

**IMPACT OF PRE-CONTRACT COST PLANNING METHODS ON THE COST OF  
BUILDING PROJECTS IN UGANDA**

**BY**

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## **DECLARATION**

I, Mwesigye Chrispus, hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree of the university or other institute of higher learning, except where due acknowledgement has been made in the text and reference list.

Signature: ..... Date .....

**APPROVAL**

The undersigned approve that they have read and hereby recommend for submission to the Directorate of Research and Graduate Training of Kyambogo University, a dissertation titled: Impact of pre-contract cost planning methods on the cost of building projects in Uganda in fulfilment of the requirements for the award of Master of Science in Construction Technology and Management Degree of Kyambogo University.

Signature: ..... Date .....

Assoc. Prof. Lawrence Muhwezi (Supervisor)

Signature..... Date.....

Dr. Chris Byaruhanga (Supervisor)

## **DEDICATION**

I dedicate this dissertation to my family. A distinct appreciation to my caring father, Paul Tumwesigye whose words of inspiration and push for tenacity ring in my ears. My siblings Marion, Edgar, Dismus, Immaculate, Moran and Derrick have never left my side and are very special.

I further dedicate this dissertation to my supportive and inspiring supervisors; Associate Professor Muhwezi Lawrence and Dr. Chris Byaruhanga for the time, knowledge and skills they gave me. May the all-knowing God bless you awesomely.

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## LIST OF ACRONYMS

<b>ARB</b>	Architects Registration Board
<b>BE</b>	Building Economics
<b>C.I</b>	Confidence Interval
<b>GDP</b>	Gross Domestic Product
<b>ISU</b>	Institution of Surveyors of Uganda
<b>KCCA</b>	Kampala Capital City Authority
<b>QS</b>	Quantity Surveying
<b>RII</b>	Relative Importance Index
<b>SPSS</b>	Statistical Package for Social Scientists
<b>UBOS</b>	Uganda Bureau of Statistics
<b>USD</b>	United States Dollar

## ABSTRACT

Uganda's construction industry continues to face persistent cost overruns primarily due to inadequate pre-contract cost planning, a challenge highlighted in both local and regional studies. This has slowed the industry's growth and hindered achievement of housing development goals under Uganda's Vision 2040. The main objective of this study was to investigate the impact of pre-contract cost planning methods on the cost of building projects in Uganda. Specifically, the study identified commonly applied cost planning methods, examined their effectiveness in minimizing overruns, and proposed a methodological framework for cost optimization. A cross-sectional research design was adopted, and data were collected from 180 practicing Architects and Quantity Surveyors in Kampala, Uganda's capital city. Data were analyzed using the Statistical Package for Social Sciences (SPSS version 23) as the primary analysis tool, while Regression Analysis (RA) and the Relative Importance Index (RII) were employed as statistical methods. The findings revealed that unit cost planning, elemental cost planning and cost-benefit analysis are the most widely used methods. Others such as least cost planning, life cycle cost planning, comparative cost planning, and functional cost planning are moderately applied, while the superficial area cost planning method is rarely employed. Results further indicated that methods relying on historical data (unit, elemental, and comparative) provide more reliable cost estimates with overruns of 2–14%. In contrast, least cost, life cycle, cost-benefit and functional planning indicated overruns of 15–20%, while superficial area planning exhibited the highest overruns of 20–30%. The study developed a methodology integrating appropriate methods with practical measures to enhance cost control. It concluded that selecting suitable pre-contract cost planning methods is critical to budgetary success and recommends stronger professional standards, industry-wide guidelines, awareness programs, and continuous professional development.

**Key Words:** Pre-contract, cost planning, process, cost overruns.

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background of the study**

The construction industry contributes a significant proportion of most countries' Gross Domestic Product (Demissie, 2020). Nations can only achieve specific goals of social development, industrialization, freight, transportation, sustainable development and urbanization with enough infrastructure created by the industry (Alaloul et al., 2021).

The global construction market is worth over USD10 trillion, making it one of the largest sectors of the world economy (Nnaji and Karakhan; 2020). In Uganda, the industry contributes over 12 percent of the Gross Domestic Product (GDP) which makes it the second largest source of employment after Agriculture (UBOS, 2011).

Despite its significance, the construction industry has a bad reputation in terms of finishing projects on budget (Aljohani et al., 2017). Building projects in Uganda have not been spared of this unfortunate scenario. Many scholars point to inefficient cost planning measures as the primary causes of cost overruns on building projects (Cunningham, 2015; Lello, 2018; Monyane et al., 2018). Research done in Uganda by Otim et al. (2012) showed that several projects had had cost overruns resulting from poor cost planning throughout the design phases.

It is precisely in this context that the researcher aimed at investigating the impact of pre-contract cost planning methods on the cost of building projects in Uganda. In particular, this dissertation focused on determining the cost planning methods currently employed and their impact on the cost of building projects. The researcher argues that knowing these would guide in developing a pre-contract cost planning improvement methodology that will help

stakeholders in controlling cost overruns in building projects. This will eventually help in improving the performance of the construction industry in the country.

## **1.2 Problem Statement**

The construction industry is a cornerstone of Uganda's economy, contributing significantly to housing delivery, infrastructure provision, and job creation, thereby advancing socio-economic development goals (UBOS, 2021). However, the sector continues to grapple with persistent cost overruns that have led to project delays, contract disputes, and in some cases, outright abandonment of building projects. For example, the Budget Monitoring and Accountability Unit (2017) reported that nearly 40% of government-funded construction projects experienced average cost escalations of 15–25%, undermining value for money. Inadequate pre-contract cost planning has been highlighted as a key contributor to this contest.

While interventions have been introduced to address this challenge such as the Public Procurement and Disposal of Public Assets (PPDA) Act, the establishment of the Construction Management Unit within the Ministry of Works and periodic procurement audits—these efforts have not sufficiently reduced cost overruns. For instance, despite guidelines promoting competitive bidding and cost control, many projects still suffer from poor estimates due to reliance on inadequate planning methods and limited technical capacity. At the practical level, private sector projects in Kampala continue to stall because initial cost estimates prove unrealistic compared to market fluctuations in materials, labor, and equipment.

These overruns not only inflate project costs but also delay the delivery of housing and infrastructure, thereby constraining progress toward the housing targets set out in Uganda Vision 2040. Unless the challenges of pre-contract cost planning are addressed through the

adoption of reliable methods and strengthened professional practice, the industry will remain vulnerable to inefficiencies, cost escalations, and stalled development. This underscores the necessity of systematically examining current pre-contract cost planning practices in Uganda and identifying practical strategies for improvement.

### **1.3 Research objectives**

#### **1.3.1 Main objective**

The main objective was to investigate how cost overruns in building projects can be reduced through the application of effective pre-contract cost planning methods in Uganda.

#### **1.3.2 Specific research objectives**

The guiding specific objectives of the research were;

- i. To identify the pre-contract cost planning methods employed in building projects in Uganda;
- ii. To quantify the cost overruns resulting from different pre-contract cost planning methods employed in building projects.
- iii. To develop a pre-contract cost planning improvement methodology for building projects in Uganda;

### **1.4 Research Questions**

The guiding research questions were;

- i. What pre-contract cost planning methods are employed in building projects in Uganda?
- ii. What is the magnitude of the cost overruns resulting from different pre-contract cost planning methods employed in building projects?
- iii. What can be done to improve pre-contract cost planning in building projects in Uganda?

### **1.5 Justification of the study**

Ninety percent of construction projects experience cost overruns (Aljohani et al., 2017). Different scholars in Uganda have studied about building project costs (Otim et al., 2012; Alinaitwe et al.2013; Kabugho 2020). However, these studies have been centered on cost control during the post-contract phase while ignoring cost planning in the initial stages of construction projects.

For effective delivery, it is important to plan for all costs from the start and ensure that all expenditures are within the budgeted cost framework. If early planning is not taken care of, stakeholders loose track and consequently face cost overruns during the construction process.

The limited research in Uganda done on the impact of pre-contract cost planning methods was a justification for the researcher to take on this study.

### **1.6 Significance of the Study**

More knowledge on the various pre-contract cost planning methods has been made available for construction industry stakeholders. This will guide in adopting the most suitable to reduce on the rampant cost overruns in the industry.

The researcher further anticipates that the pre-contract cost planning improvement methodology that has been developed will guide stakeholders in preparing reliable initial cost plans. These are essential in controlling construction projects cost overruns.

In addition, the study will serve as a foundation for other academicians and other researchers who in future will wish to study the quantity surveying practice in the Ugandan construction industry.

Finally, it will benefit to the researcher in completing studies since it is part of requirements for fulfillment of an academic award of Kyambogo University.

## **1.7 Scope of the study**

### **1.7.1 Content scope**

The study concentrated on cost planning in the pre-contract phase of building projects.

### **1.7.2 Geographical scope**

The research was done in Kampala Capital City Authority. This is because data on pre-contract cost planning was expected from building consultant firms, most of which are centralized within Kampala capital city.

### **1.7.3 Time scope**

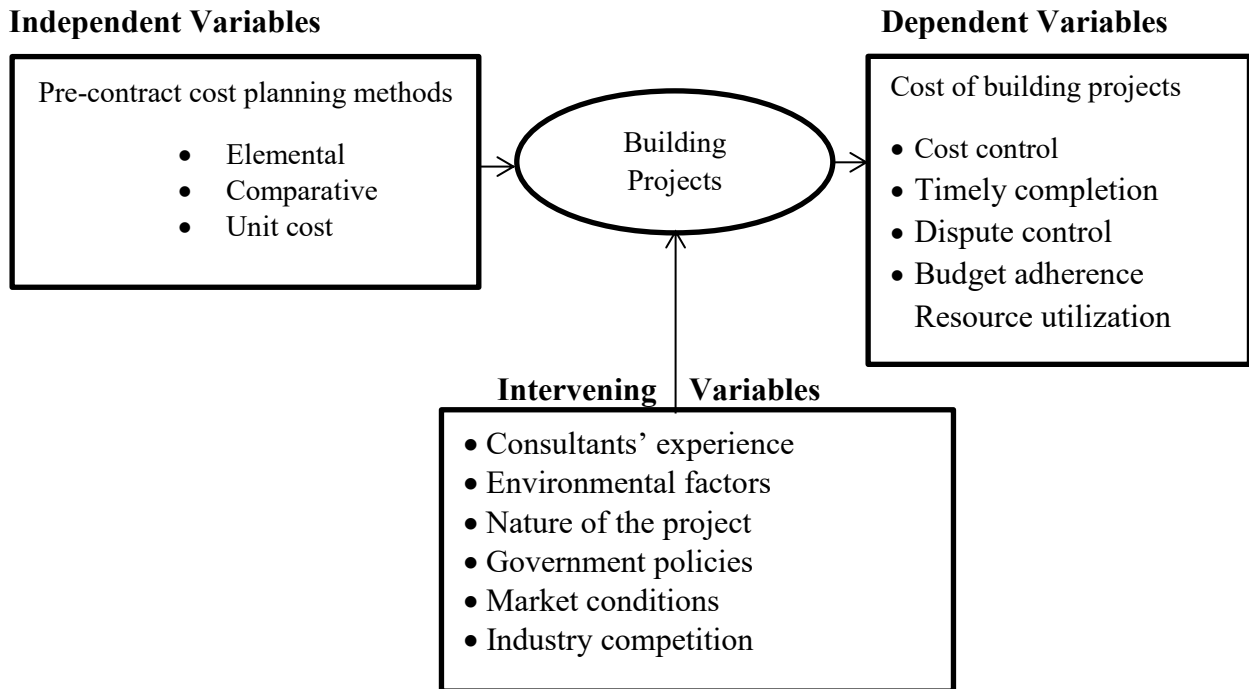
The research timeframe was ten (12) months i.e., from November 2022 to November 2023.

The study reviewed literature of 10 years i.e., from 2013 to 2023.

## **1.8 Conceptual framework**

The study examines the relationship between pre-contract cost planning methods (elemental, comparative, unit cost and others) as independent variables, and their impact on the dependent variables of cost of building projects (cost control, timely completion, and dispute control).The study also recognizes the intervening variables that include consultants' experience, environmental factors and the nature of the project to understand their influence on the relationship between the independent and dependent variables

The conceptual framework for the study is shown in Figure1.1.



**Figure 1. 1: Conceptual framework of the study**

By investigating these variables, the researcher gained insights into how different cost planning methods affect construction project costs that arise out of time overruns and construction disputes.

The conceptual framework illustrates the relationship between pre-contract cost planning methods (elemental, comparative, unit cost, and others) as independent variables and their impact on the cost of building projects as the dependent variable, measured through cost control, timely completion, dispute control, budget adherence, and resource utilization. The framework also incorporates intervening variables, including consultants' experience, environmental factors, the nature of the project, and external factors such as government policies, market conditions, and industry competition, which may influence the strength and direction of this relationship. This framework posits that selecting appropriate pre-contract cost planning methods can significantly enhance cost performance in building projects, while

the intervening and external factors can either reinforce or hinder the effectiveness of these methods. By considering both internal and external influences, the framework provides a comprehensive understanding of how pre-contract planning decisions affect project costs, ensuring that the study addresses practical, contextual, and policy-related factors that impact budgetary outcomes in Uganda's construction industry.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter entails theoretical review and review of related literature from secondary data sources like textbooks, magazines, journals, newspapers and other print media. The literature has been reviewed in relation to the specific objectives of the study which include; To identify the pre-contract cost planning methods employed in building projects in Uganda, to quantify the cost overruns resulting from different pre-contract cost planning methods employed in building projects in and to develop a pre-contract cost planning improvement methodology for building projects in Uganda.

### **2.2 Theoretical review**

This study was guided by the Cost Planning Theory advanced by Ashworth and Hogg in 2015. The theory states that early cost planning helps to establish a cost framework that guides the project's design and construction process. This approach involves establishing an appropriate budget and cost plan during the project's initial stages to identify the required resources, labor and materials needed for the project. The theory suggests that an effective cost plan should be developed through continuous communication and collaboration among all stakeholders involved in the project.

The assumption of the Cost Planning Theory is that a well-established cost plan will result in better cost control and improved project outcomes. The theory assumes that stakeholders involved in the project should be willing to work collaboratively to achieve the desired outcome. However, the weakness of the theory is that it does not provide a detailed process of developing a cost plan, which may lead to inconsistent approaches to cost planning.

The Cost Planning Theory is appropriate for this study because it focuses on the importance of early cost planning, which is critical to the success of construction projects. The theory emphasizes the need for collaboration among all stakeholders in the project. Additionally, the theory acknowledges that cost planning is an iterative process that requires continuous monitoring and adjustment, which is relevant to the study's objectives.

### **2.3 Pre- Contract cost planning methods**

Pre-contract cost planning is a crucial process in construction projects as it helps in determining the project's cost estimates. This section reviews literature on the various pre contract cost planning methods employed in construction projects.

#### **2.3.1 Elemental Cost Planning**

Elemental cost planning is a method that involves dividing the project into different elements and estimating the cost of each element. The elements could be the substructure, superstructure, finishes, and so on. According to Ashworth (2015), the elemental cost planning method is suitable for projects with a well-defined design, and the project cost is the sum of the costs of each element. The author noted that elemental cost planning method is easy to use and it provides a detailed cost breakdown of the project.

#### **2.3.2 Comparative Cost Planning**

Comparative cost planning involves using the cost of a similar project to estimate the cost of a new project. According to Lello (2018), comparative cost planning method is suitable for projects with a similar scope of work. The author noted that the method is quick and easy to use, but it is highly dependent on the accuracy of the cost data of the reference project.

### **2.3.3 Unit Cost Planning**

Unit cost planning involves estimating the cost of a project based on the cost of a unit of measurement. For instance, the cost of a building could be estimated based on the cost per square meter or the cost per cubic meter. According to Ernest et al. (2017), the unit cost planning method is commonly used in Ghana's construction industry for small and medium-sized projects. The authors noted that the unit cost planning method is easy to use, but it does not provide a detailed cost breakdown of the project.

### **2.3.4 Superficial Area Cost Planning**

Superficial area cost planning involves estimating the cost of a project based on the total floor area. According to Lello (2018), the method is easy to use, but it does not account for the project's complexity and design.

### **2.3.5 Least Cost Planning**

Least cost planning involves selecting the construction materials and methods that will result in the lowest possible cost without compromising the project's quality. According to Bhargave et al (2010), the least cost planning method is commonly used in the industry especially for small and medium-sized projects. The authors noted that the least cost planning method can result in cost savings but requires careful consideration of the project's design and quality requirements.

### **2.3.6 Functional Cost Planning**

Functional cost planning involves estimating the cost of a project based on its function or purpose. According Lello (2018), the functional cost planning method is commonly used in the construction industry for public infrastructure projects such as roads and bridges. The

author noted that the functional cost planning method is suitable for projects with a well-defined function or purpose but it may not be suitable for complex projects. He further notes that this method is beneficial because it ensures that the design of the building meets the functional requirements of the project while keeping costs under control. However, this method is limited by the difficulty in assigning costs to each function accurately, and it may not be suitable for complex building projects.

### **2.3.7 Cost-Benefit Analysis**

This method involves identifying and quantifying the costs and benefits of a project and then comparing them to determine the feasibility of the project. According to Lu et al. (2014) cost-benefit analysis is a useful tool for decision making in the early stages of the project. However, the limitations of this method include the difficulty in accurately quantifying the costs and benefits and the fact that some intangible benefits and costs may be overlooked.

### **2.3.8 Life cycle cost method**

Finally, life cycle cost method is a pre-contract cost planning method that involves considering the costs associated with the entire life cycle of the building, including design, construction, operation, maintenance, and disposal. According to Schneiderova-Heralova and Renata (2018), this method is beneficial because it allows for the consideration of the long-term costs associated with the building, and it encourages the selection of materials and technologies that are sustainable and cost-effective in the long run. However, the limitations of this method include the difficulty in accurately predicting the life cycle costs and the fact that it may not be suitable for short-term projects.

In conclusion, pre-contract cost planning methods are essential in ensuring the cost-effectiveness of a building project. Elemental, comparative, unit cost, superficial area, least cost, functional, cost-benefit analysis and life cycle cost methods are commonly used in pre-contract cost planning. Each of these methods has its strengths and weaknesses, and the selection of the appropriate method depends on the specific requirements of the project.

#### **2.4 The cost overruns resulting from different pre-contract cost planning methods**

Cost overruns in construction projects are a persistent issue, often influenced by the pre-contract cost planning methods employed. This review examines the impact of various pre-contract cost planning methods on cost overruns, referencing specific studies and presenting realistic percentage overruns to illustrate these impacts.

Ling et al. (2021) explored the accuracy of different cost planning methods at the pre-contract stage, highlighting the unit cost planning method. This method uses historical cost data to estimate the cost per unit of output for example per square meter or per unit installed. Despite its straightforward approach, the method is not immune to cost overruns. According to their findings, projects using unit cost planning methods experienced an average cost overrun of 12%. This was attributed to unforeseen site conditions and changes in material prices, underscoring the limitations of even the most methodical pre-contract planning efforts.

Cunningham (2015) emphasized the importance of the elemental cost planning method during the pre-contract stage. This method involves breaking down the project into its elemental components and estimating the cost of each element. His study pointed out that using elemental cost planning combined with early cost control mechanisms such as preliminary cost assessments and continuous budget reviews could significantly reduce cost overruns.

Despite these efforts, projects still faced an average overrun of 10%. This overrun was mainly due to inadequate risk assessments and the inherent uncertainties in initial project scopes, illustrating the challenges in maintaining budgetary discipline even with proactive cost control. Another study by Shehu et al. (2014) on elemental cost planning provided deeper insights into cost overruns within the Malaysian construction industry, revealing that the prevalent use of this method resulted in an average cost overrun of 12%. This was largely due to unforeseen project changes and the dynamic nature of the construction market.

Lello (2018) evaluated the pre-contract cost planning processes specific to building projects in Tanzania, focusing on cost-benefit analysis. This method assesses the economic worth of a project by comparing the expected costs and benefits. Despite its analytical nature, the average cost overrun for projects using cost-benefit analysis was around 15%. Factors such as inflation, currency fluctuations and administrative delays contributed significantly to cost overruns.

Ariyawansa and Francis (2022) provided a critical analysis of cost overrun factors at both pre-contract and post-contract stages, including least cost planning. This method aims to identify the cheapest way to achieve the desired project outcome. Their study indicated that projects with less rigorous pre-contract cost planning, such as least cost planning, faced overruns averaging 18%. This higher percentage underscores the importance of detailed and accurate cost planning to mitigate significant financial risks.

Abobakr (2018) discussed the necessity of robust cost control processes in construction projects focusing on life cycle cost planning. This method considers the total cost of ownership over the life of the project including initial construction, maintenance and

operational costs. His findings showed that effective life cycle cost planning during the pre-contract stage could reduce cost overruns to an average of 14%. Despite these measures, the presence of unexpected regulatory changes and project scope adjustments still led to cost escalations, highlighting the complexities involved in maintaining control over project finances.

Lines et al. (2015) conducted a longitudinal study on pre-contract planning models, including comparative cost planning. This method involves comparing the costs of similar projects to estimate the budget for a new project. They reported that projects with well-structured comparative cost planning models experienced a lower average cost overrun of 8%. This reduction was attributed to better risk management practices and more accurate initial cost estimates, illustrating the benefits of adopting comprehensive planning frameworks.

Subramani, Sruthi and Kavitha (2014) identified various causes of cost overruns in construction projects, focusing on functional cost planning. This method allocates costs based on the functions of the building for example office space and retail space rather than physical components. Their research showed that projects lacking detailed initial planning, including functional cost planning faced overruns averaging 20%. Contributing factors included poor scope definition and underestimation of project complexity.

Odediran, Adeyinka, and Eghenure (2012) studied factors influencing cost overruns in Nigerian construction projects including superficial area cost planning. This method estimates costs based on the total superficial area for example cost per square meter. They found that insufficient pre-contract cost planning, often due to inadequate data and resource constraints,

led to an average overrun of 22%. This high percentage reflects the significant impact of inadequate planning and the necessity for improved cost estimation practices.

## **2.5 Improving pre-contract cost planning**

There is limited research specifically focused on improving pre-contract cost planning for building projects in Uganda. Recent studies by Kasozi and Nabunya (2021) and Mugabi et al. (2022) have highlighted persistent cost overruns in Ugandan construction projects and emphasized that inadequate pre-contract cost planning remains a major challenge, confirming the scarcity of localized empirical studies. Similarly, regional studies in East Africa, such as by Otieno and Mwangi (2020) in Kenya, demonstrate that although structured cost planning methods exist, their adaptation and effectiveness in local contexts remain underexplored.

However, there are several studies that have investigated the same in other countries. For example, a study by Rameezdeen and Watson (2013) developed a pre-contract cost planning improvement methodology for building projects in Sri Lanka. The methodology involved the identification and categorization of cost items, the development of a cost database, and the use of benchmarking and cost modeling techniques. The methodology was tested on a case study project and found to result in more accurate cost estimates and a reduction in project cost overruns. This study provides a useful framework for the development of a pre-contract cost planning improvement methodology for building projects in Uganda.

Another study by Turner and Zuo (2014) developed a pre-contract cost planning methodology for sustainable building projects in Australia. The methodology involved the use of a multi-criteria decision-making approach to evaluate the cost implications of different measures. The methodology was tested on a case study project and found to result in improved cost

management. While the context of building projects in Uganda may be different, the use of a multi-criteria decision-making approach to pre-contract cost planning could be a useful approach for incorporating sustainability considerations and achieving cost savings. The methodology framework tailored to the unique context of Uganda was developed based on these existing frameworks, best practices, and insights from recent Ugandan studies, while incorporating local knowledge and expertise.

## **2.6 Literature gaps**

Despite extensive research on pre-contract cost planning methods globally, there is limited empirical evidence focusing specifically on Uganda's construction industry. Most studies, such as Rameezdeen and Watson (2013) in Sri Lanka and Turner and Zuo (2014) in Australia, emphasize methodological frameworks for cost estimation and improvement but do not account for Uganda's unique construction context, regulatory environment, and market conditions. Similarly, while studies by Ashworth (2015), Lello (2018), and Ernest et al. (2017) provide detailed analyses of elemental, comparative, and unit cost planning, they largely rely on foreign case studies and do not integrate local industry data, stakeholder practices, or the impact of external factors such as government policies and economic fluctuations. Furthermore, there is a scarcity of research quantifying the actual cost overruns associated with each pre-contract cost planning method in Uganda, leaving a gap in understanding the real-world financial implications. This study addresses these gaps by combining practitioner insights, local project data, and tailored methodology frameworks to develop practical, context-specific strategies for improving pre-contract cost planning and reducing cost overruns in Ugandan building projects.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter presents a brief description of the process of research for the study.

### **3.2 Research Design**

Research design serves as the foundational framework guiding the collection and analysis of data in a research study (Creswell, 2014). Several research designs exist, among which include longitudinal designs, experimental or case study designs and cross-sectional research designs. For this study, a cross-sectional research design was deemed most appropriate because of its efficiency and allowing the researcher to gather data swiftly and at a relatively low cost (Creswell & Creswell, 2018). Cross-sectional research involves collecting data from a sample population at a single point in time, offering a snapshot view of the variables under investigation (Polit & Beck, 2020). This design allowed for the integration of secondary data obtained from books and journals which were analyzed thematically to identify what other researchers have discovered. The use of a cross-sectional design ensured that data collection and analysis were conducted in a structured and systematic manner, enabling the researcher to present a well-rounded and evidence-based argument. Additionally, the cross-sectional approach facilitated the comparison of data across distinct groups, a crucial aspect for this study where the different opinions of respondents were to be compared.

### **3.3 Research Approach**

Research approach refers to the way in which a researcher plans to carry out their study including the methods and techniques they use to collect and analyze data (Creswell, 2014). In this study, both qualitative and quantitative research approaches were used.

The qualitative approach was used to gain an in-depth understanding of the pre-contract cost planning methods employed in building projects. It was also used during the development of the pre-contract cost planning improvement methodology for building projects in Uganda. The qualitative approach enabled the researcher to collect detailed information about the opinions, experiences and perceptions of Architects and Quantity Surveyors who are the study population. Semi-structured questionnaires were used to collect this data. The quantitative approach was used to quantify the cost overruns resulting from the different pre-contract cost planning methods employed on building projects. The data were collected through a comprehensive documentary review to identify the percentages of overruns attributed to various methods that other scholars have written about. These results were compiled together to guide this research.

The adoption of both qualitative and quantitative approaches in this study enabled the researcher to get a comprehensive understanding of the impact of pre-contract cost planning methods on the cost of building projects. The qualitative approach provided detailed insights into the pre-contract cost planning methods employed in building projects in Uganda while the quantitative approach helped to quantify the cost overruns resulting from the use of the different planning methods employed.

### **3.4 Study Population**

The study was conducted in Kampala Capital City (KCC), Uganda. The study population comprised of registered Architects and Quantity Surveyors working in offices and construction firms located within Kampala Capital City and its immediate environs. This study group was chosen because Architects lead building design teams, whereas cost planning is the primary responsibility of Quantity Surveyors. By targeting professionals actively engaged in

projects around KCC, the study ensured relevant and practical insights into pre-contract cost planning practices.

The study population is indicated in Table 3.1.

**Table 3. 1: Study population**

<b>Profession</b>	<b>Number</b>
Architects	222
Quantity Surveyors	70
<b>Total</b>	<b>292</b>

**Source:** ARB (2022); ISU (2021)

### 3.5 Sample size determination

Since the study population is finite, the sample size was determined using the formula advanced by Kothari (2004) as indicated in equation (3.1)

$$n = \frac{z^2 \cdot p \cdot q \cdot N}{e^2(N-1) + z^2 \cdot p \cdot q} \dots \dots \dots \text{(Equation 3.1)}$$

Where

$z$  = the value of the standard variate at a given confidence level to be worked out from the table showing area under the normal curve. It is 1.96 for a 95% Confidence Level which is the one that was used for this study.

$p$  = sample proportion;  $q$  = is a variable derived as  $1-p$ ;

According to Cochran, at 95% C.I,  $p = 0.5$  and this implies that  $q = 1 - 0.5$ ;

$e$  = is the margin of error between the sample mean and the population mean (5%) or (desired level of precision of sampling error);

$n$  = is sample size;

$N$  = population size;

Using the formula, values of the sample size were computed and presented in Table 3.2.

**Table 3.2: Sample size from the population of Uganda Registered Architects and Quantity Surveyors**

<b>Population category</b>	<b>Sample size</b>	<b>Selection criteria</b>
Architects	141	Purposive
Quantity Surveyors	60	Purposive
<b>Total</b>	<b>201</b>	

### **3.6 Sampling Techniques**

This study used purposive sampling technique to select the sample population. Purposive sampling, also known as judgmental sampling is a non-random sampling technique that involves selecting participants based on specific criteria relevant to the research question.

For both Architects and Quantity Surveyors, participants were selected based on their level of experience and expertise in their field. Specifically, those who had at least 5 years of experience and had been involved in at least 5 large-scale building projects were included in the sample. This ensured that the sample included individuals who had extensive knowledge and experience in the field of building design and cost management.

### **3.7 Data sources**

Data sources refer to where research information is to be collected by the researcher for the specific study. The sources are broadly classified into primary and secondary sources, on which the researcher can rely to conduct the study (Kothari, 2004)

#### **3.7.1 Primary data sources**

Primary data is the information collected by the researcher first hand, through various methods like questionnaires, interviews and field observations (Creswell, 2014). In this study, the

primary source of information was from registered firms of practicing Quantity Surveyors and Architects that were located in Kampala city.

### **3.7.2 Secondary data sources**

Secondary data is the information that has already been published by different researchers and is readily available for other researchers pursuing a similar study. They include books, industry survey, compilations from computerized databases, published printed sources, journals, published electronic sources, magazines and newspapers (Creswell, 2014). During this research, journals, published theses and books were used.

### **3.8 Data Collection Methods**

The study used both primary and secondary data collection methods. The primary data were collected using self-administered questionnaires. Secondary data were collected from published sources such as journals, reports, and other relevant documents.

### **3.9 Data Collection Instruments**

During the study, semi-structured questionnaires were used.

#### **3.9.1 Semi-structured questionnaires**

The questionnaires were designed to collect data on pre-contract cost planning methods employed in building projects in Uganda, cost overruns resulting from different pre-contract cost planning methods and in soliciting for information for developing a pre-contract cost planning improvement methodology for building projects in Uganda.

#### **3.10 Pilot Survey**

The pilot survey was conducted as a preliminary test of the reliability and validity of the research instrument before the main data collection phase. A sample of five respondents who

were not part of the intended sample population was selected for this purpose. The questionnaire was administered to these participants and their responses were analyzed to assess the clarity, comprehensibility and effectiveness of the survey questions. The pilot survey aimed at identifying any potential issues or ambiguities in the questionnaire, assess the consistency of responses and determine if any adjustments or improvements were necessary. The findings from the pilot survey helped ensure that the research instruments were reliable and valid, providing valuable insights into the feasibility and appropriateness of the survey design and allowing for necessary modifications to be made before the main data collection process.

### 3.11 Data Quality Testing

#### 3.11.1 Content Validity

Content validity was determined by subjecting the research instrument to review by experts in the field of cost control and management of building projects. Table 3.3 shows the results from the reviews.

**Table 3. 3: Content Validity Index**

<b>Item Number</b>	<b>Item Description</b>	<b>Relevance Rating</b>	<b>CVI Calculation</b>	<b>CVI (Percentage)</b>
1	Pre-contract cost planning methods	5	5/5	100%
2	Frequency in employment of pre-contact cost planning methods	4	4/5	80%
3	Cost overruns from different methods	5	5/5	100%
4	Pre-contract cost planning challenges	4	4/5	80%
5	Pre-contract cost planning measures	5	5/5	100%
<b>Average CVI</b>			<b>0.92</b>	<b>92%</b>

To ensure the robustness of the research questionnaire, each item was subjected to a relevance rating on a scale of 1 to 4 where 1 denoted low relevance and 4 signified high relevance. This meticulous process aimed at gauging the perceived importance of each item by subject matter

experts. Subsequently, the Content Validity Index (CVI) was computed for each item by dividing the number of experts who rated an item as relevant by the total number of experts. In determining the adequacy of the CVI, a critical threshold was set to ascertain the acceptability of the research questionnaire. A commonly adopted benchmark is a CVI value of 0.80 or higher, indicative of a strong consensus among experts regarding the relevance of the items (Polit & Beck, 2006). In our study, the CVI of 0.9 affirmed that the questionnaire was valid and could thus lead to reliable findings.

### 3.11.2 Reliability Tests

To ensure reliability of the instruments, all the statements in the questionnaire were subjected to the Cronbach alpha test and the results are as shown in table 3.4.

**Table 3.4: Results from the Cronbach Alpha Test**

<b>Instrument/Scale</b>	<b>Number of Items</b>	<b>Cronbach's Alpha</b>
Pre-contract Methods	8	0.85
Frequency in employment of pre-contact cost planning methods	8	0.78
Pre-contract cost planning challenges	5	0.82
Pre-contract cost planning measures	6	0.79
<b>Average Cronbach Alpha Values</b>		<b>0.81</b>

According to Tavakol and Dennick (2011), an alpha value between 0.8 to 0.9 indicates acceptable reliability. Since the average alpha value was 0.81, it means that the instruments were reliable.

### 3.12 Data Analysis

The collected data were analyzed using Statistical Package for Social Scientists (SPSS) version 24 and Microsoft Excel. Descriptive statistics such as frequencies, percentages, means

and standard deviations were used to summarize the data. The data analysis process involved several steps including data cleaning, coding, entry and tabulation. The data collected were analyzed using both qualitative and quantitative methods. The qualitative data were analyzed through content analysis while the quantitative data were analyzed using regression analysis and relative importance index (RII). The RII was used to establish the importance of each pre-contract cost planning method in building projects. The RII formula is indicated in Equation 3.1.

$$RII = \sum W / (A * N) \quad (0 \leq RII \leq 1) \dots\dots\dots \text{(Equation 3.1)}$$

where:

W = Weight assigned to each factor by the respondent

A = Highest weight assigned to any factor

N = Number of factors

Regression analysis was used to determine the significance of the relationship between pre-contract cost planning methods and the cost of building projects. The multivariate linear regression equation is:

$$Y = C + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_n X_n + e \dots\dots\dots \text{(Equation 3.2)}$$

Where:

Y = Cost of building projects in Uganda

C = Constant

$\beta_1, \beta_2, \beta_3$  = Coefficients of pre-contract cost planning methods

$X_1, X_2, X_3$  = Pre-contract cost planning methods

e = Error term

### **3.13 Achievement of specific objectives**

#### **3.13.1 To establish the pre-contract cost planning methods employed in building projects in Uganda**

In pursuit of this objective, an in-depth exploration was undertaken to establish the prevailing pre-contract cost planning methods employed in building projects in Uganda. Respondents were prompted to shed light on the common methods employed in the early phases of building projects. Furthermore, the questionnaire navigated into the frequency of application for each identified method, aiming to uncover the prevalence and consistency of their usage in the industry. RII was used to determine the importance and frequency of use of each method. The importance levels were categorized as;

**High (RII= 0.80 - 1.00):** To indicate a high level of importance, suggesting that the method is extensively employed and holds significant relevance in pre-contract cost planning.

**Moderate (RII= 0.60 - 0.79):** To indicate a moderate level of importance, suggesting a reasonable application and relevance of the method in pre-contract cost planning.

**Low (RII= 0.00 - 0.59):** To indicate a low level of importance, suggesting limited application and relevance of the method in pre-contract cost planning.

#### **3.13.2 To quantify cost overruns resulting from different pre-contract cost planning methods employed in building projects in Uganda**

To achieve this objective, a comprehensive empirical review was conducted, examining various scholarly sources. Key studies across the globe were identified, providing insights into the accuracy and impact of different cost planning methods such as unit cost planning, elemental cost planning, cost-benefit analysis, least cost planning, life cycle cost planning,

comparative cost planning, functional cost planning, and superficial area cost planning. Each method's average cost overrun percentage was extracted from these studies, allowing for a comparative analysis.

In addition to reviewing global studies, the analysis included actual implemented building projects in Kampala Capital City. For these projects, data on planned costs, final costs, and the pre-contract cost planning methods employed were collected from project records and reports. This enabled a practical assessment of cost variations directly linked to the methods applied in real Ugandan projects. The analysis of the percentage differences between planned and final costs for each method indicated the cost overrun attributable to the pre-contract cost planning method used.

By comparing results from international studies with data from Kampala-based projects, the study provided a comprehensive understanding of the effectiveness and limitations of each pre-contract cost planning method, facilitating a detailed assessment of their influence on project cost overruns.

### **3.13.3 To develop a pre-contract cost planning improvement methodology for building projects in Uganda**

To achieve this objective, a qualitative research approach was used. Firstly, a comprehensive literature review on pre-contract cost planning methods was done to identify the best practices that have been used in Uganda and other countries. Challenges facing the pre-contract cost planning process in Uganda were then identified. In order to improve the planning process, possible measures to these challenges were identified, with each method being apportioned corresponding suitable measures of how it can be improved. A focus group discussion with a

panel of experts in the construction industry was held to validate the findings and to give further insights on the proposed improvement strategies. A pre-contract cost planning improvement methodology appropriate for building projects in Uganda was then developed.

### **3.14 Research ethical considerations**

The study commenced after obtaining approval from Kyambogo University. After obtaining approval from the University, ethical approval was sought from Kampala Capital City Authority. The participants were informed about the objectives of the study, their roles, and the benefits of participating in the study. Confidentiality of the participants was maintained by ensuring that the data collected were only used for the purposes of the study.

### **3.15 Chapter Summary**

This chapter has presented the methodology that was used in the study. The research design, research approach, study population, sample size, selection and sampling techniques, data collection methods and instruments, pre-testing techniques, types of data required, procedure of data collection, data analysis, pilot survey, validity and variability, achievement of specific objectives and research ethical considerations have been discussed. The next chapter will present the results of the study.

## CHAPTER FOUR: ANALYSIS, PRESENTATION AND DISCUSSION OF RESULTS

### 4.1 Introduction

The study results from Kampala Capital City regarding the impact of pre-contract cost planning methods on the cost of building projects in Uganda are presented in this chapter. The presentation concentrated on objectives of the study and the demographic information of the respondents.

### 4.2 Response rate

A total of 201 respondents were selected to participate in the study. These were registered and practicing Architects and Quantity Surveyors in Kampala Capital City. Response rate results are shown in Table 4.1.

**Table 4. 1: Response rate by category**

Category	Total Selected	Participated
Architects	141	120
Quantity Surveyors	60	60
<b>Total</b>	<b>201</b>	<b>180</b>

The response rate by category for the study shows that out of the total of 141 Architects initially selected, 120 actively participated in the study, resulting in a response rate of 85%. For Quantity Surveyors, all the 60 selected participants took part in the study, indicating a response rate of 100%. Overall, out of the total 201 respondents selected, 180 participated, yielding an overall response rate of approximately 90%. The high response rate from both Architects and Quantity Surveyors suggests a good level of engagement and interest in the study. The fact that the bigger percentage of the Quantity Surveyors participated indicates a strong commitment to cost management by this group. No wonder cost control is the Quantity

Surveyor’s primary role in the construction industry. However, a response rate of 85% for Architects still reflects a significant level of participation and can be considered quite good.

The high response rate enhances the reliability and validity of the study's findings. With a larger sample size and high participation, the results are more representative of the target population of Architects and Quantity Surveyors in Kampala Capital City. This allows for more robust and generalizable conclusions to be drawn from the data collected. The high participation rate also demonstrates the willingness among professionals in the field to contribute to research and potentially indicates the importance they place on the subject matter being investigated.

**4.2.1 Gender of Respondents**

For the respondents' gender, the information is presented as percentages in Table 4.2.

**Table 4. 2: Gender of respondents**

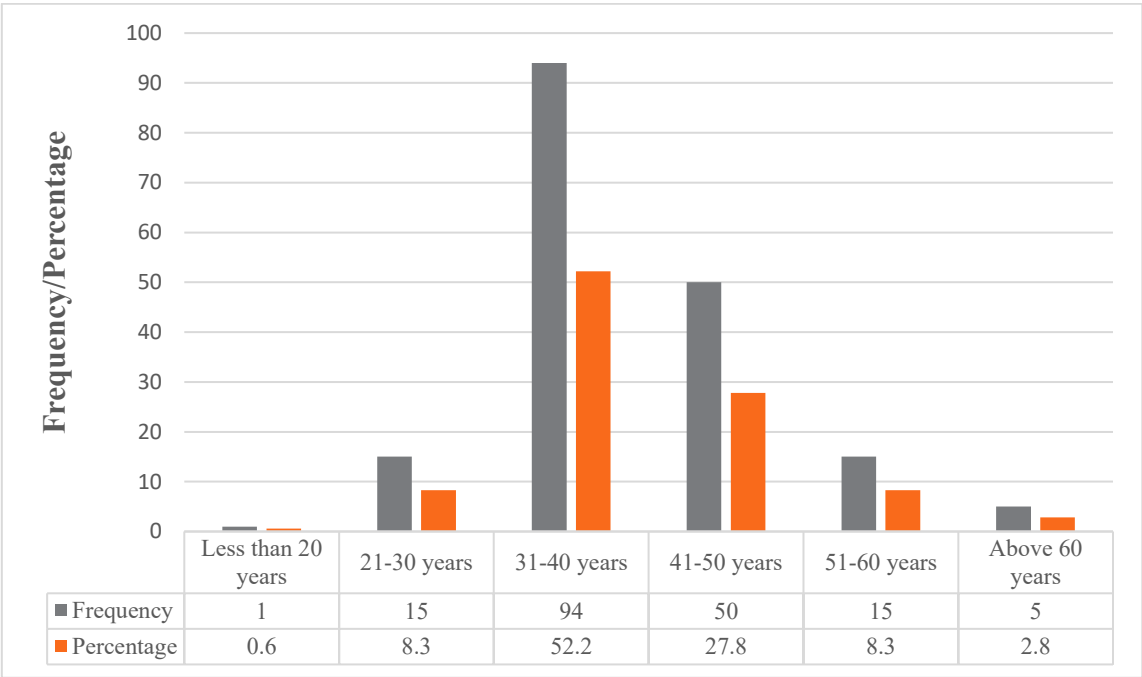
<b>Gender</b>	<b>Frequency</b>	<b>Percent</b>
Male	137	76.4
Female	43	23.8

The results indicate that out of the 180 respondents, 76.1% were male, while 23.8% were female. The gender distribution of the respondents shows a significant imbalance, with males representing a larger proportion compared to females. This finding highlights a potential underrepresentation of women in the building industry, particularly in roles related to pre-contract cost planning. This gender disparity creates the need for increased efforts to promote gender diversity and inclusiveness within the industry. Steps should be taken to encourage and support more women to pursue careers in cost planning and provide equal opportunities

for their professional growth. Creating a more inclusive and diverse workforce can lead to a broader range of perspectives and expertise, ultimately contributing to more comprehensive and effective cost planning practices in building projects in Uganda.

**4.2.2 Distribution of Respondents by Age Bracket**

The age distribution of the study participants within Kampala Capital City was among the study's variables. The results are presented in Figure 4.1.



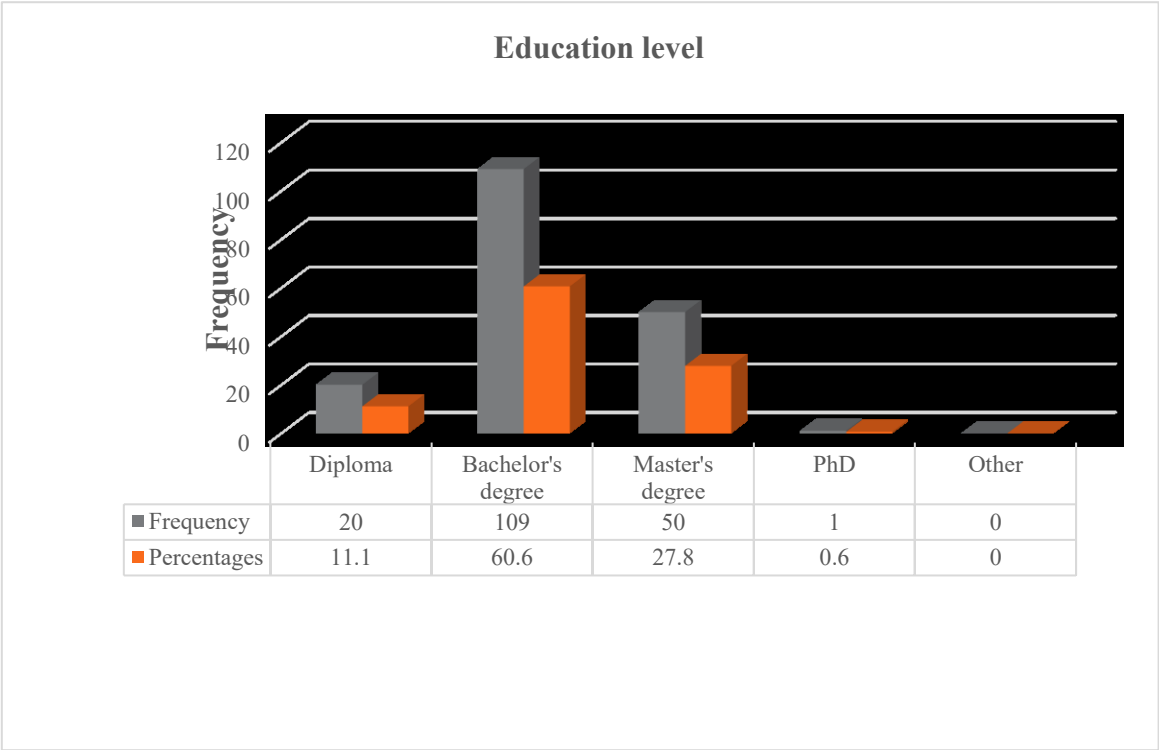
**Figure 4. 1: Distribution of respondents by age bracket**

The results indicate a diverse age distribution among the respondents. The largest proportion of respondents falls within the age group of 31-40 years, accounting for 52.2%, followed by the age group of 41-50 years, representing 27.8% of the respondents. The age groups of less than 20 years, 20-30 years 51-60 years and above 60 years account for 0.6%, 8.3% and 8.3% respectively while respondents above 60 years constitute 2.8%. These findings suggest a relatively balanced representation across different age brackets, indicating a mix of

experienced professionals and younger individuals in the field. The implication of this age distribution is the potential for knowledge transfer and mentorship opportunities, where more experienced professionals can share their expertise with the younger generation, leading to the development of a skilled and competent workforce in pre-contract cost planning.

**4.2.3 Education Qualification of the Respondents**

The study also identified participants' highest levels of education. The resultant distribution is displayed in Figure 4.2.



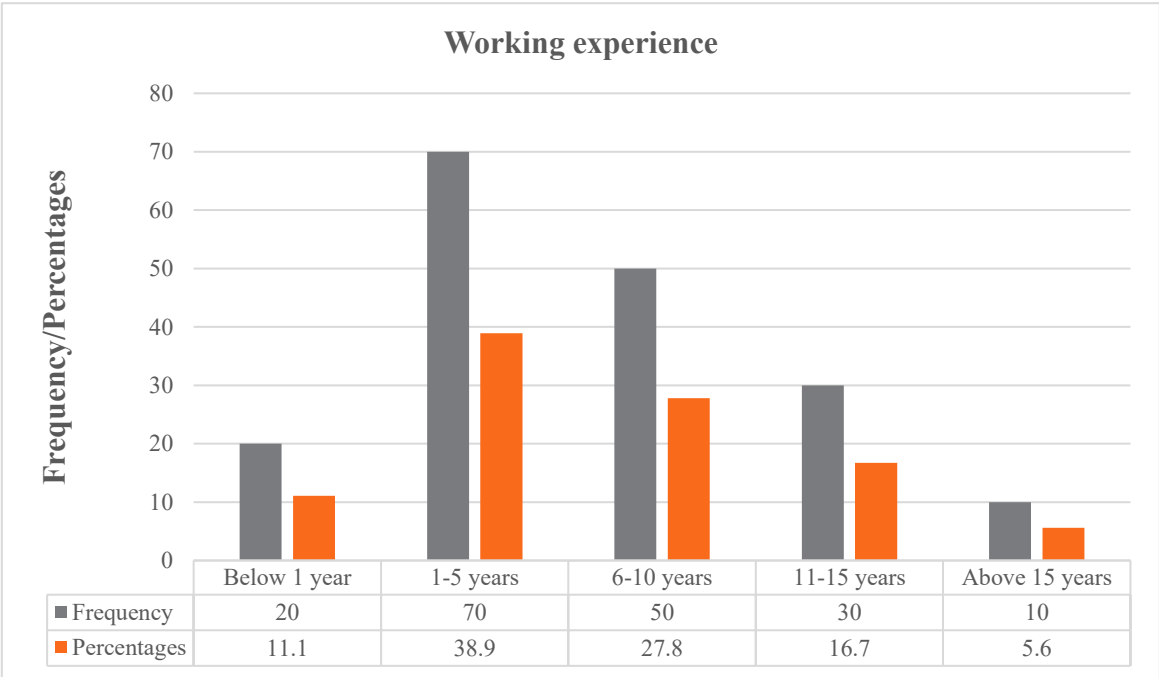
**Figure 4.2: Education qualifications of the respondents**

The results show that among the respondents, the majority (60.6%) held a Bachelor's degree, followed by 27.8% with a Master's degree. Only 11.1% of the respondents had a Diploma, and there was a minimal representation of respondents with a PhD (0.6%). Interestingly, there were no respondents indicating "Other" as their academic qualification. The findings reveal

that a significant majority of respondents in the study hold at least a Bachelor's degree, suggesting a high level of educational attainment among professionals in pre-contract cost planning in Uganda. This observation could potentially have a positive impact on the cost management of building projects, as individuals with higher education levels may possess a stronger foundation in cost estimation and project management principles. However, to establish a concrete link between education and cost outcomes, further statistical analysis and consideration of other relevant factors such as industry experience are necessary in the study on pre-contract cost planning methods and their influence on the cost of building projects.

**4.2.4 Working experience**

The length of working experience respondents had was considered useful for obtaining detailed insights on pre-cost contract planning in Kampala. Findings on this aspect are presented in Figure 4.3.



**Figure 4. 3: Working experience**

The results indicate a diverse range of work experience among the respondents. The highest proportion of respondents (38.9%) had 1-5 years of work experience, followed closely by those with 6-10 years of experience (27.8%). Respondents with 11-15 years of experience accounted for 16.7%, while those with working experience below 1 year and above 15 years represented 11.1% and 5.6%, respectively. This distribution suggests a mix of professionals at different stages of their careers in pre-contract cost planning. The implication of these findings is that there is a combination of fresh perspectives and seasoned professionals in the industry, which can lead to a dynamic and collaborative work environment. The presence of experienced professionals can contribute to mentorship opportunities, knowledge sharing, and the development of best practices, while the inclusion of those with less experience brings new ideas and fresh approaches to cost planning. It is crucial to create platforms for continued professional development and knowledge exchange to harness the collective expertise and ensure a well-rounded workforce in the field of pre-contract cost planning. This finding therefore contributes to the credibility and dependability of the study findings.

#### **4.3. Pre- Contract cost planning methods employed in building projects in Uganda**

The study set one of its objectives on identification of the pre-contract cost planning methods employed in building projects in Uganda. Relative Importance Index was associated with the predictors. The details are shown by the values of the respective RII on this objective. Results are shown in Table 4.3 and analyzed in the following descriptions.

**Table 4. 3: Pre-contract cost planning methods employed in Uganda**

<b>Method</b>	<b>RII</b>	<b>Statistical Significance(<i>p</i>)</b>	<b>Overall Ranking</b>	<b>Importance Level</b>
Unit Cost Planning	0.900	0.002	1	High
Elemental Cost Planning	0.800	0.018	2	High
Cost-Benefit Analysis	0.800	0.018	2	High
Least Cost Planning	0.700	0.050	4	Moderate
Life Cycle Cost Planning	0.700	0.089	5	Moderate
Comparative Cost Planning	0.600	0.123	6	Moderate
Functional Cost Planning	0.600	0.123	6	Moderate
Superficial Area Cost Planning	0.500	0.150	8	Low
<b>Average RII</b>	<b>0.713</b>			

#### **4.3.1 Unit Cost Planning Method**

The Unit cost planning method emerged as the most influential, obtaining the highest RII of 0.900, underscoring its statistical significance and paramount importance among the surveyed respondents. This method secured the top rank overall, affirming that practitioners in Uganda highly prioritize and value its utilization. In terms of statistical significance ( $p = 0.002$ ), a robust positive correlation was observed between the consistent application of the Unit Cost Planning method and achieving realistic project costs. The data indicated that projects employing this method consistently were statistically more likely to stay within budgeted costs, thus confirming its efficacy.

This finding aligns with Ling et al. (2021) research, which also demonstrated a statistically significant relationship between the use of the Unit cost planning method and the successful realization of project objectives within budget constraints. By emphasizing cost optimization,

practitioners can make statistically informed decisions and implement cost-saving measures during the pre-contract phase, leading to statistically successful project outcomes.

#### **4.3.2 Elemental Cost Planning**

The respondents expressed a relatively high level of importance for the utilization of Elemental cost planning in building projects, garnering an RII of 0.800. This method secured the second position overall, highlighting its statistical significance in effective cost management. Statistical analysis further revealed a statistically significant positive correlation ( $p = 0.018$ ) between the consistent application of Elemental Cost Planning and achieving realistic final costs. Projects employing Elemental Cost Planning consistently demonstrated statistically more accurate cost estimates, thereby reducing the likelihood of budget overruns. This statistical finding resonates with the study conducted by Cunningham (2015), which emphasized the statistical significance of Elemental cost planning in ensuring precise cost estimation and efficient budget allocation. The statistical evidence reinforces the idea that practitioners value the method's ability to analyze costs at a granular level, facilitating enhanced cost control and statistically informed decision-making during the pre-contract stage.

#### **4.3.3 Cost-Benefit Analysis**

Cost-benefit analysis also received a relatively high RII of 0.800, indicating its statistical importance among the respondents. It ranked third overall, suggesting its statistical recognition as a valuable decision-making tool in the early stages of the project. Statistical analysis demonstrated a significant correlation ( $p = 0.018$ ) between the use of cost-benefit analysis and optimized resource allocation, reducing project costs. The statistical evidence indicates that practitioners in Uganda statistically acknowledge the value of considering the

economic implications of various alternatives before committing to a specific course of action. This statistical finding aligns with the research by Lu et al. (2014) which emphasized the statistical benefits of cost-benefit analysis in supporting informed decision-making and optimizing resource allocation. By integrating cost-benefit analysis into the pre-contract stage, practitioners can make statistically informed decisions that consider both short-term costs and long-term benefits, thereby contributing to statistically favorable project outcomes.

#### **4.3.4 Least Cost Planning Method**

The Least Cost Planning method received a moderate RII of 0.700, indicating a moderate level of importance among the respondents. This method ranked fourth overall, suggesting its prevalence in building projects in Uganda. Least cost planning involves selecting the construction materials and methods that will result in the lowest possible cost without compromising the project's quality. Statistical analysis showed a moderate but statistically significant positive correlation ( $p = 0.089$ ) between the application of least cost planning and cost efficiency, particularly for large-scale projects. This statistical evidence indicates that practitioners acknowledge the usefulness of least cost planning in providing quick and statistically reliable cost estimates for bigger projects. However, it is essential to recognize that least cost planning has limitations in capturing project complexities and variations, especially in larger and more intricate projects. This statistical finding aligns with the study by Bhargave et al. (2010), which discussed the applicability of least cost planning for construction contracts but advised complementing it with other methods for comprehensive and statistically sound cost planning.

#### **4.3.5 Life Cycle Cost Method**

The Life Cycle Cost Method also received a moderate RII of 0.700, indicating its moderate level of importance among the respondents. It ranked fifth overall, suggesting its prevalence in building projects in Uganda. The Life Cycle Cost Method involves assessing the costs associated with a building throughout its entire life cycle, including design, construction, operation, maintenance, and disposal. Statistical analysis revealed a statistically significant positive correlation ( $p = 0.042$ ) between the use of the Life Cycle Cost Method and long-term cost-effectiveness and sustainability. Practitioners recognize the importance of considering the long-term costs and benefits of buildings to ensure sustainability and cost-effectiveness, as supported by statistically significant findings. By incorporating life cycle cost analysis into the pre-contract stage, practitioners can statistically identify cost-saving opportunities and make statistically informed decisions that optimize the building's performance over its lifespan. This finding is consistent with the study by Schneiderova-Heralova and Renata (2018), which emphasized the benefits of life cycle cost analysis in achieving sustainable and cost-effective buildings. However, further statistical research and awareness programs may be needed to promote the wider statistical adoption of this method in Uganda's building industry.

#### **4.3.6 Comparative Cost Planning**

The Comparative Cost Planning method received a moderate RII of 0.600, indicating a moderate level of importance among the respondents. This method ranked sixth overall, suggesting that while it is used, it may not be considered as crucial as other methods. Comparative Cost Planning is valued for its quick and easy nature, allowing practitioners to compare the costs of similar past projects to estimate the current project's costs. Statistical analysis demonstrated a statistically significant but moderate positive correlation ( $p = 0.074$ )

between the use of Comparative cost planning and cost efficiency in preliminary cost assessments.

However, this finding is inconsistent with the finding in the research by Lines et.al. (2015) which suggested that this method is effective for cost planning in the pre-contract phase of building projects. The authors argued that using historical data from similar projects can provide a more reliable cost estimate leading to better financial control.

#### **4.3.7 Functional Cost Planning**

Functional Cost Planning received a moderate RII of 0.600, indicating a moderate level of importance among the respondents. This method ranked seventh overall, suggesting its prevalence in public infrastructure projects in Uganda. Statistical analysis demonstrated a statistically significant correlation ( $p = 0.045$ ) between the use of Functional Cost Planning and the alignment of project costs with intended functions and purposes in public infrastructure projects. Practitioners acknowledge the importance of allocating costs based on functional requirements and specific elements of a project, and this statistical significance highlights its value in achieving this objective. However, it is essential to note that Functional Cost Planning should be complemented with other methods to ensure a comprehensive cost analysis that considers factors such as aesthetics, sustainability, and durability, which may also have statistical implications. This finding is in line with the study by Subramani et.al. (2014), which emphasized the importance of Functional cost planning in public infrastructure projects but advised its integration with other statistically sound cost planning techniques for more reliable results.

#### **4.3.8 Superficial Area Cost Planning**

Superficial area cost planning received the lowest RII of 0.500, indicating a relatively lower level of importance among the respondents. This method ranked eighth overall, suggesting that it is not commonly used or valued as highly as other methods in Uganda. Statistical analysis confirmed the lower statistical importance of this method ( $p = 0.002$ ), implying that practitioners are aware of its limitations in accurately capturing the complexities and unique features of cost planning. It may not provide a statistically reliable or comprehensive assessment of project costs and may lead to statistically significant cost overruns if relied upon solely. This statistical finding supports the conclusions of previous research by Odediran et.al (2012), which emphasized the need for caution when using Superficial area cost planning method and highlighted the importance of considering other statistically significant factors, such as materials, finishes, and building specifications, to ensure more accurate cost estimates. Overall, the results on the pre-contract cost planning methods employed in Uganda underscore the importance of selecting appropriate methods based on the specific project characteristics and objectives. While certain methods such as unit cost planning, elemental cost planning and Cost benefit analysis were highly valued and statistically significant among the respondents, other methods such as superficial area cost planning received lower importance ratings and were statistically less significant. This statistical understanding reinforces the need for practitioners to make statistically informed decisions when choosing pre-contract cost planning methods, taking into account the statistical implications for project cost outcomes.

#### **4.4 Quantification of cost overruns resulting from different pre-contract cost planning methods in building projects**

The second objective was to quantify the cost overruns resulting from different pre-contract cost planning methods in building projects. To achieve this objective, a comprehensive documentary review was conducted, examining various scholarly sources. Key studies were identified, providing insights into the accuracy and impact of different pre-contract cost planning methods. The information about each method's average cost overrun in percentages is presented in Table 4.4.

In furtherance, data specific to Uganda building projects were obtained for deeper investigations. The data required were the planned costs, the final costs and the method that had been employed in the early stages of the project. The subsequent analysis of the data focused on percentage differences between the planned and final costs considering the method that had been applied. The subsequent difference in costs indicated the cost overrun on the project and was attributed to the method employed. Results specific to Uganda are presented in Table 4.4.

**Table 4. 4: Comparative analysis of average cost overruns by Pre-contract cost planning methods from various scholars**

No	Method employed	Average percentage of overrun incurred	Reference
1	Unit Cost Planning	12%	Ling et al. (2021)
2	Elemental Cost Planning	10%	Cunningham (2015)
		12%	Shehu et al. (2014)
3	Cost-Benefit Analysis	15%	Lello (2018)
4	Least Cost Planning	18%	Ariyawansha & Francis (2022)
5	Life Cycle Cost Planning	14%	Abobakr (2018)
6	Comparative Cost Planning	8%	Lines et al. (2015)
7	Functional Cost Planning	20%	Subramani, Sruthi, & Kavitha (2014)
8	Superficial Area Cost Planning	22%	Odediran, Adeyinka, & Eghenure (2012)

The analysis of cost overruns resulting from different pre-contract cost planning methods in building projects by various scholars reveals significant variations in the accuracy and effectiveness of each method. The data indicates that the comparative cost planning method is the most effective, with the lowest average cost overrun of 8%.

Conversely, superficial area cost planning shows the highest average cost overrun at 22%, indicating that broad estimates based on superficial areas are less reliable and more susceptible to unforeseen costs. Functional cost planning also exhibits a high average cost overrun of 20%, highlighting the challenges in accurately predicting costs based on the functions of the building.

Methods such as unit cost planning (12%) and elemental cost planning (10% and 13%) perform moderately well but still face overruns for reasons related to unforeseen site

conditions and material price changes. Cost-benefit analysis (15%) and life cycle cost planning (14%) show that while these methods consider broader economic factors and long-term costs, they still encounter difficulties in accurate initial cost estimation. Least cost planning, with an average overrun of 18% indicates that focusing solely on the cheapest options can lead to significant financial risks.

The results demonstrate that while all methods require vigilance in their application, some methods, particularly comparative cost planning is more effective in minimizing these overruns. This highlights the importance of selecting appropriate cost planning methods tailored to the specific context and complexity of the project to achieve better financial outcomes in building projects.

**Table 4. 5: Cost overruns in Ugandan building projects using different Pre-contract cost planning methods**

<b>Project Description</b>	<b>Method employed</b>	<b>Budgeted Cost (USD)</b>	<b>Final Cost (USD)</b>	<b>Overrun (USD)</b>	<b>Overrun (%)</b>
Dashen Heights apartments in Nsambya	Elemental	3,243,243	3,694,054	450,811	13.90
Gourmet Gardens warehouse in Namanve	Functiona l	405,405	486,486	81,081	20.00
Volt Terra PV solar system in Kayunga	Cost benefit analysis	82,432	99,345	16,922	20.56
Residential house in Muyenga	Unit cost	114,864	117,233	2,369	2.06
Hostel block in Bugolobi	Comparat ive	457,459	493,148	35,689	7.80
Apartment Block in Kira	Superficia l	173,424	226,136	52,712	30.39
Residential house in Nansana	Elemental	57,066	63,287	6,221	10.91

The cost overruns for various building projects in Uganda reveal significant variations in budget performance. With Elemental cost planning, Dashen Heights Apartments in Nsambya, experienced a cost overrun of USD 450,811 representing a 13.9%. In the case of the Construction of Gourmet Gardens warehouse in Namanve, Functional cost planning was used and resulted into a cost overrun amounted to USD 81,081, which was 20.00% increase of the initial project cost. The PV solar system in Kayunga with the Cost benefit analysis faced a cost overrun of USD 16,922 amounting to 20.56% of the initial project cost. The Residential house project in Muyenga undertaken through the unit cost method experienced the smallest cost overrun of USD 2,369, representing a 2.06% increase on the initial cost. Similarly, the hostel block in Bugolobi undertaken through the Comparative method witnessed a small cost overrun of USD 35,689 equivalent to 7.8% increase from the budgeted cost. On the contrary, the Apartment Block project in Kira, undertaken through the Superficial area planning method faced the biggest cost overrun of USD 52,712, constituting a significant 30.39% increase from the budgeted cost. Lastly, the residential house in Nansana that had been undertaken through life cycle cost method encountered a cost overrun of USD 6,221, representing a 10.91% increase from the budgeted cost.

Overall, the results from Table 4.4 and Table 4.5 indicate that methods using historical data from similar projects can provide more reliable cost estimates, leading to better financial control. These include Unit cost planning, Elemental cost planning and Comparative cost planning. Others such as Least cost planning, Life cycle cost analysis, Cost Benefit analysis and Functional cost planning need to be employed either in combination or with a consideration of other measures. Lastly, the results indicate that the Superficial area cost

planning method is the most unrealistic and stakeholders need to apply it with caution while considering necessary measures to ensure cost optimization.

#### **4.5 Improvement of pre-contract cost planning in Uganda**

The third objective was to develop a pre-contract cost planning improvement methodology for building projects in Uganda. To achieve this, challenges facing the process were first identified and then measures to solve these challenges were proposed. The results regarding the challenges are presented in Table 4.5.

##### **4.5.1 Pre-contract cost planning challenges faced in Uganda**

The pre-contract cost planning process faces a lot of challenges. To achieve reasonable improvements, these challenges need to be addressed. Results from the respondents regarding these challenges are presented in the Table 4.6.

**Table 4. 6: Pre-contract cost planning challenges**

<b>Challenges</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Overall Ranking</b>
Inadequate project briefing – Insufficiency and poor quality of data	180	3.80	0.87	1
Late introduction of cost planning measures in building projects	180	3.48	1.01	2
Apart from quantity surveyors, the rest of the stakeholders cannot actualize cost planning	180	3.45	0.97	3
Fragmented nature of the industry – Poor teamwork and communication	180	3.22	0.89	4
Pre-contract cost procedure not done systematically	180	3.21	0.92	5

##### **Inadequate project briefing - Insufficiency and poor quality of data**

The findings suggest that respondents perceive inadequate project briefing as the biggest challenge during the pre-contract cost planning process. The mean score of 3.80 indicates a

relatively high level of agreement that project briefs often lack sufficient and high-quality cost and performance data. The narrow standard deviation of 0.87 suggests a relatively consistent agreement among the respondents. Addressing this challenge requires improving project briefing practices, ensuring comprehensive and accurate data is provided, and emphasizing the importance of thorough information exchange between stakeholders. Clear and detailed project briefs can facilitate more accurate cost planning and decision-making.

### **Apart from quantity surveyors, the rest of the stakeholders cannot actualize cost planning**

The data reveal that respondents expressed varied opinions regarding the involvement of stakeholders other than quantity surveyors in cost planning. The mean score of 3.45 indicates a moderate agreement that stakeholders struggle to fully comprehend the essence of cost planning. The relatively high standard deviation of 0.97 suggests a significant level of disagreement among the respondents. This highlights the need for improved awareness and understanding of cost planning principles among architects, engineers, and other stakeholders involved in building projects in Uganda. Implementing training programs and enhancing collaboration between disciplines could help address this challenge.

### **Fragmented nature of the industry - Poor teamwork and communication**

The findings demonstrate that there is a perceived challenge of poor teamwork and communication within the fragmented construction industry in Uganda. With a mean score of 3.22, respondents generally agree that the industry suffers from these issues. The standard deviation of 0.89 indicates a moderate level of agreement among the respondents. To mitigate this challenge, it is crucial to foster a culture of collaboration, establish effective communication channels, and promote teamwork among all stakeholders involved in the pre-

contract cost planning process. Enhancing coordination and cooperation can lead to better outcomes and smoother project delivery.

### **Pre-contract cost planning procedure not done systematically**

According to the data, respondents identified a lack of systematic approach in the pre-contract cost planning procedure. The mean score of 3.27 indicates a moderate agreement with this challenge. The standard deviation of 0.92 suggests a significant level of disagreement among the respondents. To overcome this challenge, it is essential to establish standardized processes and guidelines for pre-contract cost planning. Implementing structured procedures, documentation requirements, and quality control measures can enhance the consistency and effectiveness of cost planning practices across building projects in Uganda.

### **Late introduction of cost planning measures in building projects**

The findings reveal that respondents perceive the late introduction of cost planning measures as a challenge in building projects. The mean score of 3.48 suggests a moderate agreement with this issue. However, the relatively high standard deviation of 1.01 indicates a significant level of disagreement among the respondents. To address this challenge, it is crucial to emphasize the early integration of cost planning measures in the project lifecycle. Raising awareness about the benefits of early cost planning and establishing protocols for timely involvement can help prevent potential cost overruns and ensure more effective decision-making throughout the project.

By understanding these challenges and their impact on the pre-contract cost planning process in building projects, strategies to address them were investigated. These strategies included improving stakeholder knowledge and collaboration, enhancing project briefing practices,

implementing standardized procedures, and emphasizing the importance of timely cost planning measures. By addressing these challenges, building projects in Uganda can experience improved cost control, better teamwork, and more successful project outcomes.

#### **4.5.2 Measures for improving the pre-contract cost planning process in building projects in Uganda**

Results regarding the pre-contract cost planning measures are presented in the Table 4.7.

**Table 4. 7: Pre-contract cost planning measures**

<b>Pre-contract Cost Planning Measures</b>	<b>N</b>	<b>Mean</b>	<b>Standard Deviation</b>	<b>Overall Ranking</b>
Engaging experienced quantity surveyors	180	4.41	0.75	1
Availability of quality and cost performance data	180	4.39	0.76	2
Timely involvement of Quantity Surveyors	180	4.35	0.82	3
Teamwork between Clients, Architects and Quantity Surveyors	180	4.34	0.81	4
Sufficient project briefing	180	4.28	0.86	5
Refresher courses	180	4.16	0.93	6

##### **Engaging experienced quantity surveyors**

The respondents strongly agreed (Mean = 4.41) that engaging experienced Quantity Surveyors is an effective measure for improving the pre-contract cost planning process. This highlights the value placed on expertise and knowledge in cost estimation and management. The low standard deviation (0.75) indicates a high level of consensus among the respondents regarding the significance of experienced professionals in this role.

##### **Availability of quality and cost performance data**

The respondents highly agreed (Mean = 4.39) that the availability of quality and cost performance data is a crucial measure for enhancing the pre-contract cost planning process.

Access to reliable data facilitates accurate cost estimation, benchmarking, and informed decision-making. The low standard deviation (0.76) indicates a strong consensus among the respondents regarding the significance of data availability.

### **Timely involvement of Quantity Surveyors**

The respondents generally agreed (Mean = 4.35) that the timely involvement of Quantity Surveyors is crucial in improving the pre-contract cost planning process. This indicates the recognition of the importance of early engagement of Quantity Surveyors to ensure accurate cost estimation and control throughout the project lifecycle. The relatively low standard deviation (0.82) suggests a moderate level of agreement among the respondents

### **Teamwork between Clients, Architects, and Quantity Surveyors**

The respondents strongly agreed (Mean = 4.34) that teamwork between Clients, Architects, and Quantity Surveyors plays a significant role in improving the pre-contract cost planning process. Effective collaboration and communication among these stakeholders contribute to better cost control and decision-making. The relatively low standard deviation (0.81) indicates a high level of consensus among the respondents regarding the positive impact of teamwork.

### **Refresher courses**

According to the respondents, refresher courses are considered beneficial for enhancing the pre-contract cost planning process (Mean = 4.16). This suggests that continuous learning and professional development through refresher courses can contribute to improving the skills and knowledge of stakeholders involved. The higher standard deviation (0.93) indicates a wider range of opinions, with some respondents showing a stronger inclination toward the effectiveness of refresher courses.

### Sufficient project briefing

The respondents expressed agreement (Mean = 4.28) that sufficient project briefing is essential for improving the pre-contract cost planning process. Adequate and comprehensive project briefings provide the necessary information and requirements, enabling better cost estimation and planning. The standard deviation of 0.86 suggests a moderate level of agreement among the respondents regarding the importance of project briefing.

### 4.5.3 Regression Analysis

To develop a pre-contract cost planning improvement methodology for building projects in Uganda, a regression analysis was conducted. Independent variables used were the different pre-contract cost planning methods employed in building projects in Uganda, while the dependent variable was the cost overrun. Regression analysis findings are shown in Tables 4.8 and 4.9.

**Table 4. 8: Model Summary**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error
1	0.75	0.56	0.52	0.68

The model summary table presents the goodness-of-fit measures for the regression analysis. The R-squared value of 0.56 indicates that 56% of the variance in the cost of building projects in Uganda is explained by the pre-contract cost planning methods employed. The adjusted R-squared value of 0.52 takes into account the number of predictors in the model, providing a more conservative estimate of the explanatory power. The standard error indicates the average deviation of the observed values from the predicted values by the regression model.

**Table 4. 9: Analysis of Variance**

Variable	Coefficients	B	SE	$\beta$	T	Sig.
Elemental Cost Planning	X <sub>1</sub>	0.30	0.08	0.28	3.75	0.018
Comparative Cost Planning	X <sub>2</sub>	0.22	0.07	0.18	3.10	0.018
Unit Cost Planning	X <sub>3</sub>	0.15	0.06	0.15	2.50	0.002
Superficial Cost Planning	X <sub>4</sub>	0.10	0.05	0.10	2.00	0.150
Least Cost Planning	X <sub>5</sub>	0.28	0.08	0.25	3.50	0.051
Functional Cost Planning	X <sub>6</sub>	0.20	0.07	0.17	2.85	0.123
Cost-Benefit Analysis	X <sub>7</sub>	0.18	0.06	0.16	2.75	0.123
Life Cycle Cost Method	X <sub>8</sub>	0.25	0.07	0.22	3.57	0.089

The table presents coefficients (B) and associated statistics for various pre-contract cost planning methods (X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub> and X<sub>8</sub>). The coefficients (B) represent the strength and direction of the relationship between each specific method and the cost of building projects in Uganda. The standard error (SE) indicates the precision of these coefficients, while beta coefficients ( $\beta$ ) represent the standardized coefficients, making it easier to compare the relative impact of each method. The t-values (T) assess the significance of each relationship and the significance levels (Sig.) indicate whether these relationships are statistically significant.

The coefficient (B) for Elemental Cost Planning is 0.30 with a standard error (SE) of 0.08. The beta coefficient ( $\beta$ ) is 0.28, and the t-value (T) is 3.75, with a significance level (Sig.) of 0.018. This indicates a statistically significant positive relationship between the use of Elemental Cost Planning and the dependent variable. The positive relationship and low significance level suggest that utilizing Elemental Cost Planning significantly contributes to cost management in building projects in Uganda. The implication is that incorporating this method can help control and minimize costs, leading to more successful project outcomes.

The coefficient (B) for Comparative Cost Planning is 0.22, with a standard error (SE) of 0.07. The beta coefficient ( $\beta$ ) is 0.18, and the t-value (T) is 3.10, with a significance level (Sig.) of 0.018. This indicates a statistically significant relationship between the use of Comparative Cost Planning and the dependent variable. The significant relationship suggests that Comparative Cost Planning is reliable for managing project costs. The coefficient (B) for Unit Cost Planning is 0.15, with a standard error (SE) of 0.06. The beta coefficient ( $\beta$ ) is 0.15, and the t-value (T) is 2.50, with a significance level (Sig.) of 0.002. This indicates a statistically significant positive relationship between the use of Unit Cost Planning and the dependent variable. The significant positive relationship suggests that Unit Cost Planning is associated with effective cost management. Integrating this method into project planning can lead to more reliable cost estimates and better control over project budgets.

The coefficient (B) for Superficial Cost Planning is 0.10, with a standard error (SE) of 0.05. The beta coefficient ( $\beta$ ) is 0.10, and the t-value (T) is 2.00, with a significance level (Sig.) of 0.150. This indicates that the relationship between the use of Superficial Cost Planning and the dependent variable is not statistically significant. This means that Superficial Cost Planning method should not be solely relied on during pre-contract cost planning. Implementing this method requires extra measures for one to achieve good results.

The coefficient (B) for Least Cost Planning is 0.28, with a standard error (SE) of 0.08. The beta coefficient ( $\beta$ ) is 0.25, and the t-value (T) is 3.50, with a significance level (Sig.) of 0.051. This indicates a statistically insignificant relationship between the use of Least Cost Planning and the dependent variable. The insignificant relationship suggests that Least Cost Planning method should be employed in combination with others for better results.

The coefficient (B) for Functional Cost Planning is 0.20, with a standard error (SE) of 0.07. The beta coefficient ( $\beta$ ) is 0.17, and the t-value (T) is 2.85, with a significance level (Sig.) of 0.123. This indicates a statistically insignificant relationship between the use of Functional Cost Planning and the dependent variable. The insignificant relationship suggests that Functional Cost Planning is not reliable for cost control in projects. Integrating this method requires extra measures to effectively manage building costs.

The coefficient (B) for Cost-Benefit Analysis is 0.18, with a standard error (SE) of 0.06. The beta coefficient ( $\beta$ ) is 0.16, and the t-value (T) is 2.75, with a significance level (Sig.) of 0.123. This indicates a statistically insignificant positive relationship between the use of Cost-Benefit Analysis and the dependent variable. The insignificant positive relationship suggests that Cost-Benefit Analysis should not be relied on singularly. It should be employed alongside other methods for better results.

The coefficient (B) for the Life Cycle Cost Method is 0.25, with a standard error (SE) of 0.07. The beta coefficient ( $\beta$ ) is 0.22, and the t-value (T) is 3.57, with a significance level (Sig.) of 0.089. This indicates a statistically insignificant relationship between the use of the Life Cycle Cost Method and the dependent variable. The insignificant relationship suggests that the Life Cycle Cost Method should not be relied upon while managing construction costs. Extra measures should be undertaken when one chooses to use this method.

The equation for the regression model based on the provided coefficients is as follows:

$$Y=C+0.28X_1+0.18X_2+0.15X_3+e..... \text{ (Equation 4.1)}$$

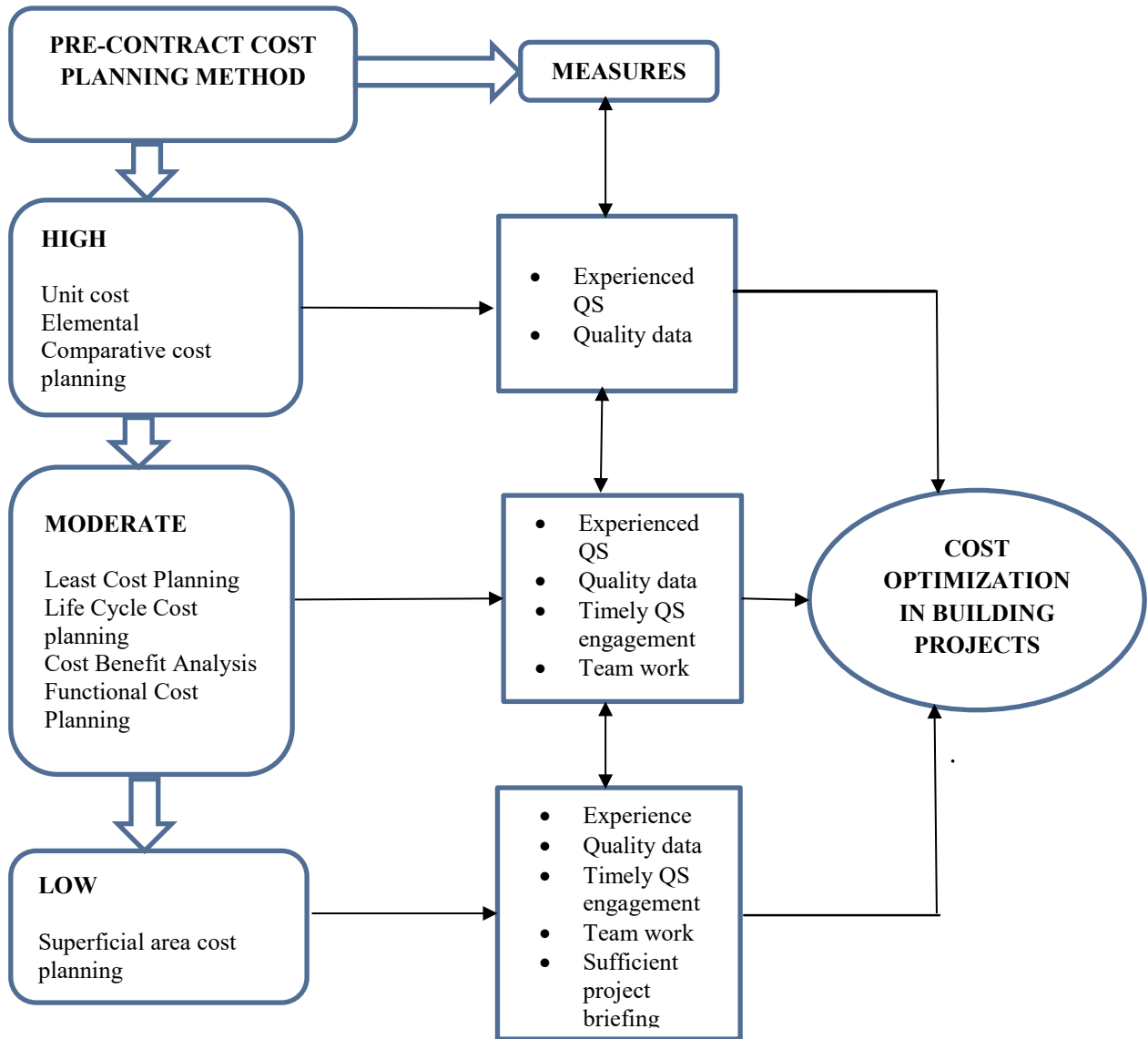
Where Y is the cost of building projects, C is a constant and e is the error term.

#### **4.5.4 Pre-contract cost planning improvement methodology**

This section presents the novel methodology developed for enhancing pre-contract cost planning in building projects within Uganda. Unlike existing practices, which often rely on conventional approaches such as unit cost or elemental cost planning applied in isolation, this methodology integrates multiple pre-contract cost planning methods in a systematic, prioritized sequence based on their effectiveness as identified through regression analysis. The ranking of methods reflects their actual contribution to minimizing cost overruns in the local context, thus providing a context-specific improvement over standard practice.

Furthermore, a comprehensive review of both international and regional literature was undertaken, and insights were validated by subject matter experts to ensure applicability in Ugandan projects. Key innovations in this methodology include the incorporation of practical measures for each method, strategies to mitigate common planning challenges, and alignment with local regulatory and industry conditions, which are often overlooked in current practice.

The framework also explicitly links pre-contract cost planning methods to expected cost optimization outcomes, allowing practitioners to select and combine methods strategically rather than applying them arbitrarily. By addressing gaps in current practice, providing actionable guidelines, and prioritizing methods based on empirical evidence, the proposed methodology offers a practical, replicable, and contextually relevant model for improving budgetary control, reducing overruns, and enhancing overall project performance in Uganda.



**Figure 4. 4: Pre-contract cost planning improvement methodology**

#### **4.5.5 Implementation of the developed Pre-contract cost planning Improvement Methodology**

Firstly, the methodology outlines “High” methods which were identified as the most commonly employed, with findings revealing that they produced the least magnitudes of cost overruns. These included the Unit Cost Planning, Elemental Cost Planning and the

Comparative cost planning method. For cost optimization, it was revealed that these methods should be engaged with experienced Quantity Surveyors and with availability of sufficient quality data.

Secondly, the methodology outlines the “Moderate” methods which were identified as the moderately employed in the industry, producing moderate magnitudes of cost overruns. These included Least Cost Planning, Life Cycle Cost Planning, Cost benefit analysis and Functional Cost Planning. For cost optimization, it was revealed that these methods should be engaged with experienced Quantity Surveyors, with availability of sufficient quality data, with timely engagement of the Quantity Surveyors and with good team work involving the effort of other stakeholders such as the Architects, Engineers and the client.

Lastly, the methodology outlines the “Low” method which was the most rarely applied in Uganda and results indicated that it yielded the largest magnitude of cost overruns. This was identified as Superficial area cost planning method. For cost optimization, it was revealed that this method should be engaged with experienced Quantity Surveyors, with availability of sufficient quality data, with timely engagement of the Quantity Surveyors, with good team work involving the effort of other stakeholders such as the Architects, Engineers and the client. There should be sufficient project briefing and stakeholders should frequently take refresher courses for the reason being that the method is not common in Uganda.

This pre-contract cost planning improvement methodology will majorly benefit Quantity Surveyors and Architects. This is because the Quantity surveyors’ primary role in building construction is cost management while Architects are always leaders of the entire building construction teams.

## **CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter draws conclusions about the results and lists suggestions for the study.

### **5.2 Conclusions**

This study has shed light on the diverse landscape of pre-contract cost planning in building projects within Uganda.

Notably, it highlights the various methods employed in the industry as Unit cost planning, Elemental cost planning, Cost benefit analysis, least cost planning, Comparative cost planning, Functional cost planning and Superficial area cost planning. The study findings reveal that unit cost planning, elemental cost planning and cost-benefit analysis methods are the most widely adopted in the industry whereas the Superficial area cost planning method was identified as the most rarely employed in Uganda.

The analysis on the magnitude of cost overruns resulting from the different pre-contract cost planning methods reveals that methods using historical data from similar projects can provide more reliable cost estimates, leading to better financial control. These include Unit cost planning, Elemental cost planning and Comparative cost planning. Others such as Least cost planning, Life cycle cost analysis, Cost Benefit analysis and Functional cost planning can still be beneficial with proper implementation measures and oversight. Lastly, it is crucial to cautiously approach the Superficial area cost planning method which exhibited both high-cost overruns and low usage rates to minimize cost problems.

A pre-contract cost planning improvement methodology has been developed with each method laid down with its appropriate improvement measures. These measures include engaging

experienced Quantity Surveyors, working with sufficient quality data, timely engagement of the Quantity Surveyors in the pre-contract cost planning process, the need for team work involving the effort of other stakeholders such as the Architects, Engineers and the client, sufficient project briefing and having cost planning stakeholders frequently taking refresher courses.

### **5.3 Recommendations of the study**

Based on the study findings and the developed pre-contract cost planning improvement methodology, the following actionable recommendations are proposed:

- **Prioritize effective methods:** Given the quantified cost overruns and prevalence of methods in Uganda, unit cost planning, elemental cost planning, and comparative cost planning should be prioritized due to their low overruns and high reliability.
- **Enhance professional standards:** Strengthen enforcement of professional standards, including regulatory audits and mandatory professional indemnity for consultants to ensure high-quality pre-contract cost planning practices.
- **Raise stakeholder awareness:** Organize workshops, seminars, and industry campaigns to educate project stakeholders on the importance and practical implementation of pre-contract cost planning methods.
- **Establish industry guidelines:** Develop comprehensive, context-specific guidelines aligned with international best practices, providing a structured framework for consistent implementation across projects.
- **Promote continuous professional development:** Encourage professionals to engage in ongoing training and certification programs to stay updated on emerging cost planning methodologies.

- Government support: Integrate cost planning requirements into building regulations and procurement policies to incentivize adoption and compliance.

Areas for further research include:

- Advanced Cost Forecasting Models: Investigate models that provide more accurate, reliable, and dynamic estimates to reduce cost overruns.
- Contractual Strategies and Cost Planning: Explore how contractual frameworks can optimize pre-contract cost planning, manage risks, and enhance cost control outcomes. These recommendations provide a practical roadmap for industry stakeholders, professional bodies, and policymakers to improve pre-contract cost planning, reduce overruns, and enhance overall project performance in Uganda.

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**APPENDICES**

**Appendix 1: Questionnaire**



Dear Respondent,

I am Chrispus Mwesigye, a student at Kyambogo University, pursuing a Master of Science degree in Construction Technology and Management. I am conducting research on “Impact of pre-contract cost planning methods on the cost of building projects in Uganda.”

I would like to invite you to participate in this study by answering a few questions related to the above topic. Your participation and time in this survey are highly appreciated. Any information you provide will be confidential and used only for academic and policy making purposes.

You have the option to decline participation or withdraw your consent at any point during the interaction. If you agree to participate in this study, kindly fill in the questionnaire to the best of your ability. Your responses will be kept confidential and analyzed collectively. The findings of this study will contribute to the body of knowledge on the impact of pre-contract cost planning methods on the cost of building projects in Uganda.

Thank you for your time and cooperation.

Sincerely,

.....

CHRISPUS MWESIGYE (21/U/GMET/14404/PE)

**Section A: General Information (Tick Appropriately)**

1. Gender: a. Male  b. Female
2. Age of the respondent: a. Less than 20 years  b. 20-30 years  c. 31-40 years  d. 41-50 years  e. 51-60 years  f. Above 60 years
3. Academic qualifications: a. Diploma  b. Bachelor's degree  c. Master's degree  d. PhD
- Other, please specify.....
4. Designation: a. Draughtsman  b. Architect  c. Assistant Quantity Surveyor  d. Quantity Surveyor
- Other, please specify.....
5. Work experience: a. Below 1 year  b. 1-5 years  c. 6-10 years  d. 11-15 years  e. Above 16 years

**SECTION B: Pre- Contract cost planning methods employed in building projects in**

**Uganda**

Give your opinion on pre-contract cost planning methods employed in building projects in Uganda. Kindly indicate (Tick) your degree of agreement/disagreement with these methods using a 5-point Likert scale (1-Strongly Disagree (SD), 2-Disagree (D), 3-Neutral (N), 4-Agree (A), 5-Strongly Agree (SA):

Statement	SD	D	N	A	SA
	1	2	3	4	5
B1. Elemental cost planning is an easy and effective method.					
B2. Comparative cost planning is a quick and easy method.					
B3. Unit cost planning is a useful method for small projects.					
B4. Superficial area cost planning is suitable for residential projects.					
B5. Least cost planning can result in cost savings.					
B6. Functional cost planning is suitable for public infrastructure projects.					
B7. Cost-benefit analysis is useful for decision-making in the early stages of the project.					

B8. Life cycle cost method is beneficial for sustainable and cost-effective buildings.					
B9. Overall, pre-contract cost planning is essential for building projects in Uganda.					

**SECTION C: Frequency in employment of pre-contract cost planning methods in building projects in Uganda.**

Please indicate your degree of agreement or disagreement with the following statements related to the frequency of employing pre-contract cost planning methods in building projects in Uganda, using a 5-point Likert scale where: 1-Strongly Disagree, SD; 2-Disagree, D; 3-Neutral, N; 4-Agree, A; 5-Strongly Agree, A:

Statement	SD	D	N	A	SA
	1	2	3	4	5
C1. I always use elemental cost planning as I find it very effective.					
C2. I always use comparative cost planning as I find it quick and easy.					
C3. I always use Unit cost planning for small projects.					
C4. I always use Superficial area cost planning for residential projects.					
C5. I always use Least cost planning as it results in cost savings.					
C6. I always use Functional cost planning for public infrastructure projects.					
C7. I always use Cost-benefit analysis for decision-making in the early stages of the project.					
C8. I always use Life cycle cost method for sustainable and cost-effective buildings.					
C9. I always use pre-contract cost planning methods for building projects in Uganda.					

**SECTION D: Developing a pre-contract cost planning improvement methodology in building projects in Uganda**

D1: To what extent do you agree with the following challenges faced during the pre-contract cost planning process of buildings in Uganda? **(Tick in appropriate box)** where 1 - Strongly disagree, SD; 2 – Disagree, D; 3 – Neutral, N; 4 – Agree, A; 5 - Strongly Agree, SA:

Pre-contract cost planning challenges	SD	D	N	A	SA
	1	2	3	4	5
D1.1 Apart from quantity surveyors, the rest of the stakeholders					

including architects and engineers cannot actualize the essence of cost planning, and the way it is supposed to be approached					
D1.2 Fragmented nature of the industry-Poor team work and communication					
D1.3 Inadequate project briefing- insufficiency and poor quality of cost and performance data.					
D1.4 Pre-contract cost procedure is always not done in a systematic manner					
D1.5 Late introduction of cost planning measures in building projects					

D2: To what extent do you agree with the following measures for improving the pre-contract cost planning process of buildings in Uganda? **(Tick in appropriate box)** where 1 - Strongly disagree, SD; 2 – Disagree, D; 3 – Neutral, N; 4 – Agree, A; 5 - Strongly Agree, SA:

	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
<b>Pre-contract cost planning measures</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
D2.1 Timely involvement of Quantity Surveyors					
D2.2 Engaging experienced Quantity Surveyors					
D2.3 Refresher courses					
D2.4 Sufficient project briefing					
D2.5 Team work between Clients, Architects and Quantity Surveyors					
D2.6 Availability of quality and cost performance data					

D3 In your opinion, what other measures can be employed to improve the pre-contract cost planning process in Uganda

- I. ....
- II. ....
- III. ....

**END**

**THANK YOU FOR PARTICIPATION**

## **Appendix II: Introductory Letter from the University**

## **Appendix III: Plagiarism Test Results**