

**EVALUATION OF THE FACTORS INFLUENCING PERFORMANCE OF
BUILDING CONSTRUCTION PROJECTS IN UGANDA: A CASE STUDY OF
MASAKA CITY**

BY

**HAKIZIMANA VENUST
20/U/GMET/13132/PE**

**A DISSERTATION SUBMITTED TO THE DIRECTORATE OF RESEARCH
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DECLARATION

I, HAKIZIMANA VENUST, hereby certify that this study is wholly original with no submissions to academic journals or universities for possible awards.

Signed..... Date.....

HAKIZIMANA VENUST

REG NO: 20/U/GMET/13132/PE

APPROVAL

The undersigned certifies that this dissertation, "EVALUATION OF THE FACTORS INFLUENCING PERFORMANCE OF BUILDING CONSTRUCTION PROJECTS IN UGANDA: A CASE OF MASAKA CITY," was completed under our guidance and is now prepared for submission to Kyambogo University.

Signed..... Date.....

Assoc. Prof. Lawrence Muhwezi (SUPERVISOR)

Signed..... Date.....

Eng. Joseph Acai (SUPERVISOR)

DEDICATION

I dedicate my dissertation to my family because it was you who first gave me the idea to pursue further education. You have always given me comfort, spiritual support, encouragement, and belief in me.

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LIST OF ABBREVIATIONS

CEOs	Chief Executive Officers
CSFs	Critical Success Factors
DV	Dependent Variables
IV	Independent Variables
NPA	National Planning Authority
RII	Relative Importance Index

ABSTRACT

In Uganda, over twelve percent (12%) of the gross domestic product (GDP) is contributed by building construction sector and is of great significance in current economy. Despite this contribution to the sector, building construction fail due to performance issues and limited research exists on the major factors contributing to this trend resulting in project delays and potential compromises in project quality. Finding ways to make building construction projects in Ugandan cities more effective was the aim of this study. a case study on the city of Masaka. Using the Krejcie and Morgan table for sample size determination, a sample of 201 respondents were chosen from the population of 420 participants in the study, which used a survey research design. A set of interview guidelines and a questionnaire were used to gather data. Excel and SPSS version 21 were utilized for the data analysis.

Cost considerations, health and safety factors, time factors, productivity factors, quality factors, project stakeholders' factors, environmental factors, and resource variables were all identified. The findings of the regression analysis showed that the time factors (RII 0.751), quality factors (RII 0.717), and cost factors (RII 0.706) had a substantial influence on the performance of building construction projects in Masaka city. To enhance the performance of building construction projects, a framework was developed based on time, quality, and cost variables (factors with major influence).

These findings highlight the need to prioritize these factors with significant impact when evaluating and managing building construction projects in Masaka City.

Key words: performance, building construction projects, impacts, strategies.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

In the entire world, the construction industry has less performed in comparison to other industries (Ingle and Mahesh, 2020). Insufficient consensus regarding construction effectiveness measurement makes it difficult for decision making of top managers in construction industry (Mansour *et al.*, 2020). There is a need to move from outcome-oriented to procedure-oriented performance and a necessity to achieve a balance between financial and non-financial metrics in the construction industry according to Zuriekata and Alrawashdeh (2011). The building construction industry should adhere to satisfaction of customers through strict process and procedure for the accountability of builders work as noted by Seshadhri and Paul (2018).

Lack of enough resources is wide challenge of performance in developing countries (Gyandu – Asiedu, 2009). Several challenges are burdening Ghana’s construction industry and these include administration of contracts, delay in payments, lengthy and complex payment procedure Gyandu – Asiedu, (2009). Construction project in India face performance challenges of over forty percent time overruns according to Jha and Iyer, (2006).

Different performance indices would satisfy different customer as found on performance evaluation in Nigeria’s Ogun state by Ibem *et al.*, (2013) on public housing estates buildings. Some of these performance indices that would satisfy customers were grouped by Aigbvboa and Thwala (2014) as social and physical factors. High efficiency performance indicators’ approach should be used universally by both construction entities and procurement, engineers and customers as indicated by Radosavljevic and Bennett (2012) argued from least cost

theory. According to Valence (2013), the other approaches need to be considered as significant steps in attaining effectiveness and excellence. In Nigeria, construction industry has been considered to be among the Africa' largest and vibrant (Odediran *et al.*, 2012).

An Ethiopian survey found that "inadequate planning, inappropriate designing, site management, decision making, construction mistakes, construction methods, technical personnel, shortage of quality labor, shortage of materials, and productivity" are the biggest factors affecting the success of construction projects (Saraf, 2013). A number of essential components are involved in the optimization of construction projects: project teams; sustainable projects; financial stability; client happiness; efficient and effective internal business procedures; and offering customers new projects.

According to Symon A.K. (2016) and Githenya and Ngugi (2014), building projects in Kenya seldom go according to plan and confront significant hurdles with regard to cost, quality assurance, schedule, safety, and environmental performance.

Regardless of the regulations and the consultancy's good training in kenya's most urban areas, construction projects are always impacted by many factors (Lavy, 2011). This is inappropriate and if these key issues are un resolved, building construction projects will keep performing poorly (Muguchu, 2012).

In Uganda, construction industry has gained rapid growth for the last decade because of growing population and resulting in housing and infrastructure demand (NPA, 2019).

Additionally, according to UBOS (2019), Uganda has a significant infrastructure need, as seen by the country's inadequate shelter for its residents and its reported 3% yearly population

growth rate. Through improved technologies and considering growing population rate, there is a need of infrastructure provision.

Tindiwensi (2006) emphasized that national building construction laws are necessary to achieve national economic growth and development. A number of factors, including "corruption, poor guidance, inadequate motivation," as well as consultant, contractor, client, and external factors, continue to have an impact on Uganda's building construction performance. (Muwhezi *et al*, 2014). As a result, this study assessed the variables affecting how well building construction projects in Uganda performed.

1.2 Problem statement

In Uganda, over twelve percent (12%) of the gross domestic product (GDP) is contributed by building construction sector and is of great significance in current economy (UNESCO, 2013). It improves citizens' wellbeing and enables other sectors for economic development. However, previously conducted studies in Uganda have indicated that building construction projects fails due to performance issues (Alinaitwe *et al.*, 2013).

The performance of building construction projects is affected by a number of variables and causes, including those pertaining to cost, time, quality, labor productivity, safety, and many more (Muwhezi *et al*, 2014).

However, limited research is available on what would be the major factors attributing to this trend and unless information is available, delays in completion of projects will continue further to manifest among projects, the quality of projects may be affected and many others.

The purpose of this study was therefore to evaluate the factors influencing performance of the building construction projects in Uganda.

1.3 Objectives of the study

1.3.1 Main objective

The study's primary goal was to establish the strategies to improve performance of building construction projects in Uganda cities.

1.3.2 Specific objectives of the study

This study was guided by the following specific objectives;

- i. To establish factors influencing performance of building construction projects in Masaka city;
- ii. To ascertain the influence of variables influencing the building construction project's performance in Masaka City;
- iii. To develop a frame work to improve performance of building construction projects in Masaka city.

1.4 Research questions

- i. What are the factors affecting the performance of building construction projects in Uganda?
- ii. What are the impacts influencing performance of building construction projects in Uganda cities?

- iii. What can be done to improve the performance of building construction projects in Uganda cities?

1.5 Justification of the Study:

The study is justified based on several key reasons and gaps in the existing literature:

Limited research on factors influencing building construction project performance in Uganda: Although the building construction sector contributes significantly to Uganda's GDP, there is a lack of comprehensive research on the factors that influence project performance. Prior research has suggested performance problems in building construction projects, but further investigation is required to identify the precise elements causing this pattern. This research will provide important insights that may be used to fix the performance issues and enhance project results.

Need for evidence-based decision making: The construction industry globally faces challenges in performance measurement and decision making. In Uganda, senior managers find it challenging to make well-informed decisions due to the lack of consensus on construction performance monitoring. By identifying and assessing the variables that affect building construction project performance in Uganda, this study seeks to close this knowledge gap and give stakeholders evidence-based information for better project management and decision-making.

Knowledge and practice contribution: The objective of this research is to contribute to the existing corpus of knowledge on the performance of building construction projects.

The study offers useful insights for scholars, practitioners, and policymakers in Uganda's construction sector by identifying the elements that effect performance. In addition, the creation of a framework for better project performance in Masaka City provides stakeholders with useful direction and resources to raise the efficacy and efficiency of building construction projects.

Economic and sociological significance: Construction projects are essential to Uganda's economic growth since they improve infrastructure, provide jobs, and improve the general well-being of the populace. This research has the capacity to improve the economy, raise stakeholder satisfaction, including customers and the general public, and increase project quality by tackling the performance issues the industry is facing.

In summary, this study is justified due to the limited research in Uganda on factors influencing building construction project performance, the need for evidence-based decision making, the contribution to knowledge and practice, and the economic and societal significance of improving project performance.

1.6 Scope of the study

1.6.1 Geographical scope

The study was carried out in Uganda, East Africa. Masaka city was used as case study by the fact that it's one of the cities that is developing at high speed as far as building infrastructure projects are concerned.

The city is located in the Masaka district, lying about 140 kilometers to the west of Kampala on the Mbarara highway, the city center of Masaka is divided into two sections: the Nyendo-Mukunge division and the Kimanya-Kabone division.

1.6.2 Content scope

The factors determining how well building construction projects function in Ugandan cities are the independent variables, while the performance of construction projects is the dependent variable.

In general, the study assessed how well building construction projects in Ugandan cities performed.

In particular, the study identified the variables affecting building construction project performance in Masaka City, ascertained the influence of these variables on project performance in Masaka City, and also created a framework to enhance project performance.

The following building construction projects as indicated in Table 1.1 were considered among others because of their magnitude in relation to the study and their construction stages in relation to performance. The performance indicators under consideration (time, cost, safety, quality) were identified and observed on the following selected projects.

Table 1. 1: Building projects under consideration in the study

Project	Location	Project size	Contract period	Contract sum	Project status by the time of research.	Cause of delay	Legal status of the company
URA service center	Plot 31 Kampala Road Masaka	Four levels	2022-2023	Ugx 9.9 billion	Third level of construction	Planned progress	Registered
Private residential home	Kayilikiti-nyendo Masaka	Two levels	2022-2023	Ugx 140 million	Second level of construction	Planned progress	Non-registered
Extension of masaka diocese pharmacy and administration block	Kitovu masaka	Four levels	From 2019-2023	Not disclosed	Fourth level of construction	Planned progress	Registered
Masaka city class room block	Kasaana Masaka	Three levels	2021-2024	Not disclosed	Second level of construction	Constraints of the client	Non-registered
Private resident home	Kasaana Masaka	One level	2023	Ugx 26 million	Finishing stages.	Planned progress.	Non-registered

1.7 Significance of the study

The study's findings will be helpful in understanding the variables that determine building projects' success, particularly in developing nations like Uganda.

The government will also use the findings to provide stimulation and regulations to ensure policy framework, capacity building and sustainable growth towards achieving millennium goal such as Vision 2040 ((NPA, 2007). Contractors will also use the outcome of the study to have deep understanding of factors that affect performance and hence, improvement on profit and reputation by ensuring improvement on financial organization, competent and skilled manpower employment.

The study will also be of importance to the consultancy on comprehension of how contractors' performance is affected by their service. The research findings will be essential to other researchers and will provide more information of performance influencing factors on building projects to the academicians. The study will also significantly contribute to our understanding of the variables influencing the literature on building projects in Uganda, such as those influencing the expansion of the construction industry in Uganda. Furthermore, the findings can be compared with others studies concluded in other countries to facilitate cross-national comparisons of construction projects.

1.8 Conceptual Framework

Factors influencing performance (IV)

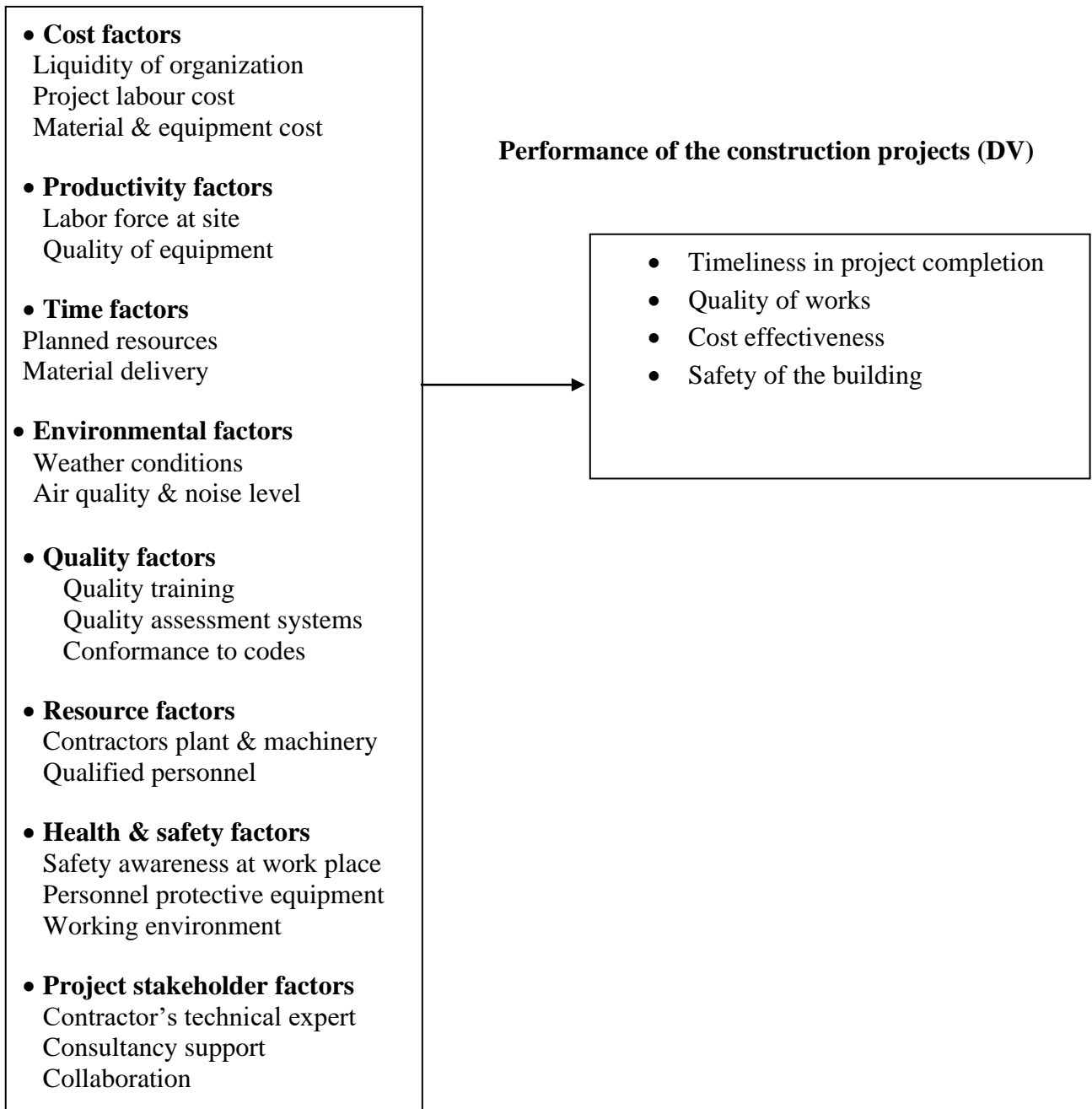


Figure 1. 1: Conceptual Framework of the study

Figure 1.1 describes the relationship between the study variables. The framework postulates that change in the independent variable (influential factors - productivity, time, environmental, health and safety, resource, and project stakeholders) directly impacts the performance of the building construction projects (DV).

1.9 Chapter summary

As a prelude to the next chapters' in-depth analysis of the variables impacting building construction project performance in Uganda, this chapter gives an outline of the study's background, goals, and scope.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Using the views of several researchers, this chapter provides a thorough summary of the factors that affect how well building construction projects function. A theoretical and contextual overview of the variables influencing project performance opens the chapter. After then, the relevant material is arranged and discussed topically in order to support the goals of the study.

2.2 Theoretical review

The Agency theory was adopted as the conceptual framework underpinning this research. The choice of the Agency theory is motivated by its focus on the difficulties that arise when one party (referred to as the agent) carries out tasks on behalf of another. The interests of the principal and the agent may not always coincide, according to the agency theory (Bendickson et al., 2016). On the other hand, the principal can efficiently oversee the agent's performance and set suitable rewards and penalties when enough trustworthy information is at their disposal.

In such cases, failures can be promptly identified and addressed. Time factors, such as site preparations, resource availability, and planned construction schedules play a crucial role in project completion. If these time factors are not adhered to, project delays may occur. Nwajei, U. O. K. (2021). suggests that longer relationship hierarchies between the principal and agent can lead to increased problems in their relationship, constraining adaptability. Assuming that

the incentives of the agent and the principal are aligned, it is expected that the agent will act in the best interest of the principal., reducing the need for extensive monitoring costs.

The Agency theory is deemed pertinent for guiding this research, as it assumes that factors such as cost, time, environment, and others significantly impact the effectiveness of building construction projects in urban areas. Moreover, the Agency theory helps identify and explore the variables related to these factors. For example, when a party (referred to as the agent) performs tasks on behalf of another (known as the principal), the matter of time factors arises based on the principle of cost effectiveness.

2.3 Factors influencing construction performance

2.3.1 Cost factors

The financial aspect of construction projects is a primary concern for clients, who often seek to minimize expenses. Various interlinked factors contribute to the overall project cost, encompassing the client's priorities, project nature, designer's involvement, procurement options, market conditions, and legislative constraints (Mohamed *et al.*, 2017).

a) Project labour costs: Accurately estimating labour costs is crucial for effective project planning. Labour expenses constitute a significant portion of project costs and can be challenging to estimate with precision. Inaccurate labour cost estimation can have severe consequences, leading to profit loss, damaged business reputation, strained relationships and other adverse effects (Abera and Fekadu, 2016). While smaller businesses may rely on their experience to estimate labour hours, larger projects necessitate more detailed estimations, increasing the risk of inaccuracies and human errors.

Many clients prioritize lower construction prices, often compromising the quality of the structure. Inadequate budgets result in cost-driven projects, where cheaper alternatives are favored over sustainable options. Fixed budgets imposed by clients require contractors to closely manage costs to ensure adherence to the specified budget (Lema, 2019). However, designing within a limited budget may restrict beneficial features and result in higher maintenance and operational costs. A well-designed project does not necessarily require a high budget but should deliver the cost-effectiveness concerning operational expenses, maintenance, energy efficiency and aesthetic considerations (Lema, 2019).

The liquidity of an organization plays a significant role in evaluating project budgets and cost performance. While owners and contractors may not prioritize liquidity, it holds moderate importance for consultants. Political and economic circumstances can influence the significance of liquidity. Financial difficulties experienced by government agencies can lead to payment delays to contractors, adversely affecting their cash flow and ultimately impacting project delivery (Murat *et al.*, 2019). Small contractors often have limited financial reserves and rely on profits from ongoing projects to fund future endeavors. Consequently, a loss in one project can lead to cash flow issues and potential bankruptcy (Rateb *et al.*, 2017). Additionally, material and equipment costs influence owners' liquidity and project budgets. In developing countries, small contractors may divert project funds for personal expenses, further straining project finances (Boon *et al.*, 2017).

b) Project profit margin: The low and unreliable profitability rate in the construction industry hinders sustainable development. Contractors of smaller and medium scale in developing nations often lack sufficient funds and struggle to provide the essential fixed

assets offered as collateral (Saleh *et al.*, 2019). Operating on tight budgets, these contractors may not have enough resources to sustain their business after incurring losses on a project. The profitability of small contractors of local origin is influenced depending on the contract type employed, as lump sum contracts necessitate contractors to possess sufficient financial resources for material procurement and worker payments (Ghanim, 2017).

Project design costs and variations during construction introduce uncertainties and risks, disrupting planned work and should be minimized whenever possible. The extent of the project scope serves as a valuable predictor for the duration of construction, with attributes such as project type, nature, number of floors, complexity, and size affecting the timeline (Ghanim, 2017). Major construction equipment procurement expenses can constitute up to 36% of the total project cost and are associated with high uncertainty in delivery time, which impacts the construction schedule (Peter and Evelyn, 2015).

2.3.2 Productivity factors in construction

The elements that impact productivity within the context of building construction projects have been extensively studied. To enhance productivity, it is crucial to examine the factors that positively or negatively affect it and utilize the ones that have a positive impact while managing the ones that hinder productivity. Understanding all the factors influencing productivity allows for accurate productivity forecasting (Lema, 2019). However, these factors are not constant and can vary between countries, projects, and also amongst the same project based on conditions, making them highly dynamic (Olomolaiye *et al.*, 2019).

a) **Site communication:** Time on completion, required quality, and budget are the main criteria related to contractor performance in Nigeria (Saleh *et al.*, 2019). Construction companies' productivity largely depends on production capacity and resource utilization, emphasizing the importance of skilled workers and high-quality resources (Saleh *et al.*, 2019).

A work breakdown structure (WBS) is a hierarchical and deliverable-oriented deconstruction of projects, providing project managers with a visual representation of tasks required for project completion. It offers several benefits, including breaking down the project into manageable components, providing a roadmap for different teams and individuals, and facilitating resource allocation, project measurement, and milestone identification (Murithi *et al.*, 2017). Moreover, while productivity factors may differ across projects, companies, and regions, lessons learned from addressing productivity challenges in one project can be applied to improve productivity in another (Mojahed and Aghazadeh, 2018). Equipment technology is also highlighted as a crucial element for long-term productivity enhancements (Goodrum and Haas, 2002).

b) **Labour force at the site:** small contractors in developing countries often face a shortage of skilled labour due to better employment opportunities and security provided by larger construction companies. Inappropriate contract documents and differing construction methods further complicate matters for small-scale contractors (Ghanim, 2017) In certain developing countries, the absence of client supervision personnel further compounds the difficulties faced by contractors and can lead to expensive corrective measures for construction projects. The quality of equipment also influences project success, with quality standards potentially

decreasing during accelerated work, leading to rework and increased effort to ensure satisfactory performance (Olanipekun *et al.*, 2017). Past performance of contractors serves as an important determinant for predicting future performance.

c) Work permits and standardization. A company will look at what needs to be done and pull together contracts, tasks, permits and responsibilities. They might draw on ideas or past experiences and when creating something new each time. This approach focuses on generation of idea and always starting at square one and trying to decide how to move forward. But the best safety management solution is to work with templates that have been standardized and go beyond generic instruction for several types of hazards and activities, like a corporate standard on how to handle hot work, line break and more others (Chigara and Moyo, 2014). This is about setting up detailed standards for various jobs that are carried out on site. Instead of creating new things, one starts from a standard and revising it along the way from the perspective of looking at the unique aspects of the particular job execution. Standardization represents a culture shift. Instead of always generating new information, one depends on checking information and always make appropriate adjustments, evaluate the process, and then revise the template for next time.

d) Employee motivation: The motivation of employees plays a critical role in their ability to work and increase productivity, which ultimately contributes to the project's success. Financial and moral support tailored to employees' needs is essential to harness their maximum effort and commitment. Further research is recommended to identify the key factors that significantly impact employee performance (Wael *et al.*, 2019).

2.3.3 Time factors in construction

The inability to meet planned project timelines is a prevalent concern within the construction industry. Clients often expect fast project completion to gain a competitive advantage (Murat *et al.*, 2019) Reducing construction durations results in heightened client satisfaction and positions contractors favorably in the market. Contractors also strive to minimize their on-site time to mitigate costs and enhance profitability, considering expenses like overheads, construction plant hire, and liquidated damages. When delays occur, efforts to make up for lost time through longer working hours, additional shifts, more workers, and extra equipment result in significant additional costs.

The performance is determined by the resources that are available during its length, especially when it comes to time and quality (Abera *et al.*, 2016).

Both human and financial resources need to be adequately provided for the success of any organizational project. Construction time holds significant economic implications for both clients and contractors, as delays lead to escalated costs and reduce quality (Saleh *et al.*, 2019). Contractor owners should focus on aspects like lifetime employment policies, fostering a stable and committed workforce, investing in training, and improving overall performance.

The choice of procurement system is another critical factor affecting the construction industry's performance (Hossam *et al.*, 2013). Competitive bidding can have adverse effects on major projects, and the number of separate contracts within a project is linked to successful project performance (Edwin *et al.*, 2019). During challenging economic conditions, contractors often struggle to deliver materials on time, increasing the risk of financial losses

during the construction stage. Proper planning and project control are necessary to avoid mistakes and additional costs.

Delays in claim approval significantly contribute to project delays (El-Razek *et al.*, 2008). Effective planning and poor scheduling are common issues among contractors, negatively affecting project success (Rateb *et al.*, 2017).

Furthermore, failure to implement variation orders leads to problems in cost and time performance in construction process (Le Hoai *et al.*, 2018). Unanticipated ground conditions, sluggish decision-making among project teams, and inadequate site management are frequent factors that contribute to time performance challenges in local construction projects. Both cost and time performance issues are widespread in the global construction industry (Kaming *et al.*, 2019).

Site preparation is a crucial step in construction, involving tasks such as clearing the site, relocating utilities, grading the land, and compacting the soil (Wael *et al.*, 2019). It ensures a safe and suitable construction site, minimizes the impact on the environment, and facilitates efficient access and movement of materials during the construction process (Ghanim, 2017).

Construction delays are a recurring problem in the industry, impacting on success of the project in terms of cost, safety, quality and time (Hafez *et al.*, 2014).

2.3.4 Environmental factors

a) Weather conditions at the construction site pose various risks, including the need to monitor factors like wind. High temperatures can be dangerous for workers and hinder their

ability to concentrate. Very low temperatures also pose a threat to equipment by reducing the loading capacity of many components. Factors such as fog, rain, and limited visibility should also be taken into consideration (Chaturvedi *et al.*, 2018). Construction workers need to be fully aware of their surroundings to ensure safety, as low visibility increases the likelihood of accidents. The risks are amplified when strong winds coincide with limited visibility. A weather monitoring system with remote connectivity is valuable for construction management. It is also useful when justifying a missed deadline to the client, as gathered data can provide evidence that construction could not proceed faster.

b) The impact of project location: Some research studies suggest that construction delays are influenced by the specific location of the project. While construction projects can vary from country to country, project characteristics often exhibit regional specificity. Msafiri (2015) proposed that different studies highlight various causes, with project location and type being among the contributing factors.

c) Site topography: The root causes with the highest or lowest impact on delays are not explicitly stated. However, there are factors associated with the construction project's location, such as weather conditions, site topography, economic conditions (such as currency and inflation rate), material shortages in the market, changes in regulations and policies, and matters related to public agencies (Jaman *et al.*, 2019).

Site waste management in the project area can be attributed to site conditions, environmental conditions, and topographical conditions. In most studies on construction delays, the aspect of the project area has received less attention, possibly due to its predictable behavior in most project situations. Site conditions include traffic situations, storage issues, site location, and

on-site accidents. Waste management challenges at construction sites are closely linked to delays in material delivery since equipment and materials need to be stored away from the construction sites. Jaman *et al.* (2019) argued that site conditions are generally ranked lower in each project because all parties involved can adapt to the existing situations.

2.3.5 Quality factors

Based on the findings of Edwin *et al.* (2019), delays in material supply in oil and gas construction projects frequently arise from the distant locations of construction sites. It is observed that various project types encounter distinct causes of delays, highlighting the specific challenges faced by each project type. These challenges give rise to shortages of materials, equipment, and manpower, along with inadequate contract management.

Training standards tailored to individual trades are created by quality training programs to address challenges unique to that skill, such as drilling, excavation, and scaffolding building. A job site safety training program normally requires instruction on dangerous situations, such as employing explosives or subterranean construction. Workers who will be required to handle hazardous machinery including power tools, cranes, welding torches, and more need to prioritize training programs (Wesam et al, 2016).

Quality control in building is essential to every construction company's success. Instead than paying to correct issues after they arise, it is preferable to invest money in strengthening the company's training programs to prevent flaws. Resolving issues after defects causes work team delays and causes other projects to go behind schedule. Although the desired quality varies according to the project's estimated duration and cost, training programs should adhere to some fundamental principles for all construction organizations (Msafiri, 2015).

The implementation of quality assessment systems and techniques is crucial for ensuring project success. Lack of formal standards in assessing quality directly impacts the overall level of success. Without proper standards, items may not be fully understood or overlooked, leading to incomplete or ineffective improvements (Hafez *et al.*, 20014). Quality assessment starts with a request from project stakeholders, followed by the preparation of an assessment plan to outline the assessment process. Interviews, audits, and inspections are then conducted to evaluate the level of quality, adherence to standards, and adherence to best practices. The findings and recommended actions are documented in a written assessment report, which is then reviewed and compiled (Wesam *et al.*, 2016).

The procurement process for materials and resources significantly influences the success or failure of a project. The project manager is responsible for selecting contractors and vendors who comply with international environmental norms and meet the organization's procurement specifications. Establishing guidelines for procurement is essential for all organizations, and project managers may need to prioritize environmental concerns for low-carbon projects. In some cases, project managers must convince the sourcing department to make exceptions for projects with specific objectives (Akamni *et al.*, 2015).

2.3.6 Health and Safety Factors

The construction industry is widely acknowledged as one of the most hazardous sectors, while also serving as a significant economic force. Accidents in construction not only cause physical pain and suffering, but they also hamper productivity, quality and project timelines. Additionally, they have adverse environmental effects and contribute to increased construction costs. Unfortunately, health, safety and environmental considerations are often neglected on building construction sites and receive minimal management attention. While safety and health are discussed as a priority in management meetings, they often take a backseat to budget and time discussions (Oladapo and Olotuah, 2017). It's critical to recognize that, in addition to more conventional variables like cost, quality, and timeliness, health and safety should be crucial for the success of a project. Accidents on construction sites may be considerably decreased by putting in place efficient safety systems. Concerns about safety and health cover a wide range of topics, including as legal compliance, financial considerations, and human issues.

Awareness of safety is a collective commitment toward promoting safe work environments by employees. Healthier workplace culture among employees towards managing hazards is promoted by the presence of safety awareness. Lack of safety awareness training at workplaces exposes several hazards that could stunt productivity. But increased output is guaranteed by recognizing and adhering to a safety awareness program in the workplace. They must be a custom safety training program at every work place that suits its unique needs. Working in the challenging conditions, safety awareness training is crucial for employees and they must recognize the training as an integral part of their overall health and safety structure.

The realization of complete safety awareness at work makes the ease of accident prevention and if accidents are prevented, losses are avoided.

Construction sites are prone to accidents due to the nature of the tasks and activities involved and numerous fatal accidents occur annually on construction sites worldwide, causing injuries, deaths, and diseases that lead to work absences, medical treatments, disabilities and survivor benefits (Ghulam and Noel, 2017). Given the increasing competition among construction companies, it is imperative to address construction productivity issues.

The adequate use of personal protective equipment (PPE) on construction sites is essential for worker safety. Regardless of the scale of the project, proper utilization of PPE provides additional protection to workers in conjunction with other safety measures (Eke *et al.*, 2016)

First aid in the workplace entails providing workers with accessible, appropriate, and prompt medical treatment. In different work environments, a variety of elements may be required to ensure occupational safety. These elements include trained occupational first aid attendants, adequate facilities such as first aid rooms or dressing stations (Chigara *et al.*, 2014), well-stocked first aid kits, arrangements for transporting injured workers to medical facilities, efficient communication between first aid attendants and workers, and a system for recording and documenting incidents.

Well-documented and evaluated health and safety plans are crucial for project success. Workers in the construction industry face a diverse array of health issues, spanning from conditions like asbestosis and back pain to ailments such as hand-arm vibration syndrome and

cement burns (Akamni, 2018). Injuries and health issues associated with construction highlight the industry's high

2.3.7 Resource Factors

Resource management in construction projects is a challenging task due to their resource-driven nature. Prior to commencing work, planning is carried out to allocate resources, which may include money, equipment, materials, time, manpower, or space. In construction, individual resources are allocated to each activity and the availability of these resources has a direct impact on cost and time (Coble and Kibert, 2019). The duration of an activity is influenced by the productivity of the resources and the amount of work involved. The contractor bears the primary responsibility of identifying the interdependencies among different combinations of resources in order to effectively carry out an activity.

In a case study published in 2012, Nagaraju et al. emphasized the significance of resource management for building projects.

Significant resources, such as machinery, materials, and labour, are employed for major works in construction projects. Without proper planning and procurement of required resources, activities cannot be executed within the scheduled time. Project managers face complex decisions under different scheduling conditions and extended task durations, which can result in increased costs (Eke et al., 2016).

Qualified personnel within building contractors play a critical role in achieving project success (Wesam *et al.*, 2016). Drawing from past experiences is an important aspect of

achieving success. One important component that might decide whether a project succeeds or fails is the qualities of the people.

The manpower and equipment of the contractor are vital considerations for construction projects, as they have significant economic implications and are closely linked to the overall economy. The success of a construction project is significantly influenced by the contractor's competence as a crucial partner. The evaluation of a contractor's workforce and equipment must take into account a number of intrinsic factors, including organizational capacity, technical proficiency, project complexity, and risk management procedures (Msafiri, 2015; Maruthi et al., 2017).

Experience with contractors is essential to guaranteeing a facility's effective completion (Hajez et al., 2020). Project success is influenced by a number of factors, including a cohesive and well-organized facility team, contracts that encourage specialized cooperation, enough project management experience, and timely input from stakeholders during the planning and design phases.

Technical expertise and skills are among the crucial factors for successful project management (Boon *et al.*, 2017). Project success requires knowledge and training in risk management principles, organizational maturity, keeping an open risk register, current risk management plans, sufficient documentation, efficient change control procedures, and defined performance assessment.

Furthermore, projects need to align with corporate strategy, be informed by decision-making, and learn from experience for continuous improvement, which contributes to overall corporate success.

2.3.8 Factors Influenced by Project Stakeholders

Consultancy support and their responsibilities contribute to better information and cost control in construction projects, reducing the risk of cost overruns and delays (Murithi *et al.*, 2017). Wael *et al.* (2019) noted that consultancy services promote innovation by fostering open communication and trust among project parties, which can lead to value engineering changes and improvements in constructability. In partnering, a new win-win approach based on shared goals, trust and teamwork is advocated, moving away from adversarial management practices and dogmas (Rateb *et al.*, 2017).

Client obligations play a crucial role in curbing irregular fund disbursements, minimizing project delays, and facilitating timely completion of construction projects (Chigara and Moyo, 2014). Improving financial management systems is recommended for clients to ensure timely payment to contractors.

External stakeholders, as classified by Eke *et al.* (2016), include users who can be operators or consumers. Operators are responsible for operating the asset on behalf of the owner and are interested in its features, performance, usability, convenience, availability, reliability, and maintainability. Consumers are those who purchase the asset and are primarily concerned with the price they pay throughout its life.

Effective collaboration with stakeholders is of utmost importance for project managers, as these individuals hold significant power and influence over projects. Recognizing the significance of stakeholder involvement and understanding their potential impact on projects is crucial. It is important to identify stakeholders, evaluate their power and influence and comprehend the potential consequences they can have on projects. Developing proper techniques to increase positive impact and limit negative influence requires an understanding of this. Construction stakeholders have the power and resources to obstruct or even end construction projects, therefore failing to recognize the significance of stakeholder involvement has resulted in many project failures (Bourne and Walker, 2005; Lim et al., 2015).

Insufficient compensation and inadequate management of individuals affected by the project can result in serious challenges in construction projects. These difficulties include imprecise definitions of the project's purpose and scope, poor distribution of resources, scope modifications, and unanticipated changes. Significant delays and cost overruns may result from all of these variables (Yang et al., 2019). It is difficult to prevent cost overruns in modern building projects because of their complexity and the participation of several stakeholders with varying interests. Identification of stakeholders, comprehension of their needs and expectations, and skillful management of their influence in compliance with project objectives are essential for successful project execution Othman and Abdellatif (2011).

2.4 Performance of Building Construction Projects

The construction industry faces various technological challenges. In the US, the construction industry accounted for 21.1% of the reported on-the-job fatalities, with falls from heights

being the primary cause Nassar, N. K. (2009). Construction work involves operating heavy machinery, working at elevated heights, and navigating chaotic construction sites, which contribute to inherent risks. Therefore, risk mitigation and safety protocols must be prioritized. Technology can have a significant advancement in enhancing safety, with wearable technology, automated equipment or robotics, and drones being recognized as potential safety-enhancing tools (Nassar, N. K. 2009).

Another technical problem facing the building sector is on-site photography. CCTV cameras are able to take detailed pictures of building sites, and the data they produce may be used to assess risks, alert workers to possible dangers, and determine which people should receive specific safety training (Chen, Xichen, et al 2021).

According to Accenture, connected workers should be outfitted with Internet of Things (IoT) gadgets that keep an eye on both their health and their surroundings.

Various devices, such as cooling mechanisms and self-charging boots with fall detection capabilities, contribute to enhancing safety on construction sites (Chen, Xichen. *et al* 2021)

2.5 Impacts of Factors Influencing Performance of Building Construction Projects

In terms of the project management component, the most significant reasons for cost overruns are believed to be inadequate cost and contract management. The use of knowledge, instruments, skills, and processes in construction project operations is highly valued in project cost management (Schaufelberger and Holm, 2017). Its responsibility is to effectively manage costs from the start of the feasibility study to the end of the project. Derakhshanlavijeh and

Teixeira (2017) claim that ineffective cost control can result in personnel changes, timetable problems, and the inefficient use of building resources.

As a sort of unique commodity, the building project also demonstrates how the contract differs from other types of contracts in that it involves a significant amount of money and a lengthy period of time. In Pakistani projects, poor contract management and frequent cost overruns have not been treated lightly by the construction sector. Poor contract administration will therefore cause significant and seamless mistakes in the project settlement later on (Foroutan Mirhosseini, 2022).

2.6 Chapter summary

The literature review synthesizes the many academics' works to give a thorough analysis of the elements influencing building construction project performance.

The chapter starts by presenting a theoretical and contextual review of the elements that influence project performance. It then proceeds to systematically review relevant literature, organizing it thematically to align with the research objectives outlined in the subsequent sections.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

An outline of the research's methodology and approaches is given in this chapter. The research design and methodology, study population, data gathering process, sample size, sampling methodologies, validity and reliability, and data analysis techniques are all included in this study.

3.2 Research Design

Research design refers to a plan, roadmap and blue print of investigations aimed at addressing research questions (Kothari, 2004). It is adopted as an established plan to address research questions effectively, economically and objectively.

There exist several research design types, including: a) longitudinal study designs, wherein the same sample is observed for a prolonged duration; b) cross-sectional designs, which include observing multiple individuals simultaneously without modifying any factors; d) historical research design, which depends on historical data like archives, maps, and diaries; e) experimental research design, which is helpful when examining how various factors affect a situation and many more other design. Therefore, the study adopted the survey design because it involved the use of questionnaires, interviews and focused on construction projects groups and information was directly corrected from sample population.

3.3 Research Approach

In research studies, one of the three approaches is adopted; quantitative, qualitative and the mixed methods as described by to Amin (2005). Qualitative methods focus on exploring in-

depth understanding, meanings, and experiences, while quantitative methods emphasize numerical data analysis and statistical relationships (Muleya *et. al.*, 2020). The "mixed methods" approach refers to combining qualitative and quantitative research approaches in a study. A more complete understanding of the research issues is attained when the two techniques are merged, as compared to when they are employed independently.

The current study used a mixed methods technique to look into the variables affecting the performance of building construction projects. This strategy enhanced the study's results by combining the benefits of quantitative and qualitative methodologies to allow for a full investigation of the topic.

3.4 Study Population

The study population comprised 420 respondents and whom included contractors (Site engineers, general site foremen, foremen carpentry, foremen masonry, material engineers, plumbers, electricians), consultants of the building firms and technical staff of the city. The main focus was on ongoing building projects (those being carried out by registered contractors and those being carried out by non-registered contractors) as given earlier in Table 1.1.

3.5 Sampling strategies

3.5.1 Sample Size

The sample size estimation table created by Krejcie and Morgan (1970) was used to get the sample size of 201 responders from a targeted population of 420.

The sample size included the following; staff from Works technical department of the city, Employees from construction firms representing technicians and management. This included site engineers, general site foremen, foremen carpentry, foremen masonry, material engineers, plumbers, electrician and the CEOs of companies.

Table 3. 1: Population size determination and Sample size of respondent

SN	Category	Target Population	Description	Sample Size	Sampling Technique
1	Consultancy firms	15	Engineers, construction managers	14	Random
2	Contractors	385	Employees of the firm (Site engineers, General site foremen, Foremen carpentry, Foremen masonry, Material engineers, Plumbers, Electricians)	167	Random
3	Construction managers	10	Professional construction managers working with in the research area.	10	Random
4	City technical staff Department of Works and Technical Services	10	City/division Engineers, planners, clerks of works and their assistants.	10	Random
	Total	420		201	

3.5.2 Sampling techniques and Procedure

A family of non-probability sampling methods known as "purposeful sampling" selects units based on the qualities that the sample needs. An impartial representative sample of people is randomly selected from a population using a basic random sampling procedure.

The study employed purposive sampling for the purpose of selecting respondents, and a simple random procedure was employed to choose construction businesses.

3.6 Data Collection Instruments

3.6.1 Questionnaire

A Self-Administered Questionnaire (SAQ) with items on the study's important variables served as the primary data collecting instrument. The amount of components that were thought to be relevant for expressing the overall issue determined how many questions there would be. One item in section C of the questionnaire had alternatives scored using 1 = having no severe impact to 5 = having extremely severe affects. Other items in section B of the questionnaire had options scaled using a five-point Likert scale, where 1 = strongly disagree and 5 = strongly agree.

3.6.2 Interview guide

In-depth face-to-face interviews were utilized to gather information for this, and respondents were required to base their responses on the most recent projects they had worked on that they had finished. Mugenda & Mugenda (2003) state that in order for a questionnaire to provide meaningful data, the response rate must be more than 30%. 27.2% is the bare minimum

response rate. The interview guide served as an additional means of gathering data. Each of the important variables' primary sections had a minimum of two items.

3.6.3 Documentary Review

Existing documents both published and unpublished related to the study area were reviewed to establish factors influencing performance of building construction projects.

3.7 Data Analysis

3.7.1 Quantitative Data Analysis

The replies were checked to make sure they were complete, within an acceptable range, and readable and intelligible. Version 21 of the Statistical Packages for Social Sciences (SPSS) was used to code, input, and analyze the data.

3.7.2 Qualitative Data Analysis

Qualitative data were transcribed verbatim in word document format. Transcripts from the interview sessions were then read and re-read three times to understand the flow and meaning of the raw data. Each transcript was then analyzed using principle of qualitative inductive content analysis to develop themes and summarize the content of the data. In the content analysis, open coding with notes and headings were written in the typed transcript during reading. Using the research questions posed as a guide, relevant parts of the transcripts were selected, themes were defined by identifying relevant words and phrases, data were sorted into thematic categories by grouping them under higher order headings to reduce the number by collapsing similar and un similar data and then draw comparative conclusions.

3.8 Data Quality Control

Data quality control processes ensured the validity and reliability of the data, while testing was the initial step in verifying the equipment's validity and dependability.

3.8.1 Validity

Following the creation of the questionnaires and interview guides, five individuals who were thought to be experts in the fields of construction management and research were given the tools to evaluate. On a two-point rating scale with Relevant (1) and Irrelevant (2), each individual assigned a score to each item. The validity of the instrument was then evaluated using the following formula.

$$CVI = \frac{RI}{TI} \dots\dots\dots (Equation 3.1)$$

Where; CVI is Content Validity Index

RI is Number of items regarded relevant by judges

TI is Total Number of items

The questionnaire was considered valid, if the generated coefficient was 0.7 and above according to Amin (2005). Their results were summed up and the CVI computed under each construct and later for the overall tool as indicated in Table 3.2.

Table 3. 2: Content Validity Index

Items	No. of Items	Content Validity Index
Influencing factors	48	0.81
Impact of factors influencing performance	48	0.79
Total Items	96	Average CVI = 0.80

As presented in Table 3.2, the CVI value for influencing factors was 0.81 and impact of factors influencing performance was 0.79 and all the values were above 0.70 the recommended minimum value and therefore, the instrument was considered valid and was used to collect data that could therefore lead to valid findings.

3.8.2 Reliability

Before the study began, the researcher conducted a pretest in the study region to gauge the questionnaire's reliability. To find out if the data instrument was trustworthy for gathering data, a pilot study was conducted. Moreover, the Cronbach Alpha (α) technique was employed in conjunction with SPSS to assess the reliability of the items in the different constructs of the data collecting instrument.

In order to assess the questionnaire's dependability, ten participants in pilot research had their answers scanned into a computer and processed using SPSS. The benchmark of $\alpha = 0.70$ and higher was reached by the reliability values of the items in the various constructs, as stated by Bolinwa (2015).

The results obtained satisfied the reliability of the instruments. The results were presented in Table 3.3.

Table 3. 3: Reliability Indices

Items	Number of Items	Cronbach Alphas	
Influencing factors	48	0.801	
Impact of factors influencing performance	48	0.773	
Total Items	96	Average α =	0.787

All the Cronbach’s Alpha Coefficient values in the two constructs were above 0.70 hence the tool being reliable for data collection. More so, the overall Alpha Coefficient values for the questionnaire instrument were 0.79 which was also above the recommended vale of 0.70 according to (Bolarinwa, 2015).

3.9. Attaining specific objective

3.9.1 Factors influencing performance of building construction projects

The following steps were used to determine the elements impacting building construction projects' performance;

- After a review of the literature, the following variables were found to affect building construction project performance: cost factors, environmental factors, time factors,

productivity factors, quality factors, health and safety factors, project stakeholders' factors, and resource factors.

- These parameters underwent extensive validation via questionnaires and interviews with various subject matter experts. On a five-point Likert scale, respondents were asked to rank the relative relevance of each identified component of job performance based on their own experience.

- Next, using SPSS, the relative importance index (RII) values of the various elements under investigation were ascertained, and their averages were calculated. This was utilized to provide a rating to each of the several project success-influencing elements that the literature research had discovered.

3.9.2 Impacts of factors influencing performance of building construction project

Statistical Package for Social Science version 21 was used to analyze the collected data. The respondents' perception level on these factors was assessed on a five-point Likert scale classified; 1= having no severe impact on the performance, 2= having least severe impacts on the performance, 3= having severe impacts on performance, 4= having very severe impacts on performance, 5= having extremely severe impacts on the performance.

The different criteria were ranked using the relative importance index (RII) system. The major elements having the greatest influence on the performance of building construction projects were determined by computing the average of the RII for each factor, which served as a baseline. The findings that were above the average were deemed noteworthy. Regression analysis was used to further confirm the components with high RII.

3.9.3 Developing a frame work to improve performance of building construction projects

First, the components in particular target impacts that were used to identify the factors that significantly impacted building construction projects' performance. The establishment of a framework to improve performance was then done using these elements. To determine the baseline point—beyond which the variables were deemed essential and below which the factors were deemed inconsequential—an average relative significance index (RII) for each sub-factor of the various group factors was also generated.

Using the available data, a framework to increase building construction projects' efficiency was created. The essential elements that were added to the framework to enhance the performance of building construction projects were also determined using the relative significance index.

The results are presented in Chapter Four.

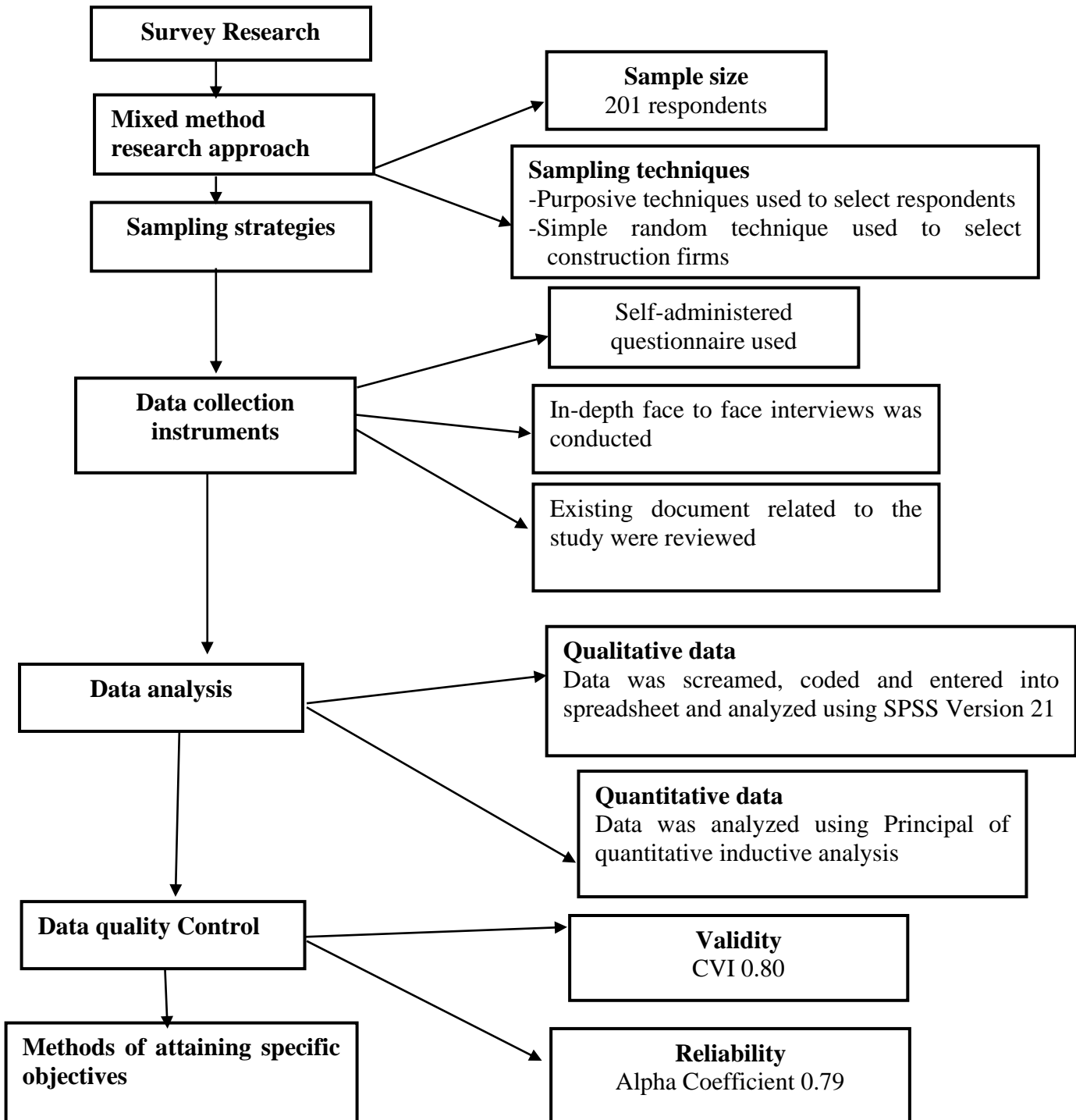


Figure 3. 1: Summary of the methodology

CHAPTER FOUR: PRESENTATION, ANALYSIS, INTERPRETATION AND DISCUSSION OF THE FINDINGS

4.1 Introduction

The results of the study titled "Evaluation of the factors influencing performance of the building construction projects in Uganda; A case study of Masaka city" are presented, analyzed, and interpreted in this chapter. The study's objectives, which included elements impacting building construction project performance, the influence of those factors, and a created framework to enhance performance, formed the basis for the presentation and analysis.

4.2 Response rate

The required sample size of the study was 201, however, those who responded were 193 and therefore, the respondent rate was $(193/201) \times 100 = 96.02\%$ which indicated a good response. Response rate for most researchers should be targeted to at least 60% as suggested by Fincham, (2008)

4.3 Demographic characteristics

The study presented a number of demographic characteristics in terms of age, level of education, time spent in the construction industry and position in the organization as further presented and discussed in subsequent section.

4.3.1 Age distribution of respondents

Respondents were able to indicate their different age groups as one of the factors that would influence their output towards performance of the building construction projects.

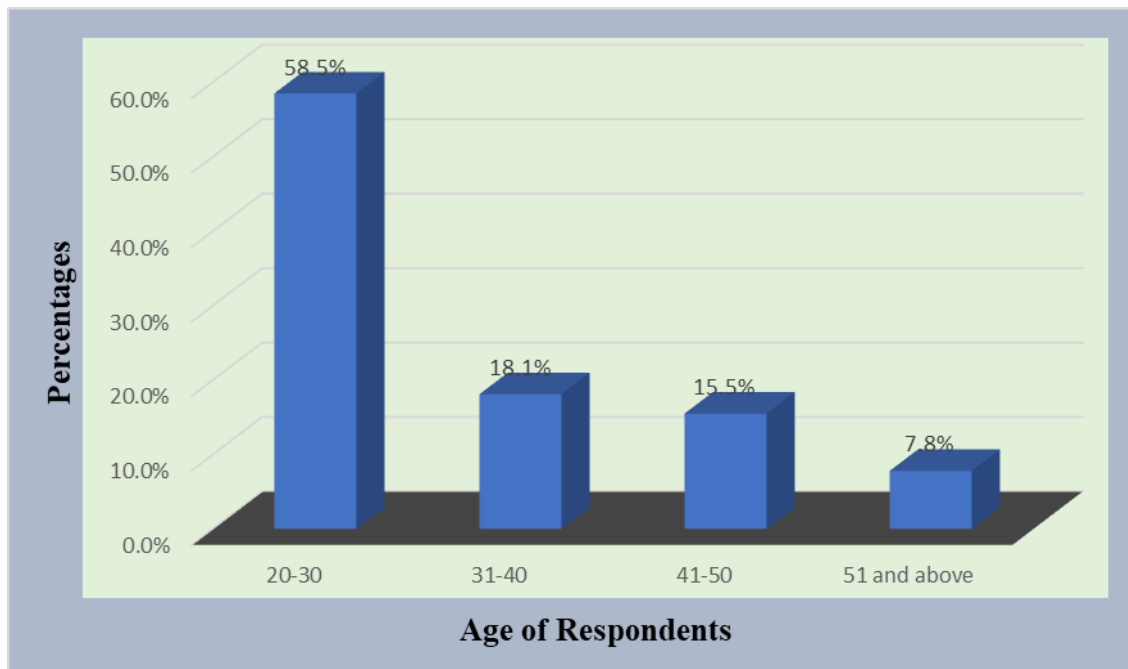


Figure 4. 1: Age distribution of respondents

As indicated in Figure 4.1 above, majority of the respondents constituting 113 (58.5%) were aged 20-30 years. These were followed by 35 (18.1%) of the respondents that were aged 31-40 years and 30 (15.5%) respondents were aged 41-50 years. The remaining 15 (7.8%) were aged 51 years and above. The findings indicated that ideally, the work force is made up of different age groups, a factor that gives opportunity to young age to learn from more experienced workers as far as factors influencing performance of building construction project in Masaka city are concerned.

4.3.2 Level of education of respondents

The respondents' level of education was also established in order to determine the extent to which this affected performance of building construction projects. The results are as presented in Figure S4.1.

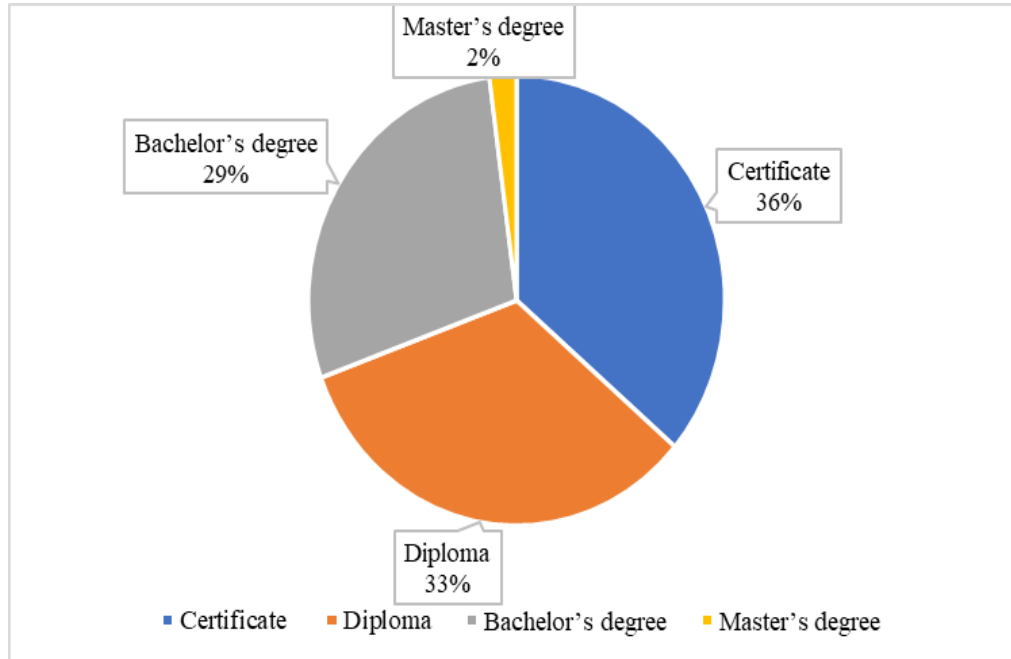


Figure 4. 2: Level of education of respondents

According to the study findings, 70 (36.3%) had attained certificate, followed by 64 (33.2%) respondents that had attained diploma, 55 (28.5%) of the respondents had attained bachelor's degree while the remaining 4 (2.1%) had attained master's degree. According to the study findings, all respondents had attained significant level of education, a factor that represented their understanding of performance factors of building construction projects.

4.3.3 Years spent in the building construction of industry

The study also generated findings regarding years spent in the construction industry and their responses are presented in Figure 4.3

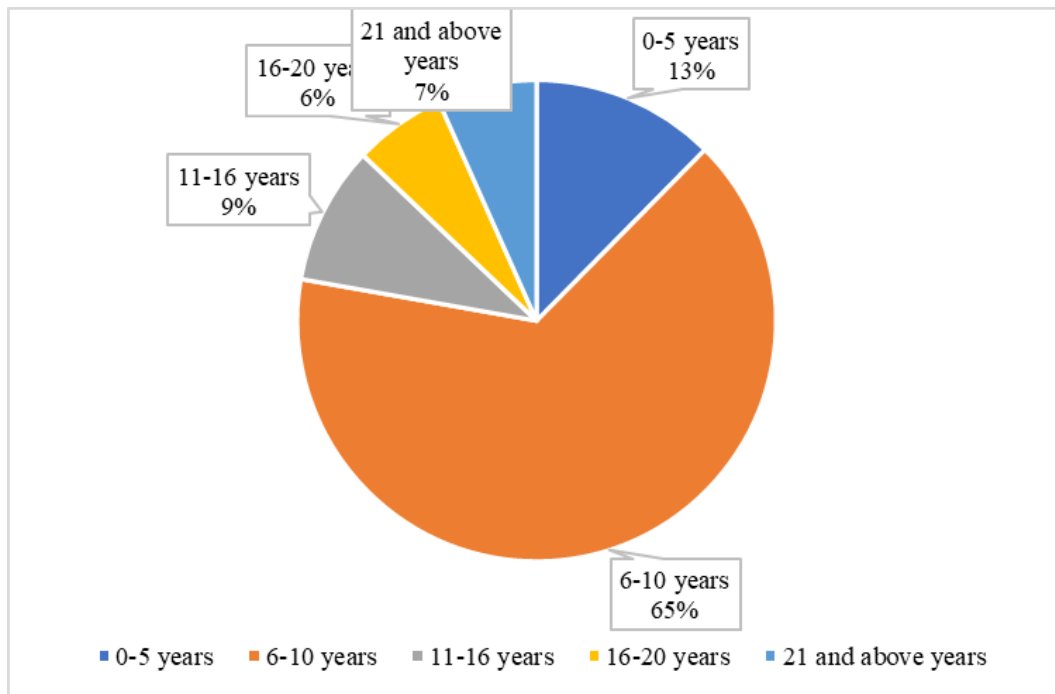


Figure 4. 3: Years spent in the construction of industry

According to the findings as presented in table 4.2, majority of the respondents constituting 126 (65.3%) had spent between 6 to 10 years in the construction industry. These were followed by 24 (12.4%) that had spent between 0 to 5 years and 18 (9.3%) that had spent between 11 to 16 years. More 13 (6.7%) had spent between 21 years and above while 12 (6.2%) had spent between 16-20 years in the construction industry. The findings indicated that majority of the respondents had spent relatively adequate time in the construction industry, a factor that gave them exposure and experience concerning factors affecting performance of building construction projects.

4.3.4 Position held by respondents

The study was able to establish the respective positions held by respondents and their responses are presented in Figure 4.4.

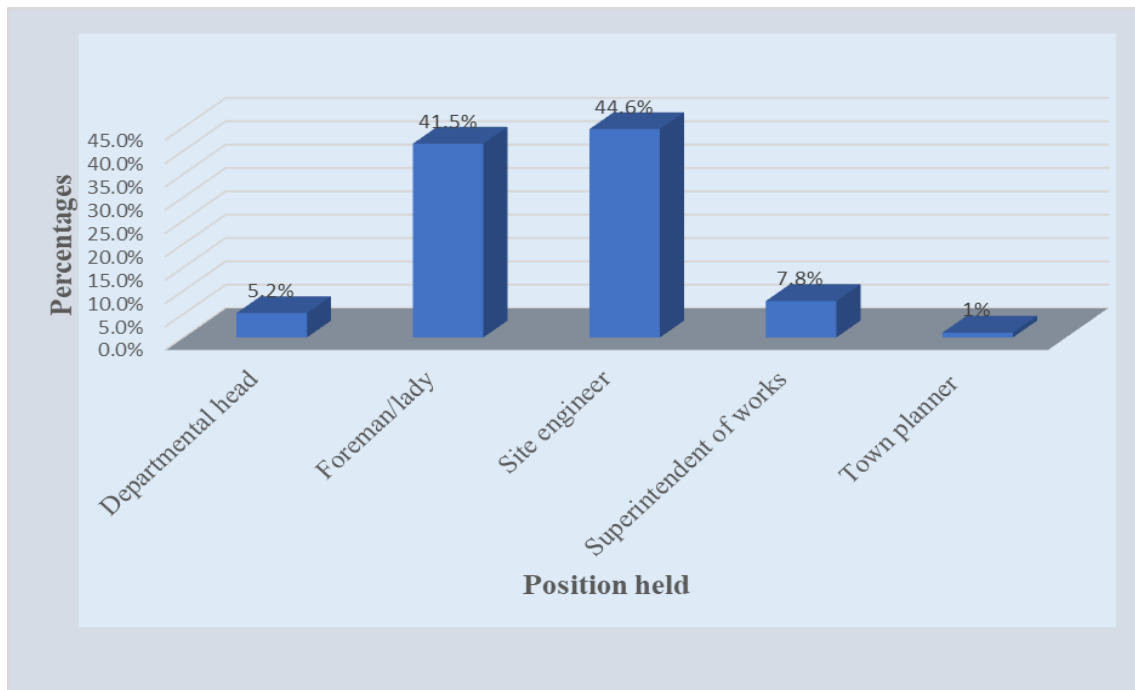


Figure 4. 4: Position held by respondents

In terms of position held by respondents, different positions were held in their respective building construction projects. According to the findings, 86 (44.6%) of the respondents were working as site engineers, followed by 80 (41.5%) respondents that were working as foremen and 15 (7.8%) that were superintendent of works. More 10 (5.2%) of the respondents were departmental heads while the least 2 (1%) were town planners. The findings indicated that majority of the respondents were technical personnels (site engineers and site foremen), hence they were able to understand and explain factors that influence performance of building construction projects in Masaka city.

4.4. Empirical findings

4.4.1 Factors Influencing the Performance of building construction projects in Masaka city

It was determined that the following criteria affected how well building construction projects performed: cost, time, quality, and productivity. A total of 48 subfactors were identified and developed. Relative significance index (RII), in accordance with the approved approach, was employed to identify the most important aspects impacting building construction project performance. Table 4.1 displays the factors' results in a ranked and presented format.

Table 4. 1: Factors influencing performance of building construction projects

Factors	RII	Rank
Cost factors		
Material and equipment	0.899	1
Liquidity of organization	0.885	2
Profit margin of project	0.849	3
Project labour force	0.780	4
Cashflow of project	0.689	5
Project design cost	0.580	6
Productivity factors		
Quality of equipment	0.896	1
Work permits and standardization	0.808	2
Level of employee motivation	0.779	3
Labour force at site	0.702	4
Communication at the site	0.580	5
Work breakdown structure	0.486	6
Time factors		

Delay in claims approval	0.897	1
Planned time for project construction is maintained	0.835	2
Availability of resources as planned through project duration	0.800	3
Material delivery schedule	0.750	4
Implementation of variation orders	0.696	5
Site preparation	0.688	6
Environmental factors		
Weather condition at site	0.805	1
Nature of access to the site	0.725	2
Site waste management	0.644	3
Site topography	0.565	4
Air quality at site	0.484	5
Noise level at site	0.377	6
Quality factors		
Conformance to codes and standards	0.898	1
Construction control meetings	0.843	2
Quality issues in material	0.798	3
Quality assessment system	0.704	4
Procurement system to obtain resources and suppliers	0.702	5
Quality training program	0.602	6
Health and safety factors		
Accidents and injuries at work place	0.864	1
Facilities for first aid workplace	0.805	2
Personal protective equipment at site	0.758	3
Safety awareness at work place	0.671	4
Documentation and evaluation plan for health and safety issues	0.668	5
Working environment	0.647	6

Resource Factors		
Building contractors plant and machinery	0.775	1
Building contractors qualified personnel	0.750	2
Contractor's experience	0.691	3
Contractors' decision-making capacity	0.549	4
Contractors' manpower and project equipment	0.523	5
Technical experts and skills	0.491	6
Project Stakeholders Factors		
Client/owners obligations fulfillment	0.717	1
Contractors' technical experts	0.658	2
Collaboration with project affected persons	0.624	3
Compensation of project affected persons	0.589	4
Provision of a reliable needed service by external stakeholders	0.529	5
Consultancy support on their responsibility	0.516	6
Average	0.699	

The elements affecting the performance of building construction projects in Masaka city are displayed in Table 4.1 along with their corresponding relative significance index (RII) and rankings. Based on the study's respondents' judgments, the RII is a metric used to assess each factor's relative importance.

Cost factors: This category includes factors related to the financial aspects of the project. Material and equipment ranked first with an RII of 0.899 indicating its high importance in project performance; liquidity of organization is ranked second with an RII of 0.885 showing its significant impact on project success; profit margin of the project is ranked third with an RII of 0.849 highlighting its influence on the overall financial viability of the project.

Productivity factors: This category encompasses factors related to the efficiency and productivity of project execution. Quality of equipment is ranked first with an RII of 0.896 indicating that the quality of equipment plays a crucial role in project productivity; work permits and standardization is ranked second with an RII of 0.808 showing the importance of adhering to regulations and obtaining necessary permits for smooth execution; level of employee motivation ranked third with an RII of 0.779 highlighting the significance of a motivated workforce in ensuring efficient project execution.

Time factors: This category includes factors related to project scheduling and timely completion. Delay in claims approval is ranked first with an RII of 0.897 emphasizing the criticality of timely approval of claims to maintain project progress; planned time for project construction is maintained is ranked second with an RII of 0.835 underlining the importance of adhering to the project schedule; availability of resources as planned through project duration ranked third with an RII of 0.800 indicating the significance of resource planning and management to avoid interruptions.

Environmental factors: This category covers factors related to the project's environmental impact and conditions. Weather condition at the site is ranked first with an RII of 0.805, indicating the importance of considering weather conditions in project planning and execution; nature of access to the site ranked second with an RII of 0.725 highlighting the impact of site accessibility on project performance; site waste management ranked third with an RII of 0.644 showing the importance of proper waste management practices during construction. Air quality and noise levels at site with RII 0.484 and RII 0.377 had minimal impact and noise was mainly from site equipment.

Quality factors: This category includes factors related to the quality of materials and workmanship in the project. Conformance to codes and standards ranked first with an RII of 0.898, indicating the significance of adhering to quality standards and codes in construction. construction control meetings ranked second with an RII of 0.843 showing the importance of regular meetings to ensure quality control; quality issues in material ranked third with an RII of 0.798 highlighting the need to address material quality concerns to maintain project standards.

Health and safety factors: This category cover factors related to the health and safety of workers on the construction site. Accidents and injuries at the workplace ranked first with an RII of 0.864, indicating the critical importance of ensuring a safe working environment; facilities for first aid workplace ranked second with an RII of 0.805 highlighting the significance of having first aid facilities readily available on-site; personal protective equipment at the site ranked third with an RII of 0.758 emphasizing the importance of providing appropriate protective gear to workers.

Resource factors: This category includes factors related to the availability and competence of project resources. Building contractors plant and machinery ranked first with an RII of 0.775 indicating the importance of having suitable equipment for efficient project execution; building contractors qualified personnel ranked second with an RII of 0.750 highlighting the significance of skilled personnel in ensuring quality construction work; contractor's experience ranked third with an RII of 0.691 underlining the value of experienced contractors in managing projects effectively.

Project Stakeholders factors: This category covers factors related to the involvement and collaboration of various project stakeholders. Client/owners obligations fulfillment ranked first with an RII of 0.717 indicating the importance of clients/owners fulfilling their obligations for successful project execution; contractors' technical experts ranked second with an RII of 0.658 showing the significance of technical expertise within the contractor's team; collaboration with project affected persons ranked third with an RII of 0.624 emphasizing the importance of engaging and collaborating with stakeholders affected by the project.

Table 4. 2: Summary of Factors Influencing the Performance of Building Construction Projects

Factors	Average RII values of factors	Rank
Time factors	0.780	1
Quality factors	0.778	2
Productivity factors	0.736	3
Cost factors	0.708	4
Health and safety	0.683	5
Project stakeholders' factors	0.606	7
Resource factors	0.630	6
Environmental factors	0.600	8

Many variables affected the building construction projects' performance in Masaka City, according to the examination of the elements influencing building construction project

performance. The components that had the greatest RII (0.780) were time factors; these were followed by quality factors (0.778), productivity factors (0.736), and cost factors (0.708).

The findings with Rohan (2020) revealed that escalation of material cost and quality among others are key parameters in the performance of building construction projects. Also, Molla, (2020) highlighted that, cost, time, quality and productivity are among the top five essential factors affecting building projects in his study area of Addis Ababa and this is in total agreement of this study findings.

4.4.2 Impact of factors influencing performance of building construction projects in Masaka City

Finding out what influences building construction projects' performance in Masaka City was the aim of the study conducted under research goal number two. To determine which of the factors that had the greatest influence, a relative significance index was computed for each and ranked. In Table 4.3, the outcomes were displayed.

Table 4. 3: Impact of factors influencing performance of building construction projects

Factors	RII	Rank
Cost factors		
Liquidity of organization	0.860	1
Profit margin of project	0.855	2
Material and equipment cost	0.850	3
Project labour force	0.760	4
Cashflow of project	0.466	5
Project design cost	0.445	6
Productivity factors		
Quality of equipment	0.923	1
Work permits and standardization	0.842	2
Level of employee motivation	0.704	3
Labour force at site	0.700	4
Communication at the site	0.470	5
Work breakdown structure	0.458	6
Time factors		
Delay in claims approval	0.893	1
Planned time for project construction	0.828	2
Availability of resources as planned through project duration	0.763	3
Material delivery schedule	0.722	4

Implementation of variation orders	0.696	5
Site preparation	0.603	6
Environmental factors		
Weather condition at site	0.751	1
Nature of access to the site	0.722	2
Site topography	0.696	3
Site waste management	0.499	4
Air quality at site	0.442	5
Noise level at site	0.364	6
Quality factors		
Quality issues in material	0.863	1
Quality assessment system	0.723	2
Construction control meetings	0.698	3
Procurement system to obtain resources and suppliers	0.655	4
Quality training program	0.485	5
Conformance to codes and standards	0.876	6
Health and safety factors		
Accidents and injuries at work place	0.869	1
Facilities for first aid workplace	0.654	2
Safety awareness at work place	0.570	3

Documentation and evaluation plan for health and safety issues	0.564	4
Working environment	0.540	5
Personal protective equipment at site	0.525	6
Resource Factors		
Building contractors plant and machinery	0.752	1
Building contractors qualified personnel	0.699	2
Contractor's experience	0.621	3
Technical experts and skills	0.608	3
Contractors' decision-making capacity	0.571	5
Contractors' manpower and project equipment	0.510	6
Project Stakeholders Factors		
Client/owners obligations fulfillment	0.739	1
Provision of a reliable needed service by external stakeholders	0.640	2
Compensation of project affected persons	0.622	3
Consultancy support on their responsibility	0.588	4
Contractors' technical experts	0.658	5
Collaboration with project affected persons	0.498	6
Average	0.663	

Table 4. 4: Summary of impactful factors

Factors	RII	Rank
Time factors	0.751	1
Quality factors	0.717	2
Cost factors	0.706	3
Productivity factors	0.683	4
Resource factors	0.627	5
Project stakeholder factors	0.624	6
Health and safety factors	0.620	7
Environmental factors	0.579	8
Total	0.663	

The factors that had a relative important index (RII) above overall average RII of 0.664 were considered to be more impactful and those that had RII below average were considered to be less impactful.

As previously mentioned, the results showed that the time component (RII of 0.751) had the greatest influence and was caused, among other things, by bad material supply schedules, delays in claim approvals, and construction schedules that were not adhered to. The results are consistent with those of Abarinda et al. (2019), who observed that most construction projects in Uganda are not finished within the original contract length and that time performance of these projects is lacking. According to Oghomwen et al. (2022), one of the top three temporal variables affecting project performance is the non-availability of resources as expected throughout the project.

Also, quality factors with RII of 0.717 had the second highest impact influencing performance and was mainly attributed by quality issues in material, quality assessment system and inadequate construction control meetings. Anita Rauzana, (2018) founded out that lack of quality material is a very influential factors on construction project performance and its in line with this study findings. This study findings are also in agreement with Mohd Yamani Yahya, (2019) whose findings concluded that, supply of defective materials among others are the most contributing significant factors on poor performance of the construction project.

Cost and productivity factors also had higher impact in influencing performance of building construction projects with RII of 0.706 and 0.683 respectively. Cost factors were mainly attributed by liquidity of organization, less profit, high cost of materials and equipment. Productivity factors were mainly due to poor quality of equipment, lack of work permits and not following guidelines for standard and lack of employee motivation. Seninde et al. (2021) reported that complicated performance challenges pertaining to cost, schedule, scope, and quality plague building projects in Uganda.

Health and safety factors (RII 0.620) and environmental factors (RII 0.579) had the least impact on performance although there were instances of accidents and minor injuries on construction projects but they did not affect the work progress. Also, they were some cases of seasonal weather changes but on most constructional projects, it was pre-planned.

4.5 Regression analysis

Regression analysis was conducted to determine the extent to which the factors affect performance in building construction projects. Four most impactful factors were considered in analysis and a multiple linear regression analysis was conducted.

Table 4. 5: Model Summary results for 4 most impactful factors and performance of building construction projects in Masaka city

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.890 ^a	0.896	0.885	0.22867

a. Predictors: (Constant), Quality factors, Cost factors, Time factors, Productivity factors

Table 4.5 displays various statistical measures to evaluate the effectiveness and accuracy of the model as described below;

R: The coefficient of determination (R) represents the correlation between the observed and predicted values in the model. In this case, the value is 0.890, indicating a very strong positive relationship between the factors and the performance of the projects.

R Square: The R Square value (0.896) indicates the proportion of the variance in the dependent variable (performance of building construction projects) that can be explained by the independent variables (Quality factors, Cost factors, Time factors, Productivity factors).

Adjusted R Square: The R square is changed to account for the number of predictors in the model, and the result is the adjusted R square (0.885). It offers a more precise assessment of

the explanatory power of the model and aids in preventing overfitting. Since the modified R Square value in this instance is almost equal to the R square, all of the model's predictors have a substantial impact on the explanation of how well building construction projects perform.

Std. Error of the Estimate: The average amount of error or residual between the observed and projected values in the model is represented by this metric (0.22867). A smaller number denotes a better match between the data and the model.

The independent variables included in the study are the predictors given below the model summary table: productivity, cost, time, and quality aspects. These elements were taken into account in order to evaluate how they might affect the effectiveness of building construction projects in Masaka.

Overall, the model summary results suggest that the included factors have a strong relationship with the performance of building construction projects in Masaka city, and they collectively explain a significant portion of the variance in project outcomes.

Table 4. 6: ANOVA Test Result

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	1149.063	4	287.266	122.581	.000 ^b
	Residual	92893.372	188	494.114		
	Total	94042.435	192			

a. Dependent Variable: performance of building construction projects

b. Predictors: (Constant), Quality factors, Cost factors, Time factors, Productivity factors

The results of an ANOVA (analysis of variance) test for the model evaluating the variables influencing the success of building construction projects in Masaka city are shown in Table 4.6.

The ANOVA test results indicate that the regression model, including the specified predictors (quality factors, cost factors, time factors, productivity factors) explains a significant amount of variability in the performance of building construction projects ($F=122.581$, $P=0.000$). The given F value of 122.581 indicated that there was a statistically significant difference between the means of the observed groups. It should however be noted that the significant F-statistics (122.581) suggests that predictors have a meaningful impact on the dependent variable. The larger difference between the mean square Regression (287.266) and mean square residual (494.114) under this impact.

The results of the regression analysis show that the productivity, time, cost, and quality factors all have a major impact on how well buildings are constructed in Masaka City. Despite significant variability that may be caused by other unmeasured factors or random error, this model may be used to forecast performance based on these parameters.

Table 4. 7: Regression Coefficients Table 4. 8: Regression Coefficients

Model		Unstandardized		Standardized		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	169.510	10.127		16.739	0.000
	Time factors	0.618	0.540	0.119	4.144	0.001
	Quality factors	0.906	0.643	0.203	5.409	0.000
	Cost factors	0.642	0.637	0.128	1.008	0.031
	Productivity factors	0.541	0.773	0.105	-0.700	0.485

a. Dependent Variable: Performance of building construction projects

In the given study, a multiple linear regression analysis was conducted to determine the impact of factors on the performance of building construction projects in Masaka City. The regression model equation was developed.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n + \varepsilon \dots\dots\dots (Eqn 4.1)$$

Where: Y represents the performance of building construction projects. X₁, X₂, ..., X_n represent the independent variables (factors). β₀, β₁, β₂, ..., β_n represent the regression coefficients. ε represents the error term.

The findings in Table 4.7 revealed the following,

Time factors: The coefficient for time factors has a p-value of 0.001, which is less than 0.05. Hence, the time factors have a significant impact on the performance of building construction projects.

Quality factors: The coefficient for quality factors has a p-value of 0.000, indicating that quality factors have significant impact on project performance.

Cost factors: The coefficient for cost factors has a p-value of 0.031, which is less than 0.05. Therefore, there is sufficient evidence to conclude that cost factors have a significant impact on project performance.

Productivity factors: The coefficient for productivity factors has a p-value of 0.485, which is greater than 0.05. Thus, there is no sufficient evidence to suggest that this factor has a significant impact on project performance.

In summary, time factors, quality factors and cost factors significantly impact the performance of building construction projects as indicated by their significant p- values (all less than 0.05). Among these, quality factors have the highest relative importance (higher Beta value of 0.203) productivity factors do not significantly impact performance as indicated by the high p- value Of 0.485.

The model suggests that improvements in time management, quality and cost are likely to enhance the performance of building construction projects in Masaka city. However, productivity factors as measured in the study do not have a significant effect.

4.6 Proposed Framework to improve performance of building construction projects

The study in third objective sought to develop a frame work to establish consistency, measure performance effectively, and drive continuous improvement. It will help create a more transparent, efficient, and sustainable built environment by enabling stakeholders to monitor,

evaluate, and enhance performance based on standardized criteria and industry best practices. The framework was developed from factors that have been found to have a significant impact on project performance

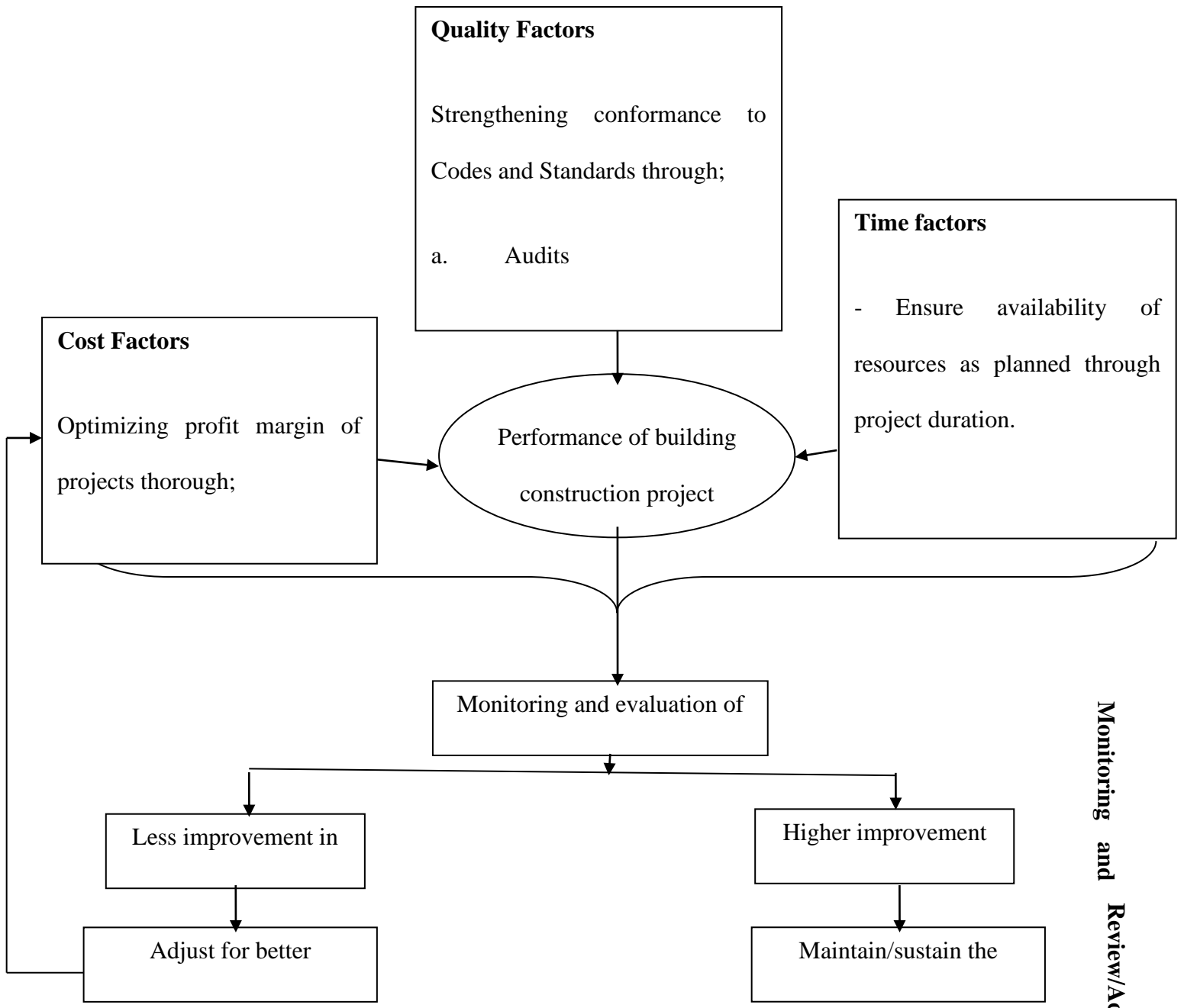


Figure 4.1 Framework to improve performance of building construction projects

4.7 Implementation of developed framework

This framework will be utilized by familiarizing oneself with its components, assessing current performance, identifying improvement areas, developing action plans, implementing and monitoring progress, reviewing and adjusting strategies, sharing and collaborating with stakeholders, and regularly updating and adapting the framework to suit organizational needs and industry standards.

Given that, factors in the framework have significant impact, they need to be given priority in efforts to improve performance of building construction projects.

Time factor can be improved by enhancing delay in claims approval through; streamlining the claims approval process to minimize delays, implementing efficient communication channels between project stakeholders and insurance providers, ensuring that project documentation and evidence for claims are well-prepared and readily available.

Quality factors can also be improved on strengthening conformance to codes and standards through; conducting regular audits and inspections to ensure compliance with relevant building codes and standards, provision of training and resources to project teams to enhance their knowledge and understanding of codes and standards, establishing quality control measures to monitor adherence to codes and standards throughout the construction process.

And also addressing quality issues in material by; establishing rigorous quality control procedures for materials used in construction, implementing strict supplier evaluation and selection processes to ensure the procurement of high-quality materials and conducting regular inspections and testing of materials to identify and address quality issues promptly.

Cost factors can be improved by optimizing profit margin of projects through; conducting thorough cost analysis and project planning to maximize profit margins, exploring opportunities to enhance project efficiency and reduce costs without compromising quality and negotiating favorable contracts and agreements with suppliers, subcontractors, and clients to improve financial outcomes.

Regular monitoring and evaluation should be conducted to assess the effectiveness of the implemented measures and make further adjustments if necessary.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter contains, conclusions and recommendations of the study findings and areas for further research.

5.2 Conclusions

From demographic characteristics of the respondents, the age distribution of respondents showed that the majority were aged 20-30 years, indicating a young workforce with opportunities to learn from more experienced workers. In terms of education, most respondents had certificates or diplomas, indicating a lower level of education that could potentially affect performance. The majority of respondents had spent 6-10 years in the construction industry, providing them with exposure and experience related to factors influencing performance. Regarding positions held, site engineers were the most common, followed by foremen and superintendents of works. This indicates that the respondents had a good understanding of the factors influencing performance in building construction projects in Masaka city.

The study assessed the effects of variables affecting how well building construction projects in Masaka City performed. To determine which factors, have the most influence, the relative importance index (RII) was computed for each and ranked.

The results showed that time factors had highest impact, followed by quality factors, cost factors and productivity factors. Environmental factors and health and safety factors had less

impact on influencing project performance. These findings highlight the need to prioritize these factors when evaluating and managing building construction projects in Masaka City.

In the regression analysis, the impact of various factors on building construction project performance was examined. Four influential factors were considered, and multiple linear regression was employed. The model summary table indicated a strong positive relationship ($R = 0.890a$) between the factors and project performance, explaining a substantial portion of the variance ($R \text{ Square} = 0.896$). The adjusted R square confirmed the significance of all predictors. The ANOVA test results supported the regression model's significance ($F = 122.581$, $p < 0.05$), highlighting the collective influence of the factors on project performance. The regression sums of squares represented the explained variability, while the residual sum of squares accounted for unexplained variability. The regression coefficients demonstrated that time factors, quality factors and cost factors significantly impacted project performance ($p < 0.05$). However, no sufficient evidence was found for significant effects of productivity factors.

In the third objective, the study aimed to develop a framework for improving the performance of building construction projects, which focuses on establishing consistency, measuring performance effectively, driving continuous improvement, supporting decision making, and fostering collaboration. The framework enables stakeholders to monitor, evaluate, and enhance performance based on standardized criteria and industry best practices. Time, quality and cost factors were identified as important considerations in improving performance. By prioritizing these factors and implementing strategies to address them, performance in building construction projects in Masaka City can be improved.

5.3 Recommendations

To improve the performance of building construction projects in Masaka City, it is recommended to prioritize investment in high-quality equipment through regular maintenance and updates. Optimal cost management should be pursued by conducting thorough cost analysis, exploring efficiency-enhancing opportunities, and negotiating favorable contracts. Streamlining the claims approval process through efficient communication and prepared documentation is crucial. Fostering collaboration among stakeholders is essential for better coordination and decision-making. Regular monitoring and evaluation should be implemented to assess effectiveness and make necessary adjustments. These actions will contribute to enhancing project performance, productivity, and financial outcomes.

5.3.1 Recommendation for Future Research

Based on the findings of this study, further research can be conducted to deepen the understanding of the following areas:

Determine the framework's long-term efficacy: The study put forward a plan for raising building construction projects' performance. Future studies might concentrate on putting this concept into practice and assessing its long-term efficacy in actual building projects. The benefits, drawbacks, and long-term effects of applying the framework in various project scenarios may all be understood from this research.

Explore the role of technology in enhancing performance: This study briefly mentioned the potential role of technology in enhancing safety and on-site imagery in the construction industry. Further research can delve deeper into the specific technologies, such as wearable

devices, automation, and drones, and their impact on project performance, safety, and efficiency. Additionally, investigating the adoption challenges and opportunities associated with integrating technology into construction projects would be valuable.

Compare the performance of building construction projects in Masaka City with other regions: Conducting comparative studies between Masaka City and other regions or cities can provide insights into regional differences in project performance and identify best practices that can be shared and implemented across different contexts. This research can contribute to a broader understanding of factors influencing project performance in the construction industry.

By addressing these areas of further research, a more comprehensive understanding of the factors influencing project performance and effective strategies for improvement can be gained, ultimately leading to enhanced outcomes in building construction projects.

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Appendices

Appendix 1: Questionnaire guide



FACULTY OF ENGINEERING

DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

RESEARCH QUESTIONNAIRE

Dear respondent,

I am **HAKIZIMANA VENUST** REG NO: **20/U/GMET/13132/PE** a student at Kyambogo University undertaking a Master's degree in Construction Technology and Management. I'm working on a research paper called "Evaluation of performance of the building construction industry in Uganda-A case study of Masaka city" as one of the prerequisites for receiving the degree. It has been determined that you are a resourceful individual who has provided pertinent and helpful information on this study. I would like to ask that you participate by completing this survey. All information collected will be used only for academic research and will be kept completely private.

Thank you for your cooperation.

Yours

Hakizimana Venust

.....

Tel; 0782099406

Email; venusteducation@gmail.com

SECTION A: BIO DATA

1. What is your gender?

- a) Male b) Female

2. What is your age?

- a) 20-30 b) 31-40 c) 41 -50 d) 51 and above

3. What is your level of education?

- a) Certificate b) Diploma b) Bachelor's degree c) Master's degree
d) Phd e) If others. please specify.....

4. How many years have you spent in the construction industry?

- a.) 0-5 years b.) 6-10 years c.) 11-16 years d.) 16-20 years
e.) 21 and above years

5. What is your position in the organization?

SECTION B: FACTORS AFFECTING PERFORMANCE OF BUILDING CONSTRUCTION PROJECTS

A variety of variables that affect how well building construction projects work are listed below. Please rate the degree of relevance with which you agree with the following aspects that affect the success of building construction projects in Ugandan cities based on your experience using a Likert scale of 1 to 5. (Please check the relevant box).

5 = Strongly agree, 4 = Agree, 3 = Average, 2 = Disagree, 1= Strongly disagree.

	INFLUENCING FACTORS	Level of agreement/disagreement				
		1	2	3	4	5
BI	COST FACTORS					
1.	Liquidity of organization					
2.	Project labour cost					
3.	Cash flow of project					
4.	Profit margin of project					
5.	Material and equipment cost					
6.	Project design cost					
B2	PRODUCTIVITY FACTORS					
1	Work breakdown structure					
2	Quality of equipment					
3	Labor force at site					
4	Work permits and standardization					

5	Level of employee motivation					
6	Communication at the site					
B3	TIME FACTORS					
1	Planned time for project construction is maintained					
2	Availability of resources as planned through project duration					
3	delay in claims approval					
4	Material delivery schedule					
5	Implementation of variation orders					
6	Site preparation					
B4	ENVIRONMENTAL FACTORS					
1	Noise level at site					
2	Weather condition at site					
3	Nature of access to the site (location of project access)					
4	Air quality at site.					
5	Site topography					
6	Site waste management					
B5	QUALITY FACTORS					
1	Quality training program					
2	Quality issues in material					
3	Quality assessment system					
4	Procurement system to obtain resources and suppliers					
5	Construction control meetings					

6	Conformance to codes and standards					
B6	HEALTH AND SAFETY FACTORS					
1	Safety awareness at work place					
2	Accidents and injuries at work place					
3	Personal protective equipment's (PPE) at site					
4	Facilities for first aid at work place					
5	Documentation and evaluation plan for health and safety issues					
6	Working environment					
B7	RESOURCE FACTORS					
1	Building contractors plant and machinery					
2	Building contractors qualified personnel					
3	Contractor's man power and project equipment					
4	Technical experts and skills					
5	Contractors' decision-making capability					
6	Contractors' experience					
B8	PROJECT STAKEKHOOLDERS FACTORS					
1	Contractors' technical experts.					
2	Consultancy support on their responsibility					
3	Client/owners obligations fulfilment					
4	Provision of a reliable needed service by external stakeholders					
5	Collaboration with project affected persons					
6	Compensation of project affected persons					

SECTION C: IMPACT OF FACTORS INFLUENCING PERFORMANCE OF BUILDING CONSTRUCTION PROJECT

Using the scale of 1 to 5, rate the extent to which the following factors have influenced the performance of building construction projects in Uganda cities:

1= having no severe impact, 2= having least impacts, 3= having severe impacts,

5= having very severe impacts, 5= having extremely severe impacts.

INFLUENCING FACTORS		Level of impact				
CI	COST FACTORS	1	2	3	4	5
1.	Liquidity of organization					
2.	Project labour cost					
3.	Cash flow of project					
4.	Profit margin of project					
5.	Material and equipment cost					
6.	Project design cost					
C2	PRODUCTIVITY FACTORS					
1	Work breakdown structure					
2	Quality of equipment					
3	Labor force at site					
4	Work permits and standardization					
5	Level of employee motivation					
6	Communication at the site					

C3	TIME FACTORS					
1	Planned time for project construction is maintained					
2	Aavailability of resources as planned through project duration					
3	delay in claims approval					
4	Material delivery schedule					
5	Implementation of variation orders					
6	Site preparation					
C4	ENVIRONMENTAL FACTORS					
1	Noise level at site					
2	Weather condition at site					
3	Nature of access to the site (location of project access)					
4	Air quality at site.					
5	Site topography					
6	Site waste management					
C5	QUALITY FACTORS					
1	Quality training program					
2	Quality issues in material					
3	Quality assessment system					
4	Procurement system to obtain resources and suppliers					
5	Construction control meetings					
6	Conformance to codes and standards					
C6	HEALTH AND SAFETY FACTORS					

1	Safety awareness at work place					
2	Accidents and injuries at work place					
3	Personal protective equipment's (PPE) at site					
4	Facilities for first aid at work place					
5	Documentation and evaluation plan for health and safety issues					
6	Working environment					
C7	RESOURCE FACTORS					
1	Building contractors plant and machinery					
2	Building contractors qualified personnel					
3	Contractor's man power and project equipment					
4	Technical experts and skills					
5	Contractors' decision-making capability					
6	Contractors' experience					
C8	PROJECT STAKEKHOOLDERS FACTORS					
1	Contractors' technical experts.					
2	Consultancy support on their responsibility					
3	Client/owners obligations fulfilment					
4	Provision of a reliable needed service by external stakeholders					
5	Collaboration with project affected persons					
6	Compensation of project affected persons					

SECTION D: Applying your knowledge previously acquired from constructed building projects, specify significant factors which influenced the building construction projects performance and to what extent?

1.
2.

THANK YOU FOR YOUR PARTICIPATION


**Appendix 2: Krejcie and Morgan (1970) Estimation Table for Determining Sample Size
of finite population.**

<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>	<i>N</i>	<i>S</i>
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

Note.—*N* is population size. *S* is sample size.

Source: Krejcie & Morgan, 1970

Appendix 3: Introductory letter


KYAMBOGO UNIVERSITY
P. O. BOX 1 KYAMBOGO
Tel: 041 - 4286792 Fax: 256-41-220464
Website :www.kyu.ac.ug, Email: drgt@kyu.ac.ug
Directorate of Research and Graduate Training
Office of the Director

Date:

TO WHOM IT MAY CONCERN

RE: HAKIZIMANA VENUST


Dear Sir/Madam,

This is to introduce to you the above named student Reg: No 20008131 pursuing Msc Construction management and
201019MET/13132/PE Technology
Department of C.V.E....., Kyambogo University.

She/he intends to carry out research on Evaluation of performance of
in partial fulfillment of the requirements for the award of Building construction in Uganda
Msc. Construction technology and management.

The purpose of this letter therefore is to request you to grant him/her permission to carry out his/her study in your institution.

Any assistance rendered to him/her will be highly appreciated.

Yours sincerely,

Prof. Bosco Bua
AG. DIRECTOR

fw

KYAMBOGO UNIVERSITY

★ 28 NOV 2022 ★

DIRECTOR

DIRECTORATE OF RESEARCH AND GRADUATE TRAINING