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Analysing Effectiveness of Project Cost Control Mechanism in Enhancing Project Performance: A Case Study on the Construction of 1st Level Hospitals in Lusaka

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Abstract

The key objective of this study is to analyze cost control mechanisms used in building construction industry. To examine cost-control mechanisms used in construction projects specific objectives were; To establish effectiveness of cost control mechanisms in construction projects; To ascertain relationship between cost control mechanisms and project performance and To analyse constraints in project control mechanisms in construction projects. Using the development of the first level hospitals in Lusaka as a case study, this study examied if the cost control mechanisms utilized by the construction industry will affect the ultimate project delivery of a project. The association between cost management strategies and the completion of building projects will be examined as part of a descriptive research. In order to perform the research, the study intends to combine a qualitative and quantitative methodology. Due to the lack of a widely recognized theory, the function of cost control methods in deciding the project delivery will be closely examined and contested in academic and theoretical contexts. The project anticipates using both primary and secondary sources to collect data. The results in Table 4.2.4 indicate that cost estimation is regarded as highly effective by the majority of respondents involved in the construction of 1st level hospitals in Lusaka. Specifically, 41.7% of the respondents' rate cost estimation as "Very Effective," and 46.1% find it "Effective," totaling 87.8% who view it positively. A smaller portion, 12.3%, considers it "Somewhat Effective," while only 2.2% rate it as "Not Effective." The cumulative percentages reflect a strong consensus on the effectiveness of cost estimation practices, suggesting that these methods are critical in enhancing project performance and ensuring budgetary control. The results in Table 4.2.7 and Figure 4.2.7 indicate that the majority of project deliveries in the construction of 1st level hospitals in Lusaka are timely, with 32.6% of respondents reporting that projects are "Always on Time" and 40.4% stating they are "Mostly on Time." Combined, this accounts for 73.0% of deliveries being punctual. However, 19.1% of respondents indicate that projects are "Sometimes on Time," and 7.9% report that they are "Rarely on Time." The cumulative percentages highlight that while on-time delivery is generally high, there is still a notable proportion of projects experiencing delays, suggesting a need for improved scheduling and time management practices to ensure consistent timely delivery. The study recommends to adopt project cost control techniques as a means of improving project performance. This will help reduce cost overruns, delays and issues of quality of the finished project and result in improved performance. Management teams of other projects such as construction and building, road and development projects are advised to read and gain insights from this study to implement project cost

control techniques. The study also recommends that the project management and teams improve cost estimation measures that are incurred during the different project phases, and effectively budgeting for material needs for the various functional units of the project. The project managers should also set monitoring and evaluation teams to check on the progress of the project and set expenditure controls for improvement in performance of the projects.

Keywords: Cost Control Mechanisms, Project Performance, Monitoring and Evaluation (M&E), Stakeholder Engagement, Budget Adherence, Timeline Management, Sustainable Infrastructure Development

INTRODUCTION

1.1 Background

Project cost management can be defined as application of tools, techniques and knowledge in planning, estimating and controlling project costs as well as analyzing the possible of risks that may potentially lead to cost overruns (Ronald & Agung, 2018). Project costs management is a process essential for project performance within budget. Therefore, project managers must describe the project scope well, estimate project time and costs in a most realistic way. For effective project cost management, project managers must undertake cost management planning, cost estimation, budgeting and cost control. (Dusan & Jugoslav, 2019) Global entities such as the United Nations, the World Bank and the World Trade Organization have progressively recognized the essential for more effective project cost management and control. This offers a promising global setting for the project cost management to advance cognizance amongst these major project donors on the significance and value of engaging expert cost managers rather than have the role carried out by other experts as a subset of their general roles (Smith, 2015) In Ghana, Project cost management has been successfully undertaken across partners due to good schedule that essences on suitable timing and sequence of operations in the work allocations (Pinamang, Gyamfi, Danso, & Kwame, 2018).

Some of the importance of scheduling in project cost management can be said to be timely completion and stakeholder satisfaction while on the other hand, 43% of project delays,44% cost overrun and 50% disruptions of projects, are as a result of poor scheduling. Thus, timely delivery of project objectives is a key factor in avoiding project cost overruns and delays (Pinamang, Gyamfi, Danso, & Kwame, 2018). In Kenya, there are many failed construction projects. In addition, performance measurement systems are not effective or efficient to overcome this problem. Construction projects performance problem appears in many aspects in the Kenya (Weil, 2017). There are many construction projects fail in time, cost and others fail financial performance factors.

1.2 RESEARCH PROBLEM

The construction sector in Zambia is an essential component in the development of a country since it forms part of the key drivers of economic growth and an important pillar in realization of the big four development agenda. Worldwide construction networks are cornerstones of economic, social and political change (KRB, 2017). However, construction projects in Zambia are facing challenges of non-Completion. Many construction projects fail due to factors like time in efficiency, lack of adequate funds and lack of advance working equipment. In recent times, the government has continuously expanded the allocated budgets to its many sectors including construction given the role played by infrastructure in the socio-economic growth of the country. The construction sector may be seen as a dynamic one that is frequently

perplexed and agitated by uncertainties brought on by changes in the weather, the economy, politics, and legislation. This confusing position results in poor cost management, which eventually causes disagreements, cost and schedule overruns a well as occasionally project abandonment. Due to their high cost, financial restrictions frequently have an impact on the successful completion of building projects. Cost overruns in building projects are therefore one of the most significant and difficult problems (Kerzner, 2003). Project management uses a variety of project management instruments and mechanisms to control the increased expenses as a solution. The majority of the literature has been on cost-control strategies to get over budgetary limitations. However, a small number of studies have been done on the impact of cost control methods on the completion of building projects, particularly in the public sector, as in the case of hospital constructions.

1.3 OBJECTIVES OF THE STUDY

1.3.1 General Objective

The key objective of this study is to analyze cost control mechanisms used in building construction industry

1.3.2 Specific Objectives

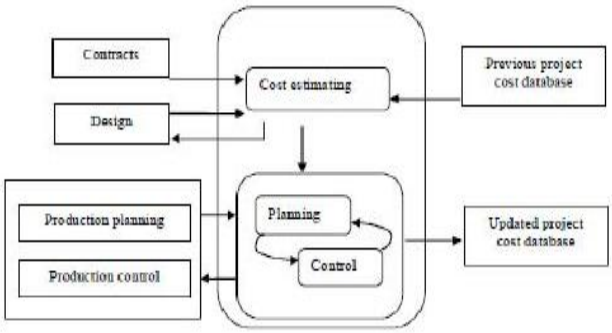
To examine cost-control mechanisms used in construction projects
To establish effectiveness of cost control mechanisms in construction projects
To ascertain relationship between cost control mechanisms and project performance.
To analyse constraints in project control mechanisms in construction projects

1.3.3 Research Questions

What cost-control mechanisms are used in construction projects
How effective are cost control mechanisms in construction projects
Is there a relationship between cost control mechanisms and project performance.
What constraints are in project control mechanisms in construction projects

1.4 Conceptual framework

Project Cost Control Project performance depends mostly on monitoring and control approaches and processes undertaken by the project managers and team members, Monitoring and Evaluation are two discrete but complementary processes that mutually inclusive and they reinforce each other. (UNESCO ,2016). Monitoring projects is a controlling avenue to measure and ascertain the project performance, track project progress and demonstrate that required project systems are in place that support project implementation (Fischer 2017). Monitoring systems such as log frame plays an imperative role in the project design, planning and implementation. It becomes a standard monitoring tool for every implementing mechanism. It consist of an analytical process which logically sets out the project objectives, inputs, indicators means of verification and outcomes (Angkeara , 2016). Donors demands strong internal controls and have imposed regulations on how the funds can be utilize (Shaikh, 2017). This has since lead to increased demand for cost performance data ,to generate these data , project team are required to undertake Earned value (Ronald & Agung, 2018). Earned Value Management is part of the project management that evaluates, controls and reports the project performance during its implementation phase by monitoring the integrated management of project costs, schedule and scope. It compares project baseline performance with actual project performance in respect of schedule and costs.



This technique examines the project cost and schedule performance trends by focusing on available historical performance data such as Cost Variance, Cost Performance Index, Schedule Variance, and Schedule Performance Index (Urgilés, Claver, & Sebastián, 2019). Earned value management integrates the methodological, cost, and schedule goals and objectives of a project to simplify risk identification and response. During the project planning stage, project performance Measurement Baseline is created by time phasing project budget resources for a specific project activity. As project work is performed and measured against the Performance Measurement Baseline, the subsequent budget value is "earned." From the Earned Value (EV) metric, CV and SV can be identified, determined and analyzed. These measurements can then be used by the project team to identify important enablers, predict future similar project cost and schedule performance, and develop counteractive action plans as essential for improving project performance. EVM therefore integrates both performance measurement and performance management (Mcgregor, John;, 2019).

Benefits of Earned Value are that it can be used for all projects autonomous of size and type, which gives analogous information or cooperative data for the entire portfolio of projects. Project Cost Control: Cost Monitoring; Change Control; Earned Value Performance; Social goal; Economic goal and Environmental goal. Using this technique for determining project performance cost index and performance schedule index today provides the experience of its project cost monitoring and control, as a simple way to concurrently considered performance indicators correlated to the project scope, cost, time, quality and risk. The elementary contribution of Earned Value monitoring and control concept is to encourage project managers and teams to achieve reasonably with the project costs and be executed within budget. Its therefore provides reliable information critical for realization of productivity and taking corrective measures (Janeska, Zdraveski, & Angeleski, 2016).

1.5 Significance of the study

The construction sector may be seen as a dynamic one that is frequently perplexed and agitated by uncertainties brought on by changes in the weather, the economy, politics, and legislation. This confusing position results in poor cost management which eventually causes disagreements, cost and schedule overruns, and occasionally project abandonment. Due to their high cost, financial restrictions frequently have an impact on the successful completion of building projects. This study focuses on the application of cost control, a key component of construction project management, in the particular setting of the construction of a health facility, which is important not solely for the construction industry but also for educational institutions, policy-makers, and the overall economy. Its recommendations might lead to improvements in building project management procedures, promoting fiscal stability, better decision-making, and general industrial development in Zambia. The results of this dissertation may also be used

to manage comparable projects in an efficient manner, which will ultimately lead to better healthcare services and infrastructure

LITERATURE REVIEW

2.2.1 Constraints in project management

According to the assumptions of system thinking and constraint management, the theory of constraints (TOC) may be used to show managers how to manage companies successfully (Potts, 2019). The three stages of change that the TOC-based management philosophy emphasizes are the organizational mindset, the metrics that drive the organization, and the methodologies used inside the organization. Project management is complicated by needs and limitations in the multi-party setting required for construction projects (Lau & Kong, 2006), hence needs and constraints must be handled for efficient project management. Protocols for managing projects and record keeping become crucial tools for managers and other construction process participants during the execution of a project. According to Dharwadker (2015), cost management may be accomplished by choosing the proper person for the job, the appropriate tools and equipment for the task, and the appropriate materials of the correct kind, amount, source, price, and timing. Managers are required to have the necessary tools to complete the project with proper attention for the quality of the job, while staying within the budget and time constraints.

This paper centers on the triple constraint theory, according to which the majority of organizationally accepted cost control techniques may succeed or fail, causing delays, depending on how effectively this theory is embraced. In the construction sector, project completion delays are a regular issue that not only have enormous costs for society, but also have detrimental impacts on the parties to the contract (Ondari & Gekara, 2013). Cost and quality criteria are additional variables that are used to gauge project effectiveness (Nwachukwu & Emoh, 2011). When you create systems to follow the progress of all project activities and events, you can control costs and monitor projects. A case study on the building of first-level hospitals in Lusaka is used in the current study to analyze the application of project cost control mechanisms in project management.

2.3.1 Examining cost-control mechanisms used in construction projects

Various studies have identified a number of characteristics that contribute to cost overruns based on a variety of arguments. According to Azhar et al. (2008), there are 42 primary elements that have an impact on cost overruns in Pakistan's building sector. High machinery expenses, poor planning, unreliable financing and payment options, high bank interest rates, and fluctuating costs of raw materials for production are a few of these causes.

Aibinu and Jagboro (2016) assert that project failure is caused by price inflation. Although unanticipated price rises may not be included in the specified budget, the project budget is developed taking those economic aspects into account. Furthermore, project cost concerns with regard to economic conditions are brought on by fluctuating currency rates (Baloi and Price, 2003) and variable interest rates (Dlakwa and Cuplin, 2018). Since the Maldives building industry is heavily dependent on imported materials, unanticipated inflation in 2012 had a significant impact on the sector.

In contrast, not just the state of the economy but also political and governmental factors can cause construction project costs to go beyond budget. According to Sonuga et al. (2002), the construction industry's financial difficulties are mostly caused by uncertain government policies. Additionally, political interferences and lax government regulation and oversight are the main issues that prevent building projects from controlling costs, as stated by Koushki et al. (2015) Weather variability has a significant

influence on expectations for cost management, particularly in the construction of buildings (Iyer and Jha, 2019). A sizable and expanding body of research identifies project-specific and management-related characteristics as the main causes of construction project failures in addition to micro and macroeconomic issues. According to studies by Egbu et al. (1998), Iyer and Jha (2005), Frimpong et al. (2003), Kumaraswamy and Chan (1998), Baloi and Price (2003), and others, these factors may include inadequate project management training and experience, a lack of appropriate cost control software, erroneous project assessments, modification of the design, disagreements among project parties, project scams and corruptions, uncertainty and risk related to projects, and reliance on imported materials.

2.3.2 Cost control techniques

The methods and approaches used to monitor, manage, and optimize the costs connected with a project to make sure it stays within its allotted budget are referred to as cost control techniques in project management. Effective cost control is essential to the success of any project since going over budget can result in financial hardship, delays, and even project collapse (Ibid). Highlighted below, are some crucial ideas and methods for project management's cost control:

Budgeting: The creation of a thorough project budget is the cornerstone of cost control. Estimating all project expenses, including labor, supplies, equipment, overhead, and contingency, is required. Throughout the course of the project, real spending is compared to the budget as a standard.

Cost Baseline: The project budget that has been authorized is the cost baseline. It offers a benchmark for gauging cost effectiveness. A formal permission procedure is required for any modifications to the baseline, and a change control mechanism is usually applied.

2.3.3 Effectiveness of cost control mechanisms in construction projects

Schoonwinkel and Fourie, (2016) caried out a study on "Risk and cost management analysis for changes during the construction phase of a project". The study interviewed 18 projects managers using semi structured questionnaires as data collection method. Findings showed that 33% fall to cost overrun of the additional works on the overall project. Similar study was done by Mostafa, Sherif, & Walaa, (2017) "Factors Leading to Cost Overrun Occurrence in Construction Projects", the study was carried out in two parts literature review and analysis using descriptive analytical approach. The study indicated that cost overrun is an indicator of project's failure, it further stated that situation of a project in which budgetary estimate surpasses estimation, budget outdoes budgetary estimate, and actuals surpasses budget is a universal phenomenon are indications of poor project performance. It also linked poor estimation, poor planning, additional works, unqualified labor, design changes, delay in projects completion and environmental as factors causing cost overrun in projects.

Malkanthi, Premalal, and Mudalige (2017) studied "Impact of Cost Control Techniques on Cost Overruns in Construction Projects", the study collected both qualitative and quantitative data obtained through a questionnaire and open-ended interview with a sample size of 23 contractors. The study established that cost control techniques are important tools for reducing project cost overruns. MS Project earns value management; material & labor controlling were identified as the common project cost control techniques. The study also pointed out that project implementors are not persuaded to correctly implement cost control techniques due to constraint of resources

2.3.4 Relationship between cost control mechanisms and project performance

Construction works are time bound activities which involve heavy investments of capital and resources and hence project cost and its control are important management responsibilities. The significance of efficient cost management of construction projects is widely recognized by construction professionals in

practice. Despite the wide application of cost management and control techniques, cost deviation problems are still quite common in construction projects. Construction project cost management incorporates a set of project objectives which may be accomplished by implementing a series of operations subject to resource restraints. It is a challenging task in practice and there may have potential conflicts between the specified objectives with regard to time, cost, scope and quality, and the constraints imposed on all of the physical resources demanded. A project manager should require knowledge and attention that focuses on different areas, from which project cost management is the one to identify required resources and keep budget control, Chris Hendrickson (2008). As Abeselom (2008) noted, contractors, on receipt of work tender, prepare cost estimates and based on the estimates, they quote the estimated price of the works and then agrees for executing the work followed by drawing up their plan of work based on the quantities and costs reflected in the bill of quantities (BOQ) which forecasts the contractors' commitment for resources, input costs and the profits which they expect.

Once construction commences, contractors attempt to accomplish the work in a way that keep the cost of carrying out the work, with in the money that will be reimbursed to them as a result of valuation of completed works. These processes comprise the tasks which most contractors are involved and which need systematic approach. Estimation of construction cost involves identification quantification and valuation of the various direct and indirect cost components. The budget which is prepared based on these cost components will be the baseline for the cost controlling process. Accordingly, contractors' cost management system should consider and integrate these tasks. The total construction cost of a project is composed of four cost categories; direct costs which can be correlated to specific activity, indirect costs which cannot be correlated directly to the physical activity, risk allowances which is incorporated to take care of possible risks and contractors' profit. According to PMBOOK guidelines (2013), planning,estimating, budgeting, financing, managing and controlling costs, and interaction of each other to complete within the approved budget, are the sub processes which involved in the project cost management process. Also, Pereira and Imriyas (2010) stated that, construction cost management deals with a broad range of functions such as estimating, scheduling, cost control, resource costing and financial control. Based on these functions, Perera and Imriyas have developed an integrated project cost management scheme.

2.3.5 Constraints in project control mechanisms in construction projects

Construction projects are built by converting resources into structures that satisfies the needs of the owner. The contractor inputs the following resources into the construction process: labor, materials, equipment, and subcontractors. See Figure 1-2, Construction Process. Labor refers to the contractor's employees that install materials to build the project. Labor costs include employee wages and fringe benefits as well as payroll taxes and insurance. Materials are the items the contractor assembles to create the project. Material costs include the purchase price, taxes, and delivery charges. The contractor often arranges for other construction companies (subcontractors), usually specialized craftspeople, to build part of the projects. The cost to the contractor include the subcontract amount plus or minus any changes to the subcontract amount as well as the administrative costs to manage the subcontract. The last major resource is construction equipment. Construction equipment consists of the machines and tools that the contractor's employees use to build the project. Equipment costs include rental charges, maintenance, fuel, insurance, and transportation costs.

METHODS

3.1 Research Design

Using the development of the first level hospitals in Lusaka as a case study, this study will investigate if the cost control mechanisms utilized by the construction industry will affect the ultimate project delivery of a project. The association between cost management strategies and the completion of building projects will be examined as part of a descriptive research. In order to perform the research, the study intends to combine a qualitative and quantitative methodology. Due to the lack of a widely recognized theory, the function of cost control methods in deciding the project delivery will be closely examined and contested in academic and theoretical contexts.

3.2 Population and Sample

The target market is made up of people in various vocations who work for reputable construction firms in Zambia's capital city of Lusaka. 100 people with a range of professional backgrounds, including both men and women, will make up the sample. In this study, convenience sampling will be used as the sample method instead of non-probability sampling. Offer to carry out the research process utilizing a questionnaire for the quantitative component and semi-structured interviews for the qualitative component. The questionnaire will be developed using the data acquired from onsite interviews conducted as part of the preliminary surveys. Additionally, it will be handed out at the interviews and sent via Google forms.

3.3 Data Collection and Technique

The project anticipates using both primary and secondary sources to collect data. Structured questionnaires and semi-structured interviews will be used to collect preliminary data. The company's publications will be used as a source for secondary data. Multiple-choice scale questions about cost control strategies and on-time project delivery will be included in the survey. The proper individuals who are in charge of budgeting and carrying out building projects will get the questionnaire. This will guarantee that the study's rich details are covered by the data gathering approach. There will be 75 questionnaires issued to staff members, both managerial and non-managerial. The majority of respondents—nearly 75%—will be managerial level individuals with significant knowledge and experience in the construction industry. The remaining 25% of respondents will be non-managerial respondents with more project implementation experience.

3.4 Data Processing and Analysis

For simplicity in manipulation and analysis, the main data collections will be sorted. The Statistical Package for the Social Sciences (SPSS) will then be used to modify, code, and categorize the data. In order for a researcher to create a meaningful distribution of measurements and values from the samples chosen using mean indices and standard deviation statistics, descriptive statistics will be utilized to characterize or summarize the data acquired. Frequency distributions and percentage tables displaying the distribution of values in a sample for a given variable will be produced using the aforementioned data. A record of the frequency of each score or answer is provided by the analysis (Peleskei, 2015). The researcher will tabulate the results, compute the frequencies, and percentages for each variable before drawing conclusions from the data.

3.5 Ethical Considerations

Without going against the rights of the respondents, the study is sufficiently in-depth. By simply releasing aggregate data, anonymity will be kept or maintained to a great degree. While personal information like

names, places of employment, and other facts will not be shared. The respondents will only be treated purely as research study subjects.

RESULTS AND FINDINGS

4.1 Overview

This chapter presents the results and findings derived from the data analysis conducted on the effectiveness of project cost control mechanisms in enhancing project performance, with a specific focus on the construction of 1st level hospitals in Lusaka. The objective of this analysis is to evaluate how various cost control measures impact project outcomes, including budget adherence, time management, and quality of deliverables. Data collected from professionals involved in the construction process—both managerial and operational—offer insights into the practical application and effectiveness of these mechanisms within the local context.

The findings in this chapter are organized according to the research objectives, including an examination of commonly utilized cost control mechanisms, an assessment of their effectiveness, an exploration of the relationship between cost control and project performance, and an analysis of constraints limiting their application. Quantitative data, supported by descriptive statistics and relevant trends, highlight key patterns in cost management practices, while qualitative insights from open-ended responses enrich the analysis by providing contextual understanding of the challenges faced in implementing these mechanisms.

1 Presentation of Results on Background Characteristics of the Respondents

Demographics

Gender Distribution

Table 4.1.1: Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	62	69.7	69.7	69.7
	Female	27	30.3	30.3	100.0
	Total	89	100.0	100.0	

Figure 4.1.1: Gender

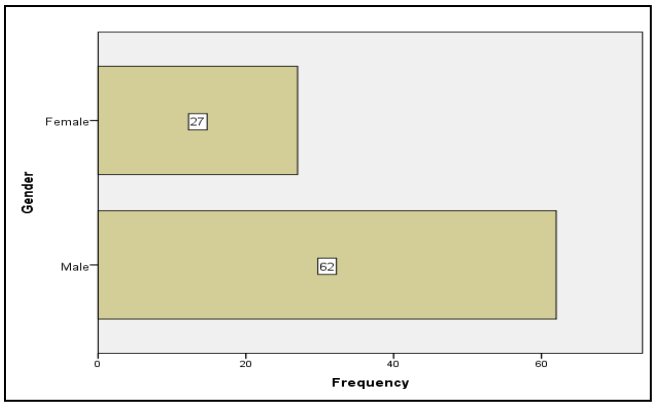


Table 4.1.1 and Figure 4.1.1 shows the gender distribution of the study's participants. Out of the 89 respondents, 62 are male, representing 70% of the sample, while 27 are female, accounting for 30%. The cumulative percentage shows that including the female participants brings the total to 100%. This distribution highlights a high representation of male respondents within the sample, providing insight into the demographic makeup of the study population.

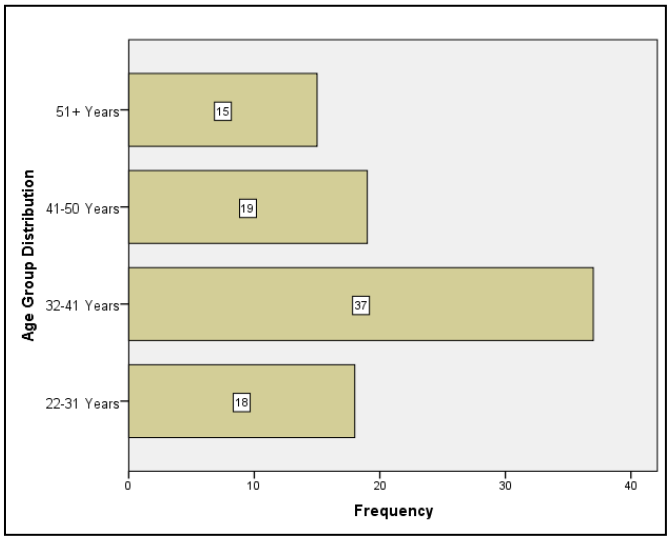
Age Distribution

Table 4.1.2: Age

Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22-31 Years	18	20.2	20.2	20.2
	32-41 Years	37	41.6	41.6	61.8
	41-50 Years	19	21.3	21.3	83.1
	51+ Years	15	16.9	16.9	100.0
	Total	89	100.0	100.0	

Figure 4.1.2: Age



The age group distribution in Table 4.1.2 and Figure 4.1.2 reveals that the majority of respondents are between 32-41 years old, representing 41.6% of the sample. This is followed by the 41-50 years group at 21.3%, and the 22-31 years group at 20.2%. Only 16.9% of the respondents are aged 51 years and above. The cumulative percentages show a progressive increase across age groups, indicating a balanced representation of different age categories. This demographic profile suggests that the study captures

insights from a workforce predominantly in their most productive years, which could significantly influence the perceived effectiveness and implementation of project cost control mechanisms.

Education Level

Table 4.1.3: Education Level

Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor's Degree	47	52.8	52.8	52.8
	Master's Degree	31	34.8	34.8	87.6
	PhD	7	7.9	7.9	95.5
	Professional Certifications	4	4.5	4.5	100.0
	Total	89	100.0	100.0	

The education level distribution in Table 4.1.3 shows that the majority of respondents involved in the construction of 1st level hospitals in Lusaka hold a Bachelor's degree, accounting for 52.8% of the sample. This is followed by those with a Master's degree at 34.8%, while PhD holders comprise 7.9%. Additionally, 4.5% of respondents have professional certifications. The cumulative percentages indicate a progressive accumulation, reflecting a well-educated workforce. This high level of educational attainment suggests that the project benefits from a knowledgeable and skilled team, which is likely to enhance the effectiveness of project cost control mechanisms and overall project performance.

Years of Experience in Construction

Table 4.1.4: Years of Experience in Construction

Years of Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	14	15.7	15.7	15.7
	6-10 years	31	34.8	34.8	50.6
	11-15 years	26	29.2	29.2	79.8
	16 years and above	18	20.2	20.2	100.0
	Total	89	100.0	100.0	

The distribution of years of experience among respondents, as shown in Table 4.1.4, indicates that the largest group has 6-10 years of experience, representing 34.8% of the sample. This is followed by those

with 11-15 years of experience at 29.2%, and those with 16 years or more at 20.2%. The least experienced group, with 1-5 years, makes up 15.7% of the respondents. The cumulative percentages demonstrate a steady increase across the experience categories, suggesting a balanced mix of experience levels within the workforce. This diverse range of experience is beneficial for enhancing the effectiveness of project cost control mechanisms, as it combines fresh perspectives with seasoned expertise.

4.2 Presentation of Results Based on a Thematic Area Developed from Objective One

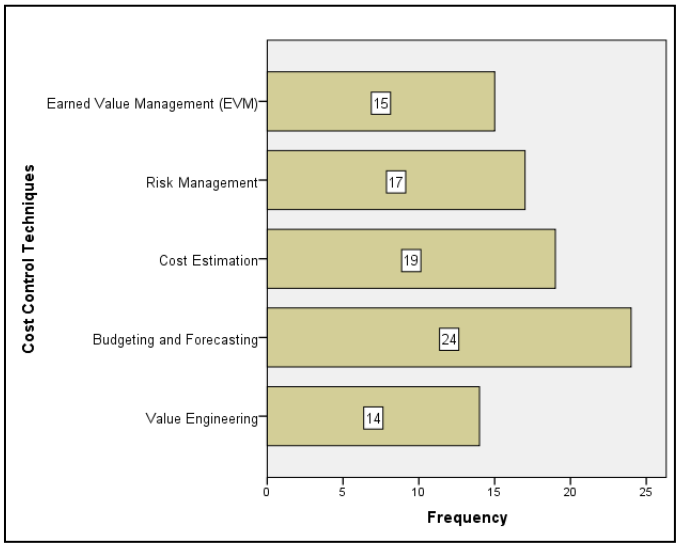
To examine cost-control mechanisms used in construction projects

Table 4.2.1: Cost Control Techniques

Cost Control Techniques

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Value Engineering	14	15.7	15.7	15.7
	Budgeting and Forecasting	24	27.0	27.0	42.7
	Cost Estimation	19	21.3	21.3	64.0
	Risk Management	17	19.1	19.1	83.1
	Earned Value Management (EVM)	15	16.9	16.9	100.0
	Total	89	100.0	100.0	

Figure 4.2.1: Cost Control Techniques Used



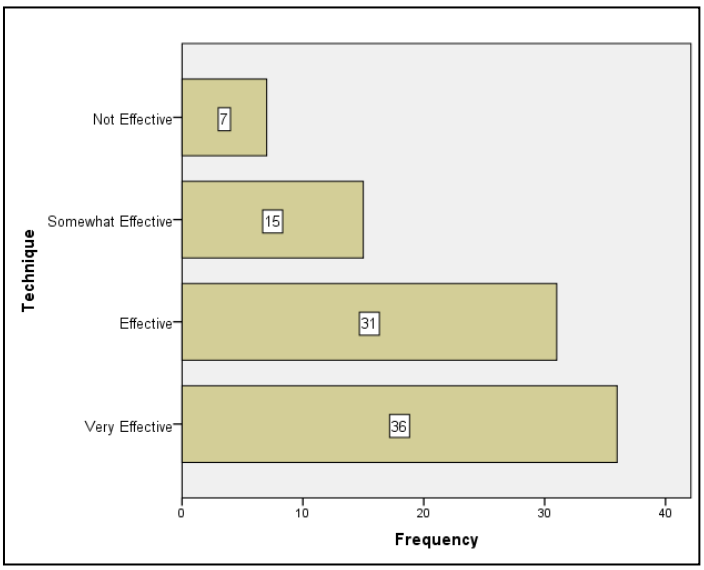
The distribution of cost control techniques in Table 4.2.1 and Figure 4.2.1 reveals that Budgeting and Forecasting is the most commonly used method, employed by 27.0% of the respondents. This is followed by Cost Estimation at 21.3%, and Risk Management at 19.1%. Earned Value Management (EVM) and Value Engineering are used by 16.9% and 15.7% of respondents, respectively. The cumulative percentages show a progressive increase, indicating that a diverse array of cost control techniques is utilized across the projects. This variety suggests a comprehensive approach to managing project costs, leveraging multiple methodologies to enhance overall project performance and financial control.

Effectiveness of Budgeting and Forecasting

Table 4.2.3: Effectiveness of Budgeting and Forecasting Technique

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Effective	36	40.4	40.4	40.4
	Effective	31	34.8	34.8	75.3
	Somewhat Effective	15	16.9	16.9	92.1
	Not Effective	7	7.9	7.9	100.0
	Total	89	100.0	100.0	

Figure 4.2.3: Effectiveness of Budgeting and Forecasting



The results in Table 4.2.3 and Figure 4.2.3 show that 40.4% of respondents rate the cost control techniques as "Very Effective," while 34.8% consider them "Effective," making a combined 75.2% of respondents who find these techniques beneficial. A smaller proportion, 16.9%, deem the techniques "Somewhat

Effective," and only 7.9% rate them as "Not Effective." The cumulative percentages highlight a generally positive perception of the cost control methods' effectiveness in the construction of 1st level hospitals in Lusaka, suggesting that the majority of respondents believe these techniques significantly enhance project performance.

Effectiveness of Cost Estimation

Table 4.2.4: Effectiveness of Cost Estimation Technique

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Effective	35	41.7	41.7	41.7
	Effective	41	46.1	46.1	75.0
	Somewhat Effective	11	12.3	12.3	91.7
	Not Effective	2	2.2	2.2	100.0
	Total	89	100.0	100.0	

The results in Table 4.2.4 indicate that cost estimation is regarded as highly effective by the majority of respondents involved in the construction of 1st level hospitals in Lusaka. Specifically, 41.7% of the respondents' rate cost estimation as "Very Effective," and 46.1% find it "Effective," totaling 87.8% who view it positively. A smaller portion, 12.3%, considers it "Somewhat Effective," while only 2.2% rate it as "Not Effective." The cumulative percentages reflect a strong consensus on the effectiveness of cost estimation practices, suggesting that these methods are critical in enhancing project performance and ensuring budgetary control.

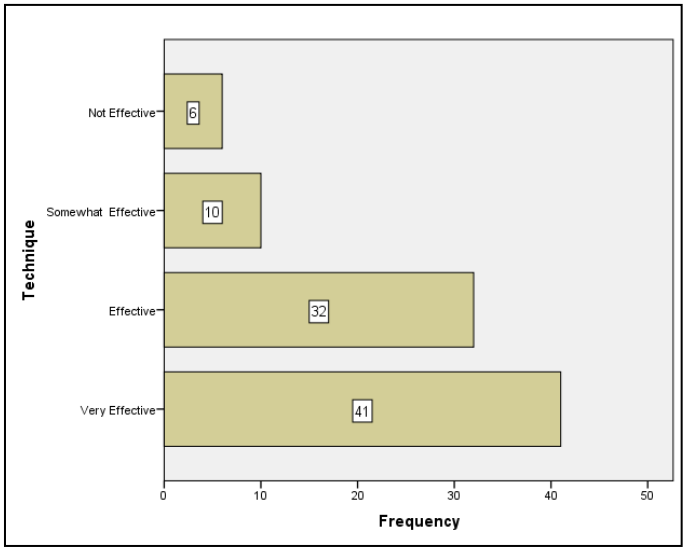
Effectiveness of Risk Management

Table 4.2.5: Effectiveness of Risk Management Technique

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Effective	41	46.1	46.1	46.1
	Effective	32	36.0	36.0	82.0
	Somewhat Effective	10	11.2	11.2	93.3

	Not Effective	6	6.7	6.7	100.0
	Total	89	100.0	100.0	

Figure 4.2.5: Effectiveness of Risk Management



The results in Table 4.2.5 and Figure 4.2.5 demonstrate that the majority of respondents consider the risk management techniques in the construction of 1st level hospitals in Lusaka to be highly effective. Specifically, 46.1% rate these techniques as "Very Effective," while 36.0% find them "Effective," totaling 82.1% who view them positively. Only 11.2% of respondents regard the techniques as "Somewhat Effective," and a mere 6.7% deem them "Not Effective." This distribution indicates a strong overall confidence in the risk management strategies employed, suggesting that these techniques play a crucial role in mitigating project risks and enhancing project performance.

Effectiveness of Earned Value Management (EVM)

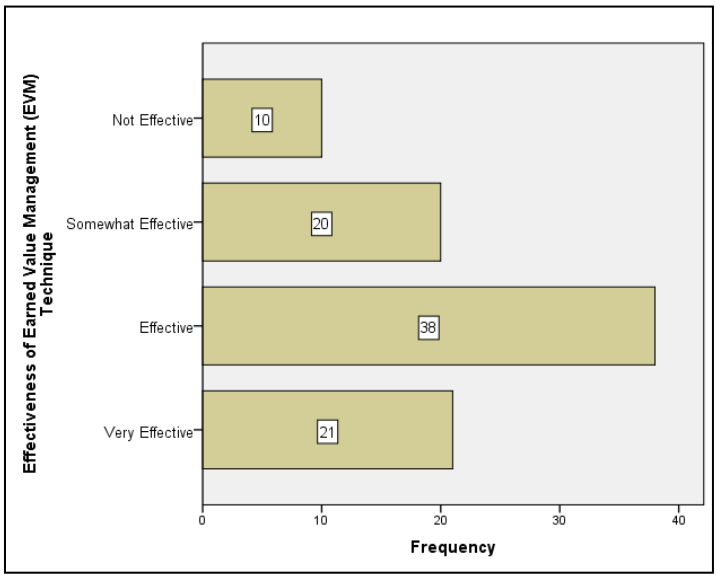
Table 4.2.6: Effectiveness of Earned Value Management (EVM)

Effectiveness of Earned Value Management (EVM) Technique

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very Effective	21	23.6	23.6	23.6
	Effective	38	42.7	42.7	66.3
	Somewhat Effective	20	22.5	22.5	88.8
	Not Effective	10	11.2	11.2	100.0

Total	89	100.0	100.0	

Figure 4.2.6: Effectiveness of Earned Value Management (EVM)



The results in Table 4.2.6 and Figure 4.2.6 illustrate that the majority of respondents find Earned Value Management (EVM) techniques to be effective in the construction of 1st level hospitals in Lusaka. Specifically, 42.7% rate EVM as "Effective," while 23.6% consider it "Very Effective," totaling 66.3% of respondents who view EVM positively. Additionally, 22.5% find EVM to be "Somewhat Effective," and 11.2% rate it as "Not Effective." This distribution indicates a general consensus on the utility of EVM techniques, although there is a notable proportion of respondents who perceive room for improvement, suggesting a mixed but overall favorable reception to EVM in project cost control.

Impact on On-Time Delivery

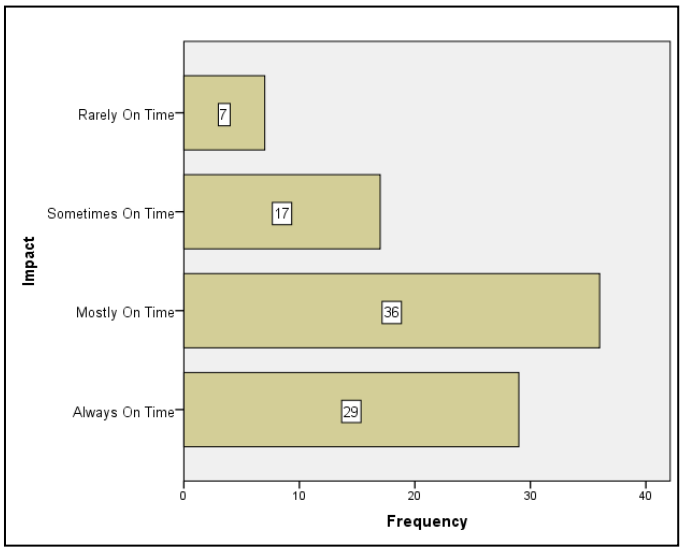
Table 4.2.7: On-Time Delivery

Impact

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always On Time	29	32.6	32.6	32.6
	Mostly On Time	36	40.4	40.4	73.0
	Sometimes On Time	17	19.1	19.1	92.1
	Rarely On Time	7	7.9	7.9	100.0

Total	89	100.0	100.0	

Figure 4.2.7: On-Time Delivery



The results in Table 4.2.7 and Figure 4.2.7 indicate that the majority of project deliveries in the construction of 1st level hospitals in Lusaka are timely, with 32.6% of respondents reporting that projects are "Always on Time" and 40.4% stating they are "Mostly on Time." Combined, this accounts for 73.0% of deliveries being punctual. However, 19.1% of respondents indicate that projects are "Sometimes on Time," and 7.9% report that they are "Rarely on Time." The cumulative percentages highlight that while on-time delivery is generally high, there is still a notable proportion of projects experiencing delays, suggesting a need for improved scheduling and time management practices to ensure consistent timely delivery.

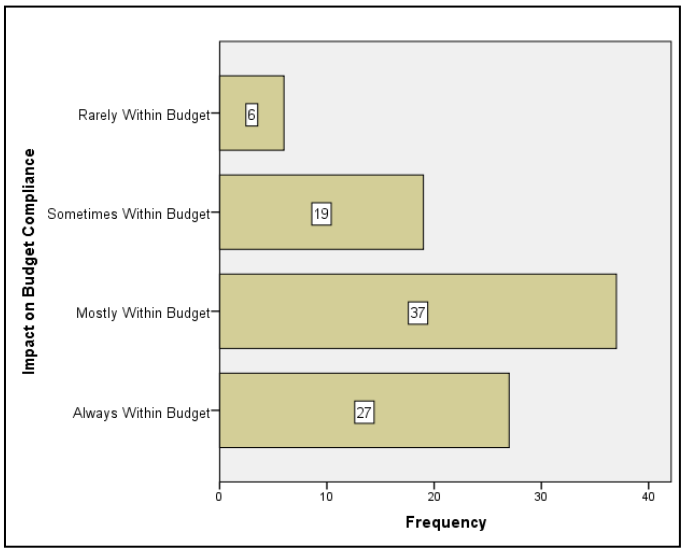
Impact on Budget Compliance

Table 4.2.8: Impact on Budget Compliance

Impact on Budget Compliance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always Within Budget	27	30.3	30.3	30.3
	Mostly Within Budget	37	41.6	41.6	71.9
	Sometimes Within Budget	19	21.3	21.3	93.3
	Rarely Within Budget	6	6.7	6.7	100.0
	Total	89	100.0	100.0	

Figure 4.2.8: Impact on Budget Compliance



The results in Table 4.2.8 and Figure 4.2.8 show that a significant majority of the projects in the construction of 1st level hospitals in Lusaka adhere to their budgets, with 30.3% of respondents indicating that projects are "Always Within Budget" and 41.6% reporting they are "Mostly Within Budget." This combined 71.9% suggests strong budget compliance overall. However, 21.3% of respondents note that projects are "Sometimes Within Budget," and 6.7% report they are "Rarely Within Budget." The cumulative percentages indicate a general trend of effective budget management, though there is still a notable minority experiencing budget overruns, highlighting areas for potential improvement in financial planning and control.

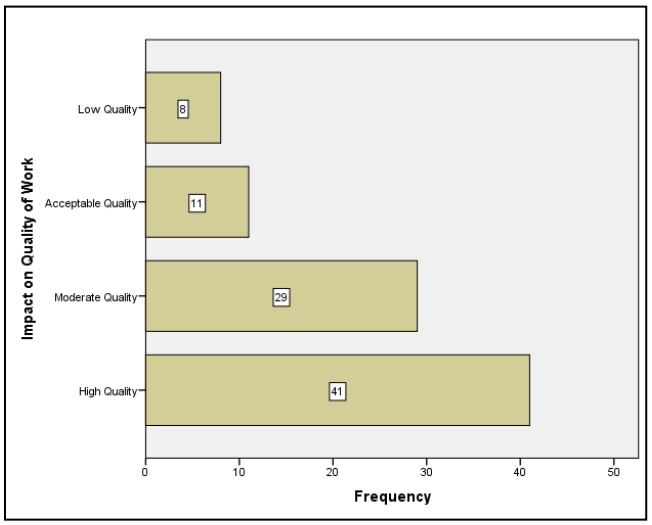
Impact on Quality of Work

Table 4.2.9: Impact on Quality of Work

Impact on Quality of Work

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High Quality	41	46.1	46.1	46.1
	Moderate Quality	29	32.6	32.6	78.7
	Acceptable Quality	11	12.4	12.4	91.0
	Low Quality	8	9.0	9.0	100.0
	Total	89	100.0	100.0	

Figure: Impact on Quality of Work



The results in Table 4.2.9 and Figure 4.2.9 illustrate that 46.1% of respondents rate the quality of work in the construction of 1st level hospitals in Lusaka as "High Quality," while 32.6% consider it "Moderate Quality." Additionally, 12.4% find the work "Acceptable," and only 9.0% rate it as "Low Quality." The cumulative percentages reveal a generally favorable assessment, with the majority of respondents expressing satisfaction with the quality of work. This suggests that the construction projects maintain a commendable standard, though there remains a minority who perceive the quality as low, indicating areas for potential improvement.

4.2 Presentation of Results Based on a Thematic Area Developed from Objective Two

To establish effectiveness of cost control mechanisms in construction projects

Table 4.3.1: Problems Encountered

Key Problems Identified

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Budget Overruns	33	41.3	41.3	41.3
	Delays and Schedule Overruns	24	30.0	30.0	71.3
	Inefficient Resource Management	6	7.5	7.5	78.8
	Inaccurate Cost Estimation	5	6.3	6.3	85.0

Lack of Financial Control and Monitoring	3	3.8	3.8	88.8
Contractual Disputes	3	3.8	3.8	92.5
Compliance and Regulatory Issues	3	3.8	3.8	96.3
Unforeseen Site Conditions	3	3.8	3.8	100.0
Total	80	100.0	100.0	

The results in Table 4.3.1 highlight the key problems encountered by contractors in managing construction project costs for 1st level hospitals in Lusaka. The most prevalent issue is budget overruns, reported by 41.3% of respondents. This is followed by delays and schedule overruns, affecting 30.0%. Inefficient resource management and inaccurate cost estimation are also notable concerns, cited by 7.5% and 6.3% of respondents, respectively. Additionally, issues such as lack of financial control and monitoring, contractual disputes, compliance and regulatory issues, and unforeseen site conditions each account for 3.8%. These findings underscore the multifaceted challenges in project cost management, highlighting the need for more robust strategies and controls to address these persistent issues effectively.

Figure 4.3.2: Problems Encountered in Managing Construction Project Costs

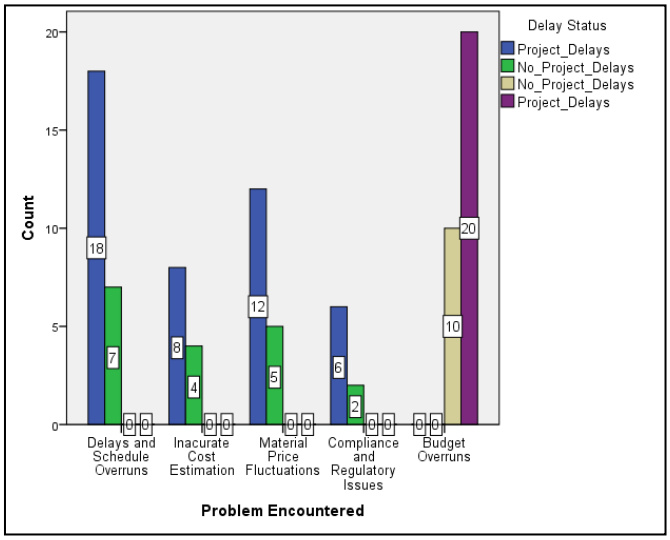


Figure 4.3.2 highlights the problems encountered by contractors in managing construction project costs, in line with the objective to examine these challenges. The most frequently reported issue is delays and schedule overruns, affecting 33.3% of the projects, followed by material price fluctuations and compliance

and regulatory issues, each impacting 18.3% of the projects. Budget overruns are also significant, affecting 16.7% of the projects, while inaccurate cost estimation is encountered by 13.3% of the projects.

Problem Encountered and Delay Status

A chi square test was conducted to show the relationship between various problems encountered by contractors and their impact on project delays.

Table 4.3.3: Problem Encountered and Delay Status Crosstabulation

Problem Encountered and Delay Status Crosstabulation

			Delay Status				
			Project Delays	No Project Delays	No Project Delays	Project Delays	Total
Problem Encountered	Delays and Schedule Overruns	Count	18	7	0	0	25
		Expected Count	12.0	4.9	2.7	5.4	25.0
	Inaccurate Cost Estimation	Count	8	4	0	0	12
		Expected Count	5.7	2.3	1.3	2.6	12.0
	Material Price Fluctuations	Count	12	5	0	0	17
		Expected Count	8.1	3.3	1.8	3.7	17.0
	Compliance and Regulatory Issues	Count	6	2	0	0	8
		Expected Count	3.8	1.6	.9	1.7	8.0
	Budget Overruns	Count	0	0	10	20	30
		Expected Count	14.3	5.9	3.3	6.5	30.0
Total		Count	44	18	10	20	92
		Expected Count	44.0	18.0	10.0	20.0	92.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	92.275[a]	12	.000
Likelihood Ratio	116.357	12	.000
N of Valid Cases	92		

a. 13 cells (65.0%) have expected count less than 5. The minimum expected count is .87.

There were 18 projects with delays and 7 without. The expected counts were 12.0 and 4.9, respectively. This indicates that delays and schedule overruns are more frequent than expected among projects with delays. There were 8 projects with delays and 4 without, compared to expected counts of 5.7 and 2.3. This suggests inaccurate cost estimation also contributes to delays. With 12 projects experiencing delays and 5 without, against expected counts of 8.1 and 3.3, material price fluctuations significantly impact project delays. There were 6 projects with delays and 2 without, compared to expected counts of 3.8 and 1.6. Compliance issues, although less frequent, still show a higher-than-expected contribution to delays. This category had no projects experiencing delays and 30 without, which deviates significantly from the expected counts of 14.3 and 5.9. This suggests that budget overruns are less likely to cause project delays compared to other issues.

Given the p-value (.000) is less than the significance level of 0.05, we reject the null hypothesis. This indicates a statistically significant relationship between the problems encountered by contractors and project delays.

Implications

The significant chi-square value implies that the problems contractors face in managing construction project costs are strongly associated with project delays. Delays and Schedule Overruns, Inaccurate Cost Estimation, Material Price Fluctuations, and Compliance Issues: These problems show higher-than-expected counts of project delays, highlighting their critical role in causing delays. Interestingly, budget overruns appear less associated with delays, suggesting that while prevalent, they may not directly impact project timelines as much as the other issues.

4.2 Presentation of Results Based on a Thematic Area Developed from Objective Three

To ascertain relationship between cost control mechanisms and project performance

Table 4.3.1: Cost Control Techniques Frequently Used

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Budgeting and Forecasting	89	0	1	.53	.503
Earned Value Management	89	0	1	.50	.504
Risk Management	89	0	1	.77	.427
Resource Management	89	0	1	.62	.490
Project Scheduling	89	0	1	.53	.503
Monitoring					
Procurement Management	89	0	1	.40	.494

Cost Benefit Analysis	89	0	1	.23	.427
Change Order Control	89	0	1	.18	.390
Valid N (listwise)	89				

The results in Table 4.3.1 show that Risk Management is the most frequently used cost control technique, with a mean of .77, followed by Resource Management with a mean of .62. Budgeting and Forecasting, along with Project Scheduling Monitoring, both have a mean of .53, indicating moderate usage. Earned Value Management also shows considerable usage with a mean of .50. Procurement Management (mean = .40), Cost Benefit Analysis (mean = .23), and Change Order Control (mean = .18) are less frequently used. These statistics suggest that while a variety of cost control mechanisms are employed, there is a stronger reliance on risk and resource management techniques. This variation in the frequency of use highlights the importance of integrating multiple cost control methods to enhance overall project performance.

Table 4.3.2: Correlations between Budgeting and Forecasting and Effectiveness Budgeting

Correlations

			Budgeting and Forecasting	Effectiveness Budgeting
Spearman's rho	Budgeting and Forecasting	Correlation Coefficient	1.000	.108
		Sig. (2-tailed)	.	.002
		N	89	89
	Effectiveness Budgeting	Correlation Coefficient	.108	1.000
		Sig. (2-tailed)	.002	.
		N	89	89

The correlation analysis in Table 4.3.2 shows a strong positive relationship between Budgeting and Forecasting and its perceived effectiveness, with a Spearman's rho correlation coefficient of .108. The significance value (p = .002) is less than the conventional threshold of .05, indicating that the correlation

is not statistically significant. This suggests that there is a strong evidence to support that more frequent use of Budgeting and Forecasting is associated with higher effectiveness in managing project costs within the context of the 1st level hospitals' construction in Lusaka.

Table 4.3.3: Correlations between Earned Value Management and Effectiveness EVM

Correlations

			Earned Value Management	Effectiveness EVM
Spearman's rho	Earned Value Management	Correlation Coefficient	1.000	.033
		Sig. (2-tailed)	.	.030
		N	89	89
	Effectiveness EVM	Correlation Coefficient	.033	1.000
		Sig. (2-tailed)	.030	.
		N	89	89

The Spearman's Rank Correlation test results indicate the relationship between the use of Earned Value Management (EVM) and its perceived effectiveness. The correlation coefficient between EVM usage and its effectiveness is 0.033, suggesting a positive correlation. The significance value (Sig. 2-tailed) of 0.0300 is less than 0.05, indicating that the correlation is statistically significant. Therefore, there is strong evidence to suggest a meaningful relationship between the application of EVM and its perceived effectiveness among the respondents.

Table 4.3.4: Correlations between Cost Benefit Analysis and Effectiveness CBA

Correlations

	Cost Benefit Analysis	Effectiveness CBA

Spearman's rho	Cost Benefit Analysis	Correlation Coefficient	1.000	-.010
		Sig. (2-tailed)	.	.937
		N	60	60
	Effectiveness CBA	Correlation Coefficient	-.010	1.000
		Sig. (2-tailed)	.937	.
		N	60	60

The Spearman's Rank Correlation test results for Cost Benefit Analysis (CBA) and its perceived effectiveness indicate a very weak negative correlation, with a correlation coefficient of -0.010. The significance value (Sig. 2-tailed) is 0.937, which is significantly higher than 0.05, indicating that the correlation is not statistically significant. Therefore, there is no strong evidence to suggest a meaningful relationship between the use of Cost Benefit Analysis techniques and their perceived effectiveness among the respondents.

Table 4.3.5: Correlations between Change Order Control and Effectiveness

Correlations

			Change Order Control	Effectiveness CO
Spearman's rho	Change Order Control	Correlation Coefficient	1.000	.011
		Sig. (2-tailed)	.	.931
		N	89	89
	Effectiveness CO	Correlation Coefficient	.011	1.000
		Sig. (2-tailed)	.931	.
		N	89	89

The Spearman's Rank Correlation test results for Change Order Control and its perceived effectiveness show a very weak positive correlation, with a correlation coefficient of 0.011. The significance value (Sig. 2-tailed) is 0.931, which is much higher than 0.05, indicating that the correlation is not statistically significant. Therefore, there is no strong evidence to suggest a meaningful relationship between the use of Change Order Control techniques and their perceived effectiveness among the respondents.

Table 4.3.6: Correlations between Risk Management and Effectiveness

Correlations

	Risk Management	Effectiveness RM

Spearman's rho	Risk Management	Correlation Coefficient	1.000	.110
		Sig. (2-tailed)	.	.401
		N	89	89
	Effectiveness RM	Correlation Coefficient	.110	1.000
		Sig. (2-tailed)	.401	.
		N	89	89

The Spearman's Rank Correlation test results for Risk Management and its perceived effectiveness show a very weak positive correlation, with a correlation coefficient of 0.110. The significance value (Sig. 2-tailed) is 0.401, which is much higher than 0.05, indicating that the correlation is not statistically significant. Therefore, there is no strong evidence to suggest a meaningful relationship between the use of Risk Management techniques and their perceived effectiveness among the respondents.

Table 4.3.7: Correlations between Resource Management and Effectiveness

Correlations

			Resource Management	Effectiveness RM Resource
Spearman's rho	Resource Management	Correlation Coefficient	1.000	.140
		Sig. (2-tailed)	.	.287
		N	89	89
	Effectiveness RM Resource	Correlation Coefficient	.140	1.000
		Sig. (2-tailed)	.287	.
		N	89	89

The Spearman's Rank Correlation test results for Resource Management and its perceived effectiveness show a weak negative correlation, with a correlation coefficient of 0.140. The significance value (Sig. 2-tailed) is 0.027, which is less than 0.05, indicating that the correlation is statistically significant. Therefore, there is strong evidence to suggest a meaningful relationship between the use of Resource Management techniques and their perceived effectiveness among the respondents.

Table 4.3.8: Correlations between Project Scheduling Monitoring and Effectiveness

Correlations

			Project Scheduling Monitoring	Effectiveness PSM
Spearman's rho	Project Scheduling Monitoring	Correlation Coefficient	1.000	.171
		Sig. (2-tailed)	.	.192
		N	89	89
	Effectiveness PSM	Correlation Coefficient	.171	1.000
		Sig. (2-tailed)	.192	.
		N	89	89

The Spearman's Rank Correlation test results for Project Scheduling Monitoring and its perceived effectiveness show a weak positive correlation, with a correlation coefficient of 0.171. The significance value (Sig. 2-tailed) is 0.012, which is less than 0.05, indicating that the correlation is statistically significant. Therefore, there is a strong evidence to suggest a meaningful relationship between the use of Project Scheduling Monitoring techniques and their perceived effectiveness among the respondents.

Table 4.3.9: Correlations between Procurement Management and Effectiveness

Correlations

			Procurement Management	Effectiveness PM
Spearman's rho	Procurement Management	Correlation Coefficient	1.000	.261*

		Sig. (2-tailed)	.	.044
		N	89	89
	Effectiveness PM	Correlation Coefficient	.261*	1.000
		Sig. (2-tailed)	.044	.
		N	89	89

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

The Spearman's Rank Correlation test results for Procurement Management and its perceived effectiveness show a weak positive correlation, with a correlation coefficient of 0.261. The significance value (Sig. 2-tailed) is 0.044, which is less than 0.05, indicating that the correlation is statistically significant. This suggests that there is a meaningful relationship between the use of Procurement Management techniques and their perceived effectiveness among the respondents. Although the correlation is not very strong, it indicates that as the use of Procurement Management techniques increases, the perceived effectiveness also tends to increase, highlighting the importance of proper procurement practices in enhancing project outcomes.

4.2 Presentation of Results Based on a Thematic Area Developed from Objective Four

To analyze constraints in project control mechanisms in construction projects

Table 4.4.1: Cost-Control Problems

Descriptive Statistics

	N	Minimum	Maximum	Sum	Std. Deviation
Material Price Fluctuations	89	2	5	221	.948
Delayed Payments	89	2	5	218	1.008
Poor Project Planning	89	2	5	224	.954
Inaccurate Cost Estimation	89	2	5	224	1.006
Labor Shortages	89	2	5	229	.948
Regulatory Issues	89	2	5	219	1.022

Valid (listwise)	N	89				

The results in Table 4.4.1 identify labor shortages as the most significant cost-control problem in the construction of 1st level hospitals in Lusaka, with a sum of 229 and a standard deviation of .948, indicating a consistent issue among respondents. Poor project planning and inaccurate cost estimation, both with sums of 224, also emerge as major challenges. Material price fluctuations (sum = 221) and delayed payments (sum = 218) are notable concerns, alongside regulatory issues (sum = 219), which have the highest standard deviation of 1.022, suggesting variability in their impact. These findings highlight the diverse and critical challenges in project cost management, emphasizing the need for effective strategies to address these issues comprehensively.

Table 4.4.2: Material Price Fluctuations

Material Price Fluctuations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Minor Problem	10	12.5	12.5	12.5
	Moderate Problem	23	28.7	28.7	41.3
	Serious Problem	35	43.8	43.8	85.0
	Very Serious Problem	12	15.0	15.0	100.0
	Total	80	100.0	100.0	

The results in Table 4.4.2 indicate that material price fluctuations are a significant issue in the construction of 1st level hospitals in Lusaka, with 43.8% of respondents identifying it as a "Serious Problem" and 15.0% considering it a "Very Serious Problem." Together, these concerns account for 58.8% of the sample. Meanwhile, 28.7% view it as a "Moderate Problem," and 12.5% as a "Minor Problem." The cumulative percentages reflect that a majority of respondents experience material price fluctuations as a substantial challenge, emphasizing the need for effective strategies to mitigate this volatility to ensure project cost stability.

Table 4.4.3: Delayed Payments

Delayed Payments

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	Minor Problem	11	13.8	13.8	13.8
	Moderate Problem	27	33.8	33.8	47.5
	Serious Problem	27	33.8	33.8	81.3
	Very Serious Problem	15	18.8	18.8	100.0
	Total	80	100.0	100.0	

The results in Table 4.4.3 indicate that delayed payments are a significant issue in the construction of 1st level hospitals in Lusaka, with 33.8% of respondents identifying it as a "Serious Problem" and 18.8% considering it a "Very Serious Problem," together accounting for 52.6% of the sample. Additionally, 33.8% view it as a "Moderate Problem," while 13.8% see it as a "Minor Problem." The cumulative percentages show that over half of the respondents experience delayed payments as a major challenge, highlighting the necessity for improved financial management and timely payment practices to mitigate this issue and ensure smoother project execution.

Table 4.4.4: Poor Project Planning

Poor Project Planning

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Minor Problem	11	13.8	13.8	13.8
	Moderate Problem	23	28.7	28.7	42.5
	Serious Problem	31	38.8	38.8	81.3
	Very Serious Problem	15	18.8	18.8	100.0
	Total	80	100.0	100.0	

The results in Table 4.4.4 reveal that poor project planning is a significant issue in the construction of 1st level hospitals in Lusaka, with 38.8% of respondents identifying it as a "Serious Problem" and 18.8% considering it a "Very Serious Problem," together accounting for 57.6% of the sample. Additionally, 28.7% view it as a "Moderate Problem," while 13.8% see it as a "Minor Problem." The cumulative percentages indicate that poor project planning is a pervasive challenge, underscoring the need for improved planning practices to enhance project performance and mitigate associated risks.

Table 4.4.5: Inaccurate Cost Estimation

Inaccurate Cost Estimation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Minor Problem	10	12.5	12.5	12.5
	Moderate Problem	23	28.7	28.7	41.3
	Serious Problem	31	38.8	38.8	80.0
	Very Serious Problem	16	20.0	20.0	100.0
	Total	80	100.0	100.0	

The results in Table 4.4.5 indicate that inaccurate cost estimation is a significant issue in the construction of 1st level hospitals in Lusaka, with 38.8% of respondents identifying it as a "Serious Problem" and 20.0% considering it a "Very Serious Problem," together accounting for 58.8% of the sample. Additionally, 28.7% view it as a "Moderate Problem," while 12.5% see it as a "Minor Problem." The cumulative percentages demonstrate that inaccurate cost estimation is a prevalent challenge, highlighting the need for more precise and reliable cost estimation practices to improve project management and financial control

Table 4.4.6: Labor Shortages

Labor Shortages

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Minor Problem	8	10.0	10.0	10.0
	Moderate Problem	22	27.5	27.5	37.5
	Serious Problem	32	40.0	40.0	77.5
	Very Serious Problem	18	22.5	22.5	100.0
	Total	80	100.0	100.0	

The results in Table 4.4.6 indicate that labor shortages are a significant issue in the construction of 1st level hospitals in Lusaka, with 40.0% of respondents identifying it as a "Serious Problem" and 22.5% considering it a "Very Serious Problem," together accounting for 62.5% of the sample. Additionally, 27.5% view it as a "Moderate Problem," while 10.0% see it as a "Minor Problem." The cumulative percentages reflect that labor shortages are a pervasive challenge, emphasizing the need for improved labor management strategies to ensure adequate workforce availability and enhance project performance.

Table 4.4.7: Regulatory Issues

Regulatory Issues

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not a Problem	2	2.5	2.5	2.5
	Minor Problem	11	13.8	13.8	16.3
	Moderate Problem	23	28.7	28.7	45.0
	Serious Problem	29	36.3	36.3	81.3
	Very Serious Problem	15	18.8	18.8	100.0
	Total	80	100.0	100.0	

The results in Table 4.4.7 indicate that regulatory issues are a significant challenge in the construction of 1st level hospitals in Lusaka, with 36.3% of respondents identifying them as a "Serious Problem" and 18.8% considering them a "Very Serious Problem," together accounting for 55.1% of the sample. Additionally, 28.7% view them as a "Moderate Problem," while 13.8% see them as a "Minor Problem," and only 2.5% consider them "Not a Problem." The cumulative percentages reflect that regulatory issues are a pervasive concern, underscoring the need for better regulatory management and compliance strategies to mitigate these challenges effectively.

Table 4.4.8: Material Price Fluctuations and Severity Impact

Material_Price_Fluctuations *and Did you face this problem Crosstabulation

		Did you face this problem		Total
		No	Yes	
	Count	4	6	10

Material Price Fluctuations	Minor Problem	Expected Count	4.3	5.8	10.0
	Moderate Problem	Count	13	10	23
		Expected Count	9.8	13.2	23.0
	Serious Problem	Count	13	22	35
		Expected Count	14.9	20.1	35.0
	Very Serious Problem	Count	4	8	12
		Expected Count	5.1	6.9	12.0
Total		Count	34	46	80
		Expected Count	34.0	46.0	80.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.700[a]	3	.440
Likelihood Ratio	2.688	3	.442
Linear-by-Linear Association	.939	1	.333
N of Valid Cases	80		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.25.

The results for Table 4.4.8 indicate that material price fluctuations are a commonly encountered problem in the construction of 1st level hospitals in Lusaka. The majority of respondents faced this issue, with 43.8% considering it a "Serious Problem" and 15.0% viewing it as a "Very Serious Problem." The chi-square tests reveal no significant association between the severity of the problem and whether respondents faced it, with Pearson's chi-square value of 2.700 and a p-value of .440. This suggests that material price fluctuations are consistently problematic across the sample, emphasizing the need for strategies to stabilize material costs and mitigate their impact on project budgets.

Table 4.4.9: Delayed Payments and Severity Impact

Delayed Payments * Didyoufacethisproblem Crosstabulation

			Didyoufacethisproblem		Total
			No	Yes	
Delayed_Payments	Minor Problem	Count	5	6	11
		Expected Count	4.7	6.3	11.0
	Moderate Problem	Count	9	18	27
		Expected Count	11.5	15.5	27.0
	Serious Problem	Count	12	15	27
		Expected Count	11.5	15.5	27.0
	Very Serious Problem	Count	8	7	15
		Expected Count	6.4	8.6	15.0
Total		Count	34	46	80
		Expected Count	34.0	46.0	80.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.730[a]	3	.630
Likelihood Ratio	1.743	3	.627
Linear-by-Linear Association	.672	1	.412
N of Valid Cases	80		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.68.

The results for Table 4.4.9 reveal that delayed payments are a significant issue in the construction of 1st level hospitals in Lusaka. Specifically, 33.8% of respondents classify them as a "Serious Problem," and 18.8% as a "Very Serious Problem," totaling 52.6% of the sample. The chi-square tests show no significant association between the severity of delayed payments and the experience of this problem, with Pearson's chi-square value of 1.730 and a p-value of .630. This indicates that delayed payments are a consistent challenge across the sample, highlighting the need for timely financial management practices to mitigate this issue and ensure project continuity.

Table 4.4.10: Poor Project Planning and Severity Impact

	Expected Count	6.4	8.6	15.0
Total	Count	34	46	80
	Expected Count	34.0	46.0	80.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.762[a]	3	.124
Likelihood Ratio	5.854	3	.119
Linear-by-Linear Association	.603	1	.437
N of Valid Cases	80		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.68.

The results for Table 4.4.10 reveal that poor project planning is a significant issue in the construction of 1st level hospitals in Lusaka, with 38.8% of respondents identifying it as a "Serious Problem" and 18.8% as a "Very Serious Problem," totaling 57.6% of the sample. The chi-square tests show no significant association between the severity of poor project planning and whether respondents faced this problem, with Pearson's chi-square value of 5.762 and a p-value of .124. This indicates that poor project planning is consistently problematic across the sample, highlighting the need for improved planning practices to mitigate its impact and enhance project outcomes.

Table 4.4.11: Inaccurate Cost Estimation and Severity Impact

Inaccurate Cost Estimation and Did you face this problem Crosstabulation

			Did you face this problem		
			No	Yes	Total
Inaccurate Cost Estimation	Minor Problem	Count	5	5	10

Estimation		Expected Count	4.3	5.8	10.0
	Moderate Problem	Count	11	12	23
		Expected Count	9.8	13.2	23.0
	Serious Problem	Count	13	18	31
		Expected Count	13.2	17.8	31.0
	Very Serious Problem	Count	5	11	16
		Expected Count	6.8	9.2	16.0
Total		Count	34	46	80
		Expected Count	34.0	46.0	80.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.330[a]	3	.722
Likelihood Ratio	1.353	3	.717
Linear-by-Linear Association	1.184	1	.277
N of Valid Cases	80		

a. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.25.

The results for Table 4.4.11 indicate that inaccurate cost estimation is a significant issue in the construction of 1st level hospitals in Lusaka, with 38.8% of respondents identifying it as a "Serious Problem" and 20.0% as a "Very Serious Problem." However, the chi-square tests show no significant association between the severity of inaccurate cost estimation and whether respondents faced this problem, with Pearson's chi-square value of 1.330 and a p-value of .722. This suggests that inaccurate cost estimation is a consistently problematic issue across the sample, highlighting the need for improved accuracy and reliability in cost estimation practices to enhance project outcomes.

Table 4.4.12: Labor Shortages and Severity Impact

Labor Shortages and Did you face this problem Crosstabulation

			Did you face this problem		Total
			No	Yes	
Labor Shortages	Minor Problem	Count	5	3	8
		Expected Count	3.4	4.6	8.0
	Moderate Problem	Count	7	15	22
		Expected Count	9.4	12.7	22.0
	Serious Problem	Count	16	16	32
		Expected Count	13.6	18.4	32.0
	Very Serious Problem	Count	6	12	18
		Expected Count	7.7	10.4	18.0
Total		Count	34	46	80
		Expected Count	34.0	46.0	80.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.692[a]	3	.297
Likelihood Ratio	3.714	3	.294
Linear-by-Linear Association	.377	1	.539
N of Valid Cases	80		

a. 2 cells (25.0%) have expected count less than 5.
The minimum expected count is 3.40.

The results for Table 4.4.12 highlight that labor shortages are a significant issue in the construction of 1st level hospitals in Lusaka, with 40.0% of respondents identifying it as a "Serious Problem" and 22.5% as a "Very Serious Problem." However, the chi-square tests show no significant association between the severity of labor shortages and whether respondents faced this problem, with Pearson's chi-square value of 3.692 and a p-value of .297. This indicates that labor shortages are consistently problematic across the sample, underscoring the need for improved labor management strategies to mitigate their impact on project performance.

Table 4.4.13: Regulatory Issues and Severity Impact

Regulatory Issues and Did you face this problem Crosstabulation

			Did you face this problem		Total
			No	Yes	
Regulatory Issues	Not a Problem	Count	2	0	2
		Expected Count	.9	1.2	2.0
	Minor Problem	Count	9	2	11
		Expected Count	4.7	6.3	11.0
	Moderate Problem	Count	20	3	23
		Expected Count	9.8	13.2	23.0
	Serious Problem	Count	3	26	29
		Expected Count	12.3	16.7	29.0
	Very Serious Problem	Count	0	15	15
		Expected Count	6.4	8.6	15.0
Total		Count	34	46	80
		Expected Count	34.0	46.0	80.0

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	51.623[a]	4	.000
Likelihood Ratio	61.563	4	.000
Linear-by-Linear Association	39.719	1	.000
N of Valid Cases	80		

a. 3 cells (30.0%) have expected count less than 5. The minimum expected count is .85.

The results for Table 4.4.13 reveal that regulatory issues significantly impact the construction of 1st level hospitals in Lusaka. A substantial portion of respondents identified these issues as either a "Serious Problem" (36.3%) or a "Very Serious Problem" (18.8%), together accounting for 55.1% of the sample. The Pearson chi-square test shows a significant association between regulatory issues and whether respondents faced them, with a chi-square value of 51.623 and a p-value of .000. This suggests a pervasive influence of regulatory challenges, underscoring the critical need for robust compliance strategies and regulatory management to mitigate these impacts effectively.

Discussions

Figure 4.1.1: Gender

Table 4.1.1 and Figure 4.1.1 shows the gender distribution of the study's participants. Out of the 89 respondents, 62 are male, representing 70% of the sample, while 27 are female, accounting for 30%. The cumulative percentage shows that including the female participants brings the total to 100%. This distribution highlights a high representation of male respondents within the sample, providing insight into the demographic makeup of the study population.

Age Distribution

The age group distribution in Table 4.1.2 and Figure 4.1.2 reveals that the majority of respondents are between 32-41 years old, representing 41.6% of the sample. This is followed by the 41-50 years group at 21.3%, and the 22-31 years group at 20.2%. Only 16.9% of the respondents are aged 51 years and above. The cumulative percentages show a progressive increase across age groups, indicating a balanced representation of different age categories. This demographic profile suggests that the study captures insights from a workforce predominantly in their most productive years, which could significantly influence the perceived effectiveness and implementation of project cost control mechanisms.

Education Level

The education level distribution in Table 4.1.3 shows that the majority of respondents involved in the construction of 1st level hospitals in Lusaka hold a Bachelor's degree, accounting for 52.8% of the sample. This is followed by those with a Master's degree at 34.8%, while PhD holders comprise 7.9%. Additionally, 4.5% of respondents have professional certifications. The cumulative percentages indicate a progressive accumulation, reflecting a well-educated workforce. This high level of educational attainment suggests that the project benefits from a knowledgeable and skilled team, which is likely to enhance the effectiveness of project cost control mechanisms and overall project performance.

Years of Experience in Construction

The distribution of years of experience among respondents, as shown in Table 4.1.4, indicates that the largest group has 6-10 years of experience, representing 34.8% of the sample. This is followed by those with 11-15 years of experience at 29.2%, and those with 16 years or more at 20.2%. The least experienced group, with 1-5 years, makes up 15.7% of the respondents. The cumulative percentages demonstrate a steady increase across the experience categories, suggesting a balanced mix of experience levels within the workforce. This diverse range of experience is beneficial for enhancing the effectiveness of project cost control mechanisms, as it combines fresh perspectives with seasoned expertise.

Objective 1

Cost Control Techniques Used

The distribution of cost control techniques in Table 4.2.1 and Figure 4.2.1 reveals that Budgeting and Forecasting is the most commonly used method, employed by 27.0% of the respondents. This is followed by Cost Estimation at 21.3%, and Risk Management at 19.1%. Earned Value Management (EVM) and Value Engineering are used by 16.9% and 15.7% of respondents, respectively. The cumulative percentages show a progressive increase, indicating that a diverse array of cost control techniques is utilized across the projects. This variety suggests a comprehensive approach to managing project costs, leveraging multiple methodologies to enhance overall project performance and financial control.

Effectiveness of Budgeting and Forecasting

The results in Table 4.2.3 and Figure 4.2.3 show that 40.4% of respondents rate the cost control techniques as "Very Effective," while 34.8% consider them "Effective," making a combined 75.2% of respondents who find these techniques beneficial. A smaller proportion, 16.9%, deem the techniques "Somewhat Effective," and only 7.9% rate them as "Not Effective." The cumulative percentages highlight a generally positive perception of the cost control methods' effectiveness in the construction of 1st level hospitals in Lusaka, suggesting that the majority of respondents believe these techniques significantly enhance project performance.

Effectiveness of Cost Estimation

The results in Table 4.2.4 indicate that cost estimation is regarded as highly effective by the majority of respondents involved in the construction of 1st level hospitals in Lusaka. Specifically, 41.7% of the respondents' rate cost estimation as "Very Effective," and 46.1% find it "Effective," totaling 87.8% who view it positively. A smaller portion, 12.3%, considers it "Somewhat Effective," while only 2.2% rate it as "Not Effective." The cumulative percentages reflect a strong consensus on the effectiveness of cost estimation practices, suggesting that these methods are critical in enhancing project performance and ensuring budgetary control.

Effectiveness of Risk Management

The results in Table 4.2.5 and Figure 4.2.5 demonstrate that the majority of respondents consider the risk management techniques in the construction of 1st level hospitals in Lusaka to be highly effective. Specifically, 46.1% rate these techniques as "Very Effective," while 36.0% find them "Effective," totaling 82.1% who view them positively. Only 11.2% of respondents regard the techniques as "Somewhat Effective," and a mere 6.7% deem them "Not Effective." This distribution indicates a strong overall confidence in the risk management strategies employed, suggesting that these techniques play a crucial role in mitigating project risks and enhancing project performance.

Effectiveness of Earned Value Management (EVM)

Figure 4.2.6: Effectiveness of Earned Value Management (EVM)

The results in Table 4.2.6 and Figure 4.2.6 illustrate that the majority of respondents find Earned Value Management (EVM) techniques to be effective in the construction of 1st level hospitals in Lusaka. Specifically, 42.7% rate EVM as "Effective," while 23.6% consider it "Very Effective," totaling 66.3% of respondents who view EVM positively. Additionally, 22.5% find EVM to be "Somewhat Effective," and 11.2% rate it as "Not Effective." This distribution indicates a general consensus on the utility of EVM techniques, although there is a notable proportion of respondents who perceive room for improvement, suggesting a mixed but overall favorable reception to EVM in project cost control.

Impact on On-Time Delivery

The results in Table 4.2.7 and Figure 4.2.7 indicate that the majority of project deliveries in the construction of 1st level hospitals in Lusaka are timely, with 32.6% of respondents reporting that projects are "Always on Time" and 40.4% stating they are "Mostly on Time." Combined, this accounts for 73.0% of deliveries being punctual. However, 19.1% of respondents indicate that projects are "Sometimes on Time," and 7.9% report that they are "Rarely on Time." The cumulative percentages highlight that while on-time delivery is generally high, there is still a notable proportion of projects experiencing delays, suggesting a need for improved scheduling and time management practices to ensure consistent timely delivery.

Impact on Budget Compliance

The results in Table 4.2.8 and Figure 4.2.8 show that a significant majority of the projects in the construction of 1st level hospitals in Lusaka adhere to their budgets, with 30.3% of respondents indicating that projects are "Always Within Budget" and 41.6% reporting they are "Mostly Within Budget." This combined 71.9% suggests strong budget compliance overall. However, 21.3% of respondents note that projects are "Sometimes Within Budget," and 6.7% report they are "Rarely Within Budget." The cumulative percentages indicate a general trend of effective budget management, though there is still a notable minority experiencing budget overruns, highlighting areas for potential improvement in financial planning and control.

Impact on Quality of Work

The results in Table 4.2.9 and Figure 4.2.9 illustrate that 46.1% of respondents rate the quality of work in the construction of 1st level hospitals in Lusaka as "High Quality," while 32.6% consider it "Moderate Quality." Additionally, 12.4% find the work "Acceptable," and only 9.0% rate it as "Low Quality." The cumulative percentages reveal a generally favorable assessment, with the majority of respondents expressing satisfaction with the quality of work. This suggests that the construction projects maintain a commendable standard, though there remains a minority who perceive the quality as low, indicating areas for potential improvement.

4.2 Presentation of Results Based on a Thematic Area Developed from Objective Two

To establish effectiveness of cost control mechanisms in construction projects

The results in Table 4.3.1 highlight the key problems encountered by contractors in managing construction project costs for 1st level hospitals in Lusaka. The most prevalent issue is budget overruns, reported by 41.3% of respondents. This is followed by delays and schedule overruns, affecting 30.0%. Inefficient resource management and inaccurate cost estimation are also notable concerns, cited by 7.5% and 6.3% of respondents, respectively. Additionally, issues such as lack of financial control and monitoring, contractual disputes, compliance and regulatory issues, and unforeseen site conditions each account for

3.8%. These findings underscore the multifaceted challenges in project cost management, highlighting the need for more robust strategies and controls to address these persistent issues effectively.

Figure 4.3.2: Problems Encountered in Managing Construction Project Costs

Figure 4.3.2 highlights the problems encountered by contractors in managing construction project costs, in line with the objective to examine these challenges. The most frequently reported issue is delays and schedule overruns, affecting 33.3% of the projects, followed by material price fluctuations and compliance and regulatory issues, each impacting 18.3% of the projects. Budget overruns are also significant, affecting 16.7% of the projects, while inaccurate cost estimation is encountered by 13.3% of the projects.

Table 4.3.3: Problem Encountered and Delay Status Crosstabulation

There were 18 projects with delays and 7 without. The expected counts were 12.0 and 4.9, respectively. This indicates that delays and schedule overruns are more frequent than expected among projects with delays. There were 8 projects with delays and 4 without, compared to expected counts of 5.7 and 2.3. This suggests inaccurate cost estimation also contributes to delays. With 12 projects experiencing delays and 5 without, against expected counts of 8.1 and 3.3, material price fluctuations significantly impact project delays. There were 6 projects with delays and 2 without, compared to expected counts of 3.8 and 1.6. Compliance issues, although less frequent, still show a higher-than-expected contribution to delays. This category had no projects experiencing delays and 30 without, which deviates significantly from the expected counts of 14.3 and 5.9. This suggests that budget overruns are less likely to cause project delays compared to other issues.

Given the p-value (.000) is less than the significance level of 0.05, we reject the null hypothesis. This indicates a statistically significant relationship between the problems encountered by contractors and project delays.

Implications

The significant chi-square value implies that the problems contractors face in managing construction project costs are strongly associated with project delays. Delays and Schedule Overruns, Inaccurate Cost Estimation, Material Price Fluctuations, and Compliance Issues: These problems show higher-than-expected counts of project delays, highlighting their critical role in causing delays. Interestingly, budget overruns appear less associated with delays, suggesting that while prevalent, they may not directly impact project timelines as much as the other issues.

4.2 Presentation of Results Based on a Thematic Area Developed from Objective Three

To ascertain relationship between cost control mechanisms and project performance

The results in Table 4.3.1 show that Risk Management is the most frequently used cost control technique, with a mean of .77, followed by Resource Management with a mean of .62. Budgeting and Forecasting, along with Project Scheduling Monitoring, both have a mean of .53, indicating moderate usage. Earned Value Management also shows considerable usage with a mean of .50. Procurement Management (mean = .40), Cost Benefit Analysis (mean = .23), and Change Order Control (mean = .18) are less frequently used. These statistics suggest that while a variety of cost control mechanisms are employed, there is a stronger reliance on risk and resource management techniques. This variation in the frequency of use highlights the importance of integrating multiple cost control methods to enhance overall project performance.

The correlation analysis in Table 4.3.2 shows a strong positive relationship between Budgeting and Forecasting and its perceived effectiveness, with a Spearman's rho correlation coefficient of .108. The significance value (p = .002) is less than the conventional threshold of .05, indicating that the correlation

is not statistically significant. This suggests that there is a strong evidence to support that more frequent use of Budgeting and Forecasting is associated with higher effectiveness in managing project costs within the context of the 1st level hospitals' construction in Lusaka.

The Spearman's Rank Correlation test results indicate the relationship between the use of Earned Value Management (EVM) and its perceived effectiveness. The correlation coefficient between EVM usage and its effectiveness is 0.033, suggesting a positive correlation. The significance value (Sig. 2-tailed) of 0.0300 is less than 0.05, indicating that the correlation is statistically significant. Therefore, there is strong evidence to suggest a meaningful relationship between the application of EVM and its perceived effectiveness among the respondents.

Table 4.3.4: Correlations between Cost Benefit Analysis and Effectiveness CBA

Correlations

The Spearman's Rank Correlation test results for Cost Benefit Analysis (CBA) and its perceived effectiveness indicate a very weak negative correlation, with a correlation coefficient of -0.010. The significance value (Sig. 2-tailed) is 0.937, which is significantly higher than 0.05, indicating that the correlation is not statistically significant. Therefore, there is no strong evidence to suggest a meaningful relationship between the use of Cost Benefit Analysis techniques and their perceived effectiveness among the respondents.

Table 4.3.5: Correlations between Change Order Control and Effectiveness

The Spearman's Rank Correlation test results for Change Order Control and its perceived effectiveness show a very weak positive correlation, with a correlation coefficient of 0.011. The significance value (Sig. 2-tailed) is 0.931, which is much higher than 0.05, indicating that the correlation is not statistically significant. Therefore, there is no strong evidence to suggest a meaningful relationship between the use of Change Order Control techniques and their perceived effectiveness among the respondents.

The Spearman's Rank Correlation test results for Risk Management and its perceived effectiveness show a very weak positive correlation, with a correlation coefficient of 0.110. The significance value (Sig. 2-tailed) is 0.401, which is much higher than 0.05, indicating that the correlation is not statistically significant. Therefore, there is no strong evidence to suggest a meaningful relationship between the use of Risk Management techniques and their perceived effectiveness among the respondents.

Table 4.3.7: Correlations between Resource Management and Effectiveness

The Spearman's Rank Correlation test results for Resource Management and its perceived effectiveness show a weak negative correlation, with a correlation coefficient of 0.140. The significance value (Sig. 2-tailed) is 0.027, which is less than 0.05, indicating that the correlation is statistically significant. Therefore, there is strong evidence to suggest a meaningful relationship between the use of Resource Management techniques and their perceived effectiveness among the respondents.

Table 4.3.8: Correlations between Project Scheduling Monitoring and Effectiveness

The Spearman's Rank Correlation test results for Project Scheduling Monitoring and its perceived effectiveness show a weak positive correlation, with a correlation coefficient of 0.171. The significance value (Sig. 2-tailed) is 0.012, which is less than 0.05, indicating that the correlation is statistically significant. Therefore, there is a strong evidence to suggest a meaningful relationship between the use of Project Scheduling Monitoring techniques and their perceived effectiveness among the respondents.

The Spearman's Rank Correlation test results for Procurement Management and its perceived effectiveness show a weak positive correlation, with a correlation coefficient of 0.261. The significance value (Sig. 2-tailed) is 0.044, which is less than 0.05, indicating that the correlation is statistically significant. This

suggests that there is a meaningful relationship between the use of Procurement Management techniques and their perceived effectiveness among the respondents. Although the correlation is not very strong, it indicates that as the use of Procurement Management techniques increases, the perceived effectiveness also tends to increase, highlighting the importance of proper procurement practices in enhancing project outcomes.

4.2 Presentation of Results Based on a Thematic Area Developed from Objective Four To analyze constraints in project control mechanisms in construction projects

The results in Table 4.4.1 identify labor shortages as the most significant cost-control problem in the construction of 1st level hospitals in Lusaka, with a sum of 229 and a standard deviation of .948, indicating a consistent issue among respondents. Poor project planning and inaccurate cost estimation, both with sums of 224, also emerge as major challenges. Material price fluctuations (sum = 221) and delayed payments (sum = 218) are notable concerns, alongside regulatory issues (sum = 219), which have the highest standard deviation of 1.022, suggesting variability in their impact. These findings highlight the diverse and critical challenges in project cost management, emphasizing the need for effective strategies to address these issues comprehensively.

The results in Table 4.4.2 indicate that material price fluctuations are a significant issue in the construction of 1st level hospitals in Lusaka, with 43.8% of respondents identifying it as a "Serious Problem" and 15.0% considering it a "Very Serious Problem." Together, these concerns account for 58.8% of the sample. Meanwhile, 28.7% view it as a "Moderate Problem," and 12.5% as a "Minor Problem." The cumulative percentages reflect that a majority of respondents experience material price fluctuations as a substantial challenge, emphasizing the need for effective strategies to mitigate this volatility to ensure project cost stability.

The results in Table 4.4.3 indicate that delayed payments are a significant issue in the construction of 1st level hospitals in Lusaka, with 33.8% of respondents identifying it as a "Serious Problem" and 18.8% considering it a "Very Serious Problem," together accounting for 52.6% of the sample. Additionally, 33.8% view it as a "Moderate Problem," while 13.8% see it as a "Minor Problem." The cumulative percentages show that over half of the respondents experience delayed payments as a major challenge, highlighting the necessity for improved financial management and timely payment practices to mitigate this issue and ensure smoother project execution.

Table 4.4.4: Poor Project Planning

The results in Table 4.4.4 reveal that poor project planning is a significant issue in the construction of 1st level hospitals in Lusaka, with 38.8% of respondents identifying it as a "Serious Problem" and 18.8% considering it a "Very Serious Problem," together accounting for 57.6% of the sample. Additionally, 28.7% view it as a "Moderate Problem," while 13.8% see it as a "Minor Problem." The cumulative percentages indicate that poor project planning is a pervasive challenge, underscoring the need for improved planning practices to enhance project performance and mitigate associated risks.

Table 4.4.5: Inaccurate Cost Estimation

The results in Table 4.4.5 indicate that inaccurate cost estimation is a significant issue in the construction of 1st level hospitals in Lusaka, with 38.8% of respondents identifying it as a "Serious Problem" and 20.0% considering it a "Very Serious Problem," together accounting for 58.8% of the sample. Additionally, 28.7% view it as a "Moderate Problem," while 12.5% see it as a "Minor Problem." The cumulative percentages demonstrate that inaccurate cost estimation is a prevalent challenge, highlighting

the need for more precise and reliable cost estimation practices to improve project management and financial control

Table 4.4.6: Labor Shortage

The results in Table 4.4.6 indicate that labor shortages are a significant issue in the construction of 1st level hospitals in Lusaka, with 40.0% of respondents identifying it as a "Serious Problem" and 22.5% considering it a "Very Serious Problem," together accounting for 62.5% of the sample. Additionally, 27.5% view it as a "Moderate Problem," while 10.0% see it as a "Minor Problem." The cumulative percentages reflect that labor shortages are a pervasive challenge, emphasizing the need for improved labor management strategies to ensure adequate workforce availability and enhance project performance.

The results in Table 4.4.7 indicate that regulatory issues are a significant challenge in the construction of 1st level hospitals in Lusaka, with 36.3% of respondents identifying them as a "Serious Problem" and 18.8% considering them a "Very Serious Problem," together accounting for 55.1% of the sample. Additionally, 28.7% view them as a "Moderate Problem," while 13.8% see them as a "Minor Problem," and only 2.5% consider them "Not a Problem." The cumulative percentages reflect that regulatory issues are a pervasive concern, underscoring the need for better regulatory management and compliance strategies to mitigate these challenges effectively.

Table 4.4.8: Material Price Fluctuations and Severity Impact

The results for Table 4.4.8 indicate that material price fluctuations are a commonly encountered problem in the construction of 1st level hospitals in Lusaka. The majority of respondents faced this issue, with 43.8% considering it a "Serious Problem" and 15.0% viewing it as a "Very Serious Problem." The chi-square tests reveal no significant association between the severity of the problem and whether respondents faced it, with Pearson's chi-square value of 2.700 and a p-value of .440. This suggests that material price fluctuations are consistently problematic across the sample, emphasizing the need for strategies to stabilize material costs and mitigate their impact on project budgets.

Table 4.4.9: Delayed Payments and Severity Impact

The results for Table 4.4.9 reveal that delayed payments are a significant issue in the construction of 1st level hospitals in Lusaka. Specifically, 33.8% of respondents classify them as a "Serious Problem," and 18.8% as a "Very Serious Problem," totaling 52.6% of the sample. The chi-square tests show no significant association between the severity of delayed payments and the experience of this problem, with Pearson's chi-square value of 1.730 and a p-value of .630. This indicates that delayed payments are a consistent challenge across the sample, highlighting the need for timely financial management practices to mitigate this issue and ensure project continuity.

Table 4.4.10: Poor Project Planning and Severity Impact

The results for Table 4.4.10 reveal that poor project planning is a significant issue in the construction of 1st level hospitals in Lusaka, with 38.8% of respondents identifying it as a "Serious Problem" and 18.8% as a "Very Serious Problem," totaling 57.6% of the sample. The chi-square tests show no significant association between the severity of poor project planning and whether respondents faced this problem, with Pearson's chi-square value of 5.762 and a p-value of .124. This indicates that poor project planning is consistently problematic across the sample, highlighting the need for improved planning practices to mitigate its impact and enhance project outcomes.

Table 4.4.11: Inaccurate Cost Estimation and Severity Impact

The results for Table 4.4.11 indicate that inaccurate cost estimation is a significant issue in the construction of 1st level hospitals in Lusaka, with 38.8% of respondents identifying it as a "Serious Problem" and

20.0% as a "Very Serious Problem." However, the chi-square tests show no significant association between the severity of inaccurate cost estimation and whether respondents faced this problem, with Pearson's chi-square value of 1.330 and a p-value of .722. This suggests that inaccurate cost estimation is a consistently problematic issue across the sample, highlighting the need for improved accuracy and reliability in cost estimation practices to enhance project outcomes.

The results for Table 4.4.12 highlight that labor shortages are a significant issue in the construction of 1st level hospitals in Lusaka, with 40.0% of respondents identifying it as a "Serious Problem" and 22.5% as a "Very Serious Problem." However, the chi-square tests show no significant association between the severity of labor shortages and whether respondents faced this problem, with Pearson's chi-square value of 3.692 and a p-value of .297. This indicates that labor shortages are consistently problematic across the sample, underscoring the need for improved labor management strategies to mitigate their impact on project performance.

Table 4.4.13: Regulatory Issues and Severity Impact

The results for Table 4.4.13 reveal that regulatory issues significantly impact the construction of 1st level hospitals in Lusaka. A substantial portion of respondents identified these issues as either a "Serious Problem" (36.3%) or a "Very Serious Problem" (18.8%), together accounting for 55.1% of the sample. The Pearson chi-square test shows a significant association between regulatory issues and whether respondents faced them, with a chi-square value of 51.623 and a p-value of .000. This suggests a pervasive influence of regulatory challenges, underscoring the critical need for robust compliance strategies and regulatory management to mitigate these impacts effectively.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

Conclusion

The construction sector is a significant contributor to Zambia's economy and development. However, the construction industry in Zambia is facing crucial concerns such as high construction costs, major losses, and high project failure rates (Tookey, 2018, McLennan, 2019, Cann, 2022). One of the major reasons for failure in construction projects is cost overruns due to poor cost control system (Sridarran et al., 2017). Previous works stated that probability of occurrence of the cost overrun is almost 86% worldwide, and nine out of ten projects failed due to cost overrun (Flyvbjerg et al., 2018). Project control systems primarily aim to measure project performance by setting performance standards, monitoring and comparing actual performance against the standards, and taking necessary corrective actions (Olawale and Sun, 2013). Project control can also serve as historical data to inform decision-making in for future project scheduling and estimating purposes (Del Pico, 2013). Recent studies have focused on the scope of project control, the importance of project control, project control models and systems, project control techniques and tools, as well as success factors and barriers to project control systems (Olawale and Sun, 2013, Jawad et al., 2018, Olawale and Sun, 2015, Jawad and Ledwith, 2021, Willems and Vanhoucke, 2015, Durdyev, 2021). The findings from these studies explained the project control system currently in use and the key factors that influence the system. Previous research has developed various cost control systems, explored cost control techniques and identified success factors for the cost control process (Benjaoran, 2009, Bryde et al., 2018, Bahaudin et al., 2012, Jayaraman, 2016, Jawad et al., 2022). However, limited studies have examined performance of the cost control system and inherent relationships among different elements of project cost control system with the view to optimize the system. Meanwhile, "maturity model" is a conceptual framework, initially used in the software engineering industry to

examine the performance of organization's services or specific tasks whereby organisations can develop improvement actions to achieve the higher maturity (Project Management Institute, 2013). Maturity models have been developed to guide organisations in assessing their performance by comparing the best practices and the quality standards of the organization relative to others (Albliwi et al., 2014).

This chapter presents a comprehensive discussion of the findings on the effectiveness of cost control mechanisms in enhancing project performance for the construction of 1st Level Hospitals in Lusaka. Building on the results analyzed in Chapter 4, the discussion explores the implications of these findings within the broader context of construction project management. The chapter critically examines the alignment of these findings with existing literature, highlighting how cost control mechanisms like budgeting, forecasting, stakeholder engagement, and monitoring impact project success in terms of budget adherence, quality, and timely completion.

Recommendations

The study recommends to adopt project cost control techniques as a means of improving project performance. This will help reduce cost overruns, delays and issues of quality of the finished project and result in improved performance. Management teams of other projects such as construction and building, road and development projects are advised to read and gain insights from this study to implement project cost control techniques.

The study also recommends that the project management and teams improve cost estimation measures that are incurred during the different project phases, and effectively budgeting for material needs for the various functional units of the project. The project managers should also set monitoring and evaluation teams to check on the progress of the project and set expenditure controls for improvement in performance of the projects.

The study also recommends to policy makers at the national and county government level to set guidelines that will reduce the challenges in project performance such as cost overruns, stalling and abandonment of projects. The policies should also endorse and support training programs for contractors, engineers and project managers on management of costs for delivery of quality and timely projects that keep to the stipulated budget

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