KYAMBOGO UNIVERSITY

DIRECTORATE OF RESEARCH AND GRADUATE TRAINING

IMPACT OF PROFESSIONAL CONTRACTS MANAGEMENT PRACTICES ON TIMELY COMPLETION OF BUILDING CONSTRUCTION PROJECTS IN UGANDA

BY

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REG. NUMBER: 20/U/GMET/13138/PE

A DISSERTATION SUBMITTED TO KYAMBOGO UNIVERSITY DIRECTOTRATE OF RESEARCH AND GRADUATE TRAINING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTERS OF SCIENCE IN CONSTRUCTION TECHNOLOGY AND MANAGEMENT DEGREE OF KYAMBOGO UNIVERSITY

May, 2025

Declaration

I, Latim Benard, hereby declare that this submission is entirely original with no recent works by others or works that have been accepted for the award of any other degree from the University or another higher education institution, to the best of my knowledge and belief, with the exception of those cases in which the text and reference list contain the proper citation.

Signed; _____

Latim Benard

Date: _____

Approval

The following people attest to having read the dissertation "Impact of Professional Contracts Management Practices on Timely Completion of Building Construction Projects in Uganda" and suggest that it be turned in to the Directorate of Research and Graduate Training at Kyambogo University to satisfy the requirements for the Master of Science in Construction Technology and Management degree.

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Assoc. Prof. Muhwezi Lawrence (Supervisor)

Date: _____

Signed; _____

Eng. Dr. Mubialiwo Ambrose (Supervisor)

Date: _____

Acknowledgements

My utmost gratitude goes to Kyambogo University and my employer Uganda National Examinations Board for giving me the opportunity to accomplish this uphill task.

A sincere appreciation also goes to my supervisors Assoc. Prof. Muhwezi Lawrence and Eng. Dr. Mubialiwo Ambrose for their guidance and dedication towards making this project a success.

I would also like to acknowledge my parents Mr. and Mrs. Olanya Alphonse for the continuous support towards my education.

Last but not least, I want to express my gratitude to the Lord God Almighty for enabling me to accomplish this task in excellent health.

Dedication

This dissertation is dedicated to my family, friends and colleagues. I also dedicate this handwork to my children Latim Harvey, Latim Haniel and Laloyo Keziah.

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List of Abbreviations

AFDB	African Development Bank
CMU	Construction Management Unit
DF	Degrees of Freedom
FIDIC	International Federation of Consulting Engineers
JCT	Joint Contracts Tribunal
MTID	Ministry of Transport and Infrastructure Development
No	Number
NRM	New Rules of Measurement
PM	Project Manager
PMI	Project Management Institute
PMBOK	Project Management Body of Knowledge
SD	Standard Deviation
UACE	Uganda Association of Consulting Engineers
UNABCEC	Uganda National Association of Building and Civil Engineering Contractors

Abstract

Building construction project completion delays are a serious problem in Uganda's construction sector and have long been significant on a worldwide scale. The price 91% of construction projects are finished late, according to Uganda. This study investigated how professional contract management techniques affect Ugandan building construction projects' timely completion. Simple random selection was used to get 82 responders from purposively chosen projects. A questionnaire was used as the data gathering instrument. Both descriptive and inferential statistics were used to assess quantitative data. The overall mean answer was 4.0 for contractor prequalification procedures and 4.6 for contractor monitoring procedures. The results of the study show that contractor prequalification procedures have a considerable impact on the timely completion of building construction projects, with a chi-square value of 101.246 and a p-value of 0.001. This also held true for contractor supervision procedures, with a p-value of 0.000 and a chi-square value of 151.046. To improve the timely completion of building construction projects, a model was created. The results of the study show that contractor pre-qualification and monitoring procedures have a favorable effect on building construction projects' timely completion. According to the report, pre-qualification procedures for contractors should be founded on their financial soundness, management team, and level of experience. Effective coordination, quality control, resolving environmental issues, and reducing site risks should be the main goals of contractor supervision procedures. This will minimize interruptions and ensure that the project is completed on schedule.

Key words: Contract management, construction, timely completion, contractor.

CHAPTER ONE: INTRODUCTION

1.1. Background to the Study

When a construction project is finished on schedule, it indicates that it was finished within the time range agreed upon between the employer and the contractor or, more frequently, within the time frame stated in the contract. In the modern construction industry, a project's timely completion is a crucial indicator of its success (Dakhil, 2013).

Data from India's Ministry of Statistics shows that 215 of the 782 building projects under monitoring are behind schedule, with time extensions ranging from 1 to 261 months (Rathod and Dhall, 2016). Most recent African initiatives have failed to meet the typical project success criteria of being finished on time, under budget, and with the required quality. This has a major detrimental effect on the continent's already few resources since, among other things, it requires the use of extra funds to begin the projects and maintain the infrastructure before it is required. These have a number of explanations. One of the most obvious reasons must be the industry's reluctance to be more professional. Projects are being planned, started, and carried out outside the parameters of professional contract management principles and practices. The outcome is inefficiency and ineffectiveness (Gashahun, 2020).

Construction project execution delays cause time overruns, which have a negative effect on how timely they are completed. Time overruns have a negative impact on many aspects of a nation's economy, not only the construction industry (Mukaddas et al., 2020).

The construction sector in Uganda mirrors these global and regional challenges, with a high prevalence of delayed projects. According to Muhwezi et al. (2014), insufficient site investigation by the consultant, financial dishonesty/indiscipline on the part of the contractor, lack of experience on the part of the contractor, mistakes made by designers, and a delay in the consultant's assessment of changes in the scope of work are the main causes of delays on construction projects in Uganda. Furthermore, Abarinda et al. (2019) determined that the three main reasons for delays were the employment of inexperienced management and contractors (30%), the delay in contractor payments (26%), and design modifications (20%). Additionally, 70% of respondents claimed that Ugandan building projects had issues with time overruns and were not finished on schedule. However, the study by Abarinda et al. (2019) did not investigate how contract management techniques affect schedule performance; instead, it concentrated on using lean construction to improve schedule performance of construction projects in Uganda.

Even though these problems are acknowledged, little is known about how expert contract management techniques affect project schedules. The current construction landscape in Uganda exhibits resistance to structured contract management principles, leading to inefficiencies and mismanagement (Gashahun, 2020). While various studies have explored the causes of construction delays, limited research has systematically examined the role of contract administration, supervision, and regulatory frameworks in mitigating these delays. This study seeks to address this gap by evaluating the impact of contract management practices on the timely completion of construction projects in Uganda, providing insights into potential strategies for improving efficiency in the sector

1.2. Problem Statement

A significant challenge for the building construction sector has been completing projects on schedule. The issue of delays in the building construction sector is extremely significant and serious on a global scale (Odeh and Battaineh, 2002). The issue of delays is also affecting the African construction sectors, and if the matter is not addressed appropriately, the continent might see a loss in gross domestic product (Gashahun, 2020).

In Uganda, many construction projects have been implemented with time overrun among which includes the construction of Church house, Mapeera and many other buildings not to forget the Nakivubbo Stadium which as of 2023 is still under construction and has exceeded the actual planned construction time (Ngwomoya, 2021).

Worrying is that, Cost Uganda, a private entity which monitors public infrastructure on transparency reported that 91% of construction projects are completed late and this deprives project beneficiaries from utilizing the facility hence affecting service delivery (Cost Uganda, 2023). It is with this background that this study scientifically attempted to ascertain how much professional contracts management by both the Consultant and Contractor on construction projects can contribute to addressing this problem of construction time overrun.

1.3. Research Objectives

1.3.1. Main Objective of the Study

To ascertain the impact of professional contracts management practices on the timely completion of building construction projects in Uganda was the study's main objective.

1.3.2. Specific Objectives of the Study

The specific objectives of the study were;

i. To establish professional contract management practices in construction projects.
ii. To determine the impacts of the established professional contract management practices on construction projects completion time.
iii. To develop a time prediction model which enhances timely completion of building construction projects.

1.4. Research Questions

The questions that guided the researcher were;

i. What professional contract management practices are being used in execution of construction projects?
ii. What is the impact of the established professional contract management practices on construction projects completion time?
iii. What can be done to enhance timely completion of building construction projects?

1.5. Research Justification

Delay in project completion increases the project costs. Some of these costs are born by Contractors whereas some of the costs rest on the Employers. Consultants are also affected by time overruns especially those executing scope-based contracts. Time overruns also deprive project beneficiaries from utilizing the facility hence affecting service delivery. This study will find out the different professional contract management practices which are key in reducing construction time overrun. The study

will identify the major bottlenecks to timely completion of building construction projects which will help improve the construction industry in regard to contract management. There is scanty data in relation to this study and results obtained will be useful to future learners and researchers. This will help further the research and advance findings for future scholars.

1.6. Significance of the Study

To the Community:

Improved Infrastructure: Construction projects that are completed on time improve the community's quality of life by delivering necessary infrastructure, such roads, schools, and medical facilities, on time.

Economic Growth: Efficient projects lead to cost savings, attract investments, and stimulate economic development, providing opportunities for job creation and boosting local businesses.

Reduced Disruptions: Timely completion minimizes disruptions caused by prolonged construction activities, leading to reduced traffic congestion and inconvenience to residents.

Public Trust: Successful projects through professional contracts management build public trust in the construction sector and government hence promoting transparency and accountability.

To Academicians:

Knowledge Advancement: By providing insights into the effect of expert contracts management on on-time project completion, this study adds to the corpus of knowledge in construction management.

Academic Enrichment: Findings can be incorporated into academic curricula, enhancing education and preparing future professionals with relevant skills and knowledge.

Research Innovation: The study makes way for more investigation into contract management procedures and how they affect building projects, encouraging a mindset of continual improvement.

Policy Guidance: Policymakers can draw on the study's results to formulate guidelines and regulations for the construction industry, aiming to improve project delivery and efficiency.

1.7. Scope of the Study

Professional contract management procedures were examined severely in the study as independent variable, and timely completion of building construction projects was examined as a dependent variable. The effects of the different contract management techniques discovered throughout the investigation were determined by the researcher. The study covered various building construction sites within Kampala metropolitan by getting information from the consultants, contractors and engineers. This is because the consultants, contractors and engineers have the right information needed during the start and finish of a given project because of their high involvement in the projects.

The research covered a period of ten months from June 2022 to March 2023. The study covered Kampala metropolitan area which includes Kampala, Wakiso and Mukono.

Kampala Metropolitan, comprising Kampala, Wakiso, and Mukono districts, was selected as the study area due to its strategic economic and infrastructural significance in Uganda. This area hosts the largest number of public and private construction projects, making it an ideal representation of construction activities in the country. Additionally, the region has a high concentration of contractors, consultants, and regulatory bodies as evident by both UNABCEC and UACE having their offices in this region hence ensuring access to varied perspectives on contract management practices.

1.8. Conceptual Framework

The links between the various components are illustrated by the conceptual framework. The timely completion of building construction projects is the dependent variable, while the procedures for contractor pre-qualification, contractor regulatory practices, contractor supervisory techniques, and subcontracting are the independent factors. The next chapter examines the literature that is pertinent to the research.

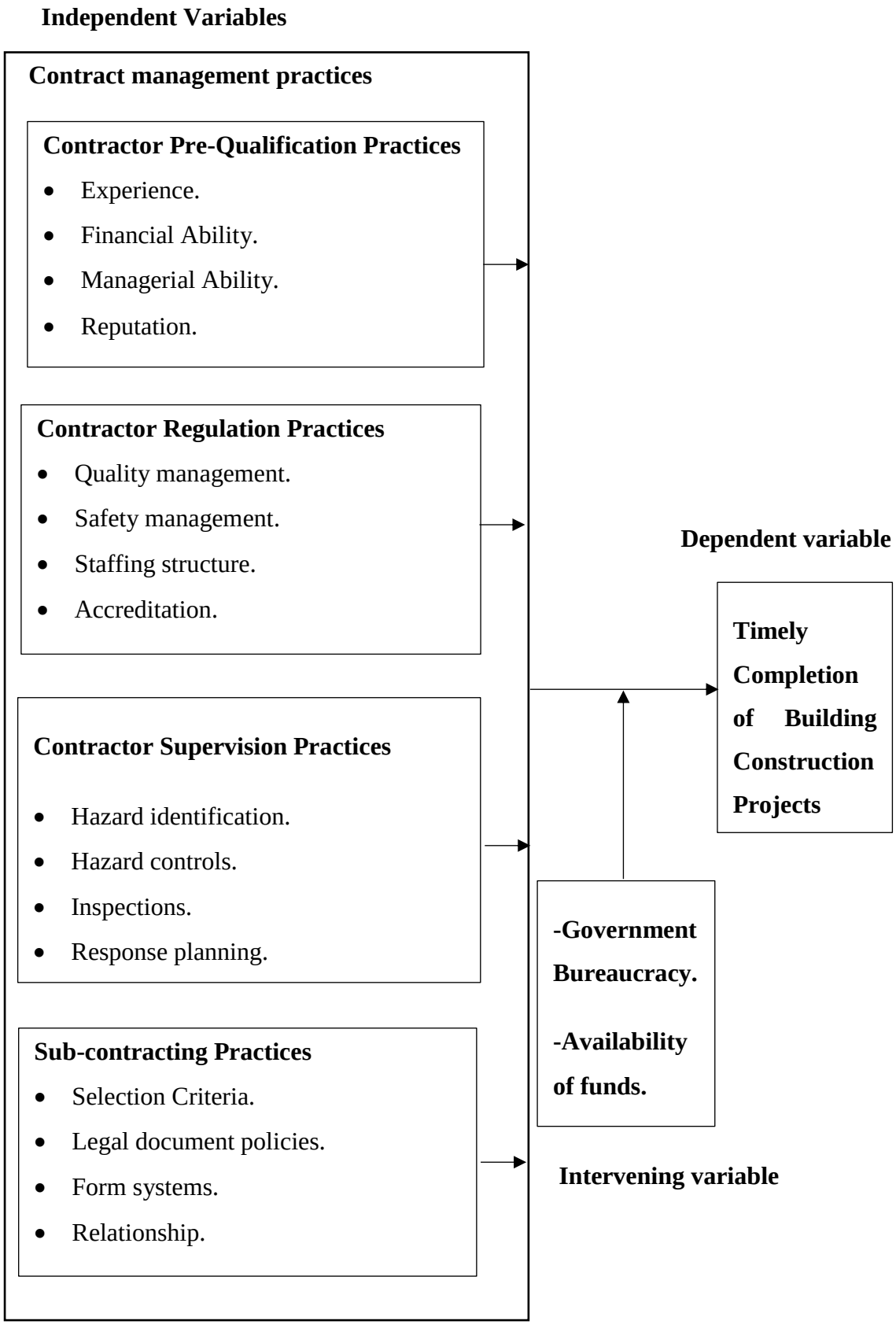

Figure 1.1: Conceptual Framework of the study

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter provides an overview of pertinent research literature. It gives a summary of the current theories, ideas, and empirical research that guide the investigation. The chapter is organized into a number of elements, such as the theoretical framework, conceptual review, and a review of previous research. Additionally, it highlights research gaps that justify the need for the current study. The literature review helps to establish a foundation for understanding key variables, their relationships, and how they have been explored by previous researchers.

According to the Project Management Institute (2013), a project is a duration bound activity created to deliver a unique good, service, or outcome. A project being duration bound means that it is given a definite start and completion dates within which all activities should be carried out. Construction projects are executed within a duration always specified in the contract and this requires proper planning and time management in order to eliminate disruptions and any causes of delays (Kikwasi, 2012).

In the construction sector, delays are thought to be a typical issue. They include occurrences that disrupt the construction program (Indhu and Ajai, 2014), extended construction periods beyond the contract period, or late completion of work in comparison to the contract timeline or anticipated schedule (Prakash and Camron, 2014).

A contract governs every building project. The efficient administration of a construction project is greatly influenced by proper contract management. Following

every clause in the contract can help you save money and time. The three main standard contract types used in construction projects are those developed by the International Federation of Consulting Engineers (FIDIC), the New Rules of Measurement (NRM), and the Joint Contracts Tribunal (JCT). The contract contains information on how to start works, what documentation is needed at each stage of the project, how to make changes, how much money is due, how to end or suspend work by either party, how to finish work, how to resolve disputes, how to arbitrate amongst other things (Khrishna, 2022).

2.1.1. Laws and Regulations in Uganda related to the study

The Contracts Act, 2010: The Contracts Act provides a legal framework for the formation, enforcement, and discharge of contracts in Uganda. Given that it sets forth the terms and conditions of contracts between all parties, including clients, contractors, and subcontractors, it is crucial for building projects. The possibility of disagreements and delays during project implementation can be decreased by adhering to the Contracts Act and ensuring that contracts are properly created, acknowledged, and carried out.

The Public Procurement and Disposal of Public Assets Act, 2003: This Act regulates the procurement process for public projects, including building construction projects commissioned by government entities. The Act specifies requirements for the acquisition of materials, labor, and services for such projects. To Act promotes openness, equity, and efficiency in the procurement process, which can positively impact projects completion time hence compliance with this Act is essential.

Uganda National Building Regulations (UNBR): The UNBR offers technical specifications, regulations, and recommendations for building development and sustainability in Uganda. It addresses a number of topics, including structural design, fire safety, accessibility, and environmental sustainability. Regarding contract management, adherence to UNBR can help ensure that building contracts comply with all necessary regulatory requirements, reducing the likelihood of delays caused by non-compliance or the need for rework.

Construction Industry Payment and Adjudication Act (CIPA), 2016: This Act addresses issues related to payment disputes in the construction industry. It introduces mechanisms for ensuring timely payments and offers adjudication procedures to resolve payment disputes swiftly. Complying with CIPA can promote better cash flow management for contractors and subcontractors, reducing the likelihood of payment-related delays.

2.2. Conceptual Review

Professional contract management practices refer to the structured and systematic processes involved in planning, executing, and overseeing contracts to ensure that all parties meet their contractual obligations efficiently, legally, and within agreed timelines and budgets. According to Rendon (2010), contract management encompasses the full lifecycle of a contract from procurement planning, contractor selection, negotiation, performance monitoring, to contract closeout. These practices aim to maximize value, manage risk, and achieve project objectives.

Professionally managed contracts in the construction sector involve clear specifications, risk mitigation measures, quality controls, and continuous stakeholder

communication. Badiru (2011) asserts that effective contract management is critical in preventing scope creep, disputes, and cost or time overruns. It supports accountability through documentation, monitoring tools, and enforcement mechanisms that ensure adherence to project milestones and legal frameworks.

Furthermore, the Project Management Institute (PMI, 2017) emphasizes that contract management is not only a procurement function but also a project control tool that ensures service delivery aligns with expectations. Professionalism in contract management demands adherence to legal, ethical, and technical standards, often guided by institutional policies or national procurement frameworks (Arrowsmith, 2010).

In developing countries like Uganda, where construction projects frequently experience delays and budget overruns, professional contract management has been identified as a key determinant of project success (Lidonga, 2014). It integrates contractor evaluation, regulatory compliance, supervision, and subcontractor coordination making it central to overall project performance.

2.2.1. Contractor Pre-Qualification Practices

Contractor pre-qualification in construction refers to the process of systematically assessing prospective contractors based on predetermined criteria such as past project experience, financial strength, managerial capability, and reputation before awarding contracts (Badiru, 2011). This proactive evaluation helps to ensure that only contractors with the capacity to meet project demands are selected, thereby reducing the risk of project delays, cost overruns, or failures (Rendon, 2010).

Contractor pre-qualification is widely recognized in both academic literature and professional industry guidelines as a strategic component of professional contract management, especially during the pre-contract phase (Badiru, 2011). The process plays a vital role in filtering capable contractors by evaluating their past experience, financial capacity, managerial competence, and reputation. This structured assessment helps reduce risks of non-performance, project delays, and quality failures (Badiru, 2011). According to Hiles & Wells (2015), pre-qualification supports procurement efficiency and lowers long-term project costs by ensuring only competent contractors enter contractual agreements. Similarly, the Project Management Institute (PMI, 2017) outlines prequalification as an essential procurement tool that aligns with broader contract objectives such as timely completion, compliance, and quality control. In developing countries like Uganda, studies have shown that inadequate pre-qualification contributes significantly to project failures, underscoring its central role in effective contract management (Lidonga, 2014).

Contractors with greater experience are better at anticipating project risks and managing timelines effectively (Badiru, 2011). Also, financially sound contractors are less likely to abandon projects due to cash flow issues (Rendon, 2010).

2.2.2. Contractor Regulation Practices

Contractor regulation practices involve implementing and enforcing rules, standards, and oversight mechanisms to ensure contractors maintain quality performance, adhere to safety guidelines, employ qualified personnel, and achieve required accreditations (Mohammed, 2010). Regulatory compliance is critical in safeguarding construction quality, ensuring worker safety, and minimizing operational risks, which directly

influence the successful and timely delivery of construction projects (Umeokafor, et al., 2014).

Contractor regulation practices are crucial to enforcing performance standards, ensuring legal compliance, and enhancing construction quality. Key regulatory components such as safety protocols, quality control systems, and accreditation requirements form part of professional contract management frameworks. Umeokafor et al. (2014) emphasize that failure to enforce occupational safety measures can lead to site accidents and project delays. Similarly, Mohammed (2010) argues that compliance with legal and planning regulations significantly affects a contractor's ability to deliver projects on time and within scope. Accreditation and structured staffing are also associated with higher project delivery reliability (Gacheru & Dianga'a, 2015). Regulatory oversight ensures that contractors meet a baseline level of competence and are continuously monitored for compliance, which contributes to better project outcomes (Ndumia, 2015).

2.2.3. Contractor Supervision Practices

Contractor supervision practices encompass the ongoing monitoring and management of construction activities to ensure compliance with safety protocols, quality standards, and project timelines. Key aspects include proactive hazard identification, hazard control measures, regular site inspections, and the establishment of effective response plans to mitigate project disruptions (Robert, 2016). Effective supervision is crucial

for minimizing errors, improving worker safety, and promoting the timely and successful completion of projects (Wambugu, 2013).

Supervision is an integral part of contract execution, with direct implications on project timeliness, safety, and quality. Effective supervision includes systematic hazard identification, consistent inspections, and well-developed response plans. Wambugu (2013) found that projects with inadequate supervision are more likely to experience rework, which leads to delays and cost overruns. Robert (2016) reinforces this by stating that routine inspections are critical for early error detection. Moreover, having predefined hazard controls and emergency protocols enhances site safety and ensures project continuity (Umeokafor et al., 2014). Response planning is particularly important in complex environments where unexpected disruptions can halt progress. Githenya and Ngugi (2014) further support the argument, showing that effective supervision is a predictor of successful project execution in housing developments.

2.2.4. Subcontracting Practices

Subcontracting in construction involves a primary contractor engaging third-party subcontractors to perform specialized tasks or services within a larger construction project. These subcontractors typically handle specific areas such as electrical work, plumbing, masonry, or finishing, allowing the main contractor to concentrate on overall project coordination and management. Subcontracting practices play a pivotal role in determining the efficiency and success of large-scale construction projects. The selection criteria for subcontractors focused on competence and past performance are fundamental to risk management strategies (Choudhry, et al., 2012).

Hatami and Behsan (2012) highlight the value of comprehensive legal agreements and clearly defined roles in avoiding disputes and performance delays. Form systems, including structured reporting and checklists, are tools that streamline communication between main contractors and subcontractors (Oshodi & Iyagba, 2013). Furthermore, the quality of the contractor-subcontractor relationship affects morale, accountability, and ultimately, project outcomes. Kimani and Kimwele (2015) found that poor subcontractor coordination is a major cause of time overruns in Kenyan housing projects, indicating the broader implications for contract management in similar environments.

2.3. Theoretical Review

The study was guided by the following theories;

2.3.1. Critical Chain Project Management Theory

The Critical Chain Project Management Theory served as the basis for this investigation. It is so named in honor of the project's long chain of interdependent, resource-reliant tasks, which is a key component. The goal of the approach is to guard against the effects of structural and resource dependency on individual activities, as well as from variation and unpredictability, on project length and, therefore, completion date. The County Government's road construction projects are impacted by structural, resource reliance on primary, and variational restrictions, making this theory appropriate.

The final result is a strong and reliable technique that enables teams to finish projects on time, every time, and most importantly, within at most 75% of the present timeframe for single projects and significantly less for individual projects in multi-

project scenarios. Businesses have a genuine potential to differentiate themselves from rivals that employ alternative project management strategies and deliver subpar work that is also late thanks to the shorter time period. Additionally, it provides a chance to complete more projects overall in the same amount of time and without an increase in operational costs, greatly improving the bottom line (Cole, 2014).

2.3.2. Principal-Agency Theory

The core idea of the principal-agency theory is that in order to reinforce desirable behavior, it is necessary to have a clear understanding of the principal's needs and the agent's capacity to meet those demands (Oluka and Basheka, 2012; Chiappori and Salanie, 2003, as quoted by Salim, 2013). The County Government is eager for a partnership like this, as are the numerous contractors that are a part of the value chains for Government projects.

According to Oluka and Basheka (2014), a well-planned and specified procurement contract makes it simple for the principal and agents to effectively satisfy one another's demands. As a result, the transaction is finished on schedule. With a case acting as the principal and suppliers, service providers, or contractors acting as agents, the principal-agent theory can be proudly applied to this subject. The idea is important because it emphasizes the necessity of clear contract criteria and specifications, together with an equitable mechanism for assigning performance ratings to contractors. Agents and principals may more readily meet one another's requests when roles and responsibilities for contract requirements are clearly defined, which promotes timely execution of the contract at the agreed-upon performance level.

2.3.3. Project Management Competency Theory

To assure the contractual party's competency on several fronts is one of the motivating factors behind all contract management methods, which is why this study's direction is being provided by this idea. McClelland and McBer (1980) were the authors of this hypothesis. Although competence is often universal, it also comprises the information, abilities, attitudes, and conduct that are directly related to the execution of complex procedures.

Using a combination of information gained via school, its subsequent application, and other skills developed through work, one can achieve professional competence in task control (Crawford and Bryce, 2013).

Prior management studies looked at the connection between performance and competence. A competency-based performance model for construction project managers includes the development of nine overall performance indicators for PM competency: group contracting, management, selection, mutuality and approachability, honesty and integrity, communication, education, know-how and application, self-efficacy, and protection of external relations (Smith et al., 2009). The project may be successfully finished within the constraints of construction project management if the team and project manager has the requisite skills.

This theory will serve as the study's guiding principle in determining competence in all contracting-related domains, such as pre-qualification, regulation, supervision, and sub-contracting. To ascertain if the contract management methods serve the interests of all participants or just their own, the inquiry will be guided by the project management competency hypothesis. In particular, the pre-qualification of subcontractors and contractors, which is primarily carried out in private and without

the purchasing organizations' participation. This premise provides an explanation for the contractor pre-qualification processes variable.

2.4. Empirical Literature

Empirical literature is organized according to the study objectives as show below;

2.4.1. Professional practices in contract management of construction projects

The process of managing settlement introduction, execution, and assessment in an orderly and effective manner to optimize operational and financial performance and decrease risk is the definition of contract management, which includes a wide variety of tasks (Bhardwaj, 2011). Negotiating contract terms and conditions, upholding compliance, and recording any variations that can arise throughout the project execution process are other definitions of contract management (Doc Juris, 2024).

Contract management is usually necessary and has many different facets, especially in the construction industry. As part of contracts that need to be handled, businesses commonly engage suppliers or contractors in one way or another to help offer a service or product to satisfy its stated requirements. Outsourcing was employed to facilitate successful service delivery, which is defined as generating work that is of exceptional quality and considered skilled (Akintoye and MacLeod, 2014).

The prequalification process for contractors suggests, in accordance with Badiru (2011), that employing best practices and a standard protocol enhances the identification of qualified contractors for specific works and reduces the time, money, and resources required to complete each prequalification. According to Hiles and Wells (2015), prequalifying contractors in business is mostly done to reduce risk and

procurement costs. It is crucial to create a prequalification procedure that is resource-efficient and streamlined because one of the key objectives is to cut expenses.

According to Simon (2015), a regulatory system that oversees the building sector may aim to sanction careless developers. To ensure compliance before a major problem occurs, a regulatory framework that pushes companies to do better based on proactive and constructive engagement can work well. The author adds that specialized entities should comprise the regulatory framework that regulates Uganda's building industry in order to support policies that streamline the sector.

The least enjoyable but most important component of project work, according to Robert (2016), is contractor supervision. This collaborative problem-solving activity is one of the finest ways to ensure project success. Construction supervision is to make sure that the parties to the project diligently carry out a high level of project supervision in a systematic manner throughout the construction process.

Contractor supervision involves several key activities essential for project success. Quality control and compliance ensure that construction adheres to project specifications, regulatory requirements, and industry standards through inspections and material testing (Wambugu, 2013). Progress monitoring tracks project milestones, identifies delays, and implements corrective measures to maintain alignment with contractual deadlines (Robert, 2016). Safety management enforces health and safety regulations, including personal protective equipment (PPE) usage and hazard identification (Umeokafor, et al., 2014). Risk management plays a role in identifying potential project disruptions, such as design flaws and material shortages, and developing mitigation strategies (Bhardwaj, 2011). Coordination and communication

facilitate effective interaction between contractors, consultants, suppliers, and regulatory authorities to address issues promptly (Gacheru & Dianga'a, 2015). Cost control ensures that the project remains within budget by monitoring expenditures, approving necessary changes, and preventing resource wastage (Mukaddas , et al., 2020). By integrating these elements, contractor supervision minimizes inefficiencies, reduces safety hazards, and enhances the timely completion of construction projects. Without proper supervision, projects are more susceptible to delays, quality defects, and cost overruns.

Mastrandera (2016) claims that unlike normal supervisory visits, which prioritize inspection and fault discovery above problem-solving to enhance performance, construction supervision is a continuous, interactive activity. According to Sturts and Schunk (2017), contractor subcontracting gives the subcontractor more freedom in labor coordination, lowers management expenses, and makes them less vulnerable to changes in the organization. Construction mismanagement may begin with a single subcontractor and spread throughout the network of workers to impact the timeline and harm several stakeholders, claim Shimizu and Cardoso (2012). Therefore, the problem of achieving the intended budget, cost, and schedule should not be solved by ignoring subcontractor difficulties.

It has been demonstrated that contract management enhances project and organizational performance. The consequences of contract management in state enterprises were examined by Cheroitich (2014). According to the study's findings, state enterprises use good settlement management, which greatly enhances their overall operational performance. The study's thesis is that strong contract control

enhances the overall operational effectiveness of government agencies in Uganda. Construction projects have never been the subject of comparable investigations.

2.4.2. Contract Management practices and Performance of Construction Projects

a) Management practices and Performance

Mutua, Waiganjo, and Otayo (2014) looked into how Nairobi's contract management affected the outcome of outsourced projects. They found that there was often a positive correlation between project success and contract administration, which is the process of overseeing contract execution to guarantee adherence to established terms and conditions, hence promoting effective project outcomes.

Project performance varied by 66 percent due to contract management and other factors and dispute resolution clauses were seen as crucial contractual provisions (Mutua, et al., 2014). The report recommends providing project managers and other team members with contract management training and certification to increase project performance. Additionally, operational variables impacting strategic relationships in the UK, social housing were researched by Camen, Gottfridsson, and Rundh in 2012. They concluded that ineffective expectation management between couples erodes relationship confidence and trust. As the authors point out, contracts serve as the foundation for partnership formation.

End-user contact and training are essential for improving operational performance, according to a 2013 study by Ronnberg-Sijodin on the life cycle viewpoint of the buyer-supplier relationship during the development of projects.

b) Contractor Pre-Qualification Practices and Performance

The pre-qualification procedure has been criticized by pointing to instances of inept contractors. In Uganda, building collapse incidents frequently cause property damage and fatalities. Honest property owners, flawed designs and noncompliance, cost-cutting and the use of inferior materials, a lack of quality control, and the employment of inexperienced contractors are a few of the potential causes (Lidonga, 2014). When evaluating the caliber of any profession, registration is crucial. According to an empirical research, the Ministry of Lands, Housing, and Urban Development's construction management unit (CMU) handles the difficulties associated with registering contractors in the building sector.

Gacheru and Diang'a (2015) evaluated the role of authorities in pre-qualification in their study of Kenya's construction contractor laws and the difficulties in carrying out the National Construction Authority's (NCA) duties. Questionnaires were used to gather information from building contractors. The results demonstrated that corruption, a lack of awareness, the centralization of NCA services, and the disarray of NCA contractor training programs were the main obstacles to the NCA's ability to effectively register and regulate the activities of construction contractors. Pre-qualification of contractors has been researched in home construction projects, but there isn't much data to support this claim, thus further research is required to confirm it.

According to Gudah, Omboto, and Tubey (2017), Kisumu County housing project implementation was impacted by contractor selection criteria. There are several events in contract initiation activities. The pre-qualification phase necessitates worker education, clear engagement tactics, relationship development, resource allocation to projects, leadership, and regulations, all of which have a direct bearing on the

outcomes for the contractors' total performance, according to Rendon (2010). There is a lack of information from a Ugandan standpoint, thus it is necessary to put the research's conclusions into practice.

c) Contractor Regulation Practices and Performance

Statutory rules known as building regulations are in place to guarantee that the terms of contracts are followed. Rules governing the cost of the construction tax, the registration of skilled workers, contractors, online supervisors of production websites, and educational institutions are all included in construction legislation (GOK, 2011).

The Nigerian construction industry's adherence to occupational safety and health regulations was examined by Umeokafor et al. (2014). According to the findings, client pressure, insufficient enforcement (which received the highest score), a lack of appropriate legislation, and unemployment (which received the lowest score) are the main barriers to adherence to occupational safety and health regulations in Nigeria's construction sector.

According to Mohammed (2010), a clause in the building laws has to specify that the contractor who intends to perform any creation must give written notice to the appropriate authorities for construction planning before displaying the artwork.

Ndumia (2015) did research on the accomplishments of building construction projects in Nairobi. According to the report, NCA records development applications, NEMA effectively executes environmental standards, and it makes recommendations for effective mitigation strategies for building construction efforts that have substantially detrimental consequences.

The regulators, NCA, NEMA, and the Nairobi County Government, have also established a legal and regulatory framework that includes a virtual tool for managing development applications that involves stakeholders in the coverage system. According to the study's findings, a regulatory framework that solely encourages company improvement through proactive and positive engagement may be successful in guaranteeing compliance before a significant problem arises, and the regulatory framework controlling the construction industry industry should take criminal prosecution for bad developers into consideration.

The standard of Uganda's contractor regulation appears concerning. Gacheru and Dianga'a (2015), looked at the NCA's issues and offered a severe assessment of the regulator's ability as a result of the difficulties they face. These difficulties included: insufficient ability to identify questionable activity on contractors through regular random surveys; poor enforcement of laws; insufficient sensitization; and unfavorable contractor attitudes about the NCA.

d) Contract Supervision Practices

Contract supervision practices refer to the structured activities undertaken to ensure that construction projects comply with contractual requirements, safety regulations, quality standards, and project timelines. These practices involve hazard identification, hazard controls, regular inspections, and response planning. Hazard identification focuses on recognizing potential risks on-site, such as structural weaknesses, environmental hazards, or safety risks that could cause delays or accidents. Hazard controls include implementing safety protocols, providing personal protective equipment (PPE), and ensuring adherence to construction safety guidelines. Regular

inspections involve continuous monitoring of project progress to verify compliance with quality standards and promptly address deviations. Response planning establishes emergency preparedness measures to handle unforeseen challenges like natural disasters, material shortages, or labor disputes. Effective contract supervision ensures that construction projects are executed efficiently, within budget, and in adherence to legal and safety standards, reducing the likelihood of disputes and delays (Mutua, et al., 2014)

Bhardwaj (2011) conducted study on the Ministry of Transport and Infrastructure Development (MTID) and found that inadequate building monitoring techniques and oversight are to blame for collapsed structures. According to Wambugu (2013), inadequate oversight and inspection of construction projects resulted in rework when subpar craftsmanship was found, delaying the assignment's total completion. Additionally, this leads to project cost overruns and may result in project termination (Wambugu, 2013).

Inadequate site inspection is one of the problems identified as delaying project completion on schedule. When implementing housing projects in Kenya, Githenya and Ngugi (2014) emphasized the importance of supervising contractors, particularly with regard to their competency. The study's objective was to evaluate Kenya's housing project management, planning, coordination, and teamwork skills. The successful completion of housing projects in Kenya has been shown to be significantly influenced by project management abilities, project control, a motivated project team, and project planning. Project control techniques were shown to have the highest impact on the execution of housing projects in Kenya, with a correlation value of 76.6 percent.

Githenya and Ngugi (2014) assessed how well housing projects were carried out in Kenya in terms of project management skills, motivated project teams, project planning, and project control. In the study, descriptive analysis was employed. To gather information, project managers were given questionnaires to fill out. The effective completion of housing projects in Kenya was shown to be significantly influenced by project planning, project control, a motivated project team, and project management expertise (Githenya & Ngugi, 2014).

e) Sub- Contracting Practices and Performance

Empirical research has supported the causes and effects of the adoption of subcontracting strategies. A study by Choudhry et al., (2012) looked into the benefits and drawbacks of subcontracting in the building sector. They discovered that receiving value reductions, gaining access to specialist services, and risk sharing are the three primary justifications for subcontracting. The study also discovered that using direct efforts was a losing strategy due to the high level of unpredictability, variations in the production workload, and higher administrative overhead expenses. Although 53% of respondents were satisfied with their present subcontracting experiences, 47% of respondents desired only modest changes made to subcontracting agreements (Choudhry et al., 2012).

According to studies, prime contractors should establish a framework for the subcontractors to follow in order to guarantee success. According to Hatami and Behsan (2012), contractors are more obedient to the risks that are specified in contracts than to other types of hazard. The characteristics of each assignment, the contractor's level of engagement, and how that affects contractor performance are the main areas of attention (Hatami & Behsan, 2012).

The consequences of subcontracting were also examined by Oshodi and Iyagba (2015), who came to a conclusion that clients, consultants, and contractors must make sure that clients hire qualified personnel and produce progress reports on time. Professional management of the design and construction phases by specialists, rather than leaving this to subcontractors, is necessary to minimize modifications throughout production. Contractors have set up nearby suitable financial, material, and agenda management systems to oversee the project's development phase.

Kimani and Kimwele's (2015), study which focused on the National Housing Corporation, sought to uncover the variables that affect project delays in Kenya. According to the survey, the majority of participants agreed that whenever projects are subcontracted, organizational structure, finances, contract management, and labor have an impact on project delays (Kimani & Kimwele, 2015). Due to the lack of a thorough research on the subject, the full scope of the subcontracting issue in Uganda's housing contracting business remains unclear. This is one of the study's justification.

2.4.3. Ways of achieving timely completion of building construction projects

Greer (2014), asserts that a project is successful if it fulfills the three constraints of performance (specification), cost, and time. This definition of success was modified by Thomsett (2013) to incorporate the factors of: provides sustained and actual benefits; appeases stakeholder groups; satisfies functional needs; satisfies quality expectations and requirements; stays under budget; meets deadline. This was done by carefully reviewing 20 failed projects that were started during an 18-year span. There is no agreement on the elements that determine whether a project succeeds or fails, despite being the subject of several study papers. Despite extensive research, Pinto and

Slevin (1987) claim that there is little consensus about the causes and elements that contribute to project success since success in terms of project is a very elusive idea (Pinto & Slevin, 1987).

According to De Wit (1988) and several other scholars, project management success and project success are two different ideas. For example, although though project management success is usually evaluated by comparing performance to the industry-set criteria for cost, time, and quality, they assert that comparing project results to the project's overall objectives determines whether the project was successful (De Wit, 1988). Furthermore, "project success factors" and "project success criteria" are not the same thing. De Wit (1988) defined success factors as the components of the management system that either directly or indirectly support the project's or company's success. The measures used to determine whether a project or business will succeed or fail are known as success criteria.

Furthermore, it was shown that project management success is more challenging to attain since it is constantly impacted by factors that might not be within the project team's control. Cooke-Davies (2002) states that the primary goal should be the development of procedures to adequately resource a portfolio of projects that are logically and dynamically related to an organization's corporate strategy and operational goals.

Sutton (2005), who claims that there are many levels of success and failure rather than a binary choice between success and failure, supports this point of view. He distinguishes four degrees of achievement, each with its own discipline, resources, and methods. Thus, for complete success, quality at every level is essential.

It is regrettable that the majority of building projects are not completed on time. These phenomena apply to projects at all levels, whether they are significant, capital, or megaprojects. This unfavorable tendency has made the sector almost universally infamous. It is also important to note that, while being the largest contributor to a nation's GDP, the construction industry's potential has never been completely realized. The construction industry attracts a wide range of stakeholders, such as designers, architects, engineers, builders, subcontractors, suppliers, and owners. Just as external factors and players, such as law enforcement, environmental agencies, governmental regulatory bodies, market hegemonic pressures, force majeure, difficulty accessing the site, and poor soil conditions, have an impact on the quick completion of construction projects, so do these numerous internal and external factors and players.

According to Haseeb (2011), the present discourse on these retrogressive phenomena aims to eliminate, redirect, or reduce their effects and recurrence. The concept of Project Integration Management is promoted by the well-known Project Management Body of Knowledge, which is now in its sixth version (PMBOK, 2017). Coordinating and using all auxiliary plans is the main goal of project integration management in order to finish projects on time and under budget.

Unfortunately, this element is disregarded or undervalued, which results in projects that have serious constructability issues, conflicts and disagreements, poor design, a lot of change orders, excessive costs, and late completions. In the worst situations, some projects are completely abandoned when contractors quit their jobs because they are frustrated.

According to Bhatti (2005), a project's ultimate client acceptance or resistance will be significantly influenced by the level of management support. According to Esteves and

Pastor-Collado (2000), continuous management support includes ongoing management commitment during implementation at both the top and middle levels, both in terms of their personal participation and their readiness to deploy important organizational resources. Support from management is crucial to achieving project goals and objectives and ensuring that they align with long-term company objectives. According to Cooper & Kleinschmidt (1987), senior management commitment is required during a project's implementation phase and must be prepared to contribute substantial resources to the implementation effort, according to Nah et al. (2001). According to Cooke-Davis (2002), senior management must periodically assess the project's progress and give guidance to the implementation teams. Furthermore, according to Nah et al. (2001), Senior Management is "generally responsible for accepting and approving the project initiatives outlined in the information technology strategic plan, including funding and prioritizing projects before they are initiated." In the context of small enterprises, Toney and Power (1997) developed and verified a statistic for top management support. Their measure considers the level of support for the project, the frequency of meetings, the level of participation in the analysis of information needs, and the level of participation in project-related decision-making.

2.5. Literature related to time prediction model

According to Hastie et al. (2009), prediction models—also referred to as forecasting models or predictive models—are statistical algorithms that use previous data to anticipate future events. Numerous industries, including marketing, healthcare, finance, and weather forecasting, use these models extensively. Because they offer insightful information about possible future trends or occurrences, they are essential to decision-making processes.

It is very difficult and complex to predict how long a project will take because of the many variables that can affect it, including the industry, the type of building that will be used, the procurement strategy, the construction materials, machinery, and equipment that will be used, the resources that were used, the work performance methods that were employed, the project's complexity and cost, the site's conditions, and many more. Therefore, determining how long a building project will take is an important, challenging, and complex task (Dimitrov & Zileska-Pancovska, 2015).

According to Petruseva et al. (2016), Bromilow, an Australian, was the first to look at the timing and cost of building projects carried out in Australia between 1963 and 1967. The research led to the development of the so-called "time-cost" model or BTC model using simple linear regression analysis as the mathematical approach: Y=aXb, where a and b are constants, X is the construction cost, and Y is the construction duration. The coefficient a represents the typical amount of time required to create a monetary value, while the coefficient b represents the sensitivity of the project's length to its value. Additional research has evaluated and validated the BTC model (Thomas, et al., 2001).

2.6. Critique of the Existing Literature Relevant to the Study

The substantial delays that affect building projects are the subject of much of the research that is currently available. The effect of expert contract management strategies on the timely completion of construction projects in Uganda is not specifically covered in the literature. The issue is not fully depicted by the few comparison studies that have been conducted. For instance, a research by Nduko et al. (2016) focused on World Bank and AfDB funding and looked at institutional elements

that affect the timely completion of road projects in Rwanda that are funded by external government money. Our field of study, contract management, was not examined. Consequently, the investigation's analytical framework has to be organized and prepared. When conducted in a variety of settings, this type of inductive research may produce information that would assist policymakers and construction managers in making decisions on project management and ensure that building construction projects in Uganda are completed efficiently and on schedule.

2.7. Research Gap

The impact of expert contract management techniques on the timely completion of building construction projects has not been investigated in the Ugandan context, based on the publications that are currently available.

According to Mutua et al.'s study, for example, the performance of outsourced projects in Nairobi, Kenya, was positively correlated with the contract type, acceptance criteria, and dispute resolution process, all of which were found to be impacted by contract management. The major related findings were primarily found in the neighboring country of Kenya. Hence the need to critically carry out the research relating to the Ugandan context. This will help policy makers by providing up to date data. Also, Existing research primarily focus on large construction firms, neglecting the challenges and opportunities related to contracts management and timely completion for Small and Medium-Sized Enterprises (SMEs) in Uganda or even micro enterprises in Uganda. The next chapter looks at the methods that were used to achieve the study objectives.

CHAPTER THREE: METHODOLOGY

3.1. Introduction

The study's methodology is presented in this chapter. The population and sample, sampling design, data sources, research tools, measuring techniques, validity and reliability testing, data analysis, and tactics for each specific aim are all covered in detail in this chapter.

3.2. Research Design and Approach

A research design is a collection of guidelines for collecting and evaluating data that aims to balance procedural efficacy with study objective relevance, according to Kothari (2004). The research design is the theoretical foundation upon which the study is conducted. It acts as a guide for collecting, evaluating, and using data. Thus, from developing the hypothesis and considering its operational implications to doing the final data analysis, the design comprises a description of the researcher's job (Kothari, 2004).

A cross-sectional study approach was used. Other research designs include experimental research, which manipulates variables under control to establish cause-and-effect relationships; longitudinal research, which collects data over a long period of time to observe changes and trends; and cohort research, which tracks a particular group of subjects over time.

The researcher used a cross sectional research design because it is efficient and relatively quick compared to other designs more still, a cross-sectional design is more feasible given limited resources and time constraints. It allowed the researcher to

collect and analyze data efficiently, making it suitable for addressing research questions within practical limitations.

To determine the effect of professional contracts management methods on the timely completion of building construction projects in Uganda, the researcher used a correlational methodology.

3.3. Study Population and Sampling

3.3.1. Study Population

According to Pandey and Pandey (2015), the parent group from which a sample is to be drawn is the complete mass of observations, which is referred to as the study population. The study population covered Contract Managers, Quantity Surveyors and Civil Engineers working for 220 Construction Companies registered with Uganda National Association of Building and Civil Engineering Contractors (UNABCEC) and have been involved in public projects that have experienced time overrun in the last eight years from 2014 to 2022 and also Contract Managers, Quantity Surveyors and Civil Engineers working for 70 Engineering Consultancy firms registered with Uganda Association of Consulting Engineers (UACE) and have been involved in public projects that have experienced time overrun in the last 8 years from 2014 to 2022.

3.3.2. Sampling Strategy

Purposive sampling was used to identify the different public building construction projects within Kampala metropolitan which has undergone time overrun in the last 8 years from 2014 to 2022 and the different Contractors and Consultants that were on these projects.

Following the identification of the projects, contractors, and consultants, participants for data collection were selected using simple random selection. Simple random sampling, according to Simkus (2022), is a sampling method that uses an equitable selection process to provide every member of a population an equal chance of being selected. Members of the sample are chosen at random, and each is given a number to establish the sample size. A random number generator (using Microsoft Excel) was used to choose the required sample size of 82 participants, and each company or organization was assigned a unique identification number. Because every person of the population had an equal chance of being selected, this method minimized bias and ensured sample fairness.

A simple random sampling approach was chosen because of its many advantages, including the fact that all decisions are made independently of each other and that each section of the population has an equal chance of being included in the sample (Kothari, 2004). Other benefits of simple random sampling include the capacity to draw inferences from the sample's observations, the freedom from subjectivity and human error, the requirement for minimal population information, and the availability of correct data for one's goals (Pandey and Pandey, 2015).

3.3.3. Sample Size

A sample, in the words of Pandey and Pandey (2015), is a fraction of a population that has been chosen for observation and study. The sample size should not be too large or small. It should be ideal. A sample that meets the requirements for effectiveness, representativeness, dependability, and adaptability is the ideal sample, according to

Kothari (2004). It is sufficient to use 10% of the sample's overall data (Pandey & Pandey, 2015). As seen in Table 3.1, the sample size was 10%.

Table 3.1: Sample Frame

No.	Respondents	Population size	Sample Size	Sampling Strategy
	Contracting firms			
1	Contract Managers	220	22	Random Sampling
2	Civil Engineers	220	21	Random Sampling
3	Quantity Surveyors	200	20	Random Sampling
	Consulting firms			
4	Project Managers	70	8	Random Sampling
5	Project Engineers	70	7	Random Sampling
6	Quantity Surveyors	40	4	Random Sampling
	Total	**820**	**82**	

3.4. Data Collection

Data collection involves use of data collection tools and a method of data collection to be employed;

3.4.1. Data collection tools

Responses were gathered using a questionnaire as the data collection tool. In order to gather specific data from respondents, a questionnaire is a research instrument that comprises a set of questions and a selection of answers printed or typed sequentially on a form (Aryal, 2022).

Structured questionnaires were designed to capture quantitative data related to professional contract management practices and project completion times. The

questionnaire consisted of both closed-ended and Likert scale questions to ensure ease of analysis.

The questionnaires were distributed physically and via email to contract managers, project managers, quantity surveyors, and civil engineers working in the selected construction and consulting firms.

To guarantee a high response rate, respondents were given two weeks to finish the surveys before follow-ups were carried out.

Regarding the timely completion of building construction projects, the questionnaire was primarily closed-ended and focused on the four contract management procedures of subcontracting, contractor pre-qualification, contractor regulation, and contractor supervision.

3.4.2. Data collection Methods

The data collection method used was a Survey: Surveys involve asking standardized questions to a sample of participants either in person, over the phone, through mail, or online. They are efficient for collecting large amounts of quantitative data (Creswell, 2014).

3.5. Data Quality testing

This necessitated data cleaning, which included identifying and correcting data faults or irregularities such missing data, outliers, and incorrect data entry. The researcher also evaluated the data to make sure it fit the objectives of the research. For example; any missing data, extreme values (outliers), or inconsistencies were identified and corrected to maintain the integrity of the dataset. Second, content validity checks were performed by comparing collected data against the study objectives to verify that

responses captured relevant insights into contract management practices and their impact on timely project completion.

3.6. Data Analysis

The act of computing certain metrics and looking for links between groups of data is known as data analysis (Kothari, 2004). The data were cleaned, grouped, coded, and tabulated to make analysis easier. The results of the data analysis which was done using the SPSS program (IBM SPSS Statistics 26) were presented in the form of tables and a prediction model.

To determine the effect of professional contract management techniques on the timely completion of construction projects, regression and correlation analysis were also conducted. The value of the dependent variable was predicted using regression analysis based on the independent components.

3.7. Achievement of specific objectives

3.2.1. Objective 1: To establish professional contract management practices in construction projects.

A thorough literature research was carried out to collect current information and best practices in professional contract management in building projects in order to accomplish this goal.

The comprehensive literature review was conducted using a structured approach that involved identifying, analyzing, and synthesizing existing research on contract management practices and their impact on construction project completion. The researcher reviewed peer-reviewed journal articles, books, industry reports, government policies, and case studies related to professional contract management in

construction. In order to uncover research gaps and create best practices, the search concentrated on subcontracting procedures, contractor regulation, contractor supervision, and contractor pre-qualification.

To ensure depth and relevance, the literature review covered both global and regional perspectives, including studies from India, the Middle East, Africa, and Uganda. The sources were obtained from academic databases such as Google Scholar, Research Gate, and institutional repositories. Additionally, legal frameworks such as Uganda's Contracts Act, 2010, and the Public Procurement and Disposal of Public Assets Act, 2003, were examined to understand regulatory influences on construction projects.

With regard to contractor prequalification processes, contractor regulation techniques, contractor supervision practices, and subcontracting activities in Uganda, the researcher identified and examined pertinent laws, regulations, and industry recommendations.

The researcher designed and administered a questionnaire survey to Contract Managers, Quantity Surveyors and Civil Engineers working for construction firms registered with UNABCEC that have had time overrun on public building construction projects within Kampala, Wakiso and Mukono.

Also, the researcher administered the questionnaire survey to Contract Managers, Quantity Surveyors and Civil Engineers working for Engineering Consultancy firms registered with UACE and have been involved in public building construction projects within Kampala, Wakiso and Mukono that have experienced time overrun.

To find common contract management techniques, the gathered data was analyzed using a thematic analysis and descriptive statistics in the SPSS program (IBM SPSS Statistics 26).

The data were carefully prepared and entered into the SPSS program to start the analysis. This made it easier to explore the data in the next phases. The variability of the pertinent variables was then thoroughly understood by using descriptive statistics. Variables involving project completion durations were measured using metrics including mean, median, standard deviation, and range.

Simultaneously, a qualitative comparative analysis was executed to delve into the qualitative data related to contract management practices which predominantly consisted of secondary data. The data were obtained and compared with the study's statistical findings and a final conclusion was made. This step ensured that no significant contract management practice was overlooked, contributing to the comprehensiveness of the analysis.

In conclusion, the combined use of descriptive statistics analysis in the SPSS software and comparative analysis method provided a holistic understanding of the various contract management practices prevalent in construction projects. This strategy made it easier to achieve the first goal and provided insightful information on the development and use of professional contract management techniques in the context of building construction projects in Uganda.

3.2.2. Objective 2: To determine the impacts of the established professional contract management practices on construction projects' completion time.

In order to achieve this objective, the researcher gathered project-specific data, including project timelines, contract management practices used, and any recorded delays or challenges faced during the projects. A comprehensive analysis was conducted, which also involved a meticulous examination of the collected data, utilizing using both quantitative and qualitative methodologies.

Through the application of descriptive statistics in the SPSS software, a quantitative understanding of the impacts was sought. The data were initially organized and prepared for analysis within the software. Descriptive statistics were then employed to extract essential insights from the data. Measures such as mean, median, standard deviation, and range were computed for variables related to project completion time. These statistical parameters provided a snapshot of the central tendency and distribution of completion times within the dataset.

The gathered data was further examined using correlation analysis and inferential statistics utilizing an ordinal logistic regression model in order to look at the relationship between professional contract management approaches and project completion time.

To test the hypothesis of whether there was a correlation between the timely completion of building construction projects and professional contracts management practices on projects within the Kampala Metropolitan area, a chi-square statistic was used to determine the significance and strength of associations. The p-values were used as a test of significance, and if it was less than 0.05, a conclusion was made that the test was significant and that there was a relationship between the test variables. If it was greater than 0.05, a conclusion was made that the test was insignificant and that

there was no relationship between the test variables. To determine the variables' importance and reach a judgment, this was carried out on each of the several independent variables.

Because of the nature of the research objectives, which included evaluating the significance of relationships between multiple independent variables (contract management practices) and the dependent variable (timely project completion), as well as the data analysis methods, which employed regression analysis and the p-value in the chi-square test to determine whether observed relationships were statistically significant, the p-test was the best choice for testing statistical significance in this study. Mann-Whitney ANOVA is used to compare means across many groups, the t-test is primarily used to compare means between two groups (such as experimental vs. control groups), and U is used for non-parametric data.

Combining these findings allowed for the achievement of the study's second objective, which was to clarify the intricate relationships between professional contract management strategies and the timely completion of building construction projects in Uganda.

3.2.3. Objective 3: To develop a time prediction model which enhances timely completion of building construction projects.

In order to achieve this objective, the researcher used questionnaire to collect historical data from completed building construction projects within Kampala, Wakiso and Mukono which have experienced time overrun, including project characteristics, contract management practices employed, and actual completion times.

The researcher analysed the collected data to identify patterns and correlations between contract management practices and project completion time and developed a predictive model using statistical techniques of regression and correlation analysis to enhance project completion time based on the identified factors.

The quantitative data amassed during the study, including variables concerning contract management practices and project completion times, played a central role. The insights garnered from the second objective, which highlighted the impacts of professional contract management practices on project completion time, provided a crucial foundation for the development of the predictive model. Inputs employed in the building of the time prediction model in the study included variables of contractor prequalification processes, contractor regulation techniques, contractor supervision methods, and subcontracting practices.

3.8. Analytical Model

An ordinal regression model was used because the dependent variable had ordinal data. The equation is as below;

Ordinal regression model *(Hosmer, et al., 2013)*

$$\text{Logit}(P(Y \leq j)) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_p X_p \quad \ldots\ldots\ldots\ldots \quad (\textit{Equation 3.1})$$

Where:

Y is the ordinal dependent variable with j categories;

$P(Y \leq j)$ is the probability of Y being less than or equal to j;

β_0 is the intercept;

$\beta_1, \beta_2, ..., \beta_p$ are the coefficients of the independent variables $X_1, X_2, ..., X_p$;

$X_1, X_2, ..., X_p$ are the independent variables;

Logit () is the natural logarithm of the odds ratio, which is defined as the probability of an event occurring divided by the probability of the event not occurring.

The link between the independent factors and the cumulative chances of falling into a higher category of the dependent variable is shown by the equation. According to Scott (1997), the coefficients show the degree and direction of each independent variable's impact on the likelihood of falling into a higher category.

The linear equation model expressed in a multiple form, as used by significant research like (Hina, 2014), is the functional form of the regression equation that has been adopted.

The following equation was used to study the association between professional contract management procedures and the timely completion of building construction projects in Uganda:

Time prediction model *(Montgomery, et al., 2012)*

$$\mathcal{Y} = \beta_0 + \beta_1\mathcal{X}_1 + \beta_2\mathcal{X}_2 + \beta_3\mathcal{X}_3 + \beta_4\mathcal{X}_4 + \beta_5\mathcal{X}_5 + \cdots \dots\dots\dots\dots + \beta_n\mathcal{X}_n + \mathcal{E} \dots\dots\dots\dots \text{(Equation 3.2)}$$

Where;

$\mathcal{Y}$= Timely completion of construction projects in Uganda

$\mathcal{X}_1, \mathcal{X}_2, \mathcal{X}_3 \dots\dots\dots\dots. \mathcal{X}_n$= Predictor variables.

The predictors are: Contractor Pre-qualification Practices, Contractor Regulation Practices, and Contractor Supervision Practices

$\beta_0 = \text{Constant}$

$\beta_1, \beta_2. \beta_3 \dots\dots\dots. \beta_n$ = Model Coefficients

$\mathcal{E}$ = Error term

The P-values to test for significance of the model coefficients was determined, then an analysis of variance was performed between the variables and after the R square statistic established. The model was used to find out how significantly the different predictor variables affect timely completion of building construction projects in Uganda.

3.8.1. Operationalization of the Variables

The prediction model was developed using data from section D and C of the questionnaire. Section D had data of the dependent variable which is timely completion of construction projects and section C had data on independent (Predictor) variables of professional contract management practices as observed in appendix A.

3.8.2. Test of Significance

The statistical significance of the effect of expert contracts management on the timely completion of building construction projects in Uganda was assessed using the F statistic test and R2 statistic. The study's 95% cutoff for significance. With a significance threshold of 0.05, the 95% was used. This indicates that there is a 95% chance that the researcher will be certain that there is a genuine or significant link between the two variables and a 5% chance that there won't be one. The statistical significance of the model coefficients was evaluated at a P-value of 5%.

Steps for developing the time prediction model

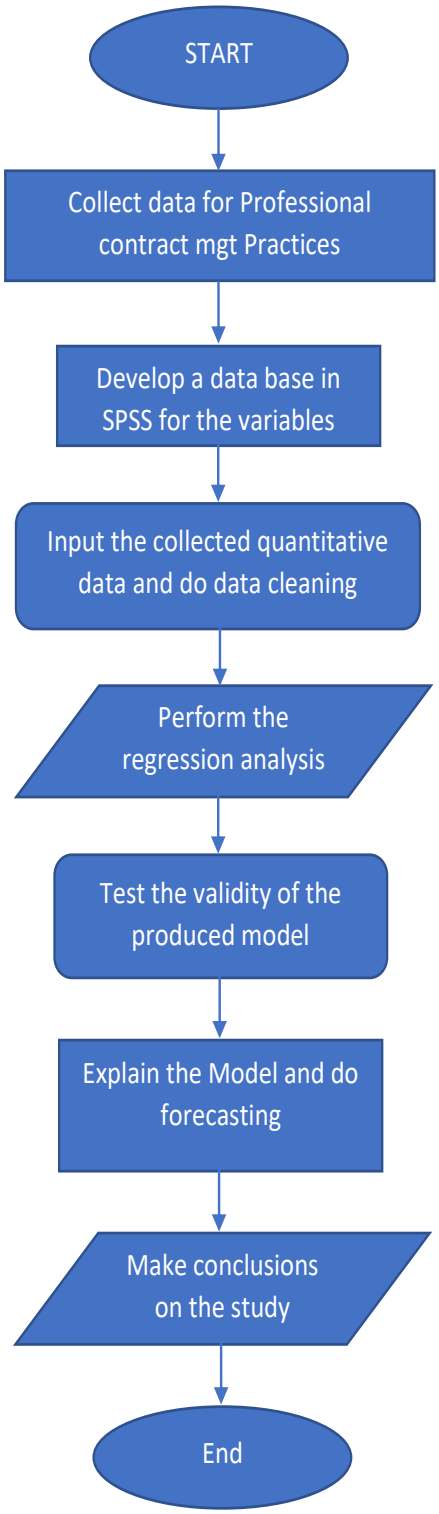

Figure 3.1: Steps for developing the time prediction model as developed by the Researcher

3.8.3. Research Ethical Considerations

The study followed important ethical guidelines, such as informed permission, confidentiality, anonymity, voluntary involvement, and upholding research integrity, to guarantee ethical compliance.

Informed Consent: Each participant was provided with a detailed explanation of the research objectives, methodology, potential risks, and benefits before their participation. In order to guarantee that individuals willingly consented to participate in the study free from undue influence or compulsion, participants had to give written consent.

Anonymity and Confidentiality: The identity of all respondents was kept confidential. Personal data was anonymized to ensure privacy, and responses were aggregated to prevent the identification of individual participants. Sensitive information was securely stored and only accessible to the researcher.

Voluntary Participation and Right to Withdraw: Participants were made aware that participation in the study was completely voluntary and that they might leave at any time without incurring any fees. This promoted candor and openness in the replies by guaranteeing that participants voluntarily engaged.

Ethical Approval and Compliance: The study was carried out in compliance with national and institutional ethical standards. To guarantee adherence to moral principles, ethical clearance was acquired from the appropriate institution ethics review body.

Avoidance of Harm: The study ensured that no participant was subjected to physical, psychological, or professional harm as a result of their involvement. Any sensitive

questions were carefully framed to minimize discomfort, and participants were given the option to skip any question they felt uncomfortable answering.

By incorporating these ethical measures, the study upheld the highest standards of research integrity and ensured that the rights, safety, and well-being of participants were protected throughout the research process. The research findings and explanations of the findings are presented in the next chapter.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

4.1. Introduction

The research findings on the impact of professional contract management strategies on the timely completion of building construction projects in Uganda are presented in Chapter 4. Establishing professional contract management practices in construction projects, assessing how these practices affect building construction project completion times, and developing a time prediction model that improves building construction project timely completion were the specific goals that shaped the research findings. The Statistical Package for Social Sciences (SPSS) was used to process the data. Tables including the mean scores and standard deviation were used to display the results.

4.2. Social Demographic Data

The findings in Table 4.1 provide a thorough overview of the basic characteristics of the respondents, enhancing the study's validity and generalizability. According to the results in Table 4.2, 67.1% of respondents were men and 32.9% of respondents were women. This indicates that the construction business in Uganda is dominated by males.

The highest number of respondents at 34 (41.46%) had at least stayed at the current station for 2-5 years since, the least number of respondents at 8 (9.76%) had stayed at the station for less than 2 years. This shows that most respondents had stayed longer at the current station hence in the position to give rich reliable results.

Table 4.1: Summary of the demographic characteristics of the respondents

Characteristic		**Count**	**Percentage**
Gender of respondent	Male	55	67.1
	Female	27	32.9
	Total	**82**	**100**
Characteristic		**Count**	**Percentage**
Length of work at current station	Less than 2 years	8	9.76
	2-5 years	34	41.46
	6-9 years	21	25.61
	10 years & Above	19	23.17
	Total	**82**	**100**
Education level of respondent	Diploma/College	13	15.9
	Bachelor's Degree	47	57.3
	Master's Degree	19	23.1
	Post-graduate Diploma	3	3.7
	Total	**82**	**100**
Do you have any certification on project management?	Yes	30	36.6
	No	52	63.4
	Total	**82**	**100**
		Count	**Percentage**
What was your project role	Contract Manager	22	26.8
	Civil Engineer	21	25.6
	Project Engineer	7	8.5
	Project Manager	8	9.8
	Quantity Surveyor	24	29.3
	Total	**82**	**100**
Average percentage time overrun had on the project in regard to the original completion time was 33%			

Table 4.1 shows that majority of respondent's highest education level was a Bachelor's degree at 47 (57.3%) and the least education level of sampled respondents was a post-graduate diploma at 3 (3.7%). This provided confidence to the study results that the sampled respondents had skills and authority on the mentioned subject and hence capable of giving rich and reliable results.

Results in Table 4.2 however, reveal that fewer respondents at 30 (36.6%) were accredited project managers against 52 (63.4%) who were accredited project managers. This is a bad finding since managers and workers on building construction projects ought to be accredited.

Results in Table 4.2 further reveal that on average, projects had time overrun of at least 33.02%. This means that on the planned project time period, there was always an extended time used by 33% of the original contract time on the building construction projects.

Results also reveal that the highest number of sampled respondents were quantity surveyors at 24 (29.3) and contract managers at 22 (26.8%). The least number were project engineers at 7 (8.5%). This implies that all respondents were skilled and qualified for the building construction projects and capable of giving reliable results.

4.3. Professional contract management practices in building construction projects

This section presents the different professional contract management practices which influence building construction projects and their rank ranging from 1=Strongly

Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA).

4.3.1. Contractor pre-qualification Practices

The different pre-qualification practices are shown in Table 4.2 with their varying measurements of mean and standard deviation (Std. Dev.). The rank of responses ranged from 1=Strongly Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA). N is the sample number.

Table 4.2: Contractor pre-qualification Practices

Descriptive Statistics								
	N	SD	D	NS	A	SA	Mean ± Std. Dev.	Ranking
Contractor's experience influences timely completion of building construction projects	81	0	0	2	23	56	4.68±0.520	1
Contractor's management ability influences timely completion of building construction projects	81	0	2	1	22	56	4.63±0.641	2
Contractor's financial ability influences timely completion of building construction projects	81	0	2	2	22	55	4.62±0.663	3
Contractor's reputation influences timely completion of building construction projects	81	13	15	12	13	28	3.40±1.497	4

From the mean values in Table 4.2, respondents either agreed or strongly agreed that yes indeed the different pre-qualification practices influence the timely completion of building construction projects. Respondents strongly agreed that indeed contractor experience influenced timely completion of building construction projects with mean value of 4.68 which is strongly agree response. Contractor reputation management techniques had the lowest mean score (3.40), making them the least reliable response.

The results of the table show that different contractor pre-qualification processes in Uganda have an effect on building construction projects' timely completion. In the context of construction project management, Smith et al. (2009) state that if the project manager and the project team possess all the skills necessary for the job, effective project execution is anticipated.

4.3.1.1. Test of statistics for Contractor prequalification practices

When evaluating the relevance of relationships between contractor prequalification procedures and the timely completion of building construction projects, the chi-square test statistic is crucial. It quantifies the observed and expected differences, guiding decisions on the relationship's validity within a building construction project. The statistics are displayed in Table 4.3;

Table 4.3: Contractor pre-qualification practices statistic

Test Statistics	
Sample No.	81
Chi-Square	78.404
Degrees of freedom	3
Asymptotic Significance (p-value)	0.000

The Chi-square statistic in Table 4.3 was significant with p-value=0.00 was less than 0.05. It is therefore concluded that different contractor pre-qualification practices significantly influenced timely completion of building construction projects in Uganda.

4.3.2. Contractor regulation practices

Table 4.4 shows the different contractor regulations practices which affect timely completion of building construction projects ranked with a likert scale ranging from

1=Strongly Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA). N represents the number of respondents.

Table 4.4: Contractor regulation practices

Descriptive Statistics								
	N	SD	D	NS	A	SA	Mean ± Std. Dev.	Ranking
Contractor's staffing structure influences timely completion of building construction projects	81	1	3	6	49	22	4.11±0.775	1
Contractor's safety management practices influence timely completion of building construction projects	81	1	2	6	52	19	4.09±0.728	2
Contractor's quality management practices influence timely completion of building construction projects	81	2	4	3	52	20	4.05±0.85	3
Contractor's accreditation practices influence timely completion of building construction projects	81	2	7	15	32	25	3.88±1.029	4

The results of the study in Table 4.4 highlight a noteworthy consensus among respondents regarding the positive impact of contractor's regulation practices on the timely completion of building construction projects. The results emphasis the significance of implementing effective contractor regulation practices as a contributing factor to ensure project completion within the expected timeframe. More still, all the values in the mean column were approximately equal to 4 which is agree response. This means that yes indeed Contractor's quality management practices influences timely completion of building construction projects with mean value of 4.05, Contractor's safety management practices influences timely completion of building

construction projects with mean response of 4.09 which is agree response, Contractor's staffing structure influences timely completion of building construction projects with mean response of 4.11 which is agree response and last but not least, Contractor's accreditation practices influences timely completion of construction projects with mean response of 3.88 which is approximately agree response.

According to Umeokafor et al. (2014), who evaluated the Nigerian construction industry's adherence to occupational safety and health regulations, performance in the sector was improved by their compliance. This corroborates our finding that contractor rules affect how quickly building construction projects in Uganda are completed.

4.3.2.1. Test of statistics for Contractor regulation practices

To determine the relevance of the relationships between contractor regulating practices and the timely completion of building construction projects, the chi-square test statistic was crucial. Decisions on the validity of the relationship within a building construction project are guided by the quantification of the observed and predicted differences. Table 4.5 presents the findings.

Table 4.5: Contractor regulation practices statistic

Test Statistics	
Sample Number, N	81
Chi-Square	3.577
Degrees of Freedom	3
Asymptotic Significance (p-value).	0.311

Considering the p-value of 0.311 in Table 4.5, it is greater than the critical value of 0.05. It is concluded that contractor regulation practices have no significant influence on timely completion of building construction projects in Uganda.

4.3.3. Contractor supervision practices

The different contractor supervision practices are shown in Table 4.6 with their varying measurements of mean and Standard deviation (Std. Dev.). The rank of responses ranged from 1=Strongly Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA). N is the sample number.

From Table 4.7, respondents agreed to the various contractor supervision practices on construction projects looking at the various mean values in Table 4.7. Since the mean value of 4.94 is a highly agree answer, the greatest percentage of respondents strongly agreed that construction project site inspections impact the timely completion of building construction projects. This gave the researcher a clear answer that project site inspection highly influences timely completion of building projects. The other responses were fairly approximating to an agree response which still validated the various supervision practices on construction projects.

According to Wambugu (2013), inadequate monitoring and inspection of the work in construction projects resulted in rework when there was poor craftsmanship, which delayed the completion of the assignment in its whole. This is consistent with the research results in Table 4.6

Table 4.6: Contractor supervision practices

Descriptive Statistics								
	N	SD	D	NS	A	SA	Mean ± Std. Dev.	Ranking
Construction project site inspections influence timely completion of construction projects	81	0	5	3	34	38	4.94±5.691	1
Construction site hazard identification influences timely completion of building construction projects	81	1	1	7	48	24	4.16±0.732	2
Construction site hazard controls influences timely completion of building construction projects	81	0	3	8	45	26	4.15±0.743	3
Construction site emergency response plans influences timely completion of building construction projects	81	2	8	6	39	26	4.01±0.994	4

4.3.3.1. Test of statistics for Contractor supervision practices

For determining the significance of relationships between contractor supervision practices and timely completion of building construction projects, the Chi-square test statistic is crucial. It quantifies the disparities between what was seen and what was predicted, assisting in determining if the connection holds true for a building construction project. The results are as in Table 4.7.

Table 4.7: Contractor supervision practices statistic

Test Statistics	
N	82
Chi-Square	9.100
Degrees of Freedom	3
Asymptotic Significance (p-value).	0.028

Given that the chi-square statistic in Table 4.8 has a p-value of 0.028, which is significant at the 5% level of significance, it was determined that contractor supervision procedures had an impact on the timely completion of building construction projects in Uganda.

4.3.4. Sub-contracting practices

The different Sub-contracting practices are shown in Table 4.8 with their varying measurements of mean and Standard deviation (Std. Dev.). The rank of responses ranged from 1=Strongly Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA). N is the sample number.

Table 4.8: Sub-contracting practices

Descriptive Statistics								
	N	SD	D	NS	A	SA	Mean ± Std. Dev.	Ranking
When subcontracting, standards and processes are explicitly defined.	81	0	4	5	34	38	4.31±0.801	1
The organization signs a formal agreement with the contractor after choosing him or her.	81	0	1	6	44	30	4.28±0.656	2
When subcontracting, the legal agreement regulatory restrictions are specifically stated.	81	0	2	9	41	29	4.21±0.737	3
For subcontracting, there are well defined, put into place systems and reporting lines.	81	0	3	8	44	26	4.19±0.709	4

Results from Table 4.8 reveal that all the respondents agreed to the various sub-contracting practices on building projects. This is because the mean value figures were all above 4 which is agree response. This meant that when subcontracting, standards and procedures should be clearly specified, that a legal contract should be entered into

by the organization and the contractor, that the structure and reporting line for subcontracting should be clearly defined and implemented, and that regulatory controls should be clearly specified in the legal agreement when subcontracting.

Law et al. (2012) provide strong support for the findings in Table 4.8, stating that the two primary factors that determine a construction project's success are the general contractor's ability to select the best subcontractor during the bidding process and the proper management of subcontractors during construction.

4.3.4.1. Test of statistics for sub-contracting practices

For determining the significance of relationships between sub-contracting practices and timely completion of building construction projects, the Chi-square test statistic is crucial. It quantifies the disparities between what was seen and what was predicted, assisting in determining if the connection holds true for a building construction project. The results are displayed in Table 9.

Table 4.9: Sub-contracting practices statistic

Test Statistics	
N	81
Chi-Square	5.653
Degrees of Freedom	3
Asymptotic Significance(p-value)	0.130

From Table 4.9, the p-value of 0.130 is greater than 0.05 at 5% level of significance and therefore we conclude that sub-contracting practices have no significant effect on timely completion of building construction projects.

Overall chi-square statistic

The overall chi-square statistic is a useful tool for testing hypotheses and making decisions throughout the study since it is essential for analyzing the correlations between expert contract management techniques and the timely completion of building construction projects. Table 4.10 lists the overall Chi-square statistic.

Table 4.10: Overall chi-square statistic

Test Statistics	
N	81
Chi-Square	145.246
Degrees of Freedom	15
Asymptotic Significance	0.000

From Table 4.10, the overall statistic to establish the different professional contract management practices in construction projects is significant since the p-value is 0.00 at 5% level of significance. Table 4.10's findings lead us to the conclusion that professional contract management techniques, such as subcontracting, contractor regulation, contractor supervision, and contractor prequalification, are essential to the timely completion of building construction projects.

4.4. The impact of the established professional contract management practices on construction projects completion time

The findings below present a detailed impact of the different established professional contract management practices identified on construction projects completion time with a likert scale from 1=Strongly Disagree, 2=Disagree, 3=Not Sure, 4=Agree and last but not least 5=Strongly Agree and results are as below;

4.4.1. Impact of Contractor prequalification practices

The impact of the different Contractor pre-qualification practices is shown in Table 4.11 with their varying measurements of mean and Standard deviation (Std. Dev.). The rank of responses ranged from 1=Strongly Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA). N is the sample number.

Table 4.11: Impact of Contractor prequalification practices

Descriptive Statistics								
	N	SD	D	NS	A	SA	Mean ± Std. Dev.	Ranking
Incompetent contractors are identified at this stage	81	1	3	6	39	31	4.21±0.832	1
The selection of contractors is done at this stage	81	3	6	6	42	25	3.96±1.006	2
Leadership and regulations on the project are initiated	81	1	4	13	46	17	3.94±0.827	3
Contractors are Educated, strategies of engagement are developed, relationship constructed, and resource allocation initiatives done	81	6	6	6	42	21	3.83±1.138	4

Findings in Table 4.11 reveal that contractor prequalification practices have approximate mean value of 4 which lies in the agree response. This concludes that contractor prequalification practices have an impact on timely completion of building construction projects. This further justifies the study parameters that Incompetent contractors are identified during this stage, the selection of contractors are done at this stage, Leadership and regulations on the project are initiated at this stage and Contractors are Educated, strategies of engagement are developed, relationship

constructed and resource allocation initiatives done. Contractor pre-qualification procedures have a significant impact on projects and their success. According to Ochola and Kirui (2018), the contractor's competency, capacity, resources, management methods, and historical performance had a major impact on the performance of home construction projects. This is consistent with the study's results that contractor pre-qualification procedures have a big influence on how quickly building construction projects are finished.

4.4.1.1. Test of statistics for Contractor pre-qualification practices

The Chi-square test statistic is essential for assessing the significance of associations between contractor prequalification practices and timely completion of building construction projects. It quantifies the observed and expected differences, guiding decisions on the relationship's validity in regard to a building construction project.

Table 4.12: Test of statistics for Contractor pre-qualification practices

Test Statistics	
N	81
Chi-Square	101.246
Degrees of Freedom	15
Asymptotic Significance	0.001

There is a significant impact between contractor pre-qualification practices and timely completion of building construction projects since the chi-square of 101.246 with a p-value of 0.001 is less than 0.05 meaning the p-value is significant.

4.4.2. Impact of Contractor regulation practices

The impact of the different Contractor regulatory practices is shown in Table 4.13 with their varying measurements of mean and Standard deviation (Std. Dev.). The rank of

responses ranged from 1=Strongly Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA). N is the sample number.

Table 4.13: Impact of Contractor regulation practices

Descriptive Statistics								
	N	SD	D	NS	A	SA	Mean ± Std. Dev.	Ranking
The regulation bodies are reviewed	81	2	3	10	41	25	4.04±0.901	1
The construction criteria outlined in the applicable regulations have been finished.	81	3	3	4	53	18	4.00±0.880	2
Enforcement teams are created	81	2	1	13	46	19	3.99±0.829	3
The various Government bodies in construction and the public are engaged and a relationship created	81	2	5	9	49	16	3.93±0.863	4

From findings in Table 4.13, the contractor regulation practices were all agreed upon by the respondents since the mean value response obtained was approximately 4 which lies in the agree response. Therefore, the ways in which contractor regulation is practiced greatly affects how quickly construction projects are finished in Uganda. Regulatory frameworks that require construction businesses to participate in constructive engagement successfully promote compliance prior to the onset of any severe problems, and are crucial for increasing effectiveness in construction, claims Odhiambo et al., (2022). This conforms to the study findings that contractor regulation practices significantly impact timely completion of building construction projects.

4.4.2.1. Test of statistics for Contractor regulation practices

The Chi-square test statistic is essential for assessing the significance of associations between contractor regulation practices and timely completion of building

construction projects. It quantifies the observed and expected differences, guiding decisions on the relationship's validity in regard to a building construction project. Table 4.14 shows the results.

Table 4.14: Test of statistics for Contractor regulation practices

Test Statistics	
N	81
Chi-Square	201.045
Degrees of Freedom	15
Asymptotic Significance	0.003

There is a significant impact between contractor regulation practices and timely completion of building construction projects since the chi-square of 201.045 with a p-value of 0.003 is less than 0.05 meaning the p-value is significant.

4.4.3. Impact of Contractor supervision practices

The impact of the different Contractor supervision practices is shown in Table 4.15 with their varying measurements of mean and Standard deviation (Std. Dev.). The rank of responses ranged from 1=Strongly Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA). N is the sample number.

Table 4.15: Impact of Contractor supervision practices

Descriptive Statistics								
	N	SD	D	NS	A	SA	Mean ± Std. Dev	Ranking
Supervision helps reduce rework activities which might have happened	81	0	1	1	16	63	4.74±0.543	1
Supervision helps reduce delay on activities	81	0	2	2	18	59	4.67±0.652	2
With supervision, Project control is improved	81	0	2	23	56	80	4.64±0.619	3
Supervision helps Construction procedures to improve	81	1	1	3	25	51	4.54±0.742	4

Contractor supervision practices in Table 4.15 had the highest ratings of responses tending to strongly agree looking at the mean values. Still the study conclude that supervision helps reduce rework activities which might have happened, supervision helps reduce delay on activities, with supervision, project control is improved and supervision helps construction procedures to improve. A study by Ogundipe, et al., (2018) states that though skilled operatives are knowledgeable in their area of specialisation, adequate supervision on application of materials and other components of building would help them to correct quite a number of error before it is escalated into exorbitant damages on sites. This conforms to the study findings that Supervision helps reduce rework activities which might have happened, Supervision helps reduce delay on activities and supervision improves construction procedures and project control hence significantly impacting on timely completion of building construction projects.

4.4.3.1. Test of statistics for Contractor supervision practices

For determining the significance of relationships between contractor supervision practices and timely completion of building construction projects, the Chi-square test statistic is crucial. It quantifies the disparities between what was seen and what was predicted, assisting in determining if the connection holds true for a building construction project. The results are as in Table 4.16.

Table 4.16: Test of statistics for Contractor supervision practices

Test Statistics	
N	81
Chi-Square	151.046
Degrees of Freedom	15
Asymptotic Significance	0.000

There is a significant impact between contractor supervision practices and timely completion of building construction projects since the chi-square of 151.046 with a p-value of 0.000 is less than 0.05 meaning the p-value is significant.

4.4.4. Impact of Sub-contracting practices

The impact of the different sub-contracting practices is shown in Table 4.17 with their varying measurements of mean and Standard deviation (Std. Dev.). The rank of responses ranged from 1=Strongly Disagree (SD), 2=Disagree (D), 3=Not Sure (NS), 4=Agree (A) and 5=Strongly Agree (SA). N is the sample number.

Table 4.17: Impact of Sub-contracting practices

Descriptive Statistics								
	N	SD	D	NS	A	SA	Mean ± Std. Dev.	Ranking
Sub-contracting helps to reduce uncertainty in areas where a contractor lacks enough knowledge	81	0	1	1	25	54	4.64±0.577	1
Having experts improves the progress of a project to reduce delays	81	1	1	2	23	55	4.58±0.722	2
Subcontracting helps in securing admissions to specialized services	81	2	2	3	26	48	4.44±0.880	3
Value discounts are obtained on a project	81	2	3	7	33	36	4.21±0.932	4

The findings in Table 4.17 show that respondents either agreed or strongly agreed to the impact of sub-contracting practices parameters being reviewed. This concludes that sub-contracting helps to reduce uncertainty in areas where a contractor lacks enough knowledge since mean value of 4.64 lies in the strongly agree response, having experts improves the progress of a project to reduce delays since mean value of 4.58 lies in the strongly agree response, subcontracting helps in securing admissions to specialized services since mean value of 4.44 lies in the agree response and also value discounts are obtained on a project since mean value of 4.21 lies in the agree response. This demonstrates the influence of various subcontracting techniques on the timely completion of building construction projects. According to Mule, et al. (2019), the construction industry frequently uses subcontracting and sub-subcontracting in order to save time and money. This conforms to the study findings that sub-contracting practices significantly impacts timely completion of building construction projects.

Test of statistics for sub-Contracting practices

For determining the significance of relationships between sub-contracting practices and timely completion of building construction projects, the Chi-square test statistic is crucial. It quantifies the disparities between what was seen and what was predicted, assisting in determining if the connection holds true for a building construction project. The findings are as shown in Table 4.18.

Table 4.18: Test of statistics for sub-contracting practices

Test Statistics	
N	81
Chi-Square	250.127
Degrees of Freedom	15
Asymptotic Significance	0.000

There is a significant impact between sub-contracting practices and timely completion of building construction projects since the chi-square of 250.127 with a p-value of 0.000 is less than 0.05 meaning the p-value is significant.

Overall chi-square statistic on the impact of the established professional contract management practices

The overall chi-square statistic is crucial for evaluating the impact of professional contract management practices on timely completion of building construction projects, making it a valuable tool for hypothesis testing, and decision-making across the study. Table 4.19 shows the overall chi-square statistic of the impact of the established professional contract management practices on construction projects completion time.

Table 4.19: Overall chi-square statistic.

Test Statistics	
N	81
Chi-Square	248.031
Degrees of Freedom	15
Asymptotic Significance (P-values)	0.000

The chi-square statistics in Table 4.19 is significant at 5% level of significance and therefore we conclude that the different established professional contract management practices have a significant impact on building construction projects completion time.

4.5. A time prediction model which enhances timely completion of building construction projects

4.5.1. Model Fitting Information

Model fitting is crucial in data analysis and statistical modeling as it determines how well a chosen model aligns with the observed data. A well-fitted model accurately captures the underlying patterns and relationships within the data, allowing for meaningful insights, predictions, and decision-making. (Hastie, et al., 2009).

The model fitting information shown in Table 4.20 refers to the evaluation and assessment of how well a statistical model represents the observed data.

Obtaining the model fitting information for a logistic regression model in SPSS involves evaluating how well the chosen model aligns with the observed data. To achieve this, data preparation was done by loading the dataset into SPSS and ensuring variables were appropriately defined and coded. From SPSS software analyze menu, "Regression" and then "Binary Logistic" was selected. The dependent binary variable (timely completion of building construction projects) and the independent variables

(contractors' prequalification, regulation, supervision, and subcontracting methods) were used to specify the variables.

The SPSS software estimated coefficients using the logistic regression model. The model fitting process iteratively adjusted these coefficients to maximize the likelihood of the observed binary outcomes. The model was evaluated by examining the “Chi-Square" statistic tests whether the model significantly deviates from the null model (no predictors). A significant p-value indicates that at least one predictor has a relationship with the outcome (Timely completion of building construction projects).

Table 4.20: Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	Degrees of Freedom	Significance
Intercept Only	379.482			
Final	360.876	18.606	4	0.001
Link function: Logit				

From Table 4.20, the p-value of the model is 0.001, the model is a good fit since the p-value is less than 0.05. This means the Model’s effects are significant and not just due to random variation.

A chi-square of 18.606 means the value suggests a larger difference between what the model predicts and what was actually observed. A model is not a good fit when it fails to accurately capture the underlying relationships between variables in the data. This might manifest as a high p-value, indicating that the model's coefficients are not statistically significant and therefore might not actually be contributing to explaining the variability in the dependent variable. But in this case the P-value was low indicating the model is a good fit.

A good fit model has statistically significant coefficients (low p-value). A poor fit model has insignificant coefficients and/or predictions that significantly deviate from the observed data.

4.5.2. R-Square statistics

The R-Square statistics shows how well professional contract managements practices account for the variation in the timely completion of building construction projects as shown in Table 4.21;

Table 4.21: R-Square of the model

Pseudo R-Square	
Nagelkerke	0.205
Link function: Logit	

The R-Square (Nagelkerke) in Table 4.21 shows that 20.5% of variations in timely completion of building projects in Uganda are explained by professional contract management practices.

4.5.3. Model parameter estimates

The model parameter estimates as presented in Table 4.22 refer to the values that are estimated for the parameters of a statistical model (Montgomery, et al., 2012).

Table 4.22: Model Parameter Estimates

Parameter Estimates							
	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Contractor prequalification practices	0.918	0.352	6.803	1	0.009	0.228	1.608
Contractor regulation practices	-0.061	0.391	0.025	1	0.875	-0.828	0.705
Contractor supervision practices	1.203	0.485	6.141	1	0.013	0.251	2.154
Sub-contracting practices	0.456	0.398	1.312	1	0.252	-0.324	1.237
Link function: Logit							

The model findings in Table 4.22 reveal that only Contractor Prequalification Practices and Contractor supervision Practices are significant considering the p-values = 0.009 and 0.013 respectively. This implies that for every one unit increase on Contractor Prequalification Practices, there is a predicted increase of 0.918 in the log odds of falling at a higher level on the timely completion of building construction projects. There is a projected increase of falling at a greater level by 0.918 on the timely completion of construction projects by a unit increase in contractor prequalification practices.

The expected rise in the log chances of falling at a higher level on the timely completion of building construction projects is 1.203 for every unit increase in contractor supervision practices. The timely completion of construction projects is

expected to decline at a larger level by 1.203 due to increased contractor supervision procedures.

It was also found out that contractor regulation practices and sub-contracting practices do not have an effect on timely completion of construction projects since their p-values are greater than 0.05.

4.5.4. Model equation

Using the given parameter estimates, the equation for the ordinal logistic regression model is as follows:

Logit (p (Y ≤ j | X)) = αj + 0.918X_1 - 0.061X_2 + 1.203X_3 + 0.456X_4 ... (Equation 4.3)

Where;

X_1, X_2, X_3, and X_4 are the predictor variables and

X_1= Contractor Prequalification Practices

X_2= Contractor Regulation Practices

X_3= Contractor supervision Practices

X_4= Sub-Contracting Practices

j is the category of the ordinal response variable, with j = 1, 2, ..., J-1 for J categories.

αj is the intercept. The coefficients β_1, β_2, β_3, and β_4 represent the effects of the predictor variables X_1, X_2, X_3, and X_4 on the log-odds of being in a higher category of the ordinal response variable.

Since X_2 and X_4 are insignificant, our final equation is;

Logit (p (Y ≤ j | X)) = -6.363 + 0.918X_1 + 1.203X_3... *(Equation 4.4): Time prediction model*

Whereby;

X_1= Contractor Prequalification Practices

X_3= Contractor supervision Practices

Y=Timely completion of building construction projects.

Constant **αj** = -6.363, this means that when contractor prequalification and supervision are at an average level, the log-odds of a project being completed on time or earlier is -6.363. Since the value is negative, it indicates that at average levels of prequalification and supervision, delays are still more likely unless these factors are improved.

This denotes that when constructing buildings, contractor pre-qualification practices and contractor supervision practices should be attended to keenly in order to have timely completion of building construction projects according to the developed model. Hence contractor prequalification practices and contractor supervision practices are the professional contract management practices which impacts significantly on timely completion of public building construction projects in Uganda.

Based on important contract management techniques, the time prediction model created for this study attempts to estimate the probability of building construction projects being completed on schedule. Ordinal regression analysis was used to build the model, with the timely completion of construction projects as the dependent variable and contractor prequalification, regulation, supervision, and subcontracting practices as the independent variables.

Application of the Developed Model with an Example;

Assume a construction company is carrying out the development of a 20-storey public building in Kampala. The project team applies the developed model to estimate

whether the project will be completed on time based on the identified contract management practices.

Step 1: Input Variables – The project team assesses the contractor's prequalification level basing on company's past experience on similar projects, company's financial ability and competencies of the deployed personnel.

Assesses the supervision strategy and intensity based on historical project data.

Step 2: Model Application – Using the developed model equation:

$$\text{Logit}(p(Y \leq j|X)) = -6.363 + 0.918X_1 + 1.203X_3$$

$$\text{Logit}(p(Y \leq j|X)) = -6.363 + 0.918X1 + 1.203X3$$

Where: X_1 (Contractor Prequalification Practices) and X_3 (Contractor Supervision Practices) are statistically significant predictors of timely completion.

Step 3: Interpretation of Results –

If contractor prequalification is high ($X_1 = 1$) and supervision practices are strong ($X_3 = 1$), the log-odds of timely completion increase significantly.

If contractor prequalification is poor or supervision is weak, the likelihood of project delays increases.

This means that projects with better contractor selection and strong supervision practices are more likely to be completed on time, reinforcing the importance of professional contract management.

Extent to Which the Model Indicates Project Performance in Terms of Time

Predictive Strength – The model explains 20.5% of the variations in project completion time (Nagelkerke $R^2 = 0.205$).

4.5.5. Correlations amongst Study Variables

The statistical relationships between the different variables are as in Table 4.23. The correlation analysis in Table 4.23 was carried out to establish the strength of relations between variables.

Table 4.23: Variable Correlations

Correlations							
		Timely completion of construction projects	Pre-qualification procedures for contractors		Practices for regulating contractors	Contractor supervision practices	Sub-contracting practices
Spearman's rho	Timely completion of construction projects	Correlation Coefficient	1.000	0.275	0.042	0.319	0.128
		Sig. (2-tailed)	0.0	0.012	0.706	0.004	0.250
		N	82	82	82	82	82
	Contractor pre-qualification practices	Correlation Coefficient	0.275	1.000	0.288	0.308	0.078
		Sig. (2-tailed)	0.012	0.0	0.009	0.005	0.484
		N	82	82	82	82	82
	Contractor regulation practices	Correlation Coefficient	0.042	0.288	1.000	0.015	0.185
		Sig. (2-tailed)	0.706	0.009	0.0	0.891	0.096
		N	82	82	82	82	82
	Contractor supervision practices	Correlation Coefficient	0.319	0.308	0.015	1.000	0.280
		Sig. (2-tailed)	0.004	0.005	0.891	0.0	0.011
		N	82	82	82	82	82
	Sub-contracting practices	Correlation Coefficient	0.128	0.078	0.185	0.280	1.000
		Sig. (2-tailed)	0.250	0.484	0.096	0.011	0.0
		N	82	82	82	82	82
Correlation is significant at the 0.05 level (2-tailed).							
Correlation is significant at the 0.01 level (2-tailed).							

The findings in Table 4.23 with r of 0.275 indicate there is a weak correlation between timely completion of building construction projects and contractor pre-qualification practices but the p-value is significant at 5% level of significance.

Timely completion of construction projects and contactor supervision practices with r of 0.319 have a weak correlation too, but still the p-value is significant at 5% level. Contactor pre-qualification practices and contractor supervision practices with r of 0.308 also have a weak correlation at 5% level of significance.

Generally, there was a weak correlation between the variables. The next chapter presents the conclusions to the study findings and makes recommendations.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter explores the findings and suggestions in the context of the study's goals. Additionally, the chapter offers recommendations for additional research.

5.2. Conclusions

The purpose of this study was to determine how professional contract management techniques affected Ugandan building construction projects' timely completion. A cross-sectional research design was employed as part of the study's methodology. Contract managers, quantity surveyors, and civil engineers from 220 construction companies and 70 engineering consulting firms made up the research population. Simple random and deliberate sampling was used to choose the 82-person sample size. To determine the effect of professional contract management techniques on the timely completion of building projects, data was gathered using questionnaires and analyzed using SPSS software, which included logistic analysis and regression. A 5% threshold was used to assess the model coefficients for statistical significance.

On construction projects, the accepted professional contract management procedures comprised subcontracting, contractor supervision, contractor rules, and contractor prequalification.

According to the study's findings, contractor pre-qualification practices such as contractors experience, contractors management ability, contractors financial ability and reputation have a significant impact on building construction projects' success in terms of their timely completion. Similarly, contractor supervision practices such as daily site inspections, site hazard identification, site hazard control and having onsite

emergency response plan have also been shown to significantly impact timely completion of building construction projects.

Variables of sub-contracting practices and contractor regulation practices can work promptly when the two most important variables are properly considered. There will be appropriate regulating procedures and subcontracting methods with the suitable pre-qualification standards and supervision techniques.

Adopting professional contract management practices can lead to more successful and timely project outcomes hence benefiting the construction industry and stakeholders.

5.3. Recommendations

Below are some recommendations based on the study's finding;

Pre-qualification procedures for contractors should take into account their work history, reputation, a capable management team and the company's financial standing. These steps should be performed to guarantee the prompt completion of building construction projects by choosing just those contractors who are completely certified due to their performance and safety programs. Potential problems that can result in project time overruns can be found or addressed by conducting a thorough evaluation procedure to evaluate the skill and capacity of a prospective contractor. The hazards associated with a construction project can be greatly decreased by thorough contractor assessments carried out prior to selection.

Construction site dangers that might cause time loss due to late detection should be the focus of contractor supervision teams. For example, if there are no remedies or right

gear for working on tall buildings, a lot of time will be wasted on treating injured workers and finding their replacements, both time and resources will be wasted. This issue may be resolved with the proper supervision, resulting in the project's timely completion. Workers should be included by contractors since they frequently have the best knowledge of the factors that lead to dangers and know how to control them. Using a hazard control strategy to guide the selection and implementation of measures, and creating plans with safeguards to protect workers during emergencies and non-routine jobs.

5.4. Study Limitation

One of the limitations to the study is Causality: The study might establish associations between contract management practices and timely completion but may not establish causality. Other unmeasured variables could be responsible for the observed effects.

5.5. Suggestion for Further Research

Based on the study findings, it is recommended that a research is carried out to determine performance of public building projects that have implemented the recommendations of this research.

This study also recommends that a research be done on the factors that affect the timely completion of public-private partnerships projects in Uganda and how Intelligence Quotient practices of building project managers influence the timely completion of building construction projects in Uganda.

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APPENDICES

Appendix A: Questionnaire

I am **Latim Benard** pursuing a Master of Science in Construction Technology and Management at Kyambogo University conducting a research study on the Impact of Professional Contracts Management Practices on the Timely Completion of Building Construction Projects in Uganda, A case of Public Projects within Kampala Metropolitan which has had Contract time extension hereby request you for your time to help me fill this questionnaire. The information taken will be treated with utmost confidentiality and only for academic purposes. I will be glad if I get a positive response.

Section A: Demographic Data

1. Gender: Male ☐ Female ☐

2. How long have you worked in the current station?

(i) Less than 2 years ☐ (iii) 2 – 5 years ☐

(ii) 6– 9 years ☐ (iv) 10 and above ☐

3. What is your level of education?

(i) Diploma/College ☐ (iii) Bachelors Degree ☐

(ii) Masters Degree ☐ (iv) Post-graduate Diploma ☐

4. Do you have any certification on project management?

(i) Yes ☐ (ii) No ☐

5. What percentage of time overrun did you have on the project in regard to the original completion time? ……

6. What was your role in the project?

(i) Contract Manager ☐ (ii) Civil Engineer ☐ (iii) Project Engineer ☐

(iv) Project Manager ☐ (iv) Quantity Surveyor ☐

7. Project Location…….

Section B: The professional contract management practices in construction projects.

Tick the appropriate answer with the following representation; Strongly disagree = 1, Disagree = 2, Not sure = 3, Agree = 4 and Strongly agree = 5.

	Contractor Pre-qualification Practices	**1**	**2**	**3**	**4**	**5**
1.	Contractor experience influences the timely completion of construction projects					
2.	Contractor financial ability influences the timely completion of construction projects					
3.	Contractor management ability influences the timely completion of construction projects					
4.	Contractor reputation influences the timely completion of construction projects					
	Contractor Regulation Practices					
5.	Contractor quality management practices influences timely completion of construction projects					
6.	Contractor safety management practices influences timely completion of construction projects					
7.	Contractor staffing structure influences timely completion of construction projects					
8.	Contractor accreditation practices influences timely completion of construction projects					
	Contractor Supervision Practices					
9.	Construction site hazard identification influences timely completion of construction projects					
10.	Construction site hazard controls influences timely completion of construction projects					

11.	Construction site project ongoing inspections influences timely completion of construction projects					
12.	Construction site emergency response planning influences timely completion of construction projects					
	Sub-Contracting Practices					
13.	Standards and procedures are clearly specified when sub-contracting					
14.	Once the contractor is selected, the organization enters legal contract with the contractor					
15.	There is a well-defined and implemented structures and reporting lines for sub-contracting					
16.	Legal agreement regulatory controls are clearly specified when sub-contracting					

Section C: The impacts of the established professional contract management practices identified in construction projects

Tick the appropriate answer with the following representation; Strongly disagree = 1, Disagree = 2, Not sure = 3, Agree = 4 and Strongly agree = 5.

	Contractor Pre-qualification Practices	**1**	**2**	**3**	**4**	**5**
1.	Incompetent contractors are identified during this stage					
2.	Contractors are Educated, strategies of engagement are developed, relationship constructing and resource allocation initiatives done.					
3.	The selection of contractors is done at this stage					
4.	Leadership and regulations on the project are initiated					
	Contractor Regulation Practices					
5.	Construction guidelines set out within relevant rules are completed.					
6.	Enforcement teams are created					
7.	The various Government bodies in construction and the public are engaged and a relationship created					

8.	The regulation bodies are reviewed					
	Contractor Supervision Practices					
9.	Supervision helps reduce delay on activities					
10.	Supervision helps reduce rework activities which might have happened					
11.	With supervision, Project control is improved					
12.	Supervision helps Construction procedures to improve					
	Sub-Contracting Practices					
13.	Value discounts are obtained on a project					
14.	Subcontracting helps in securing admissions to specialized services					
15.	Sub-contracting helps to reduce uncertainty in areas where a contractor lacks enough knowledge.					
16.	Having experts improves the progress of a project to reduce delays					

Section D: Measures of ensuring timely completion of construction projects through professional contract management practices

Tick the appropriate answer with the following representation; Strongly disagree = 1, Disagree = 2, Not sure = 3, Agree = 4 and Strongly agree = 5.

	Measures of Ensuring timely completion of construction projects	**1**	**2**	**3**	**4**	**5**
1.	Timely completion of construction projects is key					
2.	Project outcomes and Project objectives should be measured initially and matched to have focus					
3.	There should be introduction of changing practices to meet the predetermined goals.					
4.	Project success is measured in levels which all must be keenly looked into					

5.	There should be an effort to put together and harness, all the subsidiary plans on the project					
6.	Top management needs to constantly monitor the progress of the project and provide direction to the implementation teams					
7.	There should be rigorous attendance and targets set in project meetings before and during the project implementation phases					

"THANK YOU FOR YOUR CONTRIBUTION TO THE STUDY"