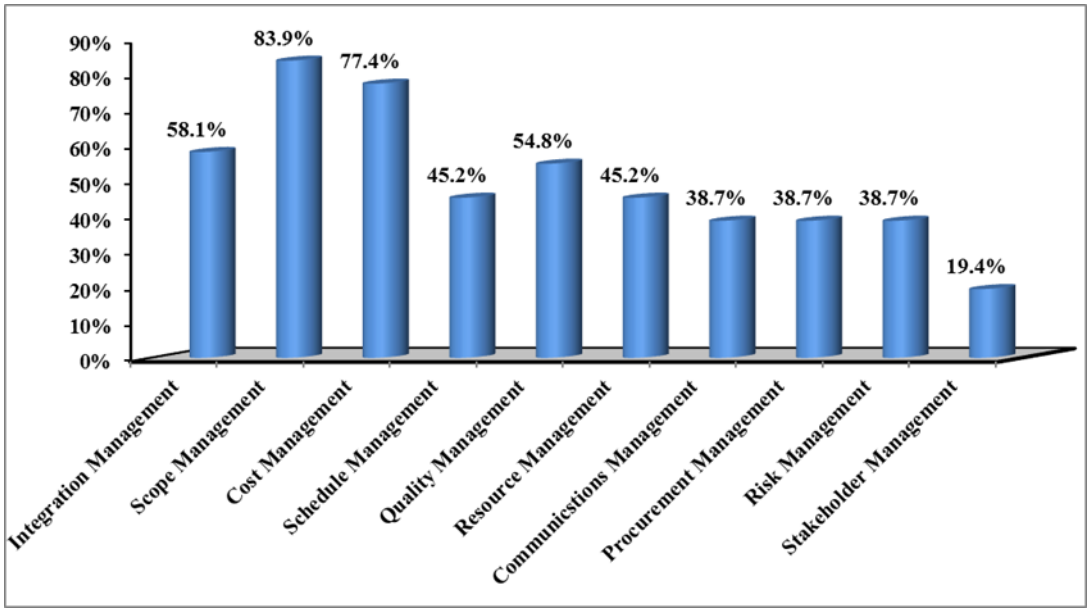

Figure 5. 4: Most effective project management knowledge areas

Source: (Author, 2021)

5.4.2 Relationship between Five Project Management Knowledge Areas and Contract Performance

The study sought to find out the extent to which project management knowledge areas influence the performance of construction contracts. The outcomes from the study respondents are summarized in the table below.

Table 5. 7: Extent to which Project Management Knowledge Areas influence Contract Performance

S/n	Details	Frequency	Percent	Cumulative Percent
1	No extent	2	2.9	2.9
2	Low Extent	10	14.3	17.1
3	Moderate Extent	28	40	57.1
4	Great Extent	20	28.6	85.7
5	Very great extent	10	14.3	100
	Total	**70**	**100**	

Source: Author (2021)

From the findings in Table 5.7 above, majority of the respondents 28 (40%) indicated a moderate extent to which project management knowledge areas influence contract performance; this was followed by 20 (28.6%) who indicated great extent and 10 (14.3%) stated a very great extent. On the other hand, 10(14.3%) and 2(2.9%) stated that project management knowledge areas influence contract performance to a low and at times no extent respectively. This implies that project management knowledge areas, moderately influence the performance of construction contracts.

5.4.2.1 Relationship between Integration Management and Contract Performance

The study then sought to establish if participants in public contraction projects or management put emphasis on project integration management practices. From Figure 5.5 below, 42 (60%) of the respondent agreed that emphasis was put on integration management practices and only 11 (16%) refuted with 17(28%) not being sure.

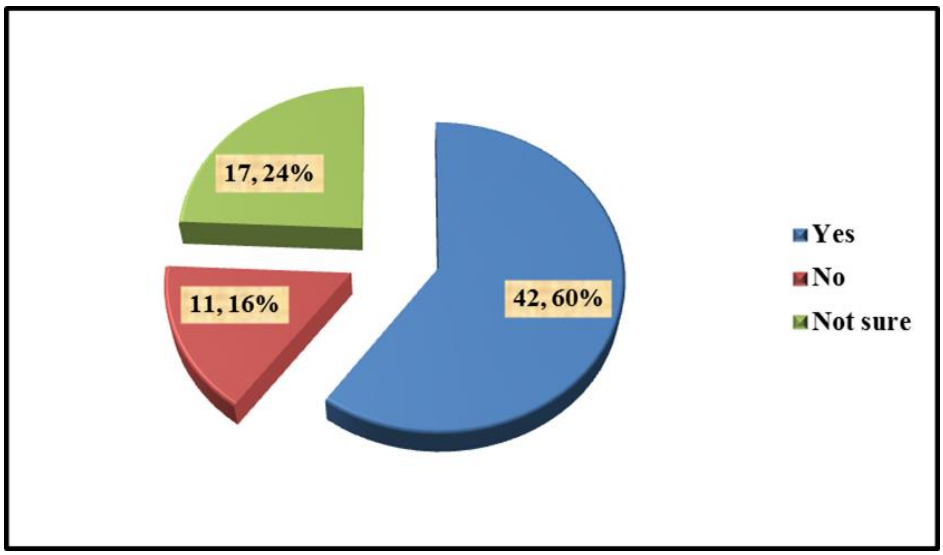

Figure 5. 5: Emphasis on Project Integration Management Practices

The study further sought to establish how project integration management practices are effectively utilised on public construction contracts. The analysis of integration management practices was based on five areas specifically effective coordination of activities, execution of activities in accordance with the project plan, knowledge management, close monitoring and control; and integrated change control. Responses from the respondents as rated on a 5 point Likert scale (1-strongly disagree, 2-disagree, 3-neutral, 4-agree and 5-strongly agree) are summarised by their corresponding means and standard deviations in the table below:

Table 5. 8: Project Integration Management Practices

S/n	Statement	Min.	Max.	Mean	Std. Deviation
1	Effective coordination of project activities during contract execution	2	5	3.29	0.95
2	Project activities are carried out in accordance with the project management plan	3	5	3.76	0.75
3	Effective knowledge management practices during the execution of the contract	1	5	3.46	0.93
4	Project activities are closely monitored and controlled	1	5	3.37	1.00
5	Project changes adhere to formulated procedures for review and approval	1	5	4.17	0.88
	Average for Project Integration Management Practices			**3.61**	**0.90**

Source: (Author, 2021)

From Table 5.8 above, the findings for project integration management practices in effectively coordinating project actives during contract execution indicated a mean of (m=3.29) and standard deviation (Std. dev. = 0.95); project activities carried out in accordance with the project plan indicated a mean of (m=3.76) and standard deviation (Std. dev. = 0.75); effective knowledge management practices indicated a mean of (m=3.46) and standard deviation (Std. dev. = 0.93); close monitoring and control of project activities indicated a mean of (m=3.37) and standard deviation (Std. dev. = 1.00); and project changes adhering to formulated procedures indicated a mean of (m=4.17) and a standard deviation (Std. dev. = 0.88). The average findings for project integration management practices revealed a mean (m=3.61) and standard deviation (Std. dev. = 0.90).

The findings as indicated above imply that there is a moderate practice of effective coordination of project activities, carrying out project activities in accordance with the project plan, knowledge management and close monitoring and control of project activities during the execution of public construction contracts. On the other hand, the findings indicate that most of the respondents agreed that project changes highly adhere to formulated procedures during

the execution of public construction contracts. In general, the findings imply that there is moderate practice of project integration management on public construction contracts in Lusaka District.

Table 5.9: Extent to which Project Integration Management influences contract performance measures

Source: Author (2021)

Performance Measure	**No extent**		**Low extent**		**Moderate extent**		**Great extent**		**Very great extent**	
	Count	***%***	***Count***	***%***	***Count***	***%***	***Count***	***%***	***Count***	***%***
Contract completed within schedule	0	0.0%	3	4.3%	27	38.6%	29	41.4%	11	15.7%
Contract completed within stipulated contract budget	1	1.4%	10	14.3%	22	31.4%	30	42.9%	7	10.0%
contract completed in accordance with specified quality requirements	2	2.9%	2	2.9%	15	21.4%	23	32.9%	28	40.0%
Contract deliverables meet client's satisfaction	3	4.3%	7	10.0%	30	42.9%	23	32.9%	7	10.0%

The study sought to find out the extent to which project integration management had an influence on contract performance measures i.e. completing a contract within schedule, within the stipulated budget, in accordance with specified quality requirements and contract deliverables meeting the client's satisfaction. From the results obtained in Table 5.9 above, it was indicated that 29 (41.4%) of the respondents agreed that integration management practices had an influence on completing public construction contracts within schedule to a great extent, 27 (38.6%) agreed to a moderate extent, 11 (15.7%) agreed to a very great extent and 3 (4.3%) agreed to a low extent.

On the other hand, 30 (42.9%) agreed to a great extent that integration management had an influence on completing construction contracts within the stipulated contract budget, 22

(31.4%) agreed to a moderate extent, 7 (10.0%) agreed to a very great extent, 10 (14.3%) to a low extent and 1 (1.4%) stated that there was no extent at all.

Further, 28 (40.0%) of the respondents agreed to a very great extent that integration management had an influence on completing construction contracts in accordance with specified quality requirements, 23 (32.9%) agreed to a great extent, 15 (21.45) agreed to a moderate extent, 2 (2.9%0 to a low extent and another 2 (2.9%) to no extent.

For the influence of integration management on ensuring that the project deliverables meet the client's satisfaction, the findings indicate that 30 (42.9%) of the respondents agreed to a moderate extent, 23 (32.9%) agreed to a great extent, 7 (10.0%) to a very great extent another 7 (10.0%) to a low extent and 3 (4.3%) stated no extent.

Generally, the results obtained indicate that majority of the respondents agreed that integration management had an influence on the contract performance measures to a great extent.

Correlation between Integration Management and Contract Performance

The study sought to establish the relationship between integration management practices and contract performance. From table 5.10 below, it was indicated that overall, putting emphasis on project integration management practises has a weak positive correlation with completing a construction contract within schedule (r=0.025, p=0.840), stipulated budget (r=0.045, p=0.710) and in accordance with specified quality requirements (r=0.069, p=0.568). On the other hand, the results indicated that there is a weak negative linear relationship (r=-0.134, p=0.270) between emphasising on integration management practices and a contract's deliverables meeting client's satisfaction. This implies that as emphasis is put on project integration management practices during the execution of a contract, the chances of completing a contract within schedule, budget and in accordance with quality requirements also increase though to a weaker extent. Additionally, it implies that an increase in emphasis on integration management practices is likely to reduce the chance of meeting a client's satisfaction.

Further, table 5.10 highlights that there is a statistically significant correlation between carrying out project activities in accordance with the project management plan and completing a contract within schedule at level 0.01 (2-tailed). The results also indicated that there is a moderately positive correlation (r=.456, p=0.000) between the two aforementioned variables. In addition, there is a strong positive relationship (r=.795, p=0.000) between effective knowledge management practices and completing a contract within budget. This implies that

effectively conducting knowledge management during contract execution enhances the chances of completing a contract within the stipulated budget.

Overall, the results in table 5.10 below indicate that there is a weak positive correlation between project integration management practices and contract completion within schedule, budget and in accordance with quality requirements whilst there was a weak negative correlation between integration management and contract deliverables meeting the client's satisfaction.

Table 5. 10: Correlation between Integration Management and Contract Performance

Details		Emphasis on project integration management practices	Project activities are carried out in accordance with the project management plan	Effective coordination of project activities during contract execution	Effective knowledge management practices during the execution of the contract	Project activities are closely monitored and controlled	Project changes adhere to formulated procedures for review and approval	Contract completed within schedule	Contract completed within stipulated contract budget	contract completed in accordance with specified quality requirements	Contract deliverables meet client's satisfaction
Emphasis on project integration management practices	Pearson Correlation	1	-0.070	0.164	0.136	-0.132	0.044	0.025	0.045	0.069	-0.134
	Sig. (2-tailed)		0.567	0.176	0.261	0.276	0.718	0.840	0.710	0.568	0.270
	N	70	70	70	70	70	70	70	70	70	70
Project activities are carried out in accordance with the project management plan	Pearson Correlation	-0.070	1	-0.165	0.037	0.084	-0.002	.456**	-0.068	-0.199	-0.126
	Sig. (2-tailed)	0.567		0.171	0.762	0.491	0.988	0.000	0.574	0.099	0.299
	N	70	70	70	70	70	70	70	70	70	70
Effective coordination of project activities during contract execution	Pearson Correlation	0.164	-0.165	1	-.364**	-.267*	0.062	-.284*	-.354**	0.033	-0.094
	Sig. (2-tailed)	0.176	0.171		0.002	0.025	0.612	0.017	0.003	0.788	0.437
	N	70	70	70	70	70	70	70	70	70	70
Effective knowledge management practices during the execution of the contract	Pearson Correlation	0.136	0.037	-.364**	1	0.096	0.097	0.140	.795**	-0.115	-0.033
	Sig. (2-tailed)	0.261	0.762	0.002		0.429	0.422	0.249	0.000	0.342	0.789
	N	70	70	70	70	70	70	70	70	70	70
Project activities are closely monitored and controlled	Pearson Correlation	-0.132	0.084	-.267*	0.096	1	-0.139	.243*	0.209	-0.220	0.155
	Sig. (2-tailed)	0.276	0.491	0.025	0.429		0.250	0.043	0.082	0.067	0.199
	N	70	70	70	70	70	70	70	70	70	70
Project changes adhere to formulated procedures for review and approval	Pearson Correlation	0.044	-0.002	0.062	0.097	-0.139	1	0.223	-0.081	.254*	-.314**
	Sig. (2-tailed)	0.718	0.988	0.612	0.422	0.250		0.063	0.507	0.034	0.008
	N	70	70	70	70	70	70	70	70	70	70
Contract completed within schedule	Pearson Correlation	0.025	.456**	-.284*	0.140	.243*	0.223	1	0.001	0.091	-0.125
	Sig. (2-tailed)	0.840	0.000	0.017	0.249	0.043	0.063		0.992	0.455	0.302
	N	70	70	70	70	70	70	70	70	70	70
Contract completed within stipulated contract budget	Pearson Correlation	0.045	-0.068	-.354**	.795**	0.209	-0.081	0.001	1	-0.229	0.084
	Sig. (2-tailed)	0.710	0.574	0.003	0.000	0.082	0.507	0.992		0.057	0.487
	N	70	70	70	70	70	70	70	70	70	70
contract completed in accordance with specified quality requirements	Pearson Correlation	0.069	-0.199	0.033	-0.115	-0.220	.254*	0.091	-0.229	1	-0.169
	Sig. (2-tailed)	0.568	0.099	0.788	0.342	0.067	0.034	0.455	0.057		0.162
	N	70	70	70	70	70	70	70	70	70	70
Contract deliverables meet client's satisfaction	Pearson Correlation	-0.134	-0.126	-0.094	-0.033	0.155	-.314**	-0.125	0.084	-0.169	1
	Sig. (2-tailed)	0.270	0.299	0.437	0.789	0.199	0.008	0.302	0.487	0.162	
	N	70	70	70	70	70	70	70	70	70	70

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

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

5.4.2.2 Relationship between Scope Management and Contract Performance

The study then sought to establish if participants in public contraction projects or management put emphasis on project scope management practices. From Figure 5.6 below, 47 (67%) of the respondents agreed that emphasis was put on scope management practices and only 11 (16%) refuted with 12 (17%) not being sure.

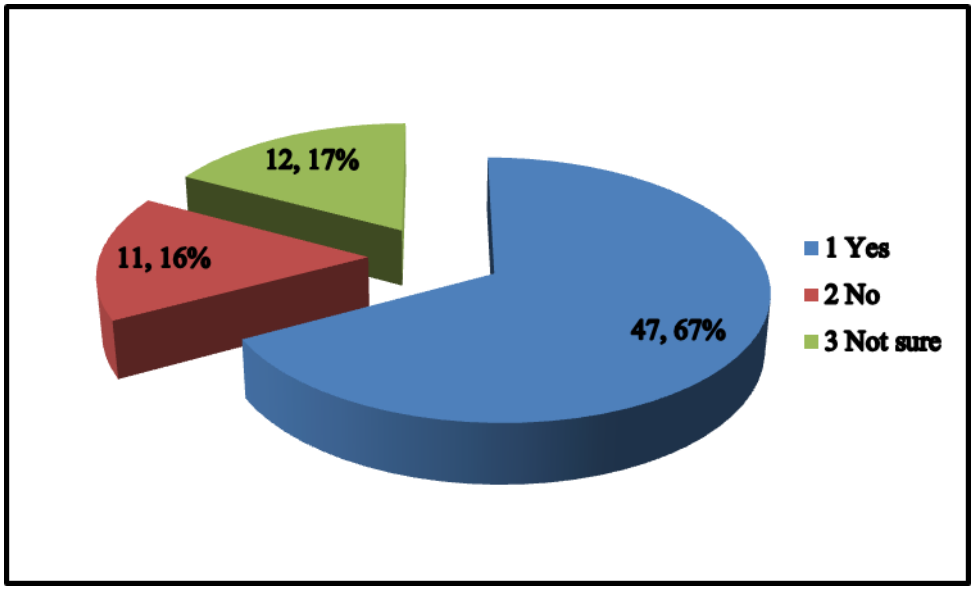

Figure 5. 6: **Emphasis on Project Scope Management Practices**

Source: Author (2021)

The researcher wanted to determine how project scope management practices are effectively utilised on public construction contracts. The analysis of scope management practices was based on five areas specifically project scope planning, collection of stakeholder's requirements, scope definition, work breakdown structure and scope validation. Responses from the respondents are depicted by the means and standard deviations in Table 5.11 below:

Table 5. 11: Project Scope Management Practices

S/n	Statement	Min.	Max.	Mean	Std. Deviation
1	Projects are executed and delivered within planned scope	1.00	5.00	3.67	1.09
2	Stakeholder's requirements and specifications are effectively collected and managed	3.00	5.00	4.17	0.72
3	Precise and clear definition of the contract's scope, objectives and key deliverables	2.00	5.00	4.07	0.79
4	Proper breakdown of the project's goals and tasks to be carried out using the work breakdown structure	2.00	5.00	3.94	0.98
5	Scope validation is carried out to ensure the project meets required specifications	2.00	5.00	3.90	0.59
	Average for Project Scope Management Practices			**3.95**	**0.83**

Source: (Author, 2021)

From Table 5.11 above, the findings for project scope management practices in terms of executing and delivering projects within planned scope indicated a mean of (m=3.67) and standard deviation (Std. dev. = 1.09); stakeholder's requirements and specifications effectively collected and managed indicated a mean of (m=4.17) and standard deviation (Std. dev. = 0.72); precise and clear definition of the contract's scope, objectives and key deliverables indicated a mean of (m=4.07) and standard deviation (Std. dev. = 0.79); proper breakdown of project's goals and tasks using work breakdown structure indicated a mean of (m=3.94) and standard deviation (Std. dev. = 0.98); and scope validation carried out to ensure the project meets required specifications indicated a mean of (m=3.90) and a standard deviation (Std. dev. = 0.59). The average findings for project scope management practices revealed a mean (m=3.95) and standard deviation (Std. dev. = 0.83).

The findings as indicated above imply that there is moderate practice of executing and delivering projects within planned scope, proper breakdown of project's goals and tasks using work breakdown structure and carrying out scope validation to ensure the project meets required specifications. On the other hand, effectively collecting and managing stakeholders' requirements and specifications; and precise and clear definition of the contract's scope, objectives and key deliverables are practiced to a greater extent. In general, the findings imply that there is moderate practice of project scope management on public construction contracts in Lusaka District.

Table 5.12 below shows the extent to which project scope management practices influence contract performance in terms of completing the contract within schedules, stipulated budget, in accordance with specified requirements and contract deliverables meeting the client's specifications.

Table 5.12: Extent to which Project Scope Management influences contract performance measures

Performance Measure	**No extent**		**Low extent**		**Moderate extent**		**Great extent**		**Very great extent**	
	Count	***%***	***Count***	***%***	***Count***	***%***	***Count***	***%***	***Count***	***%***
Contract completed within schedule	0	0.0%	0	0.0%	14	20.0%	29	41.4%	27	38.6%
Contract completed within stipulated contract budget	1	1.4%	3	4.3%	13	18.6%	30	42.9%	23	32.9%
contract completed in accordance with specified quality requirements	0	0.0%	1	1.4%	17	24.3%	25	35.7%	27	38.6%
Contract deliverables meet client's satisfaction	2	2.9%	4	5.7%	33	47.1%	26	37.1%	5	7.2%

Source: (Author, 2021)

The findings, as shown above, indicated that 29 (41.4%) of the respondents agreed that scope management practices had an influence on completing public construction contracts within schedule to a great extent, 27 (38.6%) agreed to a very extent and 14 (20.0%) agreed to a moderate extent.

On the other hand, 30 (42.9%) agreed to a great extent that scope management had an influence on completing construction contracts within the stipulated contract budget, 23 (32.9%) agreed to a very great extent, 13 (18.6%) agreed to a moderate extent, 3 (4.3%) to a low extent and 1 (1.4%) stated that there was no extent at all.

27 (38.6%) of the respondents agreed to a very great extent that scope management had an influence on completing construction contracts in accordance with specified quality requirements, 25 (35.7%) agreed to a great extent, 17 (24.3%) agreed to a moderate extent and 1 (1.4%) to a low extent.

For the influence of scope management on ensuring that the project deliverables meet the client's satisfaction, the findings indicate that 33 (47.1%) of the respondents agreed to a moderate extent, 26 (37.1%) agreed to a great extent, 5 (7.2%) to a very great extent, 4 (5.7%) to a low extent and 2 (2.9%) stated no extent.

Generally, the results obtained indicate that majority of the respondents agreed that scope management had an influence on the contract performance measures to a great extent.

Correlation between Scope Management and Contract Performance

Further, the study sought to establish the correlation between scope management knowledge area practices and contract performance. In this regard, Table 5.13 below shows that there is a statistically significant correlation between effective collection and management of stakeholder's requirements and specifications (independent variable) and completing a contract within schedule (dependent variable) at the 0.01 level (2-tailed). Further, the results also indicated that there is a moderate positive linear relationship (r=.423, p=0.055) between the two variables. Overall, the results indicated that there is a weak negative relationship between effective collection and management of stakeholder's requirements and specifications and completing a contract within stipulated budget (r=-0.048, p=0.693), specified quality requirements (r=-0.171, p= 0.157) and contract deliverables meeting client's satisfaction (r=-0.024, p=0.846).

In addition, the results show that there is a statistically significant correlation between the proper breakdown of the project's goals and tasks using the WBS and contract deliverables

meeting client's satisfaction at the level 0.01 (2-tailed). They also show a moderate positive linear relationship between the two variables. In the same vein, the results indicate that there is a statistically significant correlation between the proper breakdown of the project's goals and tasks using the WBS and completing the contract in accordance with specified quality requirements at the 0.05 level (2-tailed). The results also indicate that there is a weak negative linear relationship (r=-.250, p=0.037) between the two variables.

Overall, Table 5.13 below shows that there is a weak positive correlation between project scope management practices and completing a contract within schedule and contract deliverables meeting client's satisfaction. This implied that there was a directly proportional relationship between the variables. On the other hand, the results indicated that there was a weak negative correlation between scope management and contract completed within the stipulated budget and in accordance with specified quality requirements. Thus, indicating an inversely proportional relationship between the independent and dependent variables.

Table 5. 13: Correlation between Scope Management and Contract Performance

Details		Stakeholder's requirements and specifications effectively collected and managed	Precise and clear definition of the contract's scope, objectives and key deliverables	Proper breakdown of the project's goals and tasks to be carried out using the work breakdown structure	Scope validation is carried out to ensure the project meets required specifications	Contract completed within schedule	Contract completed within stipulated contract budget	contract completed in accordance with specified quality requirements	Contract deliverables meet client's satisfaction
Stakeholder's requirements and specifications are effectively collected and managed	Pearson Correlation	1	0.106	-0.089	-0.23	.423**	-0.048	-0.171	-0.024
	Sig. (2-tailed)		0.383	0.465	0.055	0	0.693	0.157	0.846
	N	70	70	70	70	70	70	70	70
Precise and clear definition of the contract's scope, objectives and key deliverables	Pearson Correlation	0.106	1	-0.051	-0.078	0.15	-0.103	-0.225	-0.014
	Sig. (2-tailed)	0.383		0.673	0.523	0.216	0.397	0.061	0.909
	N	70	70	70	70	70	70	70	70
Proper breakdown of the project's goals and tasks to be carried out using the work breakdown structure	Pearson Correlation	-0.089	-0.051	1	0.165	0.174	-0.113	-.250*	.320**
	Sig. (2-tailed)	0.465	0.673		0.172	0.151	0.35	0.037	0.007
	N	70	70	70	70	70	70	70	70
Scope validation carried out to ensure the project meets required specifications	Pearson Correlation	-0.23	-0.078	0.165	1	-0.088	0.003	-0.042	0.114
	Sig. (2-tailed)	0.055	0.523	0.172		0.468	0.982	0.733	0.349
	N	70	70	70	70	70	70	70	70
Contract within schedule	Pearson Correlation	.423**	0.15	0.174	-0.088	1	-0.217	-0.03	0.175
	Sig. (2-tailed)	0	0.216	0.151	0.468		0.071	0.804	0.147
	N	70	70	70	70	70	70	70	70
Contract within stipulated contract budget	Pearson Correlation	-0.048	-0.103	-0.113	0.003	-0.217	1	-.304*	0.011
	Sig. (2-tailed)	0.693	0.397	0.35	0.982	0.071		0.011	0.927
	N	70	70	70	70	70	70	70	70
contract in accordance with specified quality requirements	Pearson Correlation	-0.171	-0.225	-.250*	-0.042	-0.03	-.304*	1	-0.169
	Sig. (2-tailed)	0.157	0.061	0.037	0.733	0.804	0.011		0.162
	N	70	70	70	70	70	70	70	70
Contract deliverables meet client's satisfaction	Pearson Correlation	-0.024	-0.014	.320**	0.114	0.175	0.011	-0.169	1
	Sig. (2-tailed)	0.846	0.909	0.007	0.349	0.147	0.927	0.162	
	N	70	70	70	70	70	70	70	70

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

5.4.2.3 Relationship between Cost Management and Contract Performance

The researcher wanted to establish if there is proper implementation of cost management practices on most construction contracts in Lusaka district. From figure 5.7 below, 61(87%) of the respondents agreed that there was proper implementation of cost management practices, 4(6%) refuted and 5 (7%) were not sure.

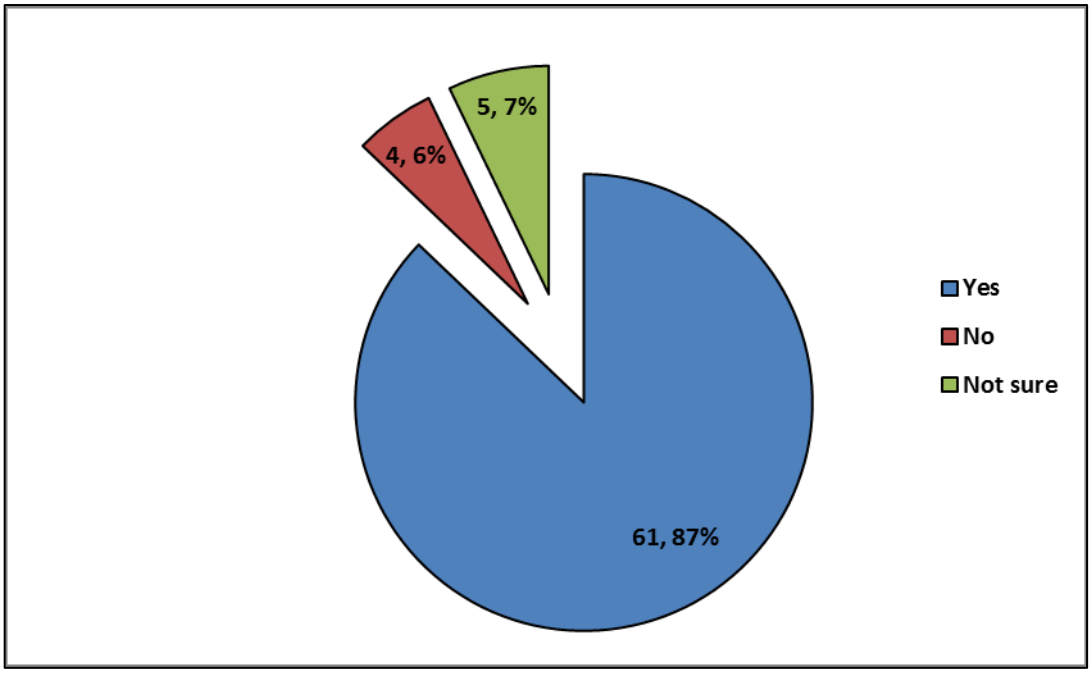

Figure 5. 7: Proper Implementation of Cost Management Practices

Source: Author (2021)

Further, the researcher wanted to determine how effectively project cost management practices are utilised on public construction contracts. The analysis of cost management practices was based on four areas specifically project cost planning, cost estimation, budgeting and cost control. Responses from the respondents are depicted by the means and standard deviations in table 5.14 below:

Table 5. 14: Project Cost Management Practices

S/n	Statement	Min.	Max.	Mean	Std. Deviation
1	Cost plan is well-defined before the project begins	1.00	5.00	4.23	0.89
2	Proper cost estimation is done to establish the entire project's cost before project begins	3.00	5.00	3.76	0.75
3	Accurate and reliable budget estimates are done to determine the required budget prior to contract commencement	1.00	5.00	3.83	1.02
4	Effective cost control systems exist on most projects	2.00	5.00	3.91	0.90
5	Adequate funding and financing exist on most contracts	1.00	5.00	4.17	0.88
6	Contracts are normally completed within the approved contract budget	3.00	5.00	4.47	0.61
	Average for Project Cost Management Practices			**4.06**	**0.84**

From table 5.14 above, the findings for project cost management practices in terms of defining the cost plan well before beginning the project indicated a mean of (m = 4.23) and standard deviation (Std. dev. = 0.89); proper cost estimation done to establish the entire project's cost before project begins indicated a mean of (m = 3.76) and standard deviation (Std. dev. = 0.75); accurate and reliable budget estimates done to determine the required budget prior to contract commencement indicated a mean of (m =3.83) and standard deviation (Std. dev. = 1.02); effective cost control systems exist on most projects indicated a mean of (m = 3.91) and standard deviation of (Std. dev. = 0.90); adequate funding and financing indicated a mean of (m = 4.17) and standard deviation (Std. dev. = 0.88) and contracts completed within the approved contract budget indicated a mean of (m = 4.47) and standard deviation (Std. dev. = 0.61). The average findings for project cost management practices revealed a mean of (m=4.06) and standard deviation (Std. dev. = 0.84).

The findings as indicated above imply that most of the respondents agreed to a fairly high extent that public contracts are normally completed within the approved budget, adequate funding and financing exists and the cost plan is well defined before the project commences. Overall, the findings imply that there is a fairly high practice of project cost management on public construction contracts in Lusaka District.

Table 5.15 below shows the extent to which project cost management practices influence contract performance in terms of completing the contract within schedules, stipulated budget, in accordance with specified requirements and contract deliverables meeting the client's specifications.

Table 5.15: Extent to which Project Cost Management influences contract performance measures

Performance Measure	**No extent**		**Low extent**		**Moderate extent**		**Great extent**		**Very great extent**	
	Count	***%***	***Count***	***%***	***Count***	***%***	***Count***	***%***	***Count***	***%***
Contract completed within schedule	0	0.0%	1	1.4%	16	22.9%	25	35.7%	28	40.0%
Contract completed within stipulated contract budget	1	1.4%	1	1.4%	12	17.1%	35	50.0%	21	30.0%
contract completed in accordance with specified quality requirements	0	0.0%	0	0.0%	21	30.0%	21	30.0%	28	40.0%
Contract deliverables	0	0.0%	0	0.0%	11	15.7%	32	45.7%	27	38.6%

meet Client's satisfaction										

Source: (Author, 2021)

The study sought to find out the extent to which project cost management had an influence on contract performance measures i.e. completing a contract within schedule, within the stipulated budget, in accordance with specified quality requirements and contract deliverables meeting the client's satisfaction. From the results obtained in Table 5.15 above, it was indicated that 28 (40.0%) of the respondents agreed that cost management practices had an influence on completing public construction contracts within schedule to a very great extent, 25 (35.7%) agreed to a great extent, 16 (22.9%) agreed to a moderate extent and 1 (1.4%) agreed to a low extent.

Additionally, 35 (50.0%) agreed to a great extent that cost management had an influence on completing construction contracts within the stipulated contract budget, 21 (30.0%) agreed to a very great extent, 12 (17.1%) agreed to a moderate extent, 1 (1.4%) to a low extent and 1 (1.4%) stated that there was no extent at all.

28 (40.0%) of the respondents agreed to a very great extent that cost management had an influence on completing construction contracts in accordance with specified quality requirements, 21 (30.0%) agreed to a great extent and another 21 (30.0%) agreed to a moderate extent.

With regards to the influence of cost management in ensuring that the project deliverables meet the client's satisfaction, the findings indicate that 32 (45.7%) of the respondents agreed to a great extent, 27 (38.6%) agreed to a very great extent and 11 (15.7%) agreed to a moderate extent.

Generally, the results obtained indicate that majority of the respondents agreed that cost management had an influence on the contract performance measures to a great extent.

Correlation between Cost Management and Contract Performance

In addition, the study sought to establish the correlation between cost management knowledge area practices and contract performance indicators. Therefore, table 5.16 below showed that overall, there was a weak negative correlation between a well-defined cost plan when a project begins and contract completed within schedule ($r=-0.125$, $p=0.303$); contract completed within stipulated budget ($r=-0.078$, $p= 0.518$); contract completed in accordance with

specified quality requirements (r=-0.129, p=0.288) and contract deliverables meet client's satisfaction (r= -0.177, p=0.142).

Further, the results revealed that there was a statistically significant correlation between proper cost estimation before the project begins and contract completed within schedule (r=.261, p=0.025); as well as with contract completed within stipulated contract budget (r=-261, p=0.029) at the 0.05 level (2-tailed).

Additionally, the results indicated a moderate negative relationship between the existence of effective cost control systems on most projects and the completion of a contract within the stipulated budget (r=-.416, p=0.000). The results also showed a statistically significant correlation between the two variables.

Generally, the results in Table 5.16 below indicated that there was a weak positive correlation between cost management practices and contracts completed within schedule and contract deliverables meeting client satisfaction. The results also showed that there was a weak negative correlation between project cost management practices and the contract completed within the stipulated budget and in accordance with specified quality requirements.

Table 5.16: Correlation between Cost Management and Contract Performance

Details		Cost plan is well-defined before the project begins	Proper cost estimation is done to establish the entire project's cost before project	Accurate and reliable budget estimates are done to determine the required budget prior to contract	Effective cost control systems exist on most projects	Adequate funding and financing exist on most contracts	Contracts are normally completed within the approved contract budget	Contract completed within schedule	Contract completed within stipulated contract budget	contract completed in accordance with specified quality requirements	Contract deliverables meet Client's satification
Cost plan is well-defined before the project begins	Pearson Correlation	1	-0.090	.444**	.244*	0.005	-.391**	-0.125	-0.078	-0.129	-0.177
	Sig. (2-tailed)		0.461	0.000	0.042	0.969	0.001	0.303	0.518	0.288	0.142
	N	70	70	70	70	70	70	70	70	70	70
Proper cost estimation is done to establish the entire project's cost before project begins	Pearson Correlation	-0.090	1	-0.055	-0.118	-0.002	.350**	.269*	-.261*	-0.168	0.052
	Sig. (2-tailed)	0.461		0.650	0.333	0.988	0.003	0.025	0.029	0.163	0.671
	N	70	70	70	70	70	70	70	70	70	70
Accurate and reliable budget estimates are done to determine the required budget prior to contract	Pearson Correlation	.444**	-0.055	1	-0.159	.354**	-0.031	0.099	-0.093	0.173	-0.146
	Sig. (2-tailed)	0.000	0.650		0.189	0.003	0.796	0.416	0.446	0.152	0.228
	N	70	70	70	70	70	70	70	70	70	70
Effective cost control systems exist on most projects	Pearson Correlation	.244*	-0.118	-0.159	1	-.347**	-.324**	-.416**	-0.112	-0.201	-0.083
	Sig. (2-tailed)	0.042	0.333	0.189		0.003	0.006	0.000	0.355	0.095	0.494
	N	70	70	70	70	70	70	70	70	70	70
Adequate funding and financing exist on most contracts	Pearson Correlation	0.005	-0.002	.354**	-.347**	1	0.171	0.125	-0.195	0.212	0.052
	Sig. (2-tailed)	0.969	0.988	0.003	0.003		0.156	0.301	0.106	0.079	0.666
	N	70	70	70	70	70	70	70	70	70	70
Contracts are normally completed within the approved contract budget	Pearson Correlation	-.391**	.350**	-0.031	-.324**	0.171	1	.415**	-0.202	-0.151	.286*
	Sig. (2-tailed)	0.001	0.003	0.796	0.006	0.156		0.000	0.094	0.212	0.016
	N	70	70	70	70	70	70	70	70	70	70
Contract completed within schedule	Pearson Correlation	-0.125	.269*	0.099	-.416**	0.125	.415**	1	-0.164	0.190	-0.182
	Sig. (2-tailed)	0.303	0.025	0.416	0.000	0.301	0.000		0.175	0.116	0.131
	N	70	70	70	70	70	70	70	70	70	70
Contract completed within stipulated contract budget	Pearson Correlation	-0.078	-.261*	-0.093	-0.112	-0.195	-0.202	-0.164	1	.268*	-0.174
	Sig. (2-tailed)	0.518	0.029	0.446	0.355	0.106	0.094	0.175		0.025	0.149
	N	70	70	70	70	70	70	70	70	70	70
contract completed in accordance with specified quality requirements	Pearson Correlation	-0.129	-0.168	0.173	-0.201	0.212	-0.151	0.190	.268*	1	-.236*
	Sig. (2-tailed)	0.288	0.163	0.152	0.095	0.079	0.212	0.116	0.025		0.049
	N	70	70	70	70	70	70	70	70	70	70
Contract deliverables meet Client's satification	Pearson Correlation	-0.177	0.052	-0.146	-0.083	0.052	.286*	-0.182	-0.174	-.236*	1
	Sig. (2-tailed)	0.142	0.671	0.228	0.494	0.666	0.016	0.131	0.149	0.049	
	N	70	70	70	70	70	70	70	70	70	70

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

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

5.4.2.4 Relationship between Quality Management and Contract Performance

The researcher wanted to establish if there is an adequate commitment by management and the project team to quality management on most construction contracts in Lusaka district. From figure 5.8 below, 60 (86%) of the respondents agreed that there was adequate commitment from management and the project team towards quality management practices, 3(4%) refuted and 7 (10%) were not sure.

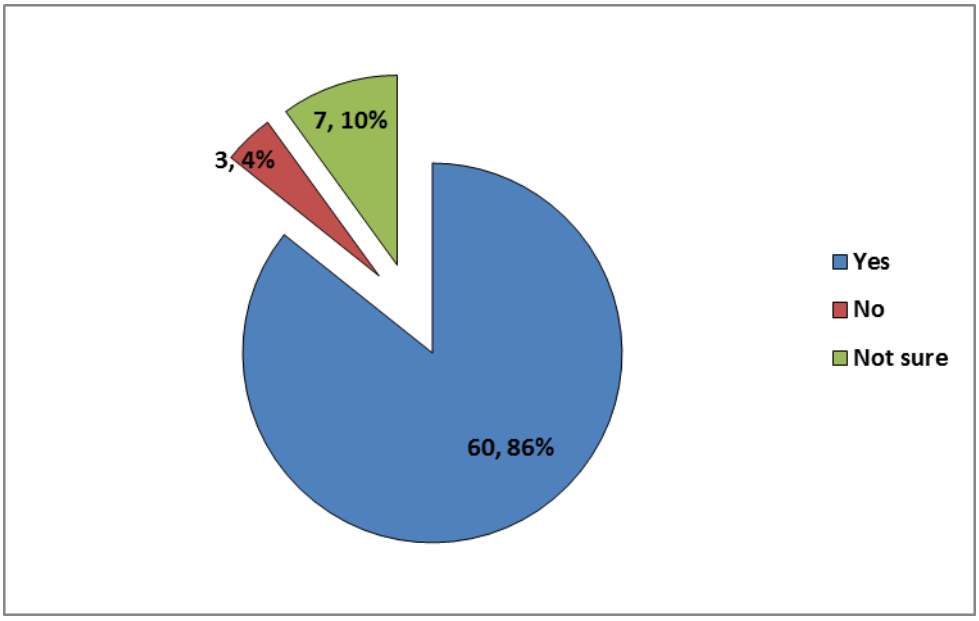

Figure 5. 8: Adequate Commitment by Management and the Project Team to Quality Management

Additionally, the researcher wanted to determine how effectively project quality management practices are utilised on public construction contracts. The analysis of quality management practices was based on four areas specifically the identification of quality requirements, quality inspection, quality monitoring and quality control. Responses from the respondents are depicted by the means and standard deviations in table 5.17 below:

Table 5. 17: Project Quality Management Practices

S/n	Statement	Min.	Max.	Mean	Std. Deviation
1	Quality requirements are well-identified before project commencement	2.00	5.00	4.11	0.88
2	Proper inspection of works at every construction stage to ensure they comply with standards	3.00	5.00	4.29	0.74
3	Frequent monitoring of quality activities to access performance	2.00	5.00	3.40	0.69
4	Effective quality control systems exist on most projects	2.00	5.00	3.60	0.69
5	Quality of works meet customer expectations	2.00	5.00	3.97	0.98
	Average for the Quality Management Practices			**3.87**	**0.80**

The findings for quality management practices as shown in Table 5.17 above in terms of well-defined quality requirements before project commencement indicated a mean of (m=4.11) and standard deviation (std. dev.=0.88); proper inspection of quality works at every construction stage to ensure compliance with standards indicated a mean of (m = 4.29) and standard deviation (Std. dev. = 0.74); frequent monitoring of quality activities indicated a mean of (m =3.40) and standard deviation (Std. dev. = 0.69); effective quality control systems in place indicated a mean of (m = 3.60) and standard deviation of (Std. dev. = 0.69); and quality of works meeting customer expectations indicated a mean of (m = 3.97) and standard deviation (Std. dev. = 0.98). The average findings for project quality management practices revealed a mean of (m=3.87) and standard deviation (Std. dev. = 0.80).

The findings as indicated above imply that most of the respondents agreed to a fairly high extent that quality requirements are well-defined before project commencement and that there is a proper inspection of works at every construction stage. Overall, the findings imply that there is a moderate practice of project quality management on public construction contracts in Lusaka District.

Further, the study wanted to establish the extent to which project quality management practices influence contract performance in terms of completing the contract within schedules, stipulated

budget, in accordance with specified requirements and contract deliverables meeting the client's specifications. The results were as indicated in Table 5.18 below:

Table 5.18: Extent to which Project Quality Management influences contract performance measures

Performance Measure	No extent		Low extent		Moderate extent		Great extent		Very great extent	
	Count	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*	*Count*	*%*
Contract completed within schedule	1	1.4%	4	5.7%	21	30.0%	22	31.4%	22	31.4%
Contract completed within stipulated contract budget	0	0.0%	8	11.4%	25	35.7%	24	34.3%	13	18.6%
contract completed in accordance with specified quality requirements	1	1.4%	1	1.4%	12	17.1%	34	48.6%	22	31.4%
Contract deliverables meet client's satisfaction	2	2.9%	1	1.4%	17	24.3%	37	52.9%	13	18.6%

From the results obtained in Table 5.18 above, it was indicated that 22 (31.4%) of the respondents agreed that quality management practices had an influence on completing public construction contracts within schedule to a very great extent, another 22 (31.4%) agreed to a great extent, 21 (30.0%) agreed to a moderate extent, 4 (5.7%) to a low extent and 1 (1.4%) to no extent.

Further, 25 (35.7%) agreed to a moderate extent that quality management had an influence on completing construction contracts within the stipulated contract budget, 24 (34.3%) agreed to a great extent, 13 (18.6%) agreed to a very great extent and 8 (11.4%) to a low extent.

34 (48.6%) of the respondents agreed to a great extent that quality management had an influence on completing construction contracts in accordance with specified quality requirements, 22 (31.4%)

agreed to a very great extent, 12 (17.1%) to a moderate extent, 1 (1.4%) to a low extent and another 1 (1.4%) stated to no extent.

With regards to the influence of quality management on ensuring that the project deliverables meet the client's satisfaction, the findings indicated that 37 (52.9%) of the respondents agreed to a great extent, 17 (24.3%) agreed to a moderate extent, 13 (18.6%) to a very great extent, 2 (2.9%) to no extent and 1 (1.4%) stated to a low extent.

Overall, the results obtained indicated that majority of the respondents agreed that quality management had an influence on the contract performance outcomes to a great extent.

Table 5. 19: Correlation between Quality Management and Contract Performance

Details		Quality requirements are well-identified before project commencement	Proper inspection of works at every construction stage to ensure they comply with standards	Frequent monitoring of quality activities to access performance	Effective quality control systems exist on most projects	Quality of works meet customer expectations	Contract completed within schedule	Contract completed within stipulated contract budget	contract completed in accordance with specified quality requirements	Contract deliverables meet client's satisfaction
Quality requirements are well-identified before project commencement	Pearson Correlation	1	-0.228	-0.101	.244*	-0.030	0.103	-.265*	-0.072	-0.168
	Sig. (2-tailed)		0.057	0.407	0.041	0.806	0.395	0.027	0.555	0.166
	N	70	70	70	70	70	70	70	70	70
Proper inspection of works at every construction stage to ensure they comply with standards	Pearson Correlation	-0.228	1	0.056	-.254*	0.051	-.260*	-0.126	0.061	.238*
	Sig. (2-tailed)	0.057		0.643	0.034	0.674	0.030	0.297	0.617	0.047
	N	70	70	70	70	70	70	70	70	70
Frequent monitoring of quality activities to access performance	Pearson Correlation	-0.101	0.056	1	-0.085	-0.155	-0.171	0.141	-.281*	0.143
	Sig. (2-tailed)	0.407	0.643		0.482	0.201	0.156	0.244	0.018	0.237
	N	70	70	70	70	70	70	70	70	70
Effective quality control systems exist on most projects	Pearson Correlation	.244*	-.254*	-0.085	1	0.047	.235*	-.392**	-0.153	-0.119
	Sig. (2-tailed)	0.041	0.034	0.482		0.697	0.050	0.001	0.205	0.328
	N	70	70	70	70	70	70	70	70	70
Quality of works meet customer expectations	Pearson Correlation	-0.030	0.051	-0.155	0.047	1	-0.170	-0.029	-0.088	-0.076
	Sig. (2-tailed)	0.806	0.674	0.201	0.697		0.159	0.812	0.471	0.534
	N	70	70	70	70	70	70	70	70	70
Contract completed within schedule	Pearson Correlation	0.103	-.260*	-0.171	.235*	-0.170	1	-0.032	-0.149	0.005
	Sig. (2-tailed)	0.395	0.030	0.156	0.050	0.159		0.793	0.219	0.968
	N	70	70	70	70	70	70	70	70	70
Contract completed within stipulated contract budget	Pearson Correlation	-.265*	-0.126	0.141	-.392**	-0.029	-0.032	1	-0.153	-0.033
	Sig. (2-tailed)	0.027	0.297	0.244	0.001	0.812	0.793		0.207	0.785
	N	70	70	70	70	70	70	70	70	70
contract completed in accordance with specified quality requirements	Pearson Correlation	-0.072	0.061	-.281*	-0.153	-0.088	-0.149	-0.153	1	0.059
	Sig. (2-tailed)	0.555	0.617	0.018	0.205	0.471	0.219	0.207		0.626
	N	70	70	70	70	70	70	70	70	70
Contract deliverables meet client's satisfaction	Pearson Correlation	-0.168	.238*	0.143	-0.119	-0.076	0.005	-0.033	0.059	1
	Sig. (2-tailed)	0.166	0.047	0.237	0.328	0.534	0.968	0.785	0.626	
	N	70	70	70	70	70	70	70	70	70

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

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

Correlation between Quality Management and Contract Performance

Additionally, the study sought to establish the correlation between quality management knowledge area practices and contract performance indicators. Therefore, table 5.19 above showed that there generally was a weak negative correlation between well-identified quality requirements before project commencement and contract completed within stipulated budget (r=-.265, p=0.027), contract completed in accordance with specified quality requirements (r=-0.072, p=0.555) and contract deliverables meet client's satisfaction (r=-0.168, p=0.166). Also, the results indicated that there was a statistically significant relationship between well-identified quality requirements before project commencement and contract completed within stipulated budget at the level 0.05 (2-tailed).

Further, the results revealed that there was a statistically significant correlation between proper inspection of works at every construction stage and contract completed within schedule with a weak negative correlation (r=-.260, p=0.030); as well as with contract deliverables meet client's satisfaction with a weak positive relationship (r=.238, p=0.047) at the 0.05 level (2-tailed).

The results revealed a statistically significant relationship between frequent monitoring of quality activities and contract completed in accordance with specified quality requirements (r=-.281, p=0.018) at the level 0.05 (2-tailed).

The results showed a moderate negative relationship between effective quality control systems exist on most projects and contract completed within stipulated budget (r-.392, p=0.001); and a weak negative correlation with contract completed in accordance with specified quality requirements (r=-0.153, p=0.205) and contract deliverables meet client's satisfaction (r=-0.119, p=0.328).

Overall, the results as indicated in Table 5.19 above revealed that there was a weak negative relationship between project quality management practices and all the contract performance measures i.e. with regards to completing the contract within schedule, stipulated budget, in accordance with specified quality requirements and contract deliverables meeting client satisfaction.

5.4.2.5 Relationship between Risk Management and Contract Performance

The researcher wanted to establish if there is proper implementation of effective risk management strategies on most construction contracts in Lusaka district. From figure 5.9 below, 65(93%) of the respondents agreed that there was proper implementation of effective risk management strategies, 3(4%) refuted and 2 (3%) were not sure.

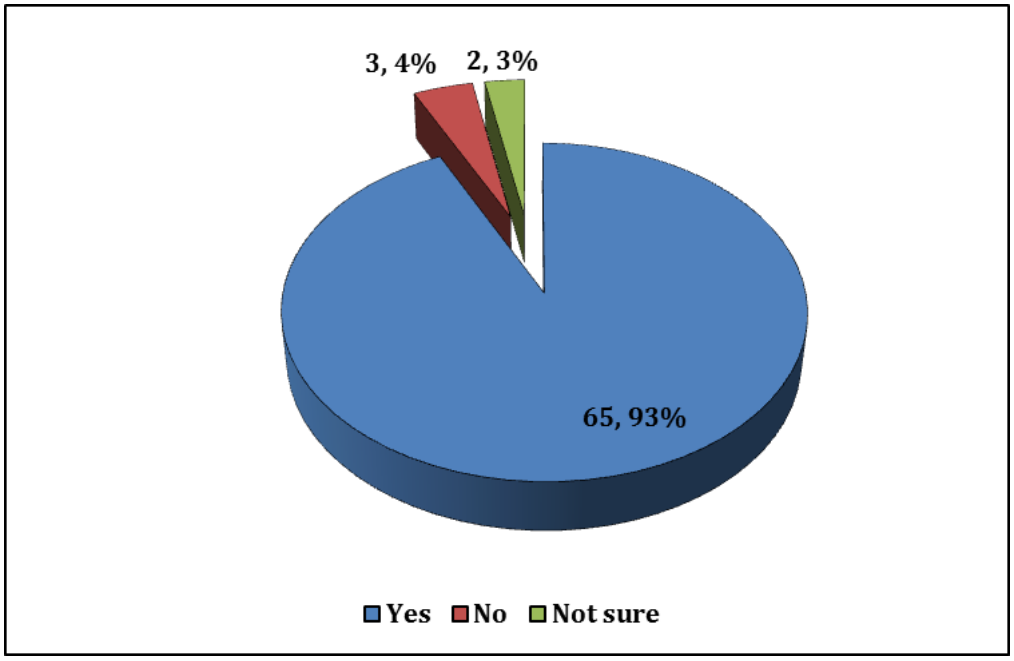

Figure 5. 9: Proper Implementation of Effective Risk Management Strategies

In addition, the researcher wanted to determine how effectively project risk management practices are utilised on public construction contracts. The analysis of risk management practices was based on five main areas specifically risk planning, risk identification, risk analysis, risk monitoring and risk control. Responses from the respondents are depicted by the means and standard deviations in table 5.20 below:

Table 5. 20: Project Risk Management Practices

S/n	Statement	Min.	Max.	Mean	Std. Deviation
1	Adequate project risk planning	1.00	5.00	2.70	0.98
2	Proper risk identification strategies are in place	1.00	5.00	3.90	0.71
3	There is adequate risk analysis	1.00	5.00	3.67	0.85
4	Contracts give clear guides on risk allocation and responsibilities of contract parties and those involved	1.00	4.00	2.40	1.10
5	Effective and appropriate risk responses in place	1.00	4.00	2.40	0.92
6	Adequate and effective risk monitoring	1.00	4.00	2.29	0.85
7	Effective risk control techniques	1.00	5.00	3.90	1.19
8	Proper risk communication between contract parties and those involved	1.00	5.00	2.71	1.01
	Average for the Risk Management Practices			**3.00**	**0.95**

Source: Author (2021)

The findings for risk management practices as shown in Table 5.20 above in terms of adequate project risk planning indicated a mean of (m=2.70) and standard deviation (std. dev.=0.98); proper risk identification strategies in place indicated a mean of (m = 3.90) and standard deviation (Std. dev. = 0.71); adequate risk analysis indicated a mean of (m =3.67) and standard deviation (Std. dev. = 0.85); contracts give clear guides on risk allocation and responsibilities of contract parties and those involved indicated a mean of (m = 2.40) and standard deviation of (Std. dev. = 1.10); effective and appropriate risk responses in place indicated a mean (m=2.40) and standard deviation (Std. dev. = 0.92), adequate and effective risk monitoring showed a mean of (m=2.29) and standard deviation (Std. dev.=0.85), whilst effective risk control techniques indicated a mean of (m=3.90) and standard

deviation (Std. dev. = 1.19) and proper communication between contract parties and those involved indicated a mean of (m = 2.71) and standard deviation (Std. dev. = 1.01). The average findings for project risk management practices revealed a mean of (m=3.00) and standard deviation (Std. dev. = 0.95).

The findings as indicated above imply that most of the respondents agreed to a low extent that there is adequate risk planning, contracts give clear guides on risk allocation, effective and appropriate risk response and risk monitoring in place and proper risk communication. On the other hand, the results revealed that there is a moderate practice of proper risk identification, adequate risk analysis and effective risk control techniques. Overall, the findings imply that there is a low practice of proper project risk management on public construction contracts in Lusaka District.

Additionally, the study sought to establish the extent to which project risk management practices influence contract performance in terms of completing the contract within schedules, stipulated budget, in accordance with specified requirements and contract deliverables meeting the client's specifications. The results were as indicated in Table 5.21 below:

Table 5.21: Extent to which Project Risk Management influences contract performance measures

Performance Measure	No extent		Low extent		Moderate extent		Great extent		Very great extent	
	Count	***%***	***Count***	***%***	***Count***	***%***	***Count***	***%***	***Count***	***%***
Contract completed within schedule	19	27.1%	4	5.7%	17	24.3%	21	30.0%	9	12.9%
Contract completed within stipulated contract budget	1	1.4%	10	14.3%	22	31.4%	30	42.9%	7	10.0%
contract completed in accordance with specified quality requirements	2	2.9%	2	2.9%	15	21.4%	23	32.9%	28	40.0%
Contract deliverables meet client's satisfaction	2	2.9%	12	17.1%	26	37.1%	23	32.9%	7	10.0%

Source: Author (2021)

From the results obtained in Table 5.21 above, it was indicated that 21 (30.0%) of the respondents agreed that risk management practices had an influence on completing public construction contracts within schedule to a great extent, 19 (27.1%) agreed to no extent, 17 (24.3%) agreed to a moderate extent, 9 (12.9%) to a very great extent and 4 (5.7%) to a low extent.

Further, 30 (42.9%) agreed to a great extent that risk management had an influence on completing construction contracts within the stipulated contract budget, 22 (31.4%) agreed to a moderate extent, 10 (14.3%) agreed to a low extent and 1 (1.4%) to no extent.

28 (40.0%) of the respondents agreed to a very great extent that risk management had an influence on completing construction contracts in accordance within specified quality requirements, 23 (32.9%) agreed to a great extent, 15 (21.4%) to a moderate extent, 2(2.9%) to a low extent and another 2 (2.9%) stated to no extent.

With regards to the influence of risk management on ensuring that the project deliverables meet the client's satisfaction, the findings indicated that 26 (37.1%) of the respondents agreed to a moderate extent, 23 (32.9%) agreed to a great extent, 12 (17.1%) to a low extent, 2 (2.9%) to no extent and 7 (10.0%) stated to a very great extent.

Generally, the results obtained indicated that majority of the respondents agreed that risk management had an influence on the contract performance outcomes to a great extent.

Table 5.22: Correlation between Risk Management and Contract Performance

Details		Adequate project risk planning	Proper risk identification strategies are in place	There is adequate risk analysis	Contracts give clear guides on risk allocation and responsibilities of contract parties and those involved	Effective and appropriate risk responses in place	Adequate and effective risk monitoring	Effective risk control techniques	Proper risk communication between contract parties and those involved	Contract completed within schedule	Contract completed within stipulated contract budget	contract completed in accordance with specified quality requirements	Contract deliverables meet client's satisfaction
Adequate project risk planning	Pearson Correlation	1	0.040	0.019	-.277*	-0.089	-.328**	-0.100	0.058	0.032	-0.055	-0.164	.339**
	Sig. (2-tailed)		0.744	0.875	0.020	0.462	0.006	0.410	0.631	0.790	0.651	0.176	0.004
	N	70	70	70	70	70	70	70	70	70	70	70	70
Proper risk identification strategies are in place	Pearson Correlation	0.040	1	.406**	-.323**	-0.049	0.048	-0.184	-0.163	-.311**	0.185	0.088	0.151
	Sig. (2-tailed)	0.744		0.000	0.006	0.687	0.692	0.127	0.178	0.009	0.126	0.466	0.213
	N	70	70	70	70	70	70	70	70	70	70	70	70
There is adequate risk analysis	Pearson Correlation	0.019	.406**	1	-0.138	-0.108	0.092	-0.133	-0.095	-0.134	0.122	0.017	0.051
	Sig. (2-tailed)	0.875	0.000		0.256	0.375	0.450	0.271	0.436	0.270	0.313	0.890	0.673
	N	70	70	70	70	70	70	70	70	70	70	70	70
Contracts give clear guides on risk allocation and responsibilities of contract parties and those involved	Pearson Correlation	-.277*	-.323**	-0.138	1	.370**	0.015	.352**	0.210	.547**	-0.113	0.090	-.497**
	Sig. (2-tailed)	0.020	0.006	0.256		0.002	0.899	0.003	0.081	0.000	0.351	0.458	0.000
	N	70	70	70	70	70	70	70	70	70	70	70	70
Effective and appropriate risk responses in place	Pearson Correlation	-0.089	-0.049	-0.108	.370**	1	0.092	.274*	0.140	0.058	-0.169	.515**	-0.185
	Sig. (2-tailed)	0.462	0.687	0.375	0.002		0.449	0.022	0.248	0.634	0.163	0.000	0.126
	N	70	70	70	70	70	70	70	70	70	70	70	70
Adequate and effective risk monitoring	Pearson Correlation	-.328**	0.048	0.092	0.015	0.092	1	.242*	-0.156	-0.122	0.090	0.138	-0.123
	Sig. (2-tailed)	0.006	0.692	0.450	0.899	0.449		0.044	0.197	0.313	0.457	0.253	0.311
	N	70	70	70	70	70	70	70	70	70	70	70	70
Effective risk control techniques	Pearson Correlation	-0.100	-0.184	-0.133	.352**	.274*	.242*	1	-0.108	0.230	-0.184	0.186	-0.224
	Sig. (2-tailed)	0.410	0.127	0.271	0.003	0.022	0.044		0.372	0.055	0.128	0.123	0.062
	N	70	70	70	70	70	70	70	70	70	70	70	70
Proper risk communication between contract parties and those involved	Pearson Correlation	0.058	-0.163	-0.095	0.210	0.140	-0.156	-0.108	1	.338**	0.175	0.156	0.074
	Sig. (2-tailed)	0.631	0.178	0.436	0.081	0.248	0.197	0.372		0.004	0.146	0.197	0.542
	N	70	70	70	70	70	70	70	70	70	70	70	70
Contract completed within schedule	Pearson Correlation	0.032	-.311**	-0.134	.547**	0.058	-0.122	0.230	.338**	1	0.151	-0.184	0.105
	Sig. (2-tailed)	0.790	0.009	0.270	0.000	0.634	0.313	0.055	0.004		0.212	0.127	0.386
	N	70	70	70	70	70	70	70	70	70	70	70	70
Contract completed within stipulated contract budget	Pearson Correlation	-0.055	0.185	0.122	-0.113	-0.169	0.090	-0.184	0.175	0.151	1	-0.229	0.138
	Sig. (2-tailed)	0.651	0.126	0.313	0.351	0.163	0.457	0.128	0.146	0.212		0.057	0.255
	N	70	70	70	70	70	70	70	70	70	70	70	70
contract completed in accordance with specified quality requirements	Pearson Correlation	-0.164	0.088	0.017	0.090	.515**	0.138	0.186	0.156	-0.184	-0.229	1	-0.193
	Sig. (2-tailed)	0.176	0.466	0.890	0.458	0.000	0.253	0.123	0.197	0.127	0.057		0.109
	N	70	70	70	70	70	70	70	70	70	70	70	70
Contract deliverables meet client's satisfaction	Pearson Correlation	.339**	0.151	0.051	-.497**	-0.185	-0.123	-0.224	0.074	0.105	0.138	-0.193	1
	Sig. (2-tailed)	0.004	0.213	0.673	0.000	0.126	0.311	0.062	0.542	0.386	0.255	0.109	
	N	70	70	70	70	70	70	70	70	70	70	70	70

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Correlation between Risk Management and Contract Performance

Further, the study sought to establish the correlation between risk management knowledge area practices and contract performance measures. Therefore, table 5.22 above showed that there was a weak positive correlation between adequate project risk planning and contract completed within schedule (r=0.032, p=0.790) and a weak negative correlation with contract completed within stipulated budget (r= -0.055, p= 0.651) and contract completed in accordance with specified quality requirements (r=-0.164, p=0.176). Further, the results indicated a moderate positive relationship between the aforementioned risk management practice and contract deliverables meeting client's satisfaction (r=.339, p=0.004). Also, the results indicated that there was a statistically significant relationship between adequate project risk planning and contract deliverables meeting client's satisfaction at the level 0.01 (2-tailed).

Further, the results revealed that there was a moderately negative correlation between proper risk identification strategies and contracts completed within schedule (r=-.311, p=0.009), the results also showed a statistically significant relationship between the two variables at the level 0.01 (2-tailed).

The results indicated a strong positive correlation between contracts giving clear guides on risk allocation and responsibilities of contract parties and those involved and contract completed within schedule (r=.547, p=0.000). There was another strong positive relationship between effective and appropriate risk responses in place and contract completed in accordance with specified quality requirements (r=.515, p=0.000). The results also indicated a statistically significant relationship at the level 0.01 (2-tailed).

Overall, the results as indicated in Table 5.22 above revealed that there was a weak positive correlation between project risk management practices and contract performance measures with regards to completing the contract within schedule, budget and in accordance with specified quality requirements. However, the results revealed a weak negative relationship between risk management practices and contract deliverables meeting client satisfaction.

5.4.3 Framework for the Integration of the Five Project Management Knowledge Area Techniques to enhance Contract Performance

The study sought to establish how the respondents would rate the performance of the majority of public construction contracts in Lusaka District based on the four (4) contract performance measures i.e. contract completed within schedule, contract completed within stipulated contract budget, contract completed in accordance with specified quality requirements and contract deliverables meet client's satisfaction. From the questionnaire designed, respondents were required to rate their degree of agreement or disagreement by indicating the appropriate option on a five (5) point Likert scale. The options as indicated on the scale were (1-Very poor, 2-Poor, 3-Satisfactory, 4-Good and 5-Excellent). The results were as indicated in Table 5.23 below:

Table 5.23: Performance of Public Construction Projects in Lusaka District

Performance Measure	**Very poor**		**Poor**		**Satisfactory**		**Good**		**Excellent**	
	Freq.	***%***	***Freq.***	***%***	***Freq.***	***%***	***Freq.***	***%***	***Freq.***	***%***
Contract completed within Schedule	3	4.3%	3	4.3%	17	24.3%	35	50.0%	12	17.1%
Contract completed within stipulated budget	1	1.4%	7	10.0%	28	40.0%	26	37.1%	8	11.4%
Contract completed in accordance with specified quality requirements	3	4.3%	10	14.3%	12	17.1%	36	51.4%	9	12.9%
Contract deliverables meet client's satisfaction	1	1.4%	7	10.0%	20	28.6%	32	45.7%	10	14.3%

The findings as indicated in Table 5.23 above showed that 35 (50.0%) of the respondents agreed that there was a good completion of a majority of construction contracts in Lusaka

district within schedule, 17 (24.3%) agreed to a satisfactory extent, 12 (17%) agreed to an excellent extent, 3 (4.3%) agreed to a poor extent and another 3(4.3%) agreed to a very poor extent.

28 (40.0%) of the respondents agreed that majority of construction contracts in Lusaka districts were completed within the stipulated contract budget to a satisfactory extent, 26 (37.1%) agreed to a good extent, 8(11.4%) agreed to an excellent extent, 7(10.0%) agreed to a very poor extent and 1(1.4%) agreed to a poor extent.

Further, 36 (51.4%) of the respondents agreed that majority of construction contracts in Lusaka are completed in accordance with specified quality requirements to a good extent, 12(17.1%) agreed to a satisfactory extent, 10(14.3%) agreed to a poor extent, 9 (12.9%) to an excellent extent and 3(4.3%) agreed to a very poor extent.

With regards to contract deliverables meeting client's satisfaction, 36(51.4%) of the respondents agreed to a good extent, 12(17.1%) agreed to a satisfactory extent, 10(14.3%) to a poor extent, 9(12.9%) to an excellent extent and 3(4.3%) agreed to a very poor extent.

Overall, many of the respondents agreed that a majority of public construction contracts within Lusaka district were completed within schedule, stipulated budget and in accordance with specified quality requirements to a good extent.

In addition, the study sought to develop a framework for the integration of the five project management knowledge area techniques to enhance contract performance. As such, the respondents were requested to rate their degree of agreement or disagreement with the statements on project management knowledge area practices that may enhance the performance of public construction contracts in Lusaka and responses were given as distributed in Table 5.24 below.

The findings as shown in Table 5.24 below in terms of both client and contractor negotiating and agreeing on the contract type (model) that best fits the nature of the project indicated a mean of (m=5.00) and standard deviation (std. dev. =0.00), a well-established project management plan indicated a mean of (m=4.07) and standard deviation (std. dev. = 0.69), proper coordination of project activities and communication between the project team showed a mean of (m=4.91) and standard deviation (std. dev. = 0.28).

Further, the results showed that proper articulation and identification of the project's needs and requirements indicated a mean (m=4.39) and standard deviation (Std. dev. = 0.77),

having a detailed and realistic work breakdown structure for site supervisors to properly coordinate and follow project activities showed a mean (m=4.30) and standard deviation (Std. dev. =0.57), regular and frequent inspection of construction works indicated a mean (m= 4.71) and standard deviation (Std. dev. = 0.70).

Overall, the results indicated a mean (m = 4.71) and standard deviation (Std. dev. = 0.63), this implies that majority of the respondents agreed with the statements on the project management knowledge areas practices which may enhance the performance of public construction contracts in Lusaka district.

Table 5.24: Enhancement of Contract Performance on Public Construction Contracts in Lusaka District

S/n	Statement	Min.	Max.	Mean	Std. Deviation
1	Both client and contractor are to negotiate and agree on the contract type (model) that best fits the nature of the construction project	5.00	5.00	5.00	0.00
2	A well-established project management plan can outline how to achieve the contract's objectives hence enhancing contract performance	2.00	5.00	4.07	0.69
3	There should be proper coordination of project activities and communication between the project team (relevant parties)	4.00	5.00	4.91	0.28
4	There should be proper articulation and identification of the project's needs and requirements and these effectively communicated to the project team during project planning to reduce changes during contract execution	2.00	5.00	4.39	0.77
5	There should be a clear definition of the contract's scope, objectives and deliverables	2.00	5.00	4.43	0.81
6	There should be a detailed and realistic work breakdown (WBS) for site supervisors to properly coordinate and follow project activities	3.00	5.00	4.30	0.57
7	There should be regular and frequent inspection of construction works	2.00	5.00	4.71	0.70
8	Timely review of status reports during contract execution	2.00	5.00	4.07	0.69
9	Adequate utilization of cost estimation and budgeting techniques	3.00	5.00	4.89	0.36
10	There should be proper and effective cost progress monitoring and control	2.00	5.00	4.33	0.77
11	Adequate utilization of quality monitoring and control techniques to access quality performance	1.00	5.00	4.16	1.06
12	Properly implement quality control procedures	2.00	5.00	4.14	0.64
13	Contract team should adequately identify all inherent risks	2.00	5.00	4.11	0.71
14	There should be proper allocation of risks between contract parties	3.00	5.00	4.66	0.63
15	There should be adequate risk response planning and effective risk monitoring techniques utilized	2.00	5.00	4.27	0.76
Average				**4.43**	**0.63**

Source: Author (2021)

5.5 Qualitative Data Analysis

In a quest to get detailed information on the relationship between the five project management knowledge areas and contract performance, interviews were conducted with key informants using a semi-structured interview guide. The results were as obtained below:

5.5.1 Impression of the performance of public construction contracts around Lusaka

The researcher sought to assess the impression of the respondents on the performance of public construction contracts around Lusaka and most of them stated that the performance was fair; however, there was need to improve the utilization of certain knowledge areas in the quest to better the performance of construction projects around Lusaka. A few responses were as follows:

"Currently the performance of most construction contracts around Lusaka is okay, we can see on our own how Lusaka has drastically changed where infrastructure is concerned this entails that we are heading in the right direction as a country"

Another respondent added*" we are not far behind but getting there, although we still have a long way to go as a nation, particularly in Lusaka*"

"It is vivid that the construction industry in Lusaka is doing fine. There has been a major improvement in the performance of the industry compared to the recent past, this is something we can't even argue about because even local contractors are doing their best to ensure that we are up to standard but this does not mean there is no room for improvement" another participant affirmed.

5.5.2 More effective knowledge area

Further, the study sought to establish if certain project management knowledge areas contribute more (are more effective) to achieving desirable performance outcomes than others. Most of the respondents affirmed that some knowledge areas are more effective in achieving desired performance outcomes than others.

"*It's normal, whenever we have two or more options, definitely other options will be more effective than others so some knowledge areas are more effective in achieving desired performance outcomes than others"* a participant stated

"Yes, some are more effective than others, this depends on the needs of the organisation at that particular time, "another participant mentioned

5.5.3 Major Project Management Knowledge Areas

When requested to state five major (key) knowledge areas they felt contributed the most to achieving desirable construction contract performance outcomes. The knowledge areas indicated to be more effective in attaining desired performance outcomes were integration management, cost management, communication management, procurement management and risk management.

"Cost and risk communication are very cardinal in every project hence this should not be omitted in the project management. A project which does not put into consideration the analysis of risks and cost is already a failed project" a participant stated

Another one added *"communication, procurement, cost management are key to me because these are key areas of the project*"

5.5.4 Project Management Knowledge Areas influence on Contract Performance

The respondents were requested to elaborate to what extent they felt the application of PMKA's influenced the performance of construction contracts. Participants observed that project management knowledge areas play a positive influential role on any project.

"*You can't run a project without knowing or mastering the key project management knowledge areas, these are what defines a project*" he mentioned

Another one added" *they are key because they drive a project*"

5.5.5 Utilization of Project Management Knowledge Areas.

Participants advised that there is need for thorough education and orientation of upcoming project managers on project management knowledge areas. Others suggested having symposiums just to keep each other updated so as to enhance linkages and connections between project managers from different companies.

"*Training and workshops on project management knowledge areas can be of help, you know most of us who are project managers today, left school a long time ago we just work using experience*" a participant narrated.

"Experience is a key factor in knowing how to utilize the knowledge areas. It is essential that project managers get as much exposure to a wide range of project phases and the challenges that might arise, this way it is much easier to identify which knowledge area to utilize or prioritize in order to rectify a situation" another participant highlighted

On the other hand, the participants suggested that there is need for construction firms, particularly locally owned firms to invest in project management softwares as this will greatly help in ensuring that there is effective and proper management of key project management knowledge areas.

5.6 Conclusion

This chapter provides the presentation and analysis of findings obtained from the questionnaires and interviews conducted based on the three research objectives. The first part gave the quantitative analysis for the findings based on the relationship between the five project management knowledge areas and contract performance of public construction contracts. The results were mostly obtained using a five-point Likert scale to test the respondents' degree of agreement or disagreement; further, the study utilized Correlation analysis to determine the relationship between the independent and dependent variables. Pearson's coefficient was used to determine the strength of the relationship between the independent and dependent variables.

The study also used qualitative analysis to present the findings from the interview guide by analysing the content obtained from the semi-structured interviews. The findings from this chapter were used as a guide for the development of a framework for the integration of the five project management knowledge area techniques to enhance the performance of public construction contracts in Lusaka district.

CHAPTER SIX

DISCUSSION AND ANALYSIS OF RESULTS

6.1 Introduction

This chapter focuses on discussing the key findings of the study whose focus was to assess the relationship between five project management knowledge areas and contract performance in the construction industry. The discussion shall be in line with the specific study objectives earlier outlined.

6.2 Discussion of Findings

This section provides a comprehensive discussion of the research findings by comparing the results obtained with the literature earlier reviewed in chapter two. The discussions of the main findings indicated below were presented following the order of the research objectives.

6.2.1 The Five Most Effective Project Management Knowledge Areas

The study established that project management knowledge areas played a critical role in achieving desired construction performance outcomes and that the appropriate application of these knowledge areas helped to enhance the performance of construction contracts. These findings were in line with (Demirkesen and Ozorhon, 2017) that construction project performance relies on different dimensions of project management, among those project management knowledge areas are of paramount importance. According to (Najmi, 2011) project management is designed to control the main important elements that provide practical information for effectively achieving project objectives. Project management is a whole system of knowledge essential for the effective management of projects especially in the construction industry (Unegbu *et al.*, 2020). Muller and Turner (2001) opined that project management knowledge areas are used as a reference to review projects and project management execution as such, identification of weakly executed knowledge areas allows for focusing on improvement activities. Novy *et al.*, (2012) also indicated that appropriately used methods of project management are able to meet all project needs and requirements. According to (Zwikael, 2009) careful application of the knowledge areas to projects enhances the achievement of the project outcome.

Further, the study revealed that some (individual) knowledge areas were more effective in attaining desired performance outcomes. Hwang and Ng, (2013) stated that although project management knowledge areas are interrelated, they are defined separately from the project

management perspective and each knowledge area contains processes that need to be accomplished within its discipline to achieve an effective project management program and produce the required outcome. Ibrahim *et al.*, (2019) stated that individual project management knowledge areas have the potential to contribute to the success of a project whilst equally interacting with each other. They further stated that enhanced project success can be accomplished by focusing on individual constructs of project management knowledge areas. Nonetheless, the dependence of the ten KAs on each other is very probable thus the importance of one KA does not completely negate the importance of the other (Mahmoudi *et al.*, 2020).

The study also revealed that the five project management knowledge areas considered being the most effective in achieving the desired performance outcomes using the quantitative data were Scope Management, Cost Management, Integration Management, Quality Management and Schedule and Resource Management which both had the same score. Conversely, the qualitative data revealed that Integration Management, Cost Management, Communication Management, Risk Management and Procurement Management were the most effective knowledge areas. To this effect, the study established that some KA areas were perceived to be more effective in achieving desired performance outcomes than others. However, the level of importance was based on the needs of the project (organisation) or those of the project manager. This was in line with (Banaitiene and Banaitis, 2012) who opined that although the knowledge areas are all equally important, in practice a project manager might determine the key areas which are of significance and that will have the greatest effect/impact on the outcome of the project. Zwikael, (2009) stated that most project managers tend to have limited time in which to perform all the processes outlined in the PMBOK Guide as such they may tend to choose to perform only those processes they are familiar with or perceive to have a greater impact on the success of a project. He further indicated that the scope of effective knowledge areas required for managing projects were influenced by the context of the industry in which the project manager works. Durdyev *et al.*, (2017) showed that cost, quality and schedule management were considered to be the most significant aspect of construction management and some of the main drivers of construction project success in Cambodia. Hwang and Ng, (2013) in their study identified scheduling and planning management as the most significant knowledge for construction projects while cost, quality, human resource and communication management were the second most significant knowledge areas. Alshami, (2018) opined that integration management was one of the most effective KAs in construction projects as it incorporates all the other knowledge areas. Dogbegah *et al.*,(2011) identified human resource, communication, financial resource, risk, quality; and procurement management as the key KAs forming the

basis for lateral project management training requirements in the Ghanaian construction industry. Similarly in Zambia, (Tembo-Silungwe and Khatleli, 2017) stated that the KAs that account for over 50 percent of performance in the Zambian construction industry are cost, procurement, scope and integration management. Based on majority response, this study adopted the knowledge areas identified using the quantitative data i.e. Scope Management, Cost Management, Integration Management, Quality Management and Schedule and Resource Management as being the most effective project management knowledge areas required to achieve desired performance outcomes.

6.2.2 The Relationship between Five Project Management Knowledge Areas and Contract Performance

The study sought to understand the relationship between each knowledge area and the performance of construction contracts. The knowledge areas of focus were project integration management, scope management, cost management, quality management and risk management.

6.2.2.1 Relationship between Integration Management and Contract Performance

The study established that there was a weak positive linear relationship between project integration management practices and contract performance measures i.e. completing a project within schedule, stipulated budget and in accordance with quality requirements. This implies that as emphasis is placed on executing integration management practices, contract performance in terms of completing a construction contract within schedule, stipulated budget and in accordance with quality requirements tend to increase since they are directly proportional. These findings were in line (Mitropoulos and Tatum, 2000) who in their investigation showed that the degree of project integration affects the performance of construction projects. The findings were also in tandem with (O'Connor and Yang, 2004) who opined that construction firms attempt to improve project performance by adopting integration and automation technology; their study revealed that utilizing integration technology may make a significant contribution to a project's cost and schedule success. Chou *et al.*, (2013) highlighted that to complete a project that successfully meets customer and stakeholder requirements and expectations, project managers must effectively integrate unifying, consolidating, articulating and integrating actions.

Nguyen *et al.*, (2020) revealed that integration management was significant in determining stakeholders' satisfaction. They opined that integration management should be emphasised not

only to ensure client satisfaction but to also improve project performance. However, the study revealed that there was a weak negative relationship between integration management practices and the contract deliverables meeting the client's satisfaction. As such the negative relationship should imply that inadequate emphasis on some integration management practices was likely to increase the chance of the contract deliverables not meeting the clients' satisfaction.

6.2.2.2Relationship between Scope Management and Contract Performance

The study established that there was a weak positive correlation between project scope management practices and completing a contract within schedule and contract deliverables meeting client's satisfaction. Thus implying that though to a weak extent, an increase in the implementation of scope management practices during the execution of a construction contract tends to increase the chances of completing a contract within schedule and meeting the client's satisfaction and vice versa. These findings were in tandem with (Unegbu *et al.*, 2020) who showed that scope management positively influences project performance and customer satisfaction, implying that improving scope management will improve project performance and customer satisfaction. Mirza *et al.*, (2013) opined that a rigorous scope is a factor that is necessary for meeting the owner's needs and thus attaining success. Alinaitwe *et al*., (2013) also stated that changes to the scope of work was found to be one of the most important causes of delays and cost overruns in the Ugandan construction industry; they further state that there is a relationship between the schedule, the scope of work and project conditions.

A discrete scope helps stakeholders involved in a project to stay on the same page throughout the project lifespan, when the project scope is clearly defined, effectively managed and communicated to project stakeholders, it safeguards the project from potential performance issues (Abdilahi *et al*., 2020).

On the other hand, it was established that there was a weak negative correlation between scope management practices and construction contracts being completed within the stipulated budget and in accordance with specified quality requirements. The negative correlation would imply that poor implementation of scope management practices on construction contracts would likely increase the chances of completing a contract beyond budget and not in accordance with the specified quality requirements. Khan, (2006) stated that in essence, effective project scope management ensures the successful management of other key project management areas, including time, cost and quality. Al-rubaiei *et al.*, (2016) indicated that a failure or uncertainty in the project scope is directly reflected in the cost, time and quality of the project. According to (Ling *et al.*, 2008) certain scope management practices can be used to predict owner

satisfaction, profit margin and cost and quality performance of the construction project. The results were also in line with (Banda and Pretorius, 2016) who stated that well-defined projects tended to exhibit good project performance indicators whilst those that were poorly defined tended to exhibit poor project performance indicators. Further, Kaliba, (2010) and Muya *et al.*, (2013) identified scope changes to be one of the major causes of cost escalations in Zambian construction projects.

6.2.2.3 Relationship between Cost Management and Contract Performance

The research established that there was a weak positive relationship between cost management practices and contracts being completed within schedule, as well as with contract deliverables meeting client's satisfaction. This implies that though to a weak extent, an increase in the implementation of effective cost management practices tends to enhance the chances of completing a construction contract within schedule and meeting clients' satisfaction. These findings collaborated with (Yang, 2018) who stated that cost management's Earned Value Management (EVM) techniques provide the construction project team with opportunities to be visible to the cost and schedule issues, to be specific, to predict the delivery time and the actual cost comparing to the schedule and the contract, in order to reduce uncertainty. He further stated that the use of EVM helps the project team highlight schedule and cost issues early, predict future trends, ensure that the project team has sufficient time to take corrective action on identified issues as well as make more accurate budgets and schedules; it also enables the construction project team make a more accurate scope and compare key factors in the contract which has a great influence on construction contract performance. The findings were also in line with (Fugar and Agyakwah-Baah, 2010) in their research study on delays in building construction projects, identified underestimation of costs as one of the major factors causing delays on construction projects in Ghana; and (Mansfield *et al.*, 1994) opined that inaccurate project cost estimation was one of the major causes of delays on most construction projects in Nigeria. In a separate analysis, (Demirkesen and Ozorhon , 2017) opined that effective project cost management has a direct impact on the performance of construction projects. The findings also collaborated with (Cheng and Proverbs, 2004) who stated that the use of an effective cost management approach during the construction contract phase has a significant effect on customer satisfaction; further, (Alshihre *et al.*, 2020) in their study on improving client's satisfaction in the construction industry in Saudi Arabia; stated that when projects are completed within budget, clients tend to be satisfied. Syamil, (2021) also revealed that for Indonesian Project Management practitioner's cost management performance was one of the factors which significantly impacted client satisfaction.

The findings also established that there was a weak negative correlation between cost management practices and contracts completed within stipulated budget as well as contracts completed within specified quality requirements. Hence, depicting an inversely proportional relationship between the independent and dependent variables. The negative correlation would imply that poor implementation of effective cost management practices on construction contracts would likely increase the chances of completing a contract beyond budget and not in accordance with specified quality requirements. These findings were in tandem with (Lee, 2008) who indicated that cost overruns in social overhead capital projects were usually due to inefficient budget usage, unreasonable estimation and adjustment to project costs and no practical use of the earned value management system. According to (Simanjuntak and Agung, 2018) poor cost estimation was one of the main causes of cost overrun in the Indonesian construction industry, they further state that increasing project cost management practices was expected to reduce potential cost overrun. Simanjuntak and Agung, (2018) also identified poor estimation of original project cost and underestimation of construction costs as the major causes of cost overruns in the Klang Valley construction projects of Malaysia. The findings also collaborated with (Oyebode, 2019) and (Anyanwu, 2013) who opined that the rising cost of materials and the ultimate astronomical increase in the cost of construction projects calls for adequate application of cost management principles to reduce the cost of construction projects. In a separate study, (Nyoni, 2019) identified poor estimation of the original cost and lack of timeous cost reports during the construction stage as some of the top causes of cost overrun in the Zimbabwean construction industry, he further opined that carrying out adequate cost studies to pave way for realistic cost estimates and proper project costing and financing are some of the measures that could minimize these cost overruns. Oni *et al.*, (2019) stated that unrealistic project cost was one of the major factors causing poor quality performance on most construction sites, in a separate study (Tan and Lu, 1995) also indicated that errors in cost estimates and lack of project budget were some of the main causes of poor quality performance on construction projects. Simanjuntak and Agung, (2018) argued that the effective application of cost management practices has an impact on decreasing the potential of the poor performance of construction project contracts.

6.2.2.4 Relationship between Quality Management and Contract Performance

The study established that there was a weak negative relationship between project quality management practices and all the contract performance measures i.e. with regards to completing the contract within schedule, stipulated budget, in accordance with specified quality requirements and contract deliverables meeting client satisfaction. The negative correlation

would imply that a lack of commitment by management and the project team to quality management would likely increase the chances of completing a contract beyond schedule, stipulated budget, not in accordance with specified quality requirements and the contract's deliverables not meeting the clients' satisfaction. These findings collaborate with (Oni *et al.*, 2019) and (Agbenyega, 2014) who opined that it is imperative for all parties involved in construction projects to consistently endeavour to accomplish acceptable quality standards as quality has remained in the forefront amongst factors used to determine the degree of success or failure of a project. The findings were also in line with (Chowdhury *et al*., 2007) and (Hoonakker *et al.*, 2010) who identified employee involvement and top management commitment as some of the most important factors impacting the successful implementation and improvement of quality management on construction projects. Grayson et al., (2016) also stated that management acts as the main driver for quality management implementation, creating values, goals and systems to satisfy customer expectations and to improve performance. Abbasnejad, (2013) stated that poor construction quality breeds several undesirable effects throughout the entire construction project supply chain; when poor quality activities made during the construction process are discovered, they necessitate costly rework and if undetected may lead to geotechnical or structural failures which can have terrible consequences such as delay, cost overruns, severe injuries and even fatalities. Kanji and Wong, (1998) indicated that quality management is increasingly been adopted by construction firms as an initiative to solve quality problems and to meet the needs of the final customer.

Gumo *et al.*, (2018) and Oni *et al.*, (2019) argued that the effect of quality management cannot be overlooked as it helps to reduce maintenance cost, ensure client satisfaction, improves the built environment, reduce excessive human resource waste, reduce project completion time, improve quality awareness and consciousness, improve organisational performance among others. Saeed and Hasan, (2012) also indicated that TQM practices can increase the performance of construction projects by reducing time and cost and increasing the quality of project implementation. Further, (Dilawo and Salimi, 2019) stated that the poor performance in the construction industry in Southern Africa (Zambia inclusive) can be attributed to a lack of adequate research and quality management initiatives undertaken in this part of the world. The findings also collaborated with (Chilongo, 2017) who in their investigation into the factors affecting project performance among contractors in Lusaka district in Zambia cites that contractors should be more interested with conformance to project specifications to overcome disputes, time and cost performance problems; and equally pay more attention to the quality of materials to improve cost, time and quality performance in Lusaka's construction projects.

6.2.2.5 Relationship between Risk Management and Contract Performance

The study established that there was a weak positive correlation between project risk management practices and contract performance measures with regards to completing the contract within schedule, budget and in accordance with specified quality requirements. This implies that proper implementation of effective risk management practices tends to enhance the chances of completing a construction contract within schedule, budget and in accordance with specified quality requirements. The findings were in agreement with (Goh *et al.*, 2013) who stated that effective risk management application can turn downside risk to upside risk thus enhancing the performance of the project and the construction firm. Kinyua *et al.*, (2015) opined that achieving project performance forms the basis to adopt and implement effective risk management practices; given the importance of project risk management in project management functioning, the efficiency of risk management is expected to significantly influence project performance. The results also collaborated with (Rabechini *et al.*, 2013) who in their study aimed at comprehending the impact of risk management on project performance in the construction industry in Brazil showed that adopting risk management practices has a positive impact on project performance. Hwang *et al.*, (2014) also indicated that there exists a positive correlation between risk management implementation and improvement in quality, cost and schedule performance of small construction projects in Singapore. The findings were also supported by (Ubani *et al.*, 2015) who in their study showed that risk management issues have a positive relationship with construction project performance i.e. if not well addressed; risk management issues can hinder the attainment of predefined construction project objectives of time, cost, quality and scope. Fischer, (2015) also argued that implementing risk management would positively impact the performance of small construction projects in South Africa, especially quality performance.

On the other hand, the results revealed a weak negative relationship between risk management practices and contract deliverables meeting clients' satisfaction. The negative correlation would imply that a low implementation of effective and proper risk management strategies would likely increase the chances of the contract deliverables not meeting the clients' satisfaction. The findings were in tandem with (Park *et al.*, 2019) who posited that by establishing more robust risk management practices, construction management firms would likely enhance the firms' profitability, project performance and customer satisfaction. Perrenoud *et al.*, (2016) also stated that early identification and communication of risks throughout the construction stage allows project teams to manage and minimise cost increase and schedule delays while increasing customer satisfaction.

6.3.1 Framework for the integration of the five Project Management Knowledge Area Techniques to enhance contract performance

The last objective of the research study was to develop a framework that would assist key players in the construction sector identify the appropriate use of the project management knowledge areas to enhance the performance of construction projects around Lusaka District.

The study established that a large number of public construction contracts within Lusaka district were achieving good performance in terms of being completed within the planned schedule, in accordance with the specified quality requirements and the contract's deliverables meeting the clients' satisfaction. Nonetheless, the study also established that most of the projects had recorded satisfactory performance in terms of their completion being within the stipulated contract budget. This implies that there is still need to enhance performance in the public construction industry. The findings were in line with (Al-otaibi *et al.*, 2013) who opined that the need for enhancement of performance has become ever more critical to the success of construction projects. According to (Bello, 2017) the complicated nature of construction projects has challenged researchers in the construction industry to research, design and develop frameworks and mechanisms to enhance the situation and to solving the complexity associated with construction works. Beatham *et al.*, (2004) indicated that in response to Latham's (1994) and Egan's (1998) reports on the need for improvement, the construction industry in the UK has resorted to utilising several performance measures to address improvement concerns of the many aspects of the industry. Ling *et al.*, (2008) developed a model for predicting project performance in the Chinese construction industry, the model was based on the project management practices adopted by construction companies in China; the findings of the study revealed that certain scope management practices can be used to predict project performance in terms of the 'triple constraint', customer satisfaction and profit margin.

The assumption for the development of the current study's proposed framework was that integrating the knowledge areas into contract performance management will allow for the proper coordination and utilization of critical project processes that will enhance the performance of construction contracts hence leading to maximisation of end-user outcomes and improved service delivery in the construction industry

6.3.1.1 Rationale for Developing the Framework

The research made use of the findings from the literature review, theoretical and conceptual analysis as well as those obtained from the quantitative and qualitative data analysis to develop

a construction contract performance enhancement framework. This was done in efforts to provide an answer to the third research question on how the five project management knowledge areas could be integrated with contract performance. The proposed framework is envisaged to enhance construction contract performance by ensuring that contracts are delivered within time, stipulated budget, in accordance with specified quality requirements and they meet the client's satisfaction.

The framework developed by the research was anchored on the general systems theory of the 1940s. Francis, (2015) postulates that the systems theory focuses on the interactions and relationships between parts to understand an entity's organisation, functioning and outcomes. According to (Kreitner, 2009) the General systems theory is an interdisciplinary area of study that is based on the premise that everything is part of a larger interdependent arrangement. Further, (Goede, 2005) argues that systems are made up of sets of components (parts/elements) that work together for the overall objective of the whole; if the performance of these components can be identified, then it is possible to improve the performance of the whole system. Hence, the framework developed focuses on understanding the interdependency and interactions between the five PMKAs and how these interactions contribute towards the project achieving its objectives and ultimately improving the overall performance of construction contracts.

6.3.1.2 Framework Validation

According to (Misra *et al.*, 2012) the success of any proposed metric is dependent on the establishment of its validation, understanding by its users and a close link between the metric and the attribute intended to be measured. Validation is the process that tries to ensure that the framework represents the characteristics of the general population and is not limited to the samples used in the estimation (Al Shamsi, 2019). Banda, (2019) postulated that validation of a framework endeavours to establish the adequacy for the measure it is to apply; as such, validity increases the extent of credibility and confidence of the framework.

The developed construction performance enhancement framework was validated by administering questionnaires and undertaking semi-interviews with eight (8) senior public sector construction officers that were purposively sampled and had prior experience of not less than ten years in the undertaking of public construction contracts. Purposive sampling techniques allowed the researcher to deliberately select their participants based on the participant's ability to provide essential information related to answering research questions

(Alotaibi, 2019). The researcher highlights that the framework developed is open for modifications in research.

The framework developed was presented in the next chapter

6.4 Conclusion

This chapter provided the discussions and analysis of the findings based on the three specific objectives of the study and was aligned to the research study findings as presented in chapter five.

The next chapter provides the recommendations and conclusions to the research findings. The chapter also proposes a performance enhancement framework.

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

This chapter presents the conclusion as drawn from the analysis and discussion of the research findings and puts across recommendations aimed at resolving the research problem. It further endeavours to meet the objectives earlier outlined by interrogating the research questions. The chapter also outlines the research's contribution to the body of knowledge and the limitations of the study.

7.2 Conclusion of the Research Findings

The study was aimed at assessing the influence of five project management knowledge areas i.e. Integration Management, Scope Management, Cost Management, Quality Management, and Risk Management on the performance of contracts in the construction industry in Lusaka District. It sought to determine and understand the correlation existing between the five aforementioned PMKAs and contract performance in terms of cost, quality, client satisfaction and time. The research questions were answered as indicated below:

7.2.1 What are the five most effective Project Management Knowledge Areas?

The study concluded that project management knowledge areas played a major role in achieving desired construction performance outcomes as such their appropriate application assists with enhancing the performance of construction contracts. Further, the study concluded that some (individual) knowledge areas were more effective in accomplishing desired performance outcomes than others. Nonetheless, the study also concluded that the level of importance given to the individual knowledge areas was based on the needs of the project (organisation) or those of the project manager. To this effect, the study identified Scope Management, Cost Management, Integration Management, Quality Management; and Schedule and Resource Management which both had the same score as being the most effective PMKAs required to achieve the desired construction performance outcomes i.e. in terms of completing the construction contract within cost, time, quality and meeting client satisfaction.

7.2.2 What is the relationship between the five Project Management Knowledge Areas and contract performance?

The study concluded that there was a weak positive linear relationship between project integration management practices and completing a construction contract within the planned schedule, stipulated budget and in accordance with the specified quality requirements. The study however concluded that there was a weak negative relationship between integration management practices and the contract deliverables meeting the clients' satisfaction. With regards to the relationship between scope management practices and contract performance, the study concluded that there was a weak positive relationship between project scope management practices and completing a construction contract within the planned schedule and contract deliverables meeting clients' satisfaction. The study further concluded that there was a weak

negative relationship between scope management practices and the construction contract being completed within the stipulated budget and in accordance with the specified quality requirements. The study also found that there was a weak positive relationship between cost management practices and construction contracts completed within the planned schedule and contract deliverables meeting client satisfaction; whilst it was established that there was a weak negative relationship between project cost management practices and the construction contract being completed within the stipulated budget and in accordance with the specified quality requirements.

In light of the relationship between project quality management and contract performance, the study concluded that there was a weak negative relationship between project quality management practices and the completion of construction contracts within the planned schedule, stipulated budget, in accordance with the specified quality requirements and the contract deliverables meeting clients' satisfaction**.** In addition, the study concluded that there was a weak positive relationship between project risk management practices and completing the construction contract within the planned schedule, stipulated contract budget and in accordance with the specified quality requirements. The study equally found that there was a weak negative relationship between risk management practices and contract deliverables meeting clients' satisfaction.

7.2.3 How can the five Project Management Knowledge Areas be integrated with contract performance?

The study concluded that the majority of public construction contracts within Lusaka district were achieving good performance in terms of being completed within the planned schedule, in accordance with the specified quality requirements and the contract's deliverables meeting the clients' satisfaction. However, the study concluded that most of the projects had recorded satisfactory performance in terms of their completion being within the stipulated contract budget. Thus, suggesting that there was still need to enhance performance in the public construction industry.

The study concluded that project management knowledge areas influenced contract performance to a great extent; as such the appropriate utilization of these KAs would greatly enhance performance in the public construction domain. To this effect, a performance

enhancement framework was developed by utilizing and integrating the knowledge area constructs within the five PMKAs i.e. Integration, Scope, Cost, Quality and Risk management and benchmarking their outcomes against the contract performance measures. The study concluded that majority respondents affirmed the statements on the KA constructs that would be used to develop the framework.

Figure 7. 1: Proposed Construction Contract Performance Enhancement Framework

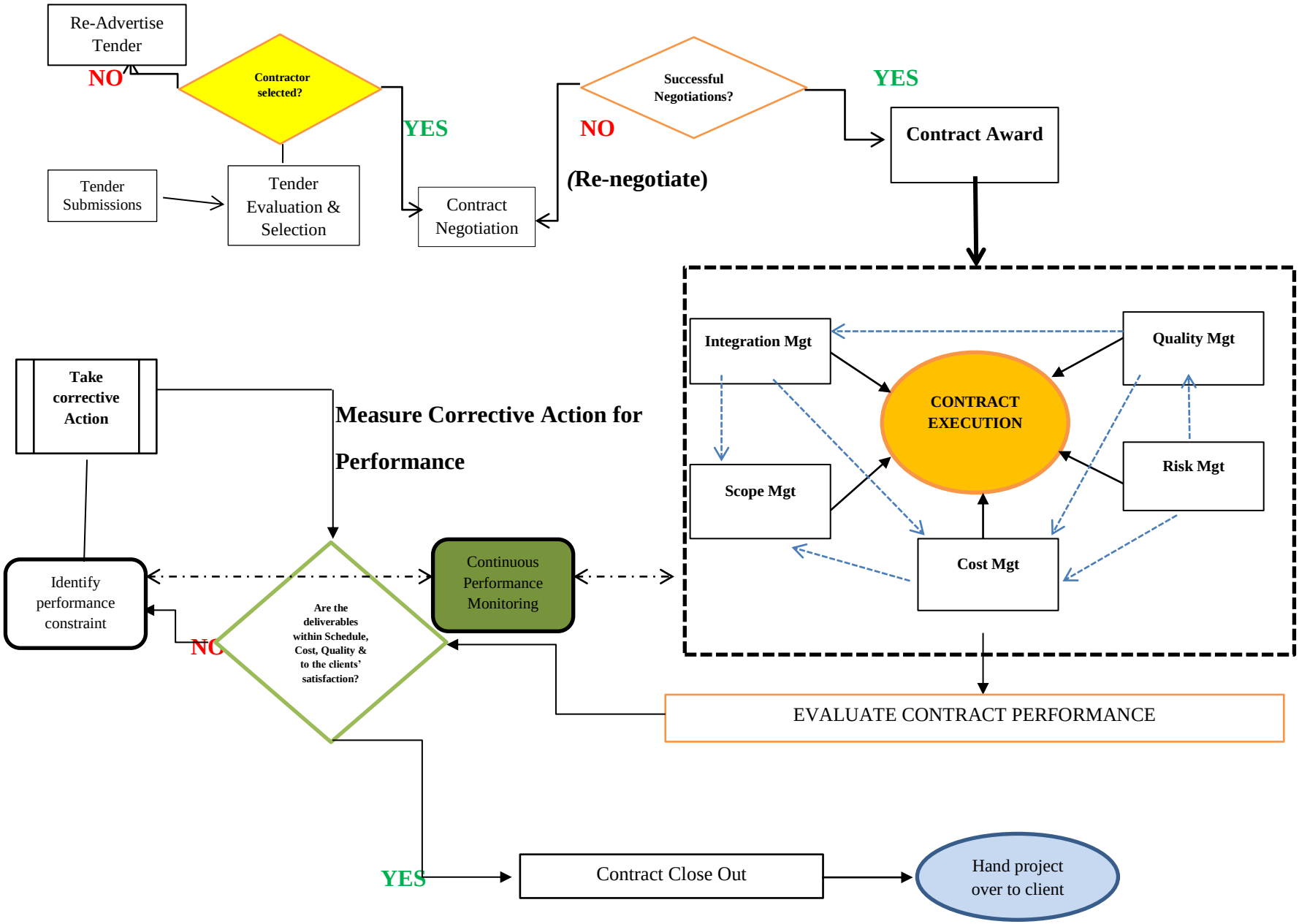

Figure 7.1 above shows a performance enhancement framework for the execution of construction contracts. The instruction manual for the proposed framework is as attached in appendix (i).

7.3 Recommendations

This research study outlines the following recommendations:

i. The study recommends that there should be the effective adoption and continuous implementation of project management knowledge area best practices on public construction contracts to ensure that all contract objectives are entirely met. The respondents indicated that integration management, cost management, quality management and scope management were among the most effective PMKAs; as such the study recommends that some knowledge area best practices especially those related to the aforementioned knowledge areas must be considered all through the contract execution phase.
ii. The study also recommended that during the contract execution phase, project managers should enhance the coordination of the construction project activities and integration of the various project elements (knowledge areas). The study revealed that the project management knowledge areas influence the performance of contraction contract to a great extent; as such 'the relationship of different parties and work sequences should be viewed as a single entity as the impact of one event/decision could affect the overall performance of the contract'.
iii. The study further recommended that there should be regular trainings and workshops among professionals in the public construction sector on project management knowledge areas and best practices to ensure that they are up to date with the prevailing project management trends so as to enhance their knowledge and project management skills. Inadequate project management expertise may prove to be a recipe for unsuccessful construction projects.
iv. The study also recommends that professionals in public construction contracts should adopt and invest in project management softwares as this will greatly enhance the effective and proper management and monitoring of key project management knowledge areas. The study also recommends that before the commencement of public construction contracts, both parties to the contract must fully understand their roles and responsibilities and all the terms of the contract.

v. The study recommends the adoption of the developed construction contract performance enhancement framework by professionals in the public construction sector. The proposed framework was envisaged to enhance construction contract performance by ensuring that there was effective utilization of PMKAs on construction contracts in efforts to ensure that contracts are delivered within time, stipulated budget, in accordance with specified quality requirements and they meet the clients' satisfaction. The framework suggests that understanding the interdependency and interactions between the five PMKAs and how these interactions contribute towards the project achieving its objectives; ultimately improves the overall performance of construction contracts.

7.4 Future Research Areas

This study suggests the following as probable areas of further/future research;

i. The study sought to establish the influence that five project management knowledge areas have on the performance of public construction contracts in Lusaka District. The main focus of the study was public construction contracts; however, similar studies should be undertaken in the private construction sector as well as other economic sectors like agriculture and manufacturing;
ii. The study was only conducted in Lusaka District due to financial and time restraints, as such the study recommends that similar research be undertaken in other districts in order to cross-examine and generalize the findings;
iii. This study only focused on the relationship between five PMKAs i.e. Integration, Scope, Cost, Quality and Risk Management. In this regard, the study recommends that further studies be undertaken to examine the relationship between contract performance and the other PMKAs in order to fully appreciate the influence that each of the knowledge areas has on achieving desirable performance;
iv. Further studies could assess the applicability of the developed performance enhancement framework to projects in other sectors.

7.5 Contributions to Body of Knowledge

The contribution of this study to the body of knowledge is mainly the development of the performance enhancement framework for the measurement and evaluation of contract performance based on the PMBOK's project management knowledge areas during the contract execution stage. This study will contribute towards improving the utilization of the PMBOK's project management knowledge area practices on construction contracts; particularly with

regards to understanding the influence that the knowledge areas, individually and collectively have on the performance of construction contracts. This study provides empirical evidence of the relationship between the PMBOK's knowledge areas and contract performance in the construction industry. Further, the study may well claim to be the first of its kind in the Zambian construction industry context as many of similar studies were conducted in developed countries, as such, it contributes to the knowledge gaps in literature on the use of project management knowledge areas in the Zambian construction sector. The study has also contributed towards enhancing our understanding of performance measurement as it relates to construction contracts.

7.6 Limitations of the Study

The limitations faced during the undertaking of the study were as outlined below:

i. The survey data collection was significantly affected due to the outbreak of the Covid-19 pandemic. Due to the restrictions in the accessibility of office buildings at the time of undertaking the data collection most of the respondents were not able to promptly respond to the questionnaires. Further, it was difficult to conduct face-to-face interviews with the key informants due to the same. Nonetheless, a significant and representative sample was still achieved;

ii. As this was the first research undertaken to evaluate the relationship between project management knowledge areas and construction contract performance in Lusaka District, there was no past research with which to compare the findings of the study.

iii. Some of the respondents found the questionnaire to be too long and complained about spending too much time filling it in. As such, this was a hindrance in effectively collecting data and attaining full participation from respondents.

7.7 Conclusion

The construction industry being a fundamental sector to the development and economic growth of Zambia has not escaped the difficulties facing other countries globally in terms of delivering undesirable performance on many construction contracts. In efforts to improve this undesirable performance mainly on construction contracts within Lusaka District, this study identified the five most effective project management knowledge areas that play a critical role in achieving

desirable performance and also established the relationship between five PMKAs and the performance of construction contracts in Lusaka.

The study proposed a performance enhancement framework that integrated the five project management knowledge areas i.e. Integration Management, Scope Management, Cost Management, Quality Management and Risk Management; and contract performance indicators. It was hoped that the findings of this study would help enhance the poor delivery of construction contracts by causing key players in the industry to focus on those areas (processes) that are critical in producing the best performance outcomes.

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APPENDIX I: FRAMEWORK INSTRUCTION MANUAL

Step 1: Tender Submission

The first step in the framework developed involves the submission of responses by prospective contractors to an invitation to tender for the construction of public infrastructure to the procuring entity. The prospective contractors are to make their tender (bidding document) submissions in the prescribed form and manner; and within the specified time frame.

Step 2: Tender Evaluation and Selection

The next step in the framework involves the formation of an ad hoc tender evaluation committee which shall be responsible for undertaking the financial and technical evaluations of the submitted bidding documents. Using the appropriate evaluation criteria (as stated in the bidding document) the committee evaluates and selects the most suitable bidder to be awarded the contract.

If upon evaluation no suitable bidder is identified, the committee in their tender evaluation report recommends that the tender be re-advertised; if a suitable candidate is identified, the committee recommends that they be awarded the contract. The tender evaluation report with its recommendations is submitted to the relevant public procurement authorization entity for approval of the award of contract.

Step 3: Contract Negotiation

Upon obtaining approval from the relevant public procurement authorization entity to award the contract to the best bidder; the procuring entity notifies the successful bidder and sets a date to negotiate the terms and references (TORs) of the construction contract before official contract award (signing).

Successful negotiations culminate into the next step in the process; if unsuccessful the parties re-negotiate the terms until they arrive at a consensus.

Step 4: Contract Award

Following successful negotiations, the parties to the contract both append their signatures on the contract document as a sign of formalising the contract. The terms of the contract at this stage become legally binding to both parties.

Step 5: Contract Execution

After successfully signing the contract, the actual construction works are undertaken by the contractor. It is during the performance of these works that the project team utilizes the project management knowledge areas towards the attainment of the contract's objectives.

At this step, each individual knowledge area contributes towards the successful undertaking of the contract, whilst at the same time interacting amongst themselves. The systems theory earlier outlined stipulates that a systems approach emphasises the contribution of the interactions and interrelationships between the knowledge areas towards the contract achieving its objective and improving its overall performance by first identifying the performance of the individual knowledge areas; then that of the project as a whole. Therefore, the framework recommends that by understanding the interdependency and interactions between the project management knowledge areas and how these KAs first individually influence the performance of the contract; and subsequently influence each other, the project team is able to effectively monitor the performance of the contract which ultimately improves overall performance.

Step 6: Continuous Performance Monitoring

The framework recommends that a robust performance monitoring system (mechanism) be implemented by the project team to allow for the continuous and regular monitoring of the various contract activities during the contract execution phase. This entails constantly monitoring the performance of each of the knowledge areas and ultimately that of the overall project. The monitoring system benchmarks the contract's performance for compliance against the key contract performance indicators i.e. time, cost and quality. By identifying the constraints to good performance, corrective action is promptly undertaken and measured against the performance indicators to measure for improvement in performance. This continuous cycle plays a critical role in attaining enhanced contract performance and promotes transparency and accountability during the execution of public contracts. This process also serves as a conduit for data required for effective contract evaluation.

Step 7: Evaluate Contract Performance

This step involves the periodic review of the final phases and overall performance of the construction contract. The framework recommends the need for robust and effective performance evaluation systems to be implemented by the project team. A comprehensive performance evaluation mechanism (system) is essential for ensuring compliance with the contract's requirements and the successful accomplishment of the contract works. By comparing performance between different time periods, the contract team is able to effectively

identify performance gaps and quickly take corrective action to improve performance. Evaluation enables the contract team to objectively assess the contract's outcomes and ascertain whether the requirements and terms of the contract are being met.

Step 8: Contract Close-Out

This step involves the completion of both physical and administrative actions. The contract close-out phase verifies through the reviewing of the contract document that all the obligations and requirements of the contract were met to the client's expectations. By conducting a final performance review, the contract team will ascertain whether the contract attained its objectives. The review takes into consideration the satisfaction of the client, the performance of the contractor, comparisons between the budgeted and actual costs, the planned quality against the actual quality, the planned/ estimated completion time against the actual time the contract was completed, variations to the contract, etc.

This phase also ensures that lessons learnt during the execution of the contract are all captured and well documented to act as a reference for similar future contracts.

STEP 9: Hand Project over to Client

The step involves the handing over of the contract's deliverables to the client. The performance of the contract was measured in terms of the timely delivery of works, cost within contract budget, quality of work and satisfaction of the client with works delivered. The timely delivery of works was with regards to how the works were to be performed and delivered within the stipulated contract period and the client had to ensure that payment was made to the contractor as of the agreed payment date. Cost within contract budget highlighted how a good performing contract increases cost efficiency and effectiveness by delivering construction works within the estimated budget; the contract must deliver works at a lower cost without compromising on the quality. The quality of works considered how the final construction works (product) had to be to the required specifications of the client and posed no safety risks to the end-user(s). Client satisfaction considers how the final works should comply with the set quality standards to meet the customer's needs, requirements and expectations. The works must be fit for use to ensure they have commercial value and are of relevance to the end-users. Therefore, improved contract performance was achieved by promptly identifying performance gaps (constraints) during the execution of the construction contract and improving their performance through the effective utilization of the project management practices within the five knowledge areas.

APPENDIX II: SURVEY QUESTIONNAIRE

UNIVERSITY OF LUSAKA

SCHOOL OF POSTGRADUATE STUDIES

Dear Respondent,

RE: Research on the Relationship between Five Project Management Knowledge Areas and Contract Performance in Lusaka District

I am a student at the University of Lusaka pursuing a Master's Degree in Project Management. As a school requirement, I am undertaking a research study in fulfilment of the award of the Master's Degree.

The purpose of this study is to investigate the relationship that exists between five project management knowledge areas (i.e. Integration, Scope, Cost, Quality and Risk Management) and the performance of construction contracts in Lusaka district. Therefore, you have been selected to participate in this academic survey. Please fill in the enclosed questionnaire by answering the questions as honestly and completely as possible. Kindly note that this research is purely academic and your responses and all information given will be treated with the utmost confidentiality.

For any queries or difficulties noticed please do not hesitate to forward them to my email address: thandiwe.ngoma06@gmail.com or cell phone number on 0977-202704.

Thank you in advance for your valuable support.

Yours Faithfully,

Thandiwe Ngoma.

SECTION A: RESPONDENT'S GENERAL INFORMATION

Please give your personal information by marking **(x)** where applicable.

1A**.** Gender **Male [ ]** **Female [ ]**

2A. Level of Education **(state your highest level)**

Certificate [ ] Diploma [ ] Undergraduate [ ] Postgraduate [ ]

Other **(Please specify)** ……

3A. Occupational Position….

Consultant [ ] Project Manager [ ] Contractor [ ] Supervisor [ ]

Other **(Please specify) ……..**

4A. How many years of experience do you have in the construction industry?

Less than 5 years [ ] 5 to 10 years [ ] 10-15 years [ ] More than 15 years [ ]

5A. Have you been involved in a public construction contract before?

Yes [ ] No [ ]

6A. What type of construction contracts do you undertake? (State all that apply)

Roads [ ] Buildings [ ] Civil [ ] Building and Civil [ ]

Other **(Please specify)……..**

SECTION B: PROJECT MANAGEMENT KNOWLEDGE AREAS PRACTICES

Based on your knowledge and experience in project management particularly the utilization of project management knowledge areas on construction contracts in Lusaka, please provide feedback to the statements below by indicating **(X)** where appropriate.

Where (1= Strongly Disagree, 2= Disagree, 3= Neutral, 4=Agree, 5= Strongly Agree)

✓ **To explore the five most effective project management knowledge areas**

		SD	D	N	A	SA
No.	**STATEMENT**	**1**	**2**	**3**	**4**	**5**
1B	Project Management Knowledge Areas play a critical role in achieving desired construction contract outcomes					
2B	Appropriate application of project knowledge areas improves contract performance					
3B	Some knowledge areas are more effective in achieving desired performance outcomes than others					

4B. If you 'Agree' or 'Strongly Agree' to 3B above please indicate **(X)** against five (5) knowledge areas you feel are the most effective (are of critical importance) in achieving desired construction contract outcomes in the table below.

No.	**Project Management Knowledge Area**	**Mark (X)**
4B.1	Integration Management	
4B.2	Scope Management	
4B.3	Cost Management	
4B.4	Schedule Management	
4B.5	Quality Management	
4B.6	Resource Management	
4B.7	Communications Management	
4B.8	Procurement Management	
4B.9	Risk Management	
4B.10	Stakeholder Management	

- ✓ **To examine the relationship between the five project management knowledge areas and contract performance**

		1	2	3	4	5
No.	**STATEMENT**	**No extent**	**Low extent**	**Moderate extent**	**Great extent**	**Very great extent**
5B	In your opinion indicate the extent to which project management knowledge areas influence contract performance					

a) Relationship between Integration Management and Contract performance

6B. Project Integration management is the practice of project management which ensures that all parts of the project are well coordinated. As a participant in public construction contracts, do you or management put emphasis on project integration management practices?

Yes [ ] **No [ ]** **Not Sure [ ]**

Please rate the extent to which you agree or disagree with the statements on project integration management practices on public construction contracts in Lusaka.

		SD	D	N	A	SA
No.	**STATEMENT**	**1**	**2**	**3**	**4**	**5**
7B	There is effective coordination of project activities during contract execution					
8B	Project activities are carried out in accordance with the project management plan					
9B	There exist effective knowledge management practices during the execution of the contract					
10B	Project activities are closely monitored and controlled					

11B Project changes adhere to formulated procedures for review and approval

12B. To what extent do you agree or disagree that project integration management practices influence the following contract performance measures

		1	2	3	4	5
No.	**PERFORMANCE MEASURE**	**No extent**	**Low extent**	**Moderate extent**	**Great extent**	**Very great extent**
12B.1	Contract completed within schedule					
12B.2	Contract completed within stipulated contract budget					
12B.3	contract completed in accordance with specified quality requirements					
12B.4	Contract deliverables meet client's satisfaction					

b) Relationship between Scope Management and Contract Performance

13B. Project scope management defines all processes that are required to ensure the project output contains all the work and only the work required to complete the project as designed. It is these processes that ensure that the project is well defined. As a participant in public construction contracts, do you or management put emphasis on project scope management practices?

Yes [ ] **No [ ]** **Not Sure [ ]**

Please rate the extent to which you agree or disagree with the statements on project scope management practices on public construction contracts in Lusaka.

		SD	D	N	A	SA
No.	**STATEMENT**	**1**	**2**	**3**	**4**	**5**
14B	Projects are executed and delivered within planned scope					
15B	Stakeholder's requirements and specifications are effectively collected and managed					
16B	There is a precise and clear definition of the contract's scope, objectives and key deliverables					
17B	There is a proper breakdown of the project's goals and tasks to be carried out using the work breakdown structure					
18B	Scope validation is carried out to ensure the project meets required specifications					

19B. To what extent do you agree or disagree that project scope management practices influence the following contract performance measures

		1	**2**	**3**	**4**	**5**
No.	**PERFORMANCE MEASURE**	**No extent**	**Low extent**	**Moderate extent**	**Great extent**	**Very great extent**
19B.1	Contract completed within schedule					
19B.2	Contract completed within stipulated contract budget					
19B.3	contract completed in accordance with specified quality requirements					
19B.4	Contract deliverables meet client's satisfaction					

c) Relationship between Cost Management and Contract Performance

20B. Project cost management defines all processes concerned with estimating, allocating and controlling all project costs. As a participant in public construction contracts, do you think there is proper implementation of cost management practices on most construction contracts?

Yes [ ] **No [ ]** **Not Sure [ ]**

Please rate the extent to which you agree or disagree with the statements on project cost management practices on public construction contracts in Lusaka.

		SD	**D**	**N**	**A**	**SA**
No.	**STATEMENT**	**1**	**2**	**3**	**4**	**5**
21B	Cost plan is well-defined before the project begins					
22B	Proper cost estimation is done to establish the entire project's cost before project begins					
23B	Accurate and reliable budget estimates are done to determine the required budget prior to contract commencement					
24B	Effective cost control systems exist on most projects					
25B	Adequate funding and financing exist on most contracts					
26B	Contracts are normally completed within the approved contract budget					

27B. To what extent do you agree or disagree that project cost management practices influence the following contract performance measures

		1	2	3	4	5
No.	**PERFORMANCE MEASURE**	**No extent**	**Low extent**	**Moderate extent**	**Great extent**	**Very great extent**
27B.1	Contract completed within schedule					
27B.2	Contract completed within stipulated contract budget					
27B.3	contract completed in accordance with specified quality requirements					
27B.4	Contract deliverables meet client's satisfaction					

d) Relationship between Quality Management and Contract Performance

28B. Quality management involves all processes that determine the project's quality requirements and standards as well as documentation of the project's compliance with quality requirements. As a participant in public construction contracts, do you think that there is adequate commitment by management and the project team to quality management?

Yes [ ] **No [ ]** **Not Sure [ ]**

Please rate the extent to which you agree or disagree with the statements on project quality management practices on public construction contracts in Lusaka.

		SD	D	N	A	SA
No.	**STATEMENT**	**1**	**2**	**3**	**4**	**5**

29B	Quality requirements are well-identified before project commencement	
30B	There is proper inspection of works at every construction stage to ensure they comply with standards	
31B	There is frequent monitoring of quality activities to access performance	
32B	Effective Quality control systems exist on most projects	
33B	Quality of works meet customer expectations	

34B. To what extent do you agree or disagree that project quality management practices influence the following contract performance measures

		1	**2**	**3**	**4**	**5**
No.	**PERFORMANCE MEASURE**	**No extent**	**Low extent**	**Moderate extent**	**Great extent**	**Very great extent**
34B.1	Contract completed within schedule					
34B.2	Contract completed within stipulated contract budget					
34B.3	Contract completed in accordance with specified quality requirements					
34B.4	Contract deliverables meet client's satisfaction					

e) Relationship between Risk Management and Contract Performance

35B. Construction projects face several risks and uncertainties which if not properly managed may adversely affect the contract's performance. As a participant in public construction contracts, do you think that there is proper implementation of effective risk management strategies on most public construction contracts in Lusaka?

Yes [ ] **No [ ]** **Not Sure [ ]**

Please rate the extent to which you agree or disagree with the statements on project risk management practices on public construction contracts in Lusaka.

		SD	**D**	**N**	**A**	**SA**
No.	**STATEMENT**	**1**	**2**	**3**	**4**	**5**
36B	There is adequate project risk planning					
37B	Proper risk identification strategies are in place					
38B	There is adequate risk analysis					
39B	Contracts give clear guides on risk allocation and responsibilities of contract parties and those involved					
40B	Effective and appropriate risk responses in place					
41B	Adequate and effective risk monitoring					
42B	Effective risk control techniques					
43B	There is proper risk communication between contract parties and those involved					

44B. To what extent do you agree or disagree that project risk management practices influence the following contract performance measures

		1	2	3	4	5
No.	**PERFORMANCE MEASURE**	**No extent**	**Low extent**	**Moderate extent**	**Great extent**	**Very great extent**
44B.1	Contract completed within schedule					
44B.2	Contract completed within stipulated contract budget					
44B.3	contract completed in accordance with specified quality requirements					
44B.4	Contract deliverables meet client's satisfaction					

✓ **To develop a framework for the integration of the five project management knowledge area techniques to enhance contract performance**

45B. In your opinion how would you rate the performance of the **majority** of construction contracts in Lusaka district in terms of the following performance measures:

		1	2	3	4	5
No.	PERFORMANCE MEASURE	Very poor	Poor	Satisfactory	Good	Excellent
45B.1	Contract completed within schedule					
45B.2	Contract completed within stipulated contract budget					
45B.3	Contract completed in accordance with specified quality requirements					
45B.4	Contract deliverables meet client's satisfaction					

46. Please rate the extent to which you agree or disagree with the statements on contract performance enhancement on public construction contracts in Lusaka.

		SD	D	N	A	SA
No.	**STATEMENT**	**1**	**2**	**3**	**4**	**5**
46B.1	Both client and contractor are to negotiate and agree on the contract type (model) that best fits the nature of the construction project					
46B.2	A well-established project management plan can outline how to achieve the contract's objectives hence enhancing contract performance					
46B.3	There should be proper coordination of project activities and communication between the project team (relevant parties)					
46B.4	There should be proper articulation and identification of the project's needs and requirements and these effectively communicated to the project team during project planning to reduce changes during contract execution					
46B.5	There should be a clear definition of the contract's scope, objectives and deliverables					
46B.6	There should be a detailed and realistic work breakdown (WBS) for site supervisors to properly coordinate and follow project activities					
46B.7	There should be regular and frequent inspection of construction works					
46B.8	Timely review of status reports during contract execution					
46B.9	Adequate utilization of cost estimation and budgeting techniques					
46B.10	There should be proper and effective cost progress monitoring and control					
46B.11	Adequate utilizations of quality monitoring and control techniques to access quality performance					
46B.12	Properly implement quality control procedures					

46B.13	Contract team should adequately identify all inherent risks	
46B.14	There should be proper allocation of risks between contract parties	
46B.15	There should be adequate risk response planning and effective risk monitoring techniques utilized	

Thank You for Sparing Your Time

APPENDIX III: INTERVIEW GUIDE

UNIVERSITY OF LUSAKA

SCHOOL OF POSTGRADUATE STUDIES

RESEARCH ON THE RELATIONSHIP BETWEEN FIVE PROJECT MANAGEMENT KNOWLEDGE AREAS AND CONTRACT PERFORMANCE IN LUSAKA DISTRICT

Dear Respondent,

My name is Thandiwe Ngoma, a postgraduate student at the University of Lusaka pursuing a Master's Degree in Project Management. As a school requirement, I am undertaking a research study in fulfilment of the award of the Master's Degree.

The purpose of this study is to investigate the relationship that exists between five project management knowledge areas (i.e. Integration, Scope, Cost, Quality and Risk Management) and the performance of public construction contracts in Lusaka district; with the view of developing a framework for integrating the knowledge areas with contract performance to help enhance performance in the construction industry. Therefore, you have been identified as a resourceful contact on this topic; and as such, I hope to share your knowledge and experience in understanding the issue at hand by taking a few minutes of your time to have a brief discussion with you. Kindly note that this interview is purely academic and your responses and all information given will be treated with the utmost confidentiality. Voice-recording of the interview will only be done if **permission is granted** by the interviewee.

Thank you in advance for your valuable support and contribution to this research.

Personal Information

1. Name: …….
2. Name of Organisation: ……..
3. Position: ……..
4. Highest academic qualification: ……..
5. How long have you been involved in construction projects: ……
6. Contact No.: ……..

Interview Questions

Q1. What is your impression of the performance of public construction contracts around Lusaka district? ……...

……..

Q2. In your opinion do you feel that certain project management knowledge areas contribute more (are more effective) to achieving desirable performance outcomes than others do? .....……
……..

Q3. Which **five** major project management knowledge areas do you feel contribute the most to achieving desirable performance of construction contracts and why? ……..

…….

Q4. To what extent do you think the application of project management knowledge areas influences the performance of construction contracts? …….

Q5. What do you think should be done in terms of utilization of project management knowledge areas to enhance the performance of construction contracts in Lusaka? ……..

Thank you for your time