

MAKERERE



UNIVERSITY

COLLEGE OF ENGINEERING, DESIGN, ART AND TECHNOLOGY

SCHOOL OF BUILT ENVIRONMENT

DEPARTMENT OF CONSTRUCTION ECONOMICS AND MANAGEMENT

QUANTITY SURVEYING

**TOPIC: INVESTIGATING THE IMPACT OF COST CONTROL TECHNIQUES ON
TIMELY COMPLETION OF CONSTRUCTION PROJECTS IN UGANDA.**

BY

NKATA DERICK

17/U/934

SUPERVISOR


MADAM NAMAKULA HIDAYA

A Research Report Submitted to the Department of Construction Economics and Management,
Makerere University in Partial Fulfilment of the requirements for the Award of the Degree of
Bachelor of Science in Quantity Surveying.

FEBRUARY 2022

DECLARATION

I NKATA DERICK declare that this research proposal is a result of my effort and hard work. It has never been submitted anywhere else for the award of degree, diploma, Certificate of Merit or as research work by an individual or group of individuals, therefore any similarity of words or ideas brought forward is because of coincidence of ideas and opinions of similar researches that have been done before.

Signature: 

Date: 14/02/2022

This report has been submitted with the approval of the university supervisor

Supervisor; Ms. Namakula Hidayah

Signature: 

Date: 15/02/2022

DEDICATION

This research is affectionately dedicated to our dear families, friends, relatives and whoever helped us in any way possible for the love, support and encouragement we have received throughout this entire learning period.

ACKNOWLEDGEMENT

I thank the Almighty God who gifted us with good health, strength, and knowledge throughout the entire time which enabled me to complete this research project.

I express my sincere gratitude to my supervisor, Madam Namakula Hidayah. The door to Madam Namakula Hidayah's office was always open whenever I ran into a trouble spot or had a question about our research. She consistently allowed this report to be my work but steered me in the right direction whenever she thought I needed it. I also thank the experts who were involved in the survey for this research project. May the Almighty God bless you all.

ABSTRACT

The purpose of the study was to investigate the impact of cost control techniques on the timely completion of construction projects and was done on a selection of 65 construction sites around the five divisions of Kampala. Previous studies focused on the causes of time and cost overruns and also the impact of cost control techniques on cost overruns. The study was done through the distribution of questionnaires online and also by interviewing the professionals at the site responsible for cost control and time management. The study identified the cost control techniques used on-site and the factors affecting the timely completion of construction projects. The cost control techniques were then assessed to find out if they could address the factors affecting the timely completion. It was found out that some cost control techniques to a greater extent to have a positive impact on timely completion since they were used to correct and prevent factors that affect the timely completion of construction projects from happening though such factors had to be falling under non-excusable delays and compensable delays.

TABLE OF CONTENTS

DECLARATION		
i		
DEDICATION		
ii		
ACKNOWLEDGEMENT		
iii		
ABSTRACT		
iv		
	CHAPTER	1
.....	1	
1.1 Topic.....		1
1.2 Introduction		1
1.3 Problem Statement		2
1.4 Main Objective		3
1.4.1 Specific Objectives		3
1.5 Research Questions		3
1.6 Justification and Significance.....		3
1.7 Scope of Study		3
1.7.1 Content Scope		3
1.7.2 Time Scope		4
CHAPTER 2 LITERATURE REVIEW		5
2.1 Construction Costs		5
2.1.1 Subprojects costs		5
2.1.2 Current projects cost		5
2.1.3 Other costs		5
2.1.4 Cost cases stipulated in the contract		5

2.1.5	Tax	5
2.2	Cost management	6
2.2.1	Cost estimating.....	6
2.2.2	Cost budgeting	6
2.2.3	Cost controlling	7
2.3	Cost control in construction	7
2.3.1	Project Resources and Controls	8
2.3.2	Cost Control Techniques.....	9
2.4	Timely completion	11
2.4.1	Delay in construction projects	11
2.5	Time-Cost Relationship.....	14
CHAPTER 3 METHODOLOGY		16
3.1	Introduction	16
3.2	Research Design	16
3.3	Research Approach	16
3.4	Study Population	16
3.5	Sampling design	16
3.6	Sample size	17
3.7	Data Collection Methods and Instruments	17
3.7.1	Data Collection Methods	17
3.7.2	Data Collection Instruments	17
3.7.3	Questionnaire Survey	18
3.7.4	Interviews	18
3.7.5	Sources of data	18
3.8	Data Analysis	18

3.9	Data Validity and Reliability.....	18
3.10	Ethical Consideration	19
CHAPTER 4 FINDINGS AND ANALYSIS		19
4.1	Introduction	19
4.2	The response rate of the questionnaire survey	19
4.3	Background of the respondents	19
4.3.1	The profession of the respondent in the construction field	19
4.3.2	Experience of the respondents in the field of construction	21
4.3.3	Project details	22
4.3.4	Kind of stakeholder being worked for in the project	23
4.3.5	Project duration	24
4.3.6	Involvement in cost control	25
4.3.7	Number of times cost control is carried out on the project	26
4.4	Cost Control	27
4.4.1	The cost control techniques used on construction sites.	27
4.4.2	The problems encountered while using cost control techniques	27
4.4.3	Factors affecting time	28
4.4.4	Effects of using cost control techniques on building construction projects	29
4.4.5	Effect of cost control techniques on the factors affecting time.	30
4.5	Key Findings	32
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS		35
5.1	Introduction	35
5.2	Conclusions	35
5.3	Recommendations	35

Bibliography	37
--------------------	----

APPENDIX	
----------------	--

1 LIST OF FIGURES

Figure 1 Showing Years of Experience	21
Figure 2 Showing Project Duration	24
Figure 3 Showing Cost Control Techniques	27
Figure 4 showing factors that can be prevented and/or corrected by monitoring work and cost performance	30
Figure 5 showing factors that can be prevented and/or corrected by site meetings	30
Figure 6 showing factors that can be prevented and/or corrected by schedules	31
Figure 7 showing factors that can be prevented and/or corrected by record keeping	31
Figure 8 showing factors that can be prevented and/or corrected reports	32
Figure 9 showing factors that can be prevented and/or corrected by evaluation of works carried out	32

LIST OF TABLES

Table 1 Showing the profession of respondents	20
Table 2 Showing Years of Experience.....	21
Table 3 Showing Project Details.....	22
Table 4 Showing kind of Stakeholder Being Worked for in the Project	23
Table 5 Showing Project Duration	24
Table 6 Involvement in Cost Control.....	25
Table 7 Showing how Often Cost control is used.....	26
Table 8 Showing Problems encountered while using cost control techniques	27
Table 9 Showing Factors affecting time	28
Table 10 Showing effects of using cost control techniques on building construction projects	29

CHAPTER 1

1.1 Topic

Investigating the impact of cost control techniques on timely completion of building construction projects in Uganda.

1.2 Introduction

The construction industry is a vital sector of a country's economy and has been a key driver of economic growth in the country. The construction industry contributes 12% of Uganda's gross development product (GDP) and has witnessed steady growth for the last 20 years and despite the recent upsurge in inflation, the sector has remained on the steady path of growth and development (Uganda National Commission for UNESCO, 2013). Therefore, efforts geared towards improving construction efficiency employing cost-effectiveness and timeliness would be worthwhile and certainly contribute to cost savings for the country as a whole (D. R. OGUNSEMI, 2006).

The construction industry is faced with various uncertainties due to the dynamic economic situations, technological advancements, environmental influences, project inherent factors, and capabilities of the project management team (Cooray, December 2018). Due to these uncertainties, stakeholders find it difficult to control their project costs and time. The performance of construction projects via the cost is a key success factor for project funding. Projects, the world over requires the budget to set the client's financial commitment and create an avenue for the control of cost and measurement of cost performance during the design process as well as during construction (Baccarini, 2005). In construction, almost all clients are interested in obtaining fully functional facilities completed in time, cost, quality, and scope. A builder who can construct within the estimated time and budget, to the right standards and scope is an excellent builder (Sherif Mohamed Hafez, 2015).

In general, most construction projects experience cost overruns and time delays during the implementation stage. Cost overruns can be considered as one of the main issues during the execution of the project. (Koushki, 2004). Therefore, project control is employed to remove these difficulties. Project controlling which consists of project monitoring and updating is the other important activity that can be carried out to accommodate the dynamic nature of construction work.

Without proper control, even a well-planned and scheduled construction system can cause problems, delays, and cost overruns (S.N. Malkanthi, 2017). In the construction industry, project control aims to ensure that projects finish on time, within budget, and achieve other project objectives. (Yakubu Adisa Olawale, 2010). It is a complex task undertaken by project managers in practice, which involves constantly measuring progress, evaluating plans and taking corrective actions when required (Kerzner, 2003). Project control includes both progress control and cost control. The control of project costs is not an easy task as it requires knowledge of the application of cost control techniques. Therefore, professionals working in the construction industry are required to have theoretical knowledge on cost controlling techniques. The project manager/planning engineer or any other related professional has to have an understanding of the important aspects of a project such as the selection of an appropriate method of cost control, time of applying the technique, etc. Therefore, it will be essential for the construction industry today to use proper project cost control (S.N. Malkanthi, 2017).

With more research and literature being devoted to the impact of cost control techniques on cost overruns, the impact of cost control techniques on the timely completion of constructions project becomes a significant research area in the current industrial community.

1.3 Problem Statement

The construction industry can be viewed as a vigorous industry that is often confused and disturbed with uncertainties coming from weather changes, economic factors political and legislative factors. This ambiguous situation creates poor cost management and ultimately leads to cost and time overruns, conflicts, and sometimes relinquishing projects. Thus, the successful execution of construction projects is often affected by financial constraints due to the high cost. Cost overruns are considered one of the most critical issues during the execution of construction projects (Chan A. S., 2004). As a solution, project management applies various project management tools and techniques to control the higher costs (Cooray, December 2018). Most of the research has focused on cost control techniques to overcome financial constraints. However, a few types of research have been conducted regarding the impact of cost control techniques on the timely completion of construction projects.

1.4 Main Objective

To investigate the impact of cost control techniques on the timely completion of building construction projects.

1.4.1 Specific Objectives

- i. To identify cost control techniques used in building construction projects.
- ii. To examine the problems encountered when using cost control techniques on building construction projects.
- iii. To examine the factors affecting time.
- iv. To determine the effect of cost control techniques on the factors affecting the timely completion of building construction projects.

1.5 Research Questions

To guide the study and achieve the above-stated research objectives; the following research questions were formulated:

What cost control techniques are frequently used by contractors in the construction process?

What are the problems encountered when using cost control techniques on building construction projects?

What are the factors affecting time?

What are the effects of cost control techniques on the factors affecting timely completion of building construction projects?

1.6 Justification and Significance

Cost control techniques are important on the construction project as they help to keep the costs under the estimated budget to reduce or eliminate cost overruns on the project. Therefore, this research is important because it will create awareness of the extent to which cost control techniques can affect the timely completion of building construction projects in Uganda.

1.7 Scope of Study

1.7.1 Content Scope

The research was carried out on building construction projects around the five divisions Kampala and focused on cost control techniques used on construction projects and how they affect the timely completion of those projects.

1.7.2 Time Scope

This study took approximately two months; one month for the collection of data and the other for analysis and presentation of the collected data.

CHAPTER 2 LITERATURE REVIEW

2.1 Construction Costs

One of the serious shortcomings in the field of construction management in-country is the failure to set up a system for recording the actual cost of certain different activities during implementing tasks. Each company to estimate its profit and loss during the project implementation creates a method but as long as these methods are not systematic and principled, always there is the danger of forgetting or neglecting some costs and responsible may face unexpected and often harsh results. Project costs include the cost of sub-projects, the cost of current issues in the project other costs available at the project, costs stipulated in the agreement and tax (Zirong, 2005) which is described below;

2.1.1 Subprojects costs

Labor costs, raw material costs, costs of construction machines in the project, investor managers rights, benefits and costs of risk.

2.1.2 Current projects cost

The cost of environmental protection facilities, the cost of security systems, facility cost of heating (thermal), the cost of the building at night, Relocation costs, construction costs and the winter rainy season, the location of this equipment and large machinery. The cost of setting up and installing the equipment, the cost of drainage construction costs spent to accelerate construction, the cost of building thermal coatings Protection of labor and equipment costs has been completed, the work and the cost of protecting and strengthening the concrete forms, scaffolding costs, the cost of lifting equipment.

2.1.3 Other costs

Temporary costs estimated prices temporarily (temporary price estimate, evaluate prices estimated by the engineers, the cost of daily living, the cost of public services to contract

2.1.4 Cost cases stipulated in the contract

The cost of clean-up and removal of waste products from campus site, value per share, a premium, domestic investment, the project sudden accident insurance

2.1.5 Tax

Business tax, maintenance tax, and urban construction.

Each of the above issues is considered as a cost in the construction project, but in most cases because of the wrong actions, require that some activities be repeated. This has led that in addition to the cost which initially allocated to activities, other costs be considered to fix the defects. (Mohammad Miri, 2015).

Considering all the above reasons, cost management tools have to be applied to be within the range of the initially allocated funds.

2.2 Cost management

Project Cost Management is a management activity that deals with forecasting, planning, control, cost finding, analysis and evaluation of the contractors and it is used to control project cost (Zhen, 2008). Organizations that are active in many different projects are very interested in accurately estimating project costs. Contractors proposed an amount for each project, and after winning it should be implemented based on funds in the tender. They need to offer an amount that covers reasonable share overhead and meet intended profit. Project cost management performance when understood tangibly that due to improper management of early cost it appears on all components of the project. (Mohammad Miri, 2015)

From the standard perspective of PMBOK, cost management consists of four arguments that are hierarchically associated with each other that including resource planning, cost estimating, cost budgeting, and cost control (Institute, 2004). Each of these cases consists of three parts: input, processing, and output and the output of each section is the input of the next section.

2.2.1 Cost estimating

Cost estimating usually involves the collection, analyzing, and summarizing of data readily available for a construction project (Choon, 2008). This normally involves taking into cognizance certain elements of labor, materials and plant unit cost of the individual items of work as specified in the bill of quantities and work specifications. The main function and purpose of cost estimation are to arrive at an accurate and dependable cost forecast of a construction project (Elhag, 1998).

2.2.2 Cost budgeting

Collecting the cost estimates, combining them to develop an overall cost and baseline. A budget is a statement of the amount of money that is available to spend over a period of time or a specific thing such as a building. It may include an outline plan or how that money will be spent, and a breakdown of the items it will be spent on. (designingbuildings, 2021) . In the process of cost

budgeting, the total estimated cost for the project is allocated separately to each of the project activities so that the basis for the cost to be defined. Following the project, the obtained base is used to measure project effectiveness (Mohammad Miri, 2015).

2.2.3 Cost controlling

Managing and controlling factors that change or affect the budget. Cost control includes identifying changes in the cost of the project, change management and evaluation of changes occurring at the moment of acceptance of changes. For this purpose, you need to control cost performance to identify potential disorders and avoid incorrect changes in costs. Cost control is a key activity, which consists of 5 steps:

- i. Determine the desired cost that project costs are controlled under that base.
- ii. Calculate the real cost based on the planned project
- iii. Comparison of the real cost and the cost of the project
- iv. Analysis of the level, degree of effects and cause of deviations
- v. Recommend ways to correct operation

Project Cost Management includes the processes required to ensure that projects are completed based on budget.

2.3 Cost control in construction

During the execution of a project, procedures for project control and record keeping become indispensable tools to managers and other participants in the construction process. (PMbook, 2020). Cost control can be achieved by selecting the right man for the right job, the right equipment and tools for the right work and the right quality of materials, in the right quantity, from the right source, at the right price and delivered at the right time (Dharwadker, 1996). Managers are expected to be well equipped to execute the project, with due consideration to the quality of work, yet within the estimated cost and limits. To achieve this, the required resources have to be in place. A Resource is an entity that contributes to the accomplishment of project activities. Time and cost are directly dependent on the availability of resources. The time required may be determined by dividing the productivity associated with the resources used on the activity into the defined quantity of work for the activity.

2.3.1 Project Resources and Controls

Resource planning determines resources, including manpower, materials, equipment, and their number to complete each of the project's activities. Cost estimates from the costs of the resources needed to complete project activities are associated with uncertainty. The degree of uncertainty in every phase of the construction project is different (Mohammad Miri, 2015). The success of a project depends upon the performance of these input resources when controlling costs (Hendrickson 1998). The clients should do everything possible to avoid unnecessary delays as it is one of the leading causes of cost escalation.

2.3.1.1 Materials

According to Butler (1982), one of the big problems on most building sites is a large amount of materials wastage due to varying circumstances. This problem requires a supervisor to constantly be on the lookout for losses. Wastage of materials can take place during the procurement process, storage, and utilization (Hendrickson, 1998). Wastage during procurement can result from one or more of the following causes: buying materials of wrong specifications, buying more than the actual requirements to cater for unrealistic and unforeseen eventualities, untimely buying of shortlife materials, improper and unnecessary handling of materials, and wastage in transportation. Wastage during storage can occur due to the following reasons: damages and breakages during handling, deterioration due to incorrect storage, incorrect maintenance and short-shelf life and losses due to fire, thefts/vandalism, and exposure to extreme climatic conditions. Other causes are lack of pre-work preparation and coordination, improper accounting and poor storekeeping, negligent and careless attitude of the supervisor, high rate of deterioration due to long storage at the place of work, and over-issues from the central stores and failures to return unused surplus materials to the stores (George Otim, 2012). Some unavoidable wastages are inherent during utilization, but excessive wastage is of concern to the management as it affects productivity adversely, with consequences of extra costs. Most problems relating to material wastage revolve around requisitioning and ordering, receipt and checking of deliveries from suppliers, offloading and handling, storing and protecting, and issuing, distributing and use of materials (Chitkara, 2005).

2.3.1.2 Plant

In construction, some tasks are labour intensive, some predominantly employ equipment, and some use a combination of both. According to (Hendrickson, 1998), while the actual work done and the

associated labour is accounted for by the supervisor concerned, the equipment and productivity control is undertaken to determine its employment time, the output achieved, and its productivity at the site. According to (Chitkara, 2005), the main purpose of the control is to minimize wastage in utilization so that the overall project cost is not affected. Industrializing construction would probably reduce the cost of construction by about 30% which would likely settle the backlog of 25% of Ugandans without proper housing (Alinaitwe, 2006) .

2.3.1.3 Labour

Labour productivity achieved at the site for a given work provides a measure of the labourer's efficiency and effectiveness and the level of site organization (George Otim, 2012). It shows the total time for which the laborer was employed at work, the time he was productive on work and the time he remained unproductive (Chitkara, 2005). According to (Alinaitwe, 2006) Craftsmen use about 40% of their available time on productive activities and about 33% of the time on nonvalue-adding activities. Productive times are wasted for various reasons such as idle waiting, unnecessary traveling, late starting, early quitting, unscheduled breaks, delays in the receipt of tolls, delays to receive materials and work instructions. The cost control process involves accounting of actual productivity, comparing with the standard, analyzing the causes for variations taking remedial measures for improvement (Chitkara, 2005). There is a need for close supervision and a good working relationship (Raina, 1999). Various report techniques used include; daily or weekly and monthly recording, schedule control, site daily diary report, and the project budget.

2.3.2 Cost Control Techniques

According to 'Project management book of knowledge (PMBOK)' there are a few techniques that would be useful for monitoring and controlling construction projects. Some of those techniques are earned value management (EVM), Project cost–value reconciliation, forecasting, To complete performance index (TCPI), Contract variance analysis (Unit costing) and performance review, reserve analysis.

i. Earned value management EVM

Earn Value Management (EVM) is a precautionary advisory system for risk planning and cost accounting. The return value provides a fixed measurement unit that analyses the actual cost and schedule performance with what is intended to give a complete picture. The EVM technique facilitates a proactive approach to observe project progress and respond to the variance (Hayes and

Miller, 2002) **ii. To complete**

performance index TCPI

To-complete performance index (TCPI) is one of the forecasting tools of earned value management. It is a useful tool for people who are engaged in the construction field (project managers, team members and other stakeholders). TCPI calculates the projection of the cost performance of the project based on the value of remaining work. TCPI helps to reach a set goal by improving the cost performance of the project (Scott, 2012) **iii. Project cost value reconciliation**

Cost value reconciliation (CVR) is used in scrutinizing the profitability of a project comparing costs.

According to George Otim (2012), Cost Control Techniques Used on Sites are seven in number and these cost control techniques used by contractors on sites were found to include: schedules, site inspection, the project budget, meetings, cost and work progress records and reports, monitoring work and cost performance and evaluation using bills of quantities and others. **a)**

Schedules

A construction project schedule is either a written or graphical representation of how the project is completed or constructed. It could be a description, depicted as a bar chart schedule or CPM schedule. A contractor bid is analogous to a contractor's bid. Just as the contractor's bid is an estimate of the cost that it expects to spend to build the project, the schedule represents the time required to construct the project. (trauner, 2021)

b) Site inspections

Inspection of works and comparison made with the budget. Sometimes subject to judgment, hence lacking.

c) Site Meetings

Meetings are held to review the progress of work and compare to the monetary allocations. Good as it provides some motivation to workers and all stakeholders are up to date on the performance of work

d) Record Keeping

Documentation of activities carried out to enable early detection of deviations from the set standards

e) Monitoring Work and Cost Performance

Clients, consultants and contractors used monitoring tools of schedules, budgets, inspection and feedbacks to keep a watch on the cost performance. With use of the right tools of control, it produces good results.

f) Evaluation of Works Carried Out

Quantification of works and comparing with the costs in the bill of quantities. The inspection was also reportedly used to evaluate works. This helps to ascertain that the progress of work is on the right track.

2.4 Timely completion

The timely completion of a construction project is one goal of the client and contractor because each party tends to incur additional costs and lose potential revenues when completion is delayed (Thomas, 1995). A project is usually regarded as successful if it is completed on time, within budget and to the level of the quality standard specified by the client at the beginning of the project (Chan D. a., 1995). However, severe criticisms of the industry are generated when projects take far longer than planned hence incurring project delays

2.4.1 Delay in construction projects

Construction Delay is generally acknowledged as the most common, costly, complex and risky problem encountered in construction projects. Because of the overriding importance of time for both the owner and the contractor, it is the source of frequent disputes and claims leading to lawsuits (Ahmed, Salman, & Kappagantula P., 2003). Delays do not always result from a single catastrophic event. They frequently develop slowly during work. To determine the critical delay, we have to compare as-planned and as-built schedules (Nirmal Kumar Acharya, 2014). Delays can cause substantial damages to an owner. This has motivated the owners to devise contract provisions and project processes to anticipate, manage and compensate for such delays so that they could be in a safe position than the contractor (Brennan, 2002). The successful execution of

construction projects and keeping them within the estimated cost and prescribed schedules depend on a methodology that requires sound engineering judgment (Nirmal Kumar Acharya, 2014).

According to Masood, et al. (2015), construction delays can be categorized into five basic types follows as:

Excusable Delays are also called “force majeure” delays. These delays occur because of natural calamities or other drastic reasons. That is why they are commonly known as the “acts of God”. As these delays do not occur because of the negligence of any specific party, most contracts allow the contractor leverage to have an extension of time for excusable delays, but without extra reimbursement.

Non-Excusable Delays occur because of the negligence of contractors, subcontractors, or material suppliers. In the case of non-excusable delays, no extra time and money is given to the contractor. The contractor, however, might be entitled to get reimbursement from the sub-contractor or supplier responsible for the delay.

Compensable Delays resulting from the negligence of the owner or its agents. Inadequate drawings and specifications are the most common form of this delay. Compensable delays may also occur because the owner fails to provide adequate information or respond properly in time. The contractor is provided with both extra money and extra time in case of compensable delays.

Non-Compensable Delays are induced by events or third parties beyond the reach of the client or the contractor. Some of its examples are protests, shutdowns, fires, government actions in its sovereign capacity, etc. In these delays, the contractor normally gets an extension of completion time but no reimbursement is given for damages caused by delay.

Concurrent Delays apply if one factor alone is the reason for delay. It is relatively very easy to find out time as well as money resulting from that single issue. Typically, many factors delay the project simultaneously in an overlapping manner, which is more complicated.

Many studies were carried out to assess the causes of delays in construction projects. A report published by the World Bank in 1984 has supported the fact, which I have raised in the above paragraph too. It stated that most of the projects executed in many developing countries have faced difficulties due to three reasons, namely:

- i) The unclear policy of the government
- ii) Lack of appropriate project design and,
- iii) Lack of institutional capabilities.

Ogulana & Promkuntong (1996), studied the delays in building projects in Thailand, as an example of developing countries' economies. In which they found three types of prevailing problems

- i) problems of shortages, mainly supply of resource
- ii) problems caused by clients and consultants
- iii) problems caused by the incompetence of contractors.

In 2002, Thomas and Ellis studied the problem of delays in highway construction in Florida, USA. Out of many factors, the most important causes found in research are

- i) construction work taking as business as usual
- ii) lacking team accountability for timely project completion,
- iii) utilities are unidentified or incorrectly located
- iv) delays in the relocation of utilities
- v) a differing or unseen site
- vi) inadequate planning by contractor
- vii) Design errors and omissions.

As indicated by the various researches, the construction industry all over the world is facing delays in the completion of their projects due to different reasons. Sanders and Eagles defined delay as “an event that causes extended time to complete all or part of a project” Various factors are found to be causing a delay in the completion of a construction project. (Ahmed, Salman, & Kappagantula P., 2003)classified into two categories as internal causes (client, contractor and consultant) and external causes which are beyond the control of the organization.

Various scholars stressed the significance of proactive measures to identify the delays in construction projects and came up with key remedies to overcome the delays.

Construction delays can be minimized only when the reasons are identified. Time is one of the major considerations throughout the project management life cycle and can be regarded as one of the most important parameters of a project and the driving force of project success.

On part of the client/owner of the project, the following problems have been identified:

Late approval of material samples, slow decision making, delayed approval and revision of drawings, change orders in the design during work and poor communication and coordination.

These problems must be taken care of seriously to avoid undesirable delays.

Consultants were also held responsible in this analysis for causing a delay. Delay in providing the design documents, and excessive mistakes and discrepancies in good for construction drawings were the key issues for the execution team that should not happen to achieve uninterrupted progress.

Poor communication and coordination between the parties involved in the project, lack of proper planning and coordination, difficulties in financing the project and utilization of proper planning tools like MS Project, Primavera, were found to be the major aspects on part of the contractor that obstructed the timely completion of work.

The progress of the project gets affected when the construction materials are not procured on time and when specially required materials and building components are manufactured late.

Shortage of labourers at the site is yet another issue that was raised by the site engineers which needs to be rectified to finish work on time.

2.5 Time-Cost Relationship

A widely recognized principle is that spending more monies during planning and design will reduce the time and cost required for construction by avoiding unforeseen conditions reducing to minimum design errors and omissions, and developing schemes that will support the most efficient approach. The relationship between time and cost is a very important aspect in the control of costs on-site as any variation in time has an automatic implication on cost. It is important to report and record all the works involving materials, plants, and labour on sites. This enables the contractor to be able to know the costs and expenses of the resources used on-site and compare them with the initial cost budget.

CHAPTER 3 METHODOLOGY

3.1 Introduction

Research methodology refers to the principles and procedures of logical thought processes which are applied to a scientific investigation (John, 2013). Methods concern the techniques available and those employed in the research project. This chapter provides the research design, the study area, the target population, sampling frame, sample size, methods of data collection and data collection instruments.

3.2 Research Design

Research design is the framework of methods and techniques chosen by a researcher to combine various components of research in a reasonably logical manner so that the research problem is efficiently handled. Research design is the plan for gathering data and involves the selection of cases, variables and data sources (John, 2013). For this project, evaluation research was used to investigate the impact of cost control techniques on the timely completion of building projects in Kampala.

3.3 Research Approach

Research approach refers to the plans and procedures for research. It refers to the plan for gathering data and involves the selection of cases, variables and data sources (John, 2013). For this project, both quantitative and qualitative methods were employed to enable the researcher to analyze information and establish patterns. The quantitative methods employed the questionnaire approach to address research objectives. Document reviews were used as the qualitative methods.

3.4 Study Population

A target population is a population to which the researcher ultimately wants to generalize the results (Amin, 2005). According to KCCA (2019), there were 78 ongoing construction projects. The study obtained data from ongoing various building sites that include different types of projects, for example, residential projects, commercial projects, institutional projects and industrial projects from all the five divisions of the Kampala districts.

3.5 Sampling design

Sampling design refers to a mathematical function that gives you the probability of any given sample being drawn (statistics, 2020). For purposes of this study, stratified random sampling will be used to

have a general geographical scope of Kampala district into strata divisions. Data was collected from sites in Kawempe division, central division, Makindye Division, Nakawa division, and Rubaga respectively.

3.6 Sample size

Sample size (S) required for given population size (N)

This formula was used to calculate the sample size with an assumption of 95% confidence level of Precision of 0.05

$$n = \frac{N}{1 + N(e)}$$

Where n is the sample size, N is the population size, and e is the level of precision. Applying this formula, where N=78, e=0.05, then n the sample size was calculated as follows;

$$n = \frac{78}{1 + 78(0.05)}$$

$$n = 65 \text{ projects}$$

3.7 Data Collection Methods and Instruments

3.7.1 Data Collection Methods

Both primary and secondary data were obtained for the research. The researcher mainly focused on collecting data using a questionnaire survey and interview to gain first-hand information because large amounts of information were collected from several people in a short time. Questionnaire surveys increase the degree of reliability as well as enhance the chances of getting valid data. Secondary data was obtained via company and websites, books, journals, and other publications.

3.7.2 Data Collection Instruments

The data collection instruments that were employed included questionnaires and interviews. And these will include both open and close-ended questions. Open-ended questions give more referable qualitative and quantitative information.

3.7.3 Questionnaire Survey

A questionnaire survey refers to the research instrument consisting of a series of questions to gather information from respondents. The questionnaire has an advantage over other instruments of data collection in that they are cheap, they don't require as much effort to compile data. This instrument helped in gathering data on cost control techniques, problems faced when using cost control techniques, the problems encountered while managing construction time and the effects of cost control techniques on the factors affecting timely completion of building construction projects.

3.7.4 Interviews

Interviews were conducted after the questionnaires to establish the reliability of the data collected using the questionnaires and those whose results needed much more explanations or could not be explained by the questionnaires. However, interviews were made through phone calls.

3.7.5 Sources of data

Data was collected from all stakeholders of a site but most importantly the principal informants will be site engineers, project administrators and contractors, construction workers, and other sources of data like publications, reports among others.

3.8 Data Analysis

The information that was collected from different data sources was compiled, edited, and tabulated to give a meaningful interpretation of the research findings. Analysis and summarizing of the data was done using Microsoft Excel and google forms.

It also involved checking the questionnaires for errors in spelling and assessing the consistency of the responses which was categorized into tables to show the frequency of particular answers given to particular questions.

3.9 Data Validity and Reliability

If a measurement is valid, it is also reliable. To establish validity, the data collection instruments were assessed by an expert (supervisor) to establish the relevance of the questions asked. A pilot study was carried out on a few selected questions to determine whether they can fairly be interpreted by the respondents. A reliable measurement gives a similar result if repeated for a second time. If the results are different, then the result is unreliable. The content of responses were

further measured against the objectives using a rating scale. The coefficients were analyzed by Microsoft Excel software and google forms.

3.10 Ethical Consideration

Before the research was carried out, the researcher obtained an introductory letter from the university which was presented to the respondents before giving out the questionnaires. The research furthermore considered the confidentiality of the information obtained on the questionnaires and withheld the identity of the respondents. To avoid bias, the researcher used the collected data for reasons for which it is collected only.

CHAPTER 4 FINDINGS AND ANALYSIS

4.1 Introduction

This chapter represents data collected from the questionnaire administration and analysed.

4.2 The response rate of the questionnaire survey

The data was gathered using an online questionnaire survey which was distributed to different professionals in the construction field through google forms. A total of 41 questionnaires was duly completed and submitted, representing a response rate of 63%. All the questionnaires were submitted online.

4.3 Background of the respondents

This section had a total of seven questions that focused on understanding a brief background or detail of the person who answered the questions in the questionnaire.

4.3.1 The profession of the respondent in the construction field

The respondents worked in the construction industry and happen to work upon issues related to using cost control techniques.

Table 1 Showing the profession of respondents

Profession	Frequency	Percentage	Cumulative percent
Engineer	9	21.9	21.9

Architect	4	9.8	31.7
Quantity surveyor	22	53.7	85.4
Project manager	2	4.9	90.3
Construction manager	3	7.3	97.6
Valuation surveyor	1	2.4	100.0
Total	41	100.0	

Table 1 shows the frequency and percentages of the professions of the respondents where the respondents were 41 in total and quantity surveyors took the highest count making the data more reliable since they provide much expertise in the field of cost control.

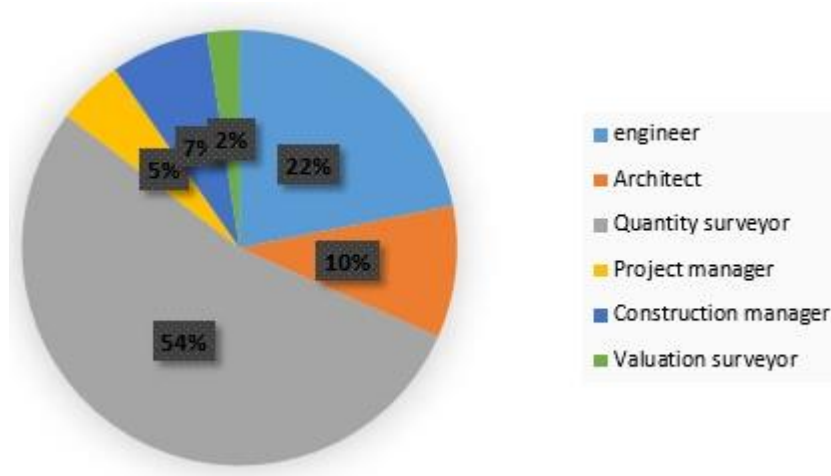


Chart 1 profession of the respondent

Chart 1 illustrates the different professionals who took part in the questionnaire survey. Quantity surveyors had the most participation with 54% segment on the pie chart, followed by engineers with 22%, followed by Architects with 10%, followed by construction managers with 7%, followed by project managers with 5% and lastly valuation surveyors with a 2%.

4.3.2 Experience of the respondents in the field of construction

The level of experience of the respondents in the construction industry is shown below; *Table 2 Showing Years of Experience*

	Frequency	Percentage	Cumulative percent
Less than 5 years	8	19.5	19.5

5 – 10 years	24	58.5	78.0
10 – 15 years	5	12.2	90.2
15 – 20 years	3	7.3	97.6
More than 20 years	1	2.4	100.0
Total	41	100.0	

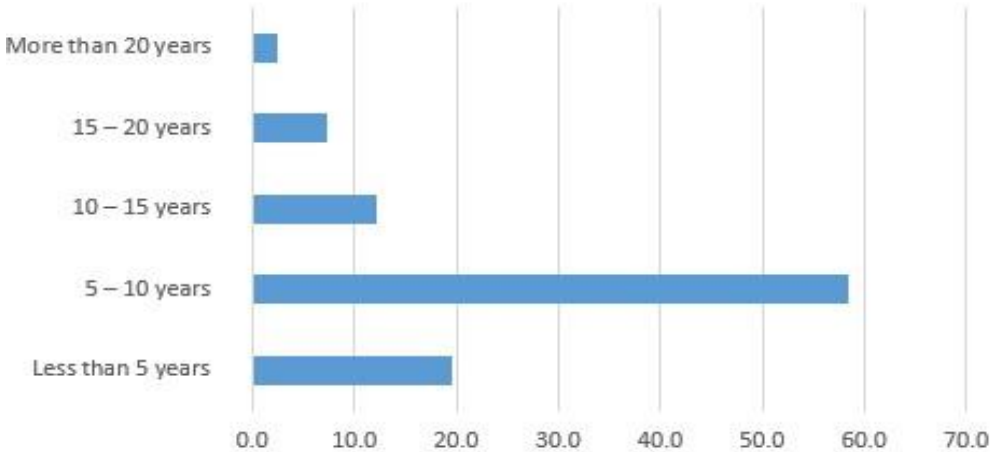


Figure 1 Showing Years of Experience

As seen from *figure1* and *table 2* above, most of the respondents had an experience of five years and above and only 8% of the respondents had their experience less than five years. This strengthens the fact that the responses are based on extensive experience.

4.3.3 Project details

The project details included commercial projects such shops, supermarkets, office blocks and shopping malls. Residential projects included private homes and apartments. Industrial included factory and ware house and also infrastructure which included schools, hospital, and church.

Table 3 Showing Project Details

	Frequency	Percentage	Cumulative percentage
--	------------------	-------------------	------------------------------

Residential	16	39.0	39.8
Commercial	19	46.3	85.4
Industrial	4	9.8	95.1
School/Hospital/Church	2	4.9	100.0
Total	41	100.0	

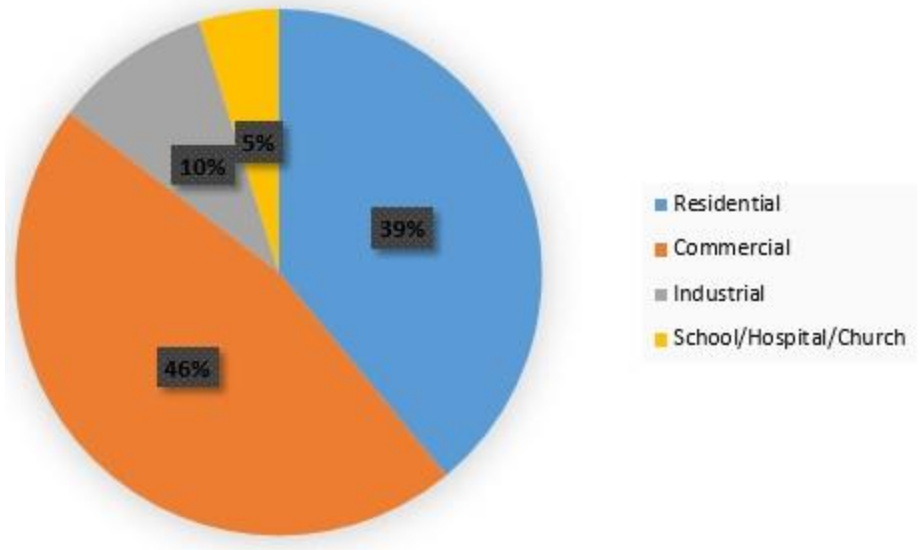


Chart 2 Showing Project Details

Table 3 and Chart 2 illustrate the details of the different projects that are being executed. These projects were diverse in nature and type including 46% commercial projects, 39% residential projects, 10% industrial projects, 5% other projects.

4.3.4 Kind of stakeholder being worked for in the project

All respondents who answered the questionnaire were working for different stakeholder as shown in Table 4 and Chart 3 below.

Table 4 Showing kind of Stakeholder Being Worked for in the Project

	Frequency	Percentage	Cumulative percentage
Client	13	31.7	31.7
Main contractor	16	39.0	70.7

Design consultant	10	24.4	95.1
Cost consultant	2	4.9	100.0
	41	100.0	

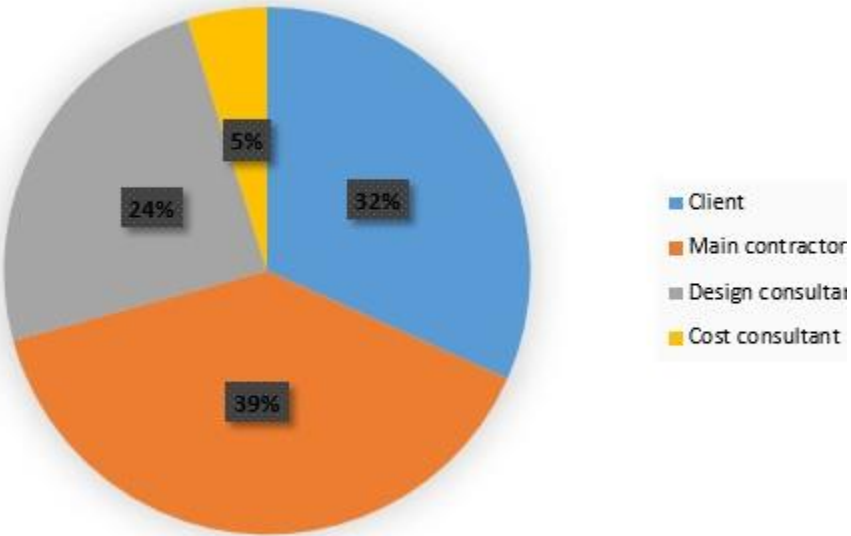


Chart 3 Showing the Kind of Stakeholder Being worked for in the project

Table 4 and Chart 3 illustrate 39% of the respondents working for the main contractor, 32% working for the client, 24% working for the design consultant, and 5% working for the cost consultant.

4.3.5 Project duration

The current duration of the projects that respondents were working on is shown below. *Table 5 Showing Project Duration*

	Frequency	Percentage	Cumulative percentage
Less than 6 months	6	14.6	14.6
Between 6 months and 1 year	24	58.5	73.1
Between 1 year to 2 years	8	19.5	92.6
More than 2 years	3	7.4	100.0
Total	41	100.0	

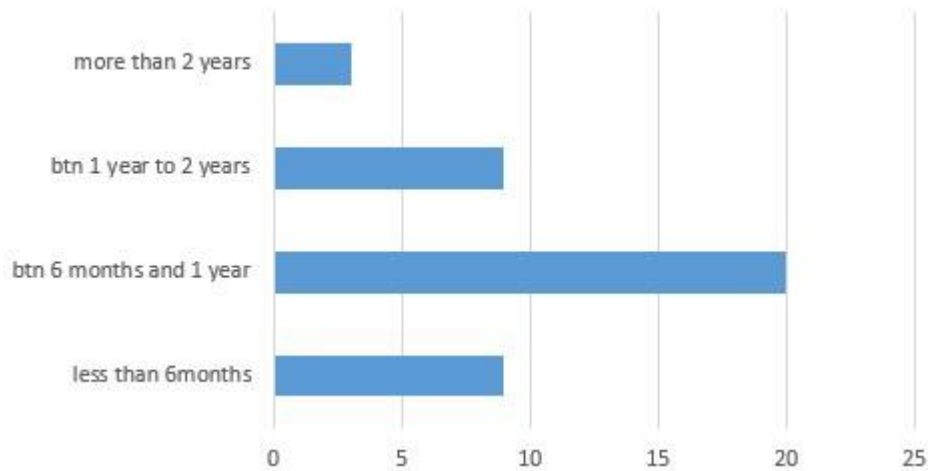


Figure 2 Showing Project Duration

Table 5 and figure 2 illustrate the durations the projects the different respondents were working on and most of the projects were between 6 months and 1 year with a frequency of 24, followed by projects 1 year to 2 years with a frequency of 8, followed by projects with a duration less than 6 months and lastly the ones that have been ongoing for 2 years.

4.3.6 Involvement in cost control

This showed how many respondents have been involved in cost control during their careers in the construction field. This is shown below.

Table 6 Involvement in Cost Control

	Frequency	Percentage	Cumulative percent
Directly	30	73.0	73
Indirectly	11	27.0	100.0
Total	41	100.0	

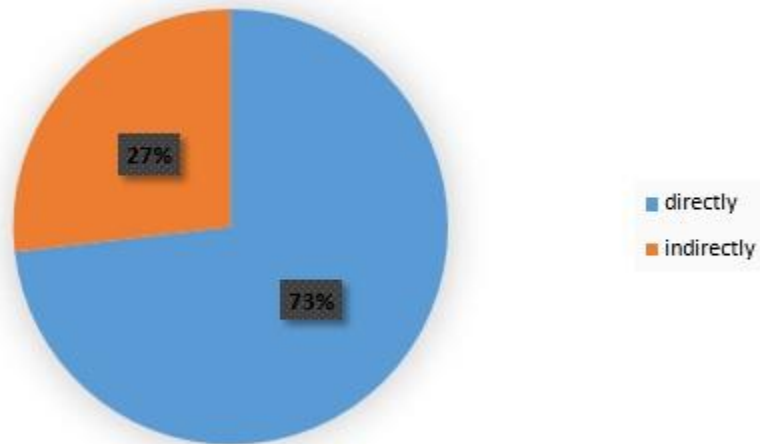


Chart 4 Showing Involvement in Cost Control

This shows that many of the respondents were directly and indirectly involved in the cost control techniques and this enabled the researcher to collect reliable data for the research based on the professionally experienced respondents in the cost control background.

4.3.7 Number of times cost control is carried out on the project

The table below shows how often the cost control was used on the current projects of the respondents.

Table 7 Showing how Often Cost control is used

	Frequency	Percentage	Cumulative percentage
All the time	10	24.4	24.4
Most of the time	19	46.3	70.7
sometimes	12	29.3	100.0
Total	41	100.0	

Table 7 shows how often cost control was used on the projects and most of the respondents who had a frequency of 19 used cost control ‘most of the time’, followed by the respondents who used the cost control ‘sometimes’ and had a frequency of 12, and lastly respondents who used it all the time and had a frequency of 12. This shows that all the respondents were involved in cost control making the results reliable.

4.4 Cost Control

4.4.1 The cost control techniques used on construction sites.

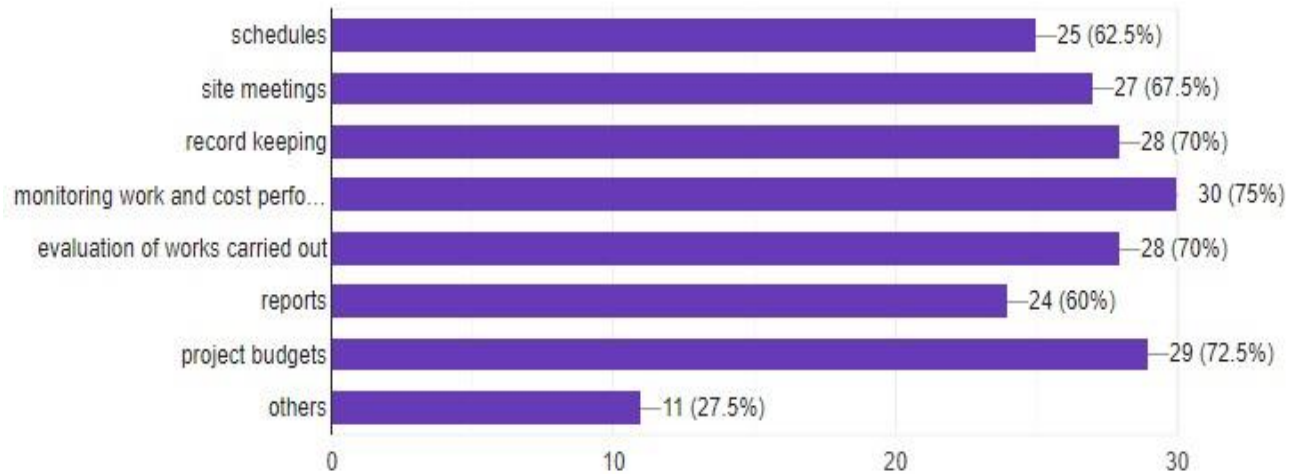


Figure 3 Showing Cost Control Techniques

Figure 3 illustrates the extent to which the different techniques were used on building construction projects. Monitoring work and cost performance was the most widely used cost control technique on building construction projects. Project budgets then followed second. Evaluation of works carried out and record-keeping were in the third position. Evaluation of works was by observing how much had been executed and comparing with the money allocated. Site meetings, schedules and reports followed in the fourth, fifth and sixth position respectively. At few sites, they had no specific cost control technique that was used hence categorizing them as others.

4.4.2 The problems encountered while using cost control techniques

Table 8 Showing Problems encountered while using cost control techniques

	Relative Importance Index	Rank
Lack of knowledge	0.8537	1
Inadequate planning for implementation	0.8390	2
Poor management of construction resources	0.7561	3

The problems that were encountered by the contractors while using the cost control techniques were ranked and lack of knowledge was the obtained the first position with an RII of 0.8537, it was then

followed by inadequate planning and implementation with an RII of 0.8390, and lastly poor management of construction resources with an RII of 0.7561.

4.4.3 Factors affecting time

Table 9 Showing Factors affecting time

Factors affecting time
Delayed payment
Rework resulting from errors in construction
Delay due to sub-contractor
Ineffective planning and scheduling
Less use of technological equipment
Poor weather condition
Poor site conditions
Delay in review and approval of design documents
Design errors and omissions
Coordination problem with stakeholders
Disputes on a project
Shortage of labourers at the site



Figure 4 Showing Factors affecting time

Table 9 shows the different factors affecting timely completion of construction projects and Figure 4 illustrates the frequency with which the factors affecting timely completion of were suggested and selected by the respondents.

4.4.4 Effects of using cost control techniques on building construction projects

Table 10 Showing effects of using cost control techniques on building construction projects

	Relative importance index	Rank
Cost control techniques reduce time wastage	0.8488	3
Cost control techniques enhance the speed of work	0.8537	2
cost control techniques cut expenses and boost profit margin	0.8780	1

Effects of cost control techniques were ranked basing of the relative importance index based on the data that was gathered from the respondents through questionnaires and the effect that got the highest relative importance is cutting expenses and boosting profit margins of contractors with an

RII of 0.8780, followed by enhancing speed and work with an RII of 0.8537, and lastly reducing time wastage with an RII of 0.8488.

4.4.5 Effect of cost control techniques on the factors affecting time.

Cost control techniques can prevent or correct the following factors affecting time as shown below. Figures 4-9 show the percentages with which the respondents agree to the prevention or correction of factors affecting time.

Monitoring of work and cost performance

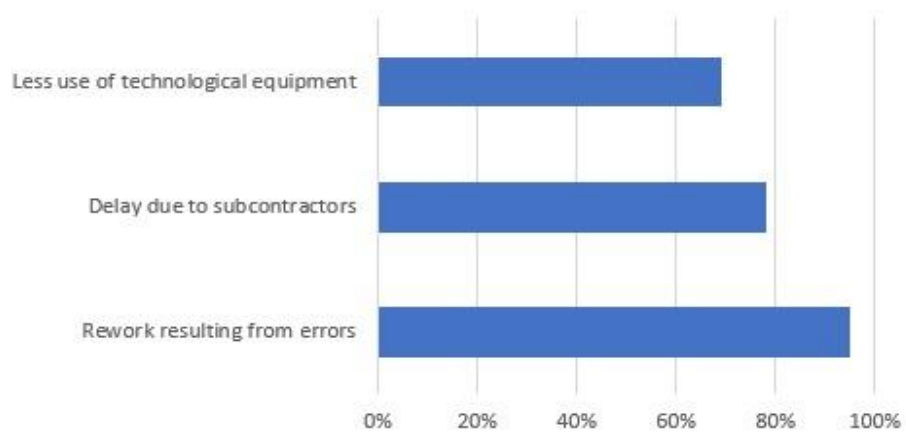


Figure 4 showing factors that can be prevented and/or corrected by monitoring work and cost performance **Site meetings**

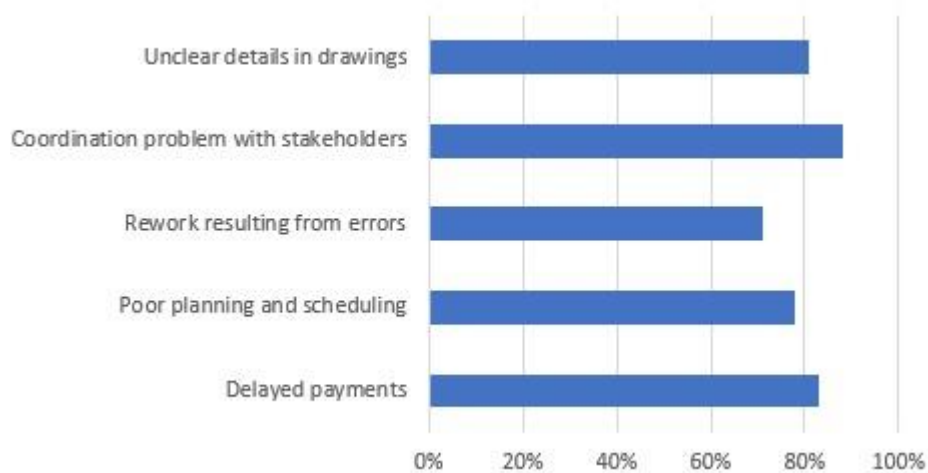


Figure 5 showing factors that can be prevented and/or corrected by site meetings

Schedules

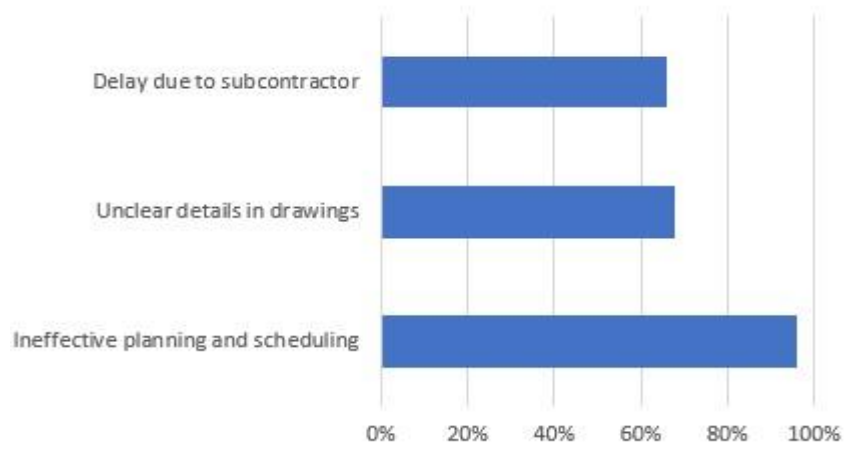


Figure 6 showing factors that can be prevented and/or corrected by schedules **Record**

keeping

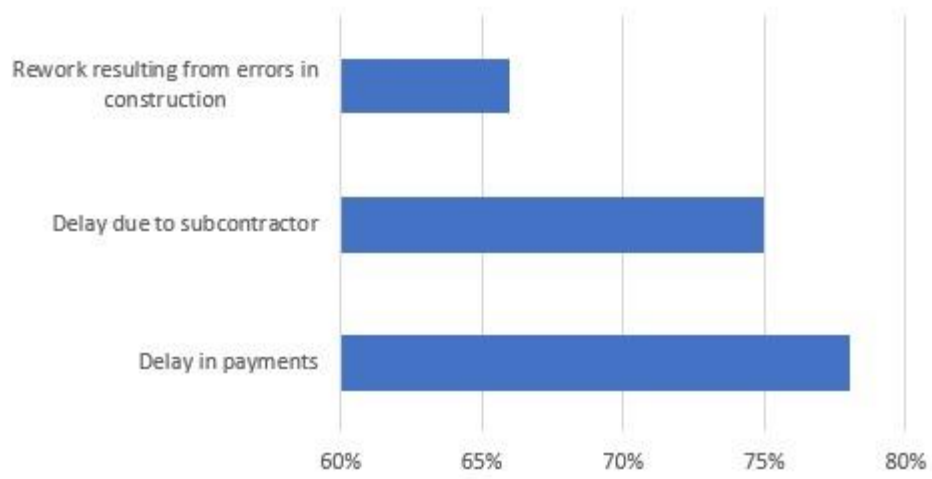


Figure 7 showing factors that can be prevented and/or corrected by record keeping

Reports

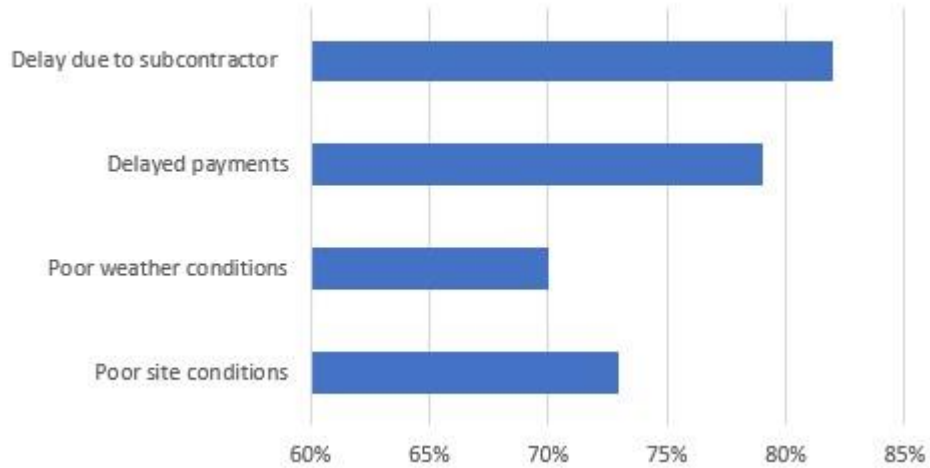


Figure 8 showing factors that can be prevented and/or corrected reports Evaluation of works carried out

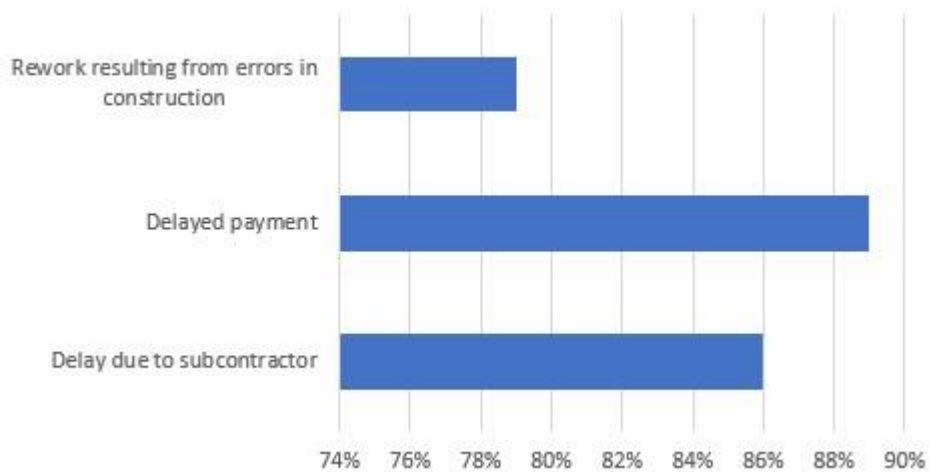


Figure 9 showing factors that can be prevented and/or corrected by evaluation of works carried out

4.5 Key Findings

Based on the objectives of the study, the researcher found out the following observation concerning the study

The first objective was to identify the cost control techniques used in building construction projects in Kampala. As observed, the cost control techniques used by contractors on their sites in Uganda

were found to include use of schedules, the project budget, inspection of works, cost reports, site meetings, monitoring of cost and work performance, and quantity evaluation using the bills of quantities, and others did not have well-defined techniques or did not even know there were traditional cost control procedures.

The second objective was to examine the problems encountered by contractors while using the cost techniques on building construction projects which included lack of knowledge on how to use the cost control techniques with an RII of 0.8537, inadequate planning for implementation with an RII of 0.8390 and poor management of construction resources with an RII of 0.7561.

The third objective was to factors that affect the timely completion of building construction projects which included delayed payment, poor weather conditions, less use of technological equipment, ineffective planning and scheduling, rework resulting from errors in construction, delay due to subcontractor, poor site conditions, coordination problem with stakeholders, delay in review and approval of design documents, unclear details in the drawing, disputes on a project and shortage of labourers at the site.

The fourth objective was to determine the effect of cost control techniques on factors affecting the timely completion of construction projects and it was found out that different cost control techniques through identifying the problem, they can address such a problem with the possible solutions or prevent it from happening as follows;

Monitoring of work and cost performance

- Rework resulting from errors
- Delay due to subcontractors
- Less use of technological equipment

Site meetings

- Delayed payments
- Poor planning and scheduling
- Rework resulting from errors
- Coordination problem with stakeholders
- Unclear details in drawings

Schedules

- Ineffective planning and scheduling
- Unclear details in drawings
- Delay due to subcontractor

Record keeping

- Delay in payments
- Delay due to subcontractor
- Rework resulting from errors in construction

Reports

- Poor site conditions
- Poor weather conditions
- Delayed payments
- Delay due to subcontractor

Evaluation of works carried out

- Delay due to subcontractor
- Delayed payment
- Rework resulting from errors in construction

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter describes the conclusions drawn from the results of the research. It also covers recommendations suggested as a result of the findings of the research.

5.2 Conclusions

This research was aimed at investigating the impact of cost control techniques on timely completion of building construction projects and based on the results above, it can be concluded that to a greater extent, there is a positive impact of cost control techniques on timely completion of building construction projects in situations where the delays are likely to be caused by nonexcusable delays and compensable delays on the assumption that there is an optimal project pace for minimal costs. This can be varied by the problems encountered during the use of construction control techniques. However, in situations where there are excusable delays, non-

compensable delays and current delays exist, cost control techniques will not have any impact on such factors since they are beyond the control of contractor and client.

5.3 Recommendations

Following this study, the researcher makes the following recommendations;

With the different factors affecting time, time extension should be granted for factors that are beyond the control of the client and contractor.

The lack of knowledge about cost control techniques being the main factor that will bring about variations in the implementation of cost control techniques, workers who are responsible for managing costs are advised to attend refresher courses to gain more knowledge about cost management.

The contractor and sub-contractor should be carefully selected on the basis of skills and expertise in order to avoid rework due to immature workmanship, the owner must ensure timely payments on the project, modern management tools and advanced technology should be introduced and used, detailed planning and subsequent monitoring/controlling should be practiced, smooth communication and steady coordination amongst the stakeholders, extensive investigations should be performed in order to evaluate the site conditions properly instead of relying on surveys done only in the initiation phase ,and lastly the consultant should make sure that the design is timely approved and delivered. **Areas of further study**

Further study should be made on the relationship between cost control techniques used on building construction projects and time.

Bibliography

- Ahmed, S. M., Salman, A., & Kappagantula P., a. G. (2003). Delays in Construction: A Brief study of the Florida construction industry. *ASC Proceedings of the 39th Annual Conference, Clemson, South Carolina.*
- Alinaitwe, H. (2006). Assessing the degree of industrialisation in construction –A case of. *Uganda. Journal of Civil Engineering and Management, Vol Xii , No 3.*
- Brennan, D. S. (2002). Tools to manage the risks of construction delays. *Shopping Center Legal Update.*
- Chan, A. S. (2004). Factors Affecting the Success of Construction Projects. *Journal of Construction Engineering and Management, 130.*
- Chan, D. a. (1995). Forecasting construction duration for public housing projects: a Hong Kong perspective. *Building and Environment, 34(5), 633–46.*
- Chitkara, K. K. (2005). *Construction Project Management: Planning, Scheduling, and Controlling.* Tata McGraw Hill Publishing Company Ltd.
- Choon, T. a. (2008). A Review of Potential Areas of Construction Cost Estimating and Identification of Research Gaps. *Jurnal Alam Bina, Jilid II; No.2, 61-72.*
- Cooray, N. H. (December 2018). Analysis of Cost Control Techniques Used on Building . *International Journal of Research, 909-923.*
- designingbuildings.* (2021, december). Retrieved from *designingbuildings: www.designingbuildings.co.uk/wiki/budget-for-building-design-and-construction-projects*
- Dharwadker, P. P. (1996). Construction Management, 2nd Ed;. In *Construction Management, 2nd Ed;*. D New, Delhi: Oxford & IBH Publishing Co. .
- Elhag, T. a. (1998). An Artificial Neural System for Cost Estimation of Construction Projects. *In: Hughes, W (Ed.), 14th Annual ARCOM Conference, 9-11 September 1998 University of Reading. Association of Researchers in Construction Management, Vol. 1, 219-226.*
- George Otim, F. N. (n.d.). Cost Control Techniques Used On Building Construction Sites in . *Second International Conference on Advances in Engineering and Technology, 7.*
- Hendrickson, C. (1998). *Project Management for Construction.* Carnegie Mellon University, PA 15213.
- Institute, P. M. (2004). "A Guide to the Project Management Body of Knowledge , *PMBOK Guide.* Project Management Institute.
- J.B, B. (1982). *Element of Administration for Building Student.* Great Britain.: Anchors press Ltd.

- Kerzner, H. (2003). *Project Management. A systems Approach to Planning, Scheduling, and Controlling*, John Wiley and sons, Hoboken, NJ.
- Koushki, P. a. (2004). impact of construction materials on project time and cost in kuwait. 123132.
- Mohammad Miri, M. K. (2015). Cost Management in Construction Projects: Rework and Its Effects . *Mediterranean Journal of Social Sciences Vol 6*, 209-215.
- Nirmal Kumar Acharya, S.-Y. K.-D. (2014). FACTORS AFFECTING TIMELY COMPLETION OF CONSTRUCTION PROJECTS. *Nirmal Kumar Acharya, Soo-Yong Kim and YoungDai Lee*, 22.4.1-22.4.13.
- Ogulana, S., & Promkuntong, K. (1996). International journal of management. *Construction delays in a fast growing economy:comparing Thailand with other economies*, 14.1, 37-45.
- PMbook. (2020, December). *cmu.edu*. Retrieved from *cmu.edu*: https://www.cmu.edu/cee/projects/PMbook/12_Cost_Control,_Monitoring,_and_Accounting.html
- Raina, V. (1999). *Construction Management Practice*. New Delhi, India: Tata McGraw-Hill Publishing Company Limited.
- S.N. Malkanthi, A. P. (2017). Impact of Cost Control Techniques on Cost Overruns in construction projects. *ENGINEER*, 53-60.
- Thomas, U. S. (1995). Have I reached substantial completion? *Journal of Construction Engineering and Management*, 121–9.
- trauner. (2021, february). *truner consulting*. Retrieved from trauner consulting website: <http://www.traunerconsulting.com/constrution-project-scheduling-a-basic-guide>
- Yakubu Adisa Olawale, M. S. (2010). Cost and time control of construction projects. *Construction Management and Economics*, 510-533.
- Zhen, M. (2008). Construction Cost Control under Engineering Quantity List Valuation. *Construction Economy*, vol. 313, 116-118.
- Zirong, H. X. (2005). Cost Management of Construction Project on BOQ Price Basis. *Building Construction*, vol. 27, 67-71.

APPENDIX

Questionnaire

Research Questionnaire

Dear respondent,

My name is Nkata Derick, I am a student of Makerere University Uganda pursuing degree of Bachelor of Science in Quantity Surveying at the College of Engineering, Design, Art, and Technology. As part of my partial fulfilment for the award of the degree, I am conducting a study on “The impact of cost control techniques on timely completion of building construction projects in Uganda”. Please spare some time and answer the questions that follow. Your response will be kept strictly confidential and will only be accessed by the research team. The information provided will only be used for academic purposes in this study.

Thank you very much for your time and cooperation.

Yours Cordially,

Researcher

Section A Respondent’s Background

1. What is your profession?

- Engineer
- Architect
- Quantity Surveyor
- Project Manager
- Construction Manager

Other

Control managers/ planners

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

- Less than 5
- 5-10
- 10-15
- 15-20
- More than 20 years

3. What kind of stakeholder are you working for in this project?

- . Client
- . Main Contractor
- . Sub-contractor
- . Design Consultant
- . Cost Consultant

4. Have you ever been responsible for cost management & control, cost estimating or budgeting during your career?

- Directly
- Indirectly

5. Project Details

- Residential building
- Commercial building
- Industrial building
- School/ hospital/church

Other (please specify)

6. How long is/was the project running

- Less than 6 months
- Between 6 months to 1 year

- Between 1 year to 2 years
- More than 2 years

7. Do/ did you carry out cost control during the construction of this project

- All the times
- Most of the times
- Some times
- Rarely
- Never

Section B Cost Control

Use the Likert Scale where 1 =Strongly Disagree, 2 = Disagree, 3 = Not Sure, 4 = Agree, 5 = Strongly Agree

8. What cost control techniques are being used on this project?

Cost control techniques	rank				
	1	2	3	4	5
Schedules					
Site Meeting					
Record Keeping					
Monitoring work and cost performance					
Evaluation of works carried out					
Reports					
Project Budget					
Others					

9. What are the problems encountered while using cost control techniques?

	rank				
	1	2	3	4	5
Lack of knowledge					
Inadequate planning for implementation					
Poor management of construction resources					

10. What are the factors that affect timely the completion of construction projects?

.....

.....

.....

.....

.....

.....

11. General effect of cost control techniques

	rank				
	1	2	3	4	5
Cost control techniques reduce time wastage					
Cost control techniques enhance the speed of work					
cost control techniques cut expenses and boost profit margin					

12. The following cost control techniques can prevent and/or correct the factors affecting time. Please tick the factors you agree with the cost control technique can prevent and/or correct

Monitoring of work and cost performance

- Rework resulting from errors
- Delay due to subcontractors
- Less use of technological equipment

Site meetings

- Delayed payments
- Poor planning and scheduling
- Rework resulting from errors
- Coordination problem with stakeholders
- Unclear details in drawings

Schedules

- Ineffective planning and scheduling
- Unclear details in drawings
- Delay due to subcontractor

Record keeping

- Delay in payments
- Delay due to subcontractor
- Rework resulting from errors in construction

Reports

- Poor site conditions
- Poor weather conditions
- Delayed payments
- Delay due to subcontractor

Evaluation of works carried out

- Delay due to subcontractor
- Rework resulting from errors in construction
- Delayed payment

INTERVIEW

1. What do you think are the effects of cost control techniques on the factors affecting timely completion of construction projects?

.....
.....
.....