ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

MASTER'S PROGRAM IN PROJECT MANAGEMENT

CAUSES OF COST OVER-RUN IN CONSTRUCTION PROJECT:
THE CASE OF ACCOMMODATION AND TRAINING CENTER
CONSTRUCTION PROJECT OF THE KAIZEN INSTITUTE

BY
NARDOS BEKELE

MARCH 2023
ADDIS ABABA, ETHIOPIA

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A THESIS SUMBITTED TO ST. MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ASRTS IN PROJECT MANAGEMENT

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DECLARATION

I, Nardos Bekele the undersigned, declare that this thesis is my original work, prepared under the guidance of Dr. Maru Bekele. All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of learning any degree.

<u>   Nardos Bekele   </u>   <u>   </u>

         Name   Signature

St. Mary's University, Addis Ababa　　　　　　　　**March ,2023**

CERTIFICATE

This is to certify that this research project, "**Causes of Cost Over-Run in Construction Project: The Case of Accommodation and Training Center Construction Project of the KAIZEN Institute"** undertaken by Nardos Bekele for the Partial fulfillment of the award of Master's degree in Project Management at St. Mary's University, School of Graduate Studies, is an original work and not submitted earlier for any degree either at this university or any other university.

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Maru Shete (Ph.D.)

Advisor

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List of Abbreviations

PMBOK	Project Management Body of Knowledge
EKI	Ethiopian Kaizen Institutes
CRKI	City and Regional Kaizen Institutes
TVET	Technical and Vocational Education and Training
KU	Kaizen Unit
GTP	Growth and Transformation Plan
MOI	Ministry of Industry
MOF	Ministry of Finance
COVID	Coronavirus Disease
WBS	Work Breakdown Structure
AACE	Association for the Advancement of Cost Engineering
EVM	Earned Value management
EAC	Estimate at completion
SOP	Statement of position
AICPA	American Institute of Certified Public Accountants
EU	European Union
GDP	Gross Domestic Growth
SPSS	Statistical Package for the Social Sciences
RII	Relative Importance Index
PMI	Project Management Institute
PP	Probability Plot
VIF	Variance Inflation Factor

ABSTRACT

The purpose of this research was to identify the major causes of cost overrun and their effects on construction project performance in KAIZEN Institute. Cost overrun is pointed out as one of the major reasons that lead to poor construction project performance. The research was explanatory, and the research design was survey design. A quantitative research approach was adopted, and the hypothesis was also tested. A Likert scale questionnaire was designed anddistributed to the Institute. Since the target population was small, a census survey was used. Out of 30 questionnaires, 30 were able to be retrieved with a response rate of 100%. The data gathered using the questionnaire was analyzed with the help of Statistical Package for Social Sciences (SPSS version 20) using descriptive statistics and regression analysis. The descriptive analysis was done to identify major causes of cost overrun which is distinguished into internal and external. The findings showed that from the internal causes Poor contract Management, Procurement process is ambiguous & without planning are the majors one which cause the institute to face cost overrun and from the external factors Escalation of Material price, Escalation of exchange rate are the major causes. Regression analysis was also conducted, and the result revealed that cost overrun has a significant effect on project with a p-value of <0.05 and regarding the hypothesis, the alternative hypothesis was accepted. The study concludes that cost overrun is a statistically significant predictor of project construction and represents the value change in project performance is associated with a unit change in cost overrun. The research finally recommends that all process which cause the construction to face cost overrun should be planned properly and take the necessary response.

Key words: Cause, Cost Overrun, Construction Project, Facto

CHAPTER ONE:

INTRODUCTION

1.1 Background of the Study

The Project Management Institute Project Management Body of Knowledge (PMBoK) Guide defines a project as "a temporary endeavor undertaken to create a unique product or service''. As one of the project management areas, project cost management includes the process required to ensure the project is completed within the approved budget and consists of resource planning, cost estimating, cost budgeting and cost control (Project Management Institute, 2000).

A Common denominator among organization resources is the cost involved in the utilization. Cost can be defined as the release of value required to accomplish some goal, objective or purpose (Vasista, 2017). Kerzner (2003) noted, time, cost and performance are the constraints of the project and achieving the project within cost is one of the primary success factors. Lutchman said new and going organizations are generally well rewarded by the market in the form of higher stakeholder confidence and share prices when projects are delivered on budget and on schedule. Failure to get it right the first-time results in rework, cost increase, schedule changes and several penalties from shareholders and other stakeholders. On budget and on schedule are powerful announcement to the market to promote and fuel sustained growth of an organization (Lutchman, 2011).

A project cost overrun is one of the worldwide problems. Project management institute quoted the studies on cost overrun and said "a recent study by Aalborg University of 258 major international transport infrastructure projects between 1927 and 1998 found that actual costs were, on average, 28% higher than estimated costs, and that in nine out of ten of these projects, costs were underestimated, resulting in cost overrun (Project Management Institute, 2016)

Current practice of the construction industry shows that it is a rare event most construction projects are completed on the scheduled time, budgeted cost and desired quality. The main reason behind is that construction projects are unique in nature, time consuming, cost demanding, and they are full of uncertainties. As a result, claims and disputes become common phenomena especially on large civil engineering contractors.

Generally, in Ethiopia the number of construction projects is increasing from time to time. However, it became very difficult to complete a project in a stipulated time and cost given in the initial contract document. Time and cost overruns are the common phenomenon in almost all construction projects. Number of unexpected problems and changes from original design arise

during construction phase, leasing time and cost overrun.

Frequent cause of cost overrun is inappropriate choice of site, changes in design, delay approval of payments. Excessive change orders and absence of site staff are causes to be faults of consultants. Time and cost overrun in this context are found to be extremely significant and serious problem in the accommodation and training construction of KIZEN Institute.

Identifying the factors that affect cost of construction projects is important so that factors affecting cost of construction projects are well identified and efforts can be made to improve the situation. Hence this study aims at finding the cost overrun, the main factors causing it and the mitigation measures that can be taken to improve cost performance in construction of accommodation and training building of KAIZEN Institute.

1.2 Background of the Organization

"Kaizen" landed in Ethiopia. The term "Kaizen" became common to Ethiopian people, and Kaizen philosophy and technology have been implementing in many places of various sectors, private enterprises, public offices, schools and hospitals. This wide-range dissemination of Kaizen was made by different stakeholders, Ethiopian Kaizen Institutes (EKIs), City and Regional Kaizen Institutes (C/RKIs), Technical and Vocational Education and Training (TVET) institutes/schools, together with high interest of policy makers and with the commitments of governmental leaders at different levels.

Then, the first phase of the Kaizen Project was launched in October 2009. The object of the project is to verify the effectiveness of Kaizen in Ethiopia, whether Kaizen could take root in Ethiopia. The Kaizen Unit (KU) was established under Ministry of Industry (MoI) and Kaizen concepts and methods were introduced in 28 manufacturing companies. Quantitative and qualitative assessment on these pilot companies clearly showed that the Kaizen improved quality, productivity, safety, reducing costs and lead time. At the final stage of the project, the project developed Kaizen manual as well as National Plan, which consists of objectives and strategies for Kaizen dissemination. The dissemination plan was taken into consideration in developing National Development Plan (GTP I) in order to formulate the modalities for supporting enterprises of various sizes.(https://ethiokaizen.org/about-us/)

1.3 Statement of the problem

The construction industry is an important part of the economy and has a considerable impact on the efficiency and output of other industries. It is not possible having extensive investment in manufacturing, agriculture or service sectors without construction of infrastructure facilities in place. One of the main objectives and policies of any public or private sectors dealing with the execution of projects is to upgrade project performance through minimization of costs, completion of projects within their assigned budget.

The Triple Constraints to be consider during construction are time, cost and quality of Projects. This needs proper planning of cost with their acceptable application. But cost overrun is created due to different factors which affects delivery of construction projects to the client on the allocated budget.

Biruktawit Tesfaye (2018) studied about the Assessment of Project cost overrun, Its cause and The Mitigation Measures to Improve Project Cost Performance and her major finding was the top factors for cost overrun are escalation of material cost, change in exchange rate, delayed approval of payment, procurement problems, excessive change orders, unclear and inadequate details in drawing, incomplete drawings, increase in cost of labor, too many scope change and constructive change orders and mistakes in design documents.

Negalign Nigatu(2020) Studied about Determinants of cost overrun on public building construction projects and mentioned that the challenges for cost overrun were indicated socio political factors due to political interference and instability, exchange rate fluctuation, fluctuation in raw materials price, managerial factors due to delay in decision making process, poor project management and owners interference construction techniques and design factor due to frequent design change ,design error and mistake, incomplete design change at the time of tender, deficient design and delays in design process and risk management strategy and time lines of payment and financial factors due to delay in progress payment by client ,poor financial control on site were identified as the cause on his paper.

The accommodation and training center of KIZEN institute is being executed with the grant given by the Japanese government. It affects the budget of the government as the allocation of the cost is come from the MOF. Inefficient performance of the contractor increases cost of the project. The increase in costs of the project's construction means affecting the budget of the government. The institution is incurring additional money because of cost overruns.

In doing preliminary study on institution by interview and group discussion with finance department we gathered different problems existing currently in the organization, which are the procurement is processed without planning, poor management, not having clear and concise contract agreement with the client, and the employees assigned are not in their right position, material cost is increasing due to inflation and exchange rate incrementation, In addition to the listed causes for the cost overrun the occurrence of the pandemic (COVID 19) and war in the Northeren part of the country has a significant effect on the cost of the construction as it increase the cost for the completion of the project. All these problems lead to affect the organization cost overrun.

In response to this problem, this study will investigate the project cost overrun of the institute. The study has planned to examine the costs of construction project and cause of project cost overrun. By looking into different perspectives and literature, it will try to propose ways to manage project costs to enhance cost performance of the projects, so that it will contribute to the economic growth of the country.

1.4. Objective of the Study

1.4.1 General Objective

The main objective of the study is to identify the major Causes of Cost Over-run in Construction Project: The case of Accommodation and Training Center Construction Project of the KAIZEN Institute.

1.4.2. Specific Objective

The specific objectives of the study include the following:

- ➢ To assess the extent of cost overrun in construction projects with respect to the project original duration and contract amount.
- ➢ To evaluate the existing problems associated with construction projects completion cost.
- ➢ To identify the responsible bodies those, contribute to critical causes of cost over runs.
- ➢ At last, to forward recommendation about minimization or avoiding cost overrun.

> ➢ To identify the internal factors responsible for construction projects cost overrun.
>
> ➢ To identify the external factors responsible for construction projects cost overrun.

1.5. Research Questions

The research questions of the study include:

a) What are the major causes of the cost overrun?

b) Which party is responsible for the cost overrun?

c) What are the effects of cost overrun in the accommodation and training center of the KIZEN Institute?

d) What are the mitigation measures used to avoid the cost overrun?

e) How much is the magnitude of the cost overrun?

1.6. Research Hypothesis

Many previous articles including the PMBOK, and research studies have indicated that the impact of effective project cost management on the overall success of project management is positive and significant. The following hypotheses have been developed for this case:

The study proposed two alternative hypotheses as follows.

i.   The project original duration and contract amount are affected by the project cost management practice.

ii.   There is a positive and statistically significant relationship between project cost overrun cause and overall project cost

1.7. Scope of the Study

This study mainly concentrates on the cause of the cos overrun of the Accommodation and Training Center of KIZEN Institution construction. The place of the study is on Lideta sub-city in Addis Ababa. The paper will assess the main cause of the cost overrun during execution of the project.

1.8. Significance of the Study

Effective and efficient public resource management and implementation process is very essential for developing countries. The overall significance of the study will be used to guide the Institute for the proper way of utilization of resource by identifying the effective procedures construction project.

- The study is very important to determine factors causing cost overrun and the mitigation measures in construction projects.
- It helps to improving cost performance in construction projects.
- It will be used as guidance to all construction practitioners such as clients, consultants and contractors in order to overcome the cost overrun issue in their projects..
- Finding from this study will assist academicians in broadening of the prospects with respect to this study hence providing a deeper understanding of the critical factor that affect the fund expenditure of the organization. In addition, it is important to other researchers as a reference who will be engaged to study in this area.
- Minimizing and eliminating the cost overrun in construction projects will reduce the conflicts among construction practitioners
- It enables the government to know what kinds of policies should be framed

1.9. Limitation of the study

The research is limited to construction project of KIZEN Accommodation and Training Center. The respondents are from this construction industry. Hence the result and the recommendation of this paper would appear to be more suitable for construction projects. In addition, the project is in progress, and the cost performance is being tracked. Cost overruns for completed projects cannot be compared to those on the go. As a result, caution is advised when applying the statistics on cost overruns and their causes from this study to other projects. Another study drawback was the inability to obtain accurate and reliable data so getting accurate date from different department of the institute impact the study to get better results.

1.10 Organization of the Research

This study organizes in to five chapters. The first chapter provides background of the study, problems of the statement, objectives, scope and limitation. Chapter two devote to review of related literature on the concept of cost overrun. The third one, present the methodology part of the study i.e., research design, research approach, sources of data, sampling techniques, methods of data analysis and ethical considerations. The fourth chapter deals with data presentation, analysis, and interpretations. Finally, on chapter five summarizing the investigation based upon the findings obtained, the conclusion drawn, and the recommendation of the researcher was forward. Lists of references and appendix attached at the end of the paper.

CHAPTER TWO:
REVIEW OF THE LITERATURE

2.1 Theoretical Review

2.1.1 General concept of cost overrun

Every project is constrained by cost, time and quality, why because almost all projects fail to meet them. Especially the first two are the most important constraint that a project driven companies or anyone who is undertaking a project should give additional attention too, hence delay or increment in one of them cause direct impact on the other. The inability to complete project on time and budget continue to become a chronic problem worldwide (Ahmed et al.2002). The success criteria for projects may differ from one to another but the commons are completing the project with the predefined schedule, with the estimated cost and finally with the requirement defined by the owner. Construction project is mainly undertaken to deliver a product or facility and this industry is growing from time to time here in Ethiopia but it faces many problems among those one is cost overrun problems. Construction projects are undertaken considering for the future, it can't be said that it will be free from uncertainties' so the project may fail due to weather conditions, owners requirement not been met and others like project complexity increases. So this days project been completed with incurring an extra cost. Studies show that in developing countries when the project is completed, the actual cost exceeds the original contract price by 30% (Al-monani, 1996). Cost overrun of 50 to 100% were common (Flyvbjerg et al.,2003). Construction and engineering projects are risky venture: 40% are late; 50 over budget; 30%fail to meet expectations of users' (Tony, 2017). There have been many factors identified by many researchers for the cost overrun. There are different stakeholders who are involved in the project mainly client, consultant, contractor, sub- contractor, government and society, and have their own reasons which can be held responsible for project cost overrun. Unfortunately, construction projects regularly are making news headlines, not for being remarkable engineering accomplishments that will support and stimulate economic growth and social integration of communities, but rather for being poorly managed and often over budget. A significant number of construction projects routinely overrun their cost estimates. According to the work of Flyvbjerg et al. (2002), infrastructure projects are reported to have an 86% probability of outrunning their set cost targets. Love et al. (2012) and Odeck (2004) on the other hand found that overruns could be as high as 70% and 183% more than

the initial estimates respectively. The global audit and professional services firm, Ernst and Young, reviewed the performance of 365 infrastructure projects delivered in the oil and gas industry and found that at least 64% of the projects were faced cost overruns.

2.1.2 Definitions of cost overrun
Cost overruns

A project cost is the total cost that the project to be implemented will incur until its finished and this cost is estimated by using different techniques, Top-down or analogous, Bottom-up and Parametric approach at the project appraisal phase. Project cost overrun occurs when the final cost incurred is greater than the budgeted cost. A cost overrun also known as cost increase or budget overrun, involves unforeseen costs incurred in excess of estimated amount due to an underestimation of the actual cost during budgeting.

Several authors have defined cost overruns differently. For instance, Al-Najjar (2002), has defined cost overruns as the change in contract amount divided by the original contract award amount. However, Zhu and Lin (2004) are of the view that cost overruns are the excess of actual cost over budget and also called it cost increase or budget overrun. Choudhury (2004) have defined cost overruns to be the difference between the original cost estimate of project and actual construction cost on completion of works of a commercial sector construction project. MattySiemiatycki (2015), the common definition of cost overrun in most studies is a change in cost relative to the final estimate provided when the approval of or "go decision" was made until the construction is completed. Widman (2002) defined it the amount by which actual cost exceed the baseline or approved costs.

Cost overrun = Final Contract Amount – Original Contract Amount

Cost overrun is a condition which the total of money that has been used was greater than the original cost or estimated cost (Frimpong et al., 2003). According to research by Flyvbjerg et al. (2002) in global construction, it was found that 9 out of 10 projects had cost overrun.

Infrastructure projects are reported to have 86% probability of outrunning their set cost targets. The average size of these overruns can be as high as 45% for rail projects, 34% for bridges, and 20% for road projects. Love et al. (2012) and Odeck (2004) on the other hand found that overrun

could be as high as 70% and 183% more than the initial estimates.Le-Hoai, et al. (2008) considered that the magnitude of cost overruns may or may not vary depending on the size of the project, the location of the project and the type of project.

Construction projects are dynamic and risky ventures where outcomes are often uncertain. The industry is characterized by the construction of one-off bespoke buildings on site whose conditions and constraints are highly variable. Each project involves unique design and construction challenges which are typically undertaken by temporary organizations assembled for the particular project (Tony, 2017).

The increasing complexity of the construction projects shows a greater demand on construction managers to deliver projects on time, within planned budget and with high quality. Most developing countries construction project is suffering from continuing problem of project cost overrun which requires a deep analysis and planning before commencing to the execution phase.

2.1.3 Project cost

Project costs are any expenditures made or estimated to be made, or monetary obligations incurred or estimated to be incurred by the implementation of the project. Project cost has been defined as the amount of commitment in terms of money that is required to produce a construction product such as building. Project cost represents all those items included under the heading of the expenditures (Ashworth, 2004). Project cost is quantitative assessment of the likely costs of resources (labor, material, supplies, etc.) required to complete all project activities (Duncan, 1990). It is the amount of money required to complete all project activities.

2.1.4 Project cost management

Project is a series of activities at bringing about clearly specified objectives within a defined time period and with a defined budget. Every project should be well defined, have accurate time and costs estimates and have a realistic budget. Cost is a resource sacrificed or foregone to achieve a specific objective or something given up in exchange (PMBOK Guide 2002, page 83-90)

Project cost management is primarily concerned with the cost of resources needed to complete the project activity. It includes four processes required to ensure that the project is completed within the budget. Resource planning, Cost estimating, Cost budgeting and Cost control.

Resource planning

It involves determining what physical resources (people, equipment, materials) and what quantities of each should be used and when they would be needed to perform project activities. For instance, construction team needs to be familiar with local building codes. Such knowledge is often readily available from local seller.

Cost Estimating

It involves developing approximation of the costs of the resource needed to complete project activities. In approximating cost, the estimator considers the cause of variation of the final estimate for purpose of better managing the project. Cost estimating involves developing an assessment of the likely quantitative result like how much will it cost the contracting organization to provide the product or service.

There are four tools/techniques to estimate the cost of projects namely, Analogous, Parametric, Bottom-up and Computerized tools, Parviz F. (2002).

□ Analogous estimating- also called top-down estimating tool, means using the actual cost of the previous or similar project as a basis for estimating the cost of the current project. It is less costly and accurate compared to the other tools but its best to use it if the project is similar to the previous.

□ Parametric modeling- uses project characteristics (parameters) in a mathematical model to predict project cost. The cost and accuracy vary and its reliable when historical information is used to develop the model is accurate, the parameters used in the model are readily quantifiable, and the model is scalable.

□ Bottom-up- involves estimating the cost of individual activities or work packages, the summarizing or rolling up the individual estimates to get a project total. The cost and accuracy depend on the size of the activities or work package, meaning the smaller the activities the more the estimates are accurate.

□ Computerized estimating tools- such as project management software spreadsheets and simulation/ statistical tools, are widely used to assist with cost estimating.

Cost Budgeting

It involves allocating the overall cost estimates to individual activities or work package to establish a cost baseline for measuring project performance. Cost baseline is a time phased budget that will be used to measure and monitor cost performance on the project, Harold K. 2009.

Cost Control

It is concerned with influencing the factors that create changes to the cost baselines to ensure that changes are agreed up on, determining that the cost baseline has changed and managing the actual changes when and as they occur.

2.1.5 Causes of Cost Overrun

Cost overruns do not just occur naturally, there are a number of factors during the construction process that when not managed properly can lead to cost overruns. Cost overrun in construction projects can occur due to many reasons. Sriprasert (2000) pointed out that cost overrun is caused by ineffective construction management and poorly established cost control systems. Apart from these, Frimpong, Oluwoye, & Crawford (2003) studied 26 factors that cause cost overruns in construction of ground water projects in Ghana and found that monthly payments difficulties was the most important cost overruns factor as indicated by contractors and consultants, while owners ranked poor contractor management as the most important factor. Despite of some difference in viewpoints among the three groups surveyed, there was high degree of agreement among them with respect to their ranking of the factors. The overall ranking results indicate that the three groups felt that the major factors that can cause excessive cost overruns in developing countries are poor contractor management, monthly payment difficulties, material procurement, poor technical performances and escalation of material prices.

Kaming, Olomolaiye, Holt, and Harris (1997) together conducted questionnaire survey in Indonesian high-rise construction projects and found that materials cost increased by inflation, inaccurate quantity take-off and labor cost increased due to environment restriction were the most critical causes of cost overruns. Lee (2008) examined cost overrun problem in Korean social overhead capital projects. In a study of 161 completed projects the causes of cost overruns were found as changes in scope, delays during construction, unreasonable estimation and adjustment of project costs and no practical use of the earned value management system. Sriprasert (2000) studying cost overrun problems in construction industry of Thailand mentioned that low quality materials cause higher construction cost than expected because of the loss of materials during construction. This is resulted from a lack of standards for materials and management systems. Also, lack of ability of management to prevent cost overruns or to control construction costs caused many Thai construction companies to fail in achieving effective cost performance in projects.

In Malaysia, Ali and Kamaruzzaman (2010) through questionnaire survey indifferent projects at Klang Valley found that main factors that contribute to cost overruns include inaccurate/poor estimation of original cost, construction cost underestimation, improper planning, poor project management, lack of experience, poor contract management, inflation of project costs, high cost of machineries, fluctuation in price of raw materials, unforeseen site conditions, insufficient fund, obsolete/unsuitable construction equipment and methods and mistake in design, while in study of MARA large projects (Memon., 2010) found that cash flow and financial difficulties faced by contractors, contractor's poor site management and supervision, inadequate contractor experience, shortage of site workers, incorrect planning and scheduling by contractors were most severe factors while changes in scope of project and frequent design changes are least affecting factors on construction cost.

2.1.6 Effects of Construction Projects Cost Overruns

Effects are the consequences that will be encountered when cost overruns occur on a construction project. Nega (2008) states that cost overruns have obvious effects for the key stakeholders in particular, and on the construction industry in general. To the client, cost overrun implies added costs over and above those initially agreed upon at the onset, resulting in less returns on investment. To the end user, the added costs are passed on as higher rental or lease costs or prices. To the professionals, cost overrun implies inability to deliver value for money and could well tarnish their reputations and result in loss of confidence reposed in them by clients. To the contractor, it implies loss of profit for non-completion, and defamation that could jeopardize his or her chances of winning further jobs, if at fault. To the industry as a whole, cost overruns could bring about project abandonment and a drop in building activities, bad reputation, and inability to secure project finance or securing it at higher costs due to added risks. The study of Nega (2008) further identified the following as the major effects of cost overruns: delays during construction, supplementary agreement, additional cost, budget short fall, adversarial relationship between participants of the project, loss of reputation to the consultant, he consultant will be viewed as incompetent by project owners, high cost of supervision and contract administration for consultants, delayed payments to contractors, the contractor will suffer from budget short fall of the client and poor quality workmanship.

2.2. Empirical Review

2.2.1 Causes of cost overrun

Cost overrun is a very common phenomenon and majority of project in construction industry are facing this problem. These problems are faced by developing and developed countries. There have been many causes identified by much research which are contributing to the cost overrun. The contractor's primary obligations are to construct the works to the specified standard within the agreed project duration. In order to achieve these objectives, the contractor must co-ordinate and motivates a team of diverse subcontractors. Contractors may experience difficulties completing project on time for variety of reasons for which they responsible. These include inadequate or incompetent staff and/or subcontractors, poor productivity and inefficient execution of the works; poor analysis of the detail of the project in producing unrealistic programs; coordination and communication problems; accidents; poor labor relations, and disputes. A particular problem arises in cases where the contractor has submitted an underpriced or unreliable cost estimate. This may have occurred as a consequence of rushed tendering time frames, indefinite and uncompleted project scope, over-optimism, inadequate contingency due to poor risk assessment (Tony,2017). According to Matty (2015), the following four major factors were identified and those are:-

- Scope change and change orders- the specification of the project is changed following the "go decision," leading to escalating of the cost. Scope change includes major alteration of the facility and change orders may take in the form of contractor-initiated variations to the approved facility design to correct errors.

- Incomplete studies prior to project approval- project approval and construction large infrastructure projects often precede before all technical feasibility and engineering studies are completed, leading to escalating costs as more details about the project are confirmed. This problem occurs because governments often expedite approvals to get urgent projects started quickly, or to make project announcements to meet program funding deadlines or election timelines.

- Inflation in labor and material costs- infrastructure projects often rely on key construction materials and workers in specialized building trades, the cost of which can escalate over the course of the project. This tends to occur when projects are built during periods of strong economic growth and tight employment markets, which creates scarcity and drive price increases.

- Inaccurate forecasting- since large infrastructure projects are complex and take place in a context of uncertainty, accurately forecasting final project costs can be difficult. Forecasting problems include the use of inappropriate methods or inaccurate underlying assumptions because of poor-quality or incomplete data, and unforeseen, dramatic shifts in external conditions.

According to User's Guide, (2005), this are the factors identified that change the cost of the construction projects through time: poor project management, design changes, unexpected ground conditions, inflation, shortage of materials, change in exchange rates, inappropriate contractors, funding problems and force majeure. Abadir, (2011), finds out that 90% of the contractors prepare detailed estimates of cost of labor, material and machinery. However, only 75% prepare detailed budget, about 70% track cost of labor, material and machinery separately and 67% collect and use company's historical data for preparation of cost estimates. His study further indicates that only 1/3 of the contractors use computer tools for cost estimate preparation and about 2/3 update that their budget regularly at least once in a month. Cost overrun has been attributed to several sources including scope creep and rework (Love et al. 2005), unrealistic cost targets and misguided trade-offs between project scope, time and cost (Ahiaga-Dagbui and Smith 2014), a poor understanding of the systematic and dynamic nature of projects (Eden et al. 2005), unidentified or improperly managed risk and uncertainty (Okmen and Oztas 2010) to suspicions of foul-play and corruption (Wachs 1990). Factors influencing cost performance based on initial estimates have been widely published and primarily concern project complexity, technology requirements, vagueness in scope, and the project team requirements (Mansfield et al. 1994; Akintoye 2000; Frimpong et al. 2003). Empirical evidence suggests that contractors' efficiency in the estimating process and appropriate tender pricing depicts the cost performance in construction projects (Skimore and Wilcock 1994). Therefore, contractors' ability in using sophisticated methods and their rationalizations at the tender development stage are considered crucial in achieving cost success.

According to Fetene (2008), the most common causes of cost overrun in public projects of Ethiopia are inflation or increase in the cost of construction materials, change in foreign exchange rate (for imported materials), change orders and lack of control on excessive change orders, failure to identify problems and institute the necessary and timely actions. Weywssa (2014), states that the main causes for cost overrun in Addis Ababa light rail transit construction projects are delay and

scope change of the contract date and items of work, variation caused due to underground and elevated structures at construction stage, inadequate preconstruction study prior to the construction period which led to change in the control system and conceptual design of works and inadequate site investigation and unexpected ground conditions. Shamble Gebre (2008), states the road construction is facing time and cost overrun. His study showed that all the 10 completed road projects overrun their time and cost estimates. The reasons were financial problems, improper planning, land acquisition and construction delay, design changes, less materials and equipment supply by contractors, incomplete design are the main source of delay and cost overrun respectively.

2.2.2 Studies of cost overrun in construction projects

There have been many studies conducted regarding factors causing cost overrun around the world and this section tries to see their findings. Muralidaran (2018) conducted research on various factors influencing cost overrun in UAE construction industry and it was through questionnaire and interview that he data were collected. 194 responses were collected out of 295 and the findings showed that the most important causes of cost overrun were poor productivity, insufficient early planning, delayed completion, and lack of skilled resource and motivation. Akinsiku, Akintola, Ameh and Ige, (2014) from Nigeria, conducted a survey on the factors causing cost overrun from the contractor perspective. Their study was conducted using questionnaire survey in which 100 questionnaires were distributed to contractors using purposive sampling and used descriptive statistic method to analyze the data by calculating the mean score and the result show that lack of adequate pre-contract planning and project team coordination are the most significant factor among construction professionals leading to cost overrun.

There are few studies conducted in our country on the cost overrun factors, but the following review shows some of them and their findings. Zinabu and Getachew (2015), conducted research on the causes of contractor on cost overrun in construction projects and it was administered through 140 questionnaire in order to rank the factors based on their occurrence and they were able to identify the top five factors as per the response of the contractors poor planning, fluctuation of price of materials, poor productivity, inflationary pressure and project financing in descending order and the following table shows all the findings.

Frimpongs et al. (2003) studied 26 factors that cause cost overrun in construction of ground water projects in Ghana. It was a questionnaire survey and distributed for 125 respondents and 40 respondents were contractors and the findings show that the major factors that caused excessive cost overrun were poor contractor management, monthly payment difficulties from gencies, material procurement, poor technical performance, escalation of material prices according to their degree of influence. Ramabodu and verster (2010) in South Africa conducted research aiming to identify the major cost overrun factors in construction sector and it included 25 questionnaires and an interview with selected groups and there were about 21 factors identified and these factors were divided in to three categories very critical factors, moderate and less critical factors.

Adnan et al. (2010) studied to identify factors influencing cost overrun and time in Gaza Strip. Their research were also conducted through detailed questionnaire of 80 containing 42 factors that caused cost overrun from contractors. Their responses were analyzed to rank the causes of time and cost overrun on an important index. The most significant causes were increase in material prices due to continuous border closures, delay in construction, supply of raw materials and equipment by contractors, fluctuation in cost of building materials, project materials monopoly by suppliers, instability of local currency in relation to dollar value, low commitment of donors to compensate any negative outcomes attributable to the poor economic and political situation, and donor policy in awarding tenders to the lowest bidder.

Fetene (2008) research showed that 67 out of 70 public building construction projects in Ethiopia suffered cost overrun. It was through questionnaire and desk study that the research was conducted, and 42 questionnaires was collected form the client, consultant and contractor. And about 39 factors were identified; the most important causes of cost overrun were inflation or increase in the cost of construction materials, poor planning and coordination, change order due to enhancement required by client, excess quantity during construction. The rate of cost overrun ranges from 0% to 126% of the contract amount for individual projects. Abubeker (2015) research showed that the cost overrun rate ranges from 4.11% to 135.06% of the contract amount. From 94 questionnaires 47 factors were identified and the most important cause were delay in construction, inadequate supply of raw materials and equipment by contractors, design changes and incomplete design at the time of tender.

2.3 Conceptual Framework

Theoretical and empirical studies reviews in the preceding section identified a number of elements that contributed to cost overruns in various construction projects. It was revealed that the contributing reasons to project cost increases vary depending on the type of project as well as the country. As a result, the current study makes use of the summary of research from these earlier investigations, which it theorizes as the primary cause of cost overruns in the training and accommodation center of the KIZEN institute.
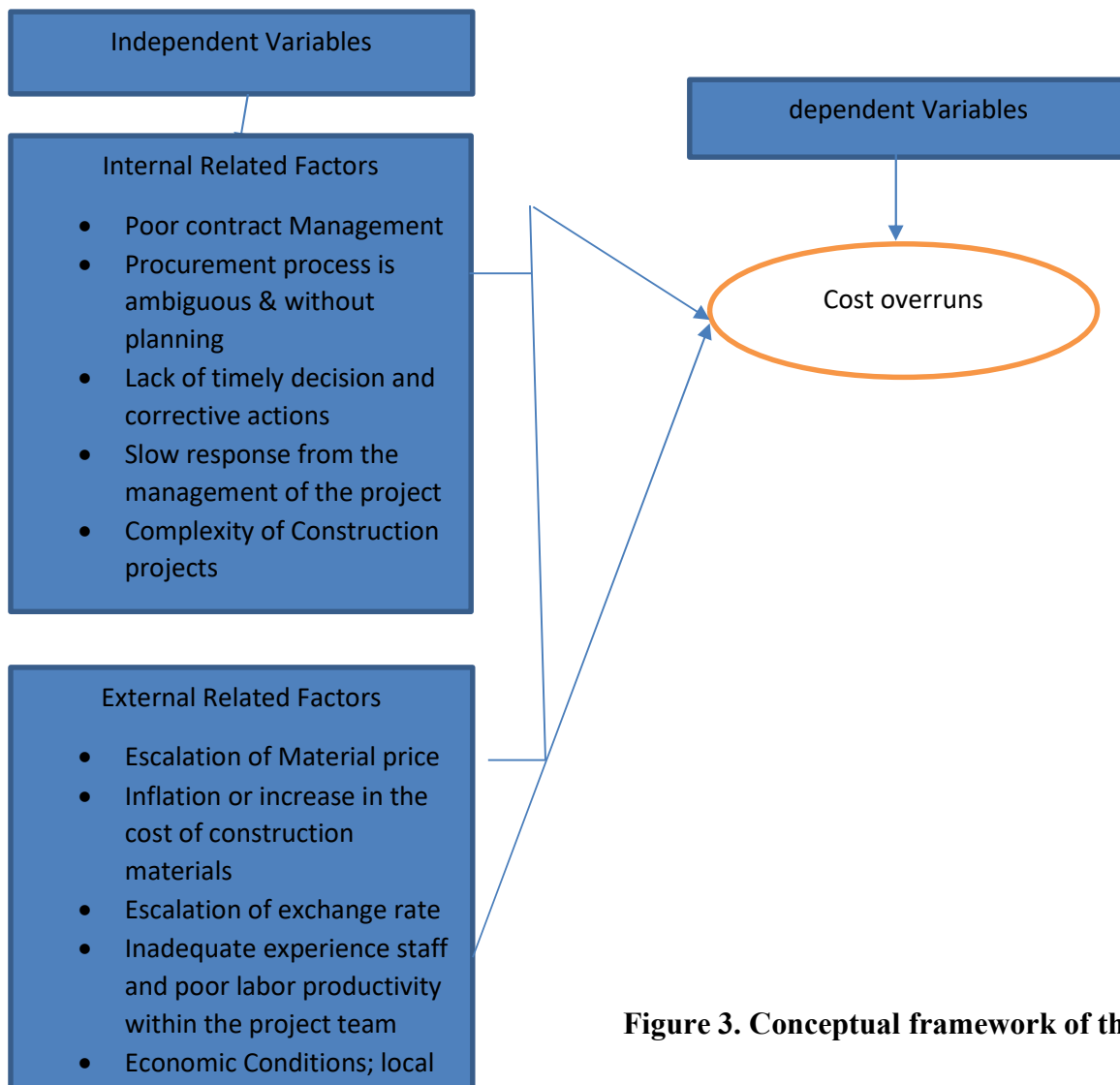
Figure 3. Conceptual framework of the study

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2.4 Knowledge Gap Identification

Construction Building projects are notorious for failing to complete in time being over budgeted, late and saddled with scope creep, as well as for poor communication protocols and in adequate controls around scope change management this especially pronounced in non profit organizations (Guerin 2012). If the project's goal and success are to be attained, timely and within budget complementation of the construction project is essential. A project that has a complementary cost demonstrates overall project planning, management, and implementation efficiency as well as excellent project progress monitoring.

Hence construction industry has been fast growing in Ethiopia. Previously researchers were conducted the cause of construction project delay as country and project level , as per the perspective of the researcher in the area of study and based on the time were study conducted. However construction project due to its uniqueness , needs of high financial investment and resources there was gap of studies from previous researcher in time, scope of study and demography basis on construction industry specifically in Addis Ababa the construction industry has different challenged and constraint like economic inflation, instability market material price(material escalation), peace and security issues concerned Northern Ethiopia war which leads to shortage of material like marble and cement in the industry, Pandemic outbreak disease across the globe like COVID 19 were not mentioned in the previous researcher in the area of study. This research was proposed to fill this gap and gives and share knowledge for further research on the area of study in the future.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1. Research Design and Methodology

3.1.1 Introduction

This chapter outlines the method used to conduct this research. The chapter starts by defining the research approach and research design used for this research. Following that the target population for the study, the sample size, sampling techniques are discussed. Furthermore, the data source, data collection methods, instruments, and methods of data analysis are covered.

3.2 Research Approach

Research approach is the methodological approach that a researcher follows to understand and address the statement of the problem. There are three type of research approach: qualitative research approach, mixed method research approach and quantitative research approach. The qualitative approach deal with multiplicity of reality and use content analysis, but quantitative research approach states reality is single and objective. Mixed research approach employs both research approaches in which reality is context based and pragmatism.

This study is a quantitative in nature as it examines the effect of independent variables on dependent variable. The findings and conclusion of the study will depend on the utilization of statistical data collected and analyzed using SPSS version 26.

3.3 Research Design

This study adopts an explanatory research design which non-experimental research design. Explanatory research design is an in-depth investigation, which shows cause-effect relationship between or among variables (anything that can be measured quantitatively). The purpose of the study is to investigate the main cause of cost overrun in the construction project. (Creswell, 2009) Assert that explanatory research is useful for identifying the type of association, explaining complex relationships of multiple factors that explain an outcome, and predicting an outcome from

one or more predictors. It is also helping to determine how events occur and which ones may influence particular outcomes. (Algozzine, 2006).

3.4 Sources of Data

This study used both secondary and primary data. Secondary data will be obtained from annual reports whereas primary data will be collected from the aforementioned samples through questionnaire. Structured questionnaires were distributed to: project manager, consultant, finance manager, and site engineers. A questionnaire is the best tool of collecting data, where respondents cooperate at will and can be reached. This way of collecting data is suitable as it can reach many people so long as the people can read and write independently. It was employed to get professional opinion and other relevant data through questionnaire. Besides this a literature review to develop conceptual basis for the study was also conducted. Through the literature review, potential causes leading to cost overrun, effects of cost overrun and methods of controlling and managing cost were identified. The review provided the basis to design the questionnaire which was distributed to professionals involved in the construction sector.

Owing to the large number of public agencies that own construction projects and the large number of contracting and consulting companies that undertake work for public agencies a survey by questionnaire was found appropriate. The questionnaire was designed in such a way as to get high response rate from respondents. The questionnaires were given to potential respondents either personally and in a few cases through e-mail. The questionnaire contained open and closed ended questions with 5 Likert Scale from "Strongly Disagree" =1 to "Strongly Agree" =5 and it is administered by the researcher.

3.5. Target Population and Sample
3.5.1 Target Population

The target population of this research were selected from relevant function or divisions namely from construction department. The selection of respondents for the questionnaires was based on the predetermine criteria namely their current role and duties, profession and experience of the staffs so that required knowledge, attitude and perception on the questions presented in the questionnaires were responded to the required level for generalizability of the result of the analysis.

Therefore, census technique was employed for this study to acquired desired data for analysis and interpretation.

3.4.2 Census Technique

According to calleam consulting Ltd(2012), a census technique is the study of every unit, or everyone or everything in a population under study. It is applicable in the situation where the entire population is less than 100. Its advantage is that it provides a true measure of the population compared to the sampling method, gives benchmark view for more detailed scrutiny in the future; detailed information about each sub group/unit/function within the population is available in most cases.

As the study is related to construction project the criteria that were used to select were their role and duties, professions of study and experience of the staffs was considered as criteria for selection of respondents. According to the data acquired from construction site, the total population consists of 1 project manager, 2 project coordinators, 24 engineers of all department, 1finance manager and 2 accountants. Among these, 24 engineers and 2 accountants, 1 project manager, 2 project coordinators and 1 1finance manager, making it a total of 30 respondents were selection for this study.

3.5. Data Collection Methods and Tools

Data collection methods and tools that were helpful to achieve the desired objectives as set in this thesis were questionnaires survey designed. Further collection of data for this research was reviewing secondary document and researcher's observation. Questionnaires having five-point Likert's scale were used for the survey data collection method. The rating scales on the Likert's scale was based on their level of agreement varying from 1 for "not significant" to 5 "extremely significant".

3.6. Data Analysis Method

This deal with the analysis of the information gathered from the questionnaire. This study primarily used two separate methods to analyze the collected data to identify the top-rated factors that affect

the project cost performance. Explanatory approach is used to direct interpretation of the report study why the cost overrun has occurred in the company. The mean score together with standard deviation were used in order to rank the factors for cost overrun. The output of the analyzed data is presented using tables, and simple percentage for further interpretation.

The data obtained from the survey was analyzed using SPSS version 26. The project will be recognized and analyzed while processing the questionnaire. Analysis of this will be carried out through response of participants giving special attention to cause of the cost overrun.

A questionnaire of 30 questions for cause of cost overrun were carefully designed from the reviewed literatures on project cost overrun. The Likert scale of 1 – 5 was applied to the factors for cost overrun and it is 1– not significant, 2 –less significant, 3 – significant, 4 – highly significant and 5 – extremely significant.

3.7 Validity and Reliability

Validity of a research is the degree to which it measures what it is supposed to measure (Paul C., 2009). To check the validity, a preliminary questionnaire based on the literature reviews was pretested on a small sample population. This was mainly to check and to ensure that the wording of the question is not ambiguous (Royer & Zarlowski, 2001). The reliability, as measured by Cronbach alpha estimates the internal consistency of the concepts. The reliability of the items for client factors, consultant factors, contractor factors and external factors were assessed.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Data presentation

This chapter presents the analysis, discussions, and findings on causes of cost overrun in a construction project. This was guided by the objectives to present empirical evidence to agree or controvert. The researcher administered questionnaires to collect the data that was analyzed using SPSS to be able to come up with the results presents here. Descriptive statistics have been used to describe respondents' characteristics. The further regression analysis has been used to determine the impact the independent variables have on the dependent variable. The researcher issued 30 questionnaires and had a return rate of 30 or hundred percent (or 100%) response rate).

Questionnaire Return rate = 30 X 100/100 = 100%

The questionnaire return rate as per the calculation is 100%. This return rate is considered acceptable for data analysis, and the discussion here forth came from these data.

4.2 Personal Profile of the Respondents

This part of the paper will discuss the respondent's general information in terms of gender, educational background, the organization they are employed in, their position, and their experience in construction projects.

Table 4.2.1. Summary of respondents' gender from the questionnaire

Variable	Frequency	Percent	Cumulative percent
Gender			
Male	25	83.30%	83.3
Female	5	16.70%	100
Total	**30**	**100%**	

(Source: Own Survey, 2022)

As the above table shows, (25) 83.3 % of the respondents are male, while (5) 16.7% are female. This shows that the majority of the respondents are male in the construction projects of KAIZEN Institute. This shows that the gender distribution is not equal in the construction of the project.

Table 4.2.2. Summary of respondents' educational background from the questionnaire

Educational Background			
Variable	**Frequency**	**Percent**	**Cumulative percent**
Master's Degree	7	23.30%	23.3
Bachelor's Degree	21	70.00%	93.3
Diploma	2	6.70%	100
Total	**30**	**100%**	

(Source: Own Survey, 2022)

It also shows that (7) 23.3% of the respondents have a master's degree, (21) 70.0% of bachelor's degree, (2) 6.7% of diploma. Most of the respondents (93.3%) have an educational background of bachelor's degree and above. This shows the respondents reading and writing skills which increases the validity of the questionnaire.

Table 4.2.3. Summary of respondents' position from the questionnaire

Position			
Variable	**Frequency**	**Percent**	**Cumulative percent**
Project Manager	**3**	**10%**	**10**
Engineer	20	66.70%	76.7
Accountant	3	10%	86.7
Other	4	13.30%	100
Total	**30**	**100%**	

(Source: Own Survey, 2022)

As it can be seen from the table, 66.7% (20) of the respondents are engineers, 10% (3) are project manager, 10% (3) are accountant, and the rest 13.3% (4) are others. The engineers and the project managers, which have a cumulative percent of 76% are the main actors, which have a direct relation with the costs of the projects. So, it can be said that their response has a significant meaning to the study.

Table 4.2.4. Summary of respondents' experience in construction projects from the questionnaire

Experience in construction projects			
Variable	**Frequency**	**Percent**	**Cumulative percent**
Less than 1 year	4	13.30%	13.3
1-5 Year	17	56.70%	70
6 to 10 years	5	16.70%	86.7
11 to 15 years	4	13.30%	100
Over 16 years			
Total	**30**	**100%**	

(Source: Own Survey, 2022)

The above table also shows experience of the respondents in construction projects. As it shows 13.3% (4) persons have less than one year of experience, 56.7% (17) have from one to five years of experience, 16.7% (5) have from six to ten years of experience and the rest 13.3% (4) have from 11 to 15 years of experience. The above experience shows that majority of the projects are handled by people who have more experience, this can increase the validity of assessment of the cause of cost overrun in this project.

4.3 Descriptive Analysis

4.3.1 Mean and Score for Cause of Cost Overrun

This section presents the finding of descriptive analysis of the respondent's opinion towards the causes of cost overrun in the construction project of KIZEN Institute. Descriptive statistics were

used to evaluate and rank the most important causes of cost overrun in the construction project. The RII method was adopted for this study to determine the relative importance of the various causes and effects of cost overrun in the construction project. The relative importance index (RII) ranges from 0-1. The five-point Likert scale ranged from 1-5 was transformed to relative importance index using the following equation.

$$RII = \frac{\Sigma w}{AN} = \frac{5n_5 + 4n_4 + 3n_3 + 2n_2 + 1n_1}{5N}$$

Where: w is the weighting given to each factor by respondent ranging from 1t o 5

A is the highest weight meaning 5 in this case

N is the total of respondents

The descriptive statistics including the mean and standard deviation along with their ranks are presented in the following tables. A mean score of 0-1.5 means that the respondents not significant with the measurement variable presented in this study, between 1.50 to 2.50 means they are slightly significant, 2.50 to 3.50 means the respondents were moderately significant, for a mean score of 3.50-4.50 respondents say very significant and for a mean over 4.50, respondents have extremely significant by the statement.(Biruktawit Tesfaye,2018)

4.3.2. Respondents Perception on the Internal Factors

Under the prevalence of the problem, there are two categories for the cause of the cost overrun in the KAIZEN Institute. As internal factors are one of the causes that the organization faced. Regarding the internal factors, the institute has to overcome or has different things needed to be solved for the project to be finished at the appropriate cost. The below table shows the questions answered by the respondents and has calculated the mean of the respondents' score to know which one is the most cause of the cost overrun.

Table 4.3.2.1 Construction Cost Overrun Internal Factor

Questionnaires' Items	N	Mean	Std. Deviation	RII	Rank
1.Delayed approval of payments	30	2.7	1.393	0.54	11
2.Lack of consultation with the client	30	2.73	1.484	0.55	10
3.Mistakes & Discrepancies in contract documents	30	2.80	1.324	0.56	9
4.Poor Communication & Coordination with employees' consultant and client	30	2.93	1.202	0.59	8
5.Fraudulent practices and Kickbacks	30	2.97	1.299	0.59	7
6.Lack of communication or integrity between difference parties	30	3.17	1.020	0.63	5
7.Complexity of Construction projects	30	3.17	1.177	0.63	5
8.Lack of timely decision and corrective actions	30	3.37	1.377	0.67	3
9.Procurement process is ambiguous & without planning	30	3.87	1.311	0.75	2
10.Poor contract Management	30	4.03	1.408	0.77	1
11.Slow response from the management of the project	30	3.33	1.028	0.67	4

(Source: Own Survey, 2022)

Under causes of cost overrun in construction projects, there are two categories these are internal and external related factors. Table 4.3.2.1 shows the means score based on the response of the participants concerning the internal related factors.

In item 1 (Delayed approval of payments), the mean score is 2.7 which implies most of the respondents lean towards moderately significant that cost overrun less likely to occur due to delay approval of payment.

In item 2 (Lack of consultation with the client), the mean score 2.73 indicates that most of the respondents tend to be moderately significant that lack of consultation with the client cause cost overrun.

In item 3 (Mistakes & Discrepancies in contract documents), the mean score is 2.80 which implies most of the respondents lean towards moderately significant on that mistakes & discrepancies in contract documents is one of the causes for cost overrun.

In item 4 (Poor Communication & Coordination with employees' consultant and client), the mean score is 2.93 which implies most of the respondents lean towards moderately significant that Poor communication & coordination with employees' consultant and client could be one of the reasons that result in cost overrun.

In item 5 (Fraudulent practices and Kickbacks), the mean score 2.97 implies most of the respondents moderately agree that fraudulent practices and kickbacks could be one of the many causes for cost overrun in construction projects.

In item 6 (Lack of communication or integrity between difference parties), the mean score is 3.17, which implies most of the respondents lean towards moderately significant that lack of communication or integrity between difference parties is a cause for a cost overrun.

In item 7 (Complexity of Construction projects), the mean score is 3.17, which implies most of the respondents chose to stay moderately significant that complexity of construction projects is a cause for a cost overrun.

In item 8 (Lack of timely decision and corrective actions), the mean score is 3.37 which implies, most of the respondents lean to moderately significant to lack of timely decision and corrective actions can cause cost overrun for the construction project.

In item 9 (Procurement process is ambiguous & without planning), the mean score 3.87 shows that most respondents say that very significant that Procurement process is ambiguous, & without planning is the cause of the cost overrun in construction projects.

In item 10 (Poor contract Management), the mean score 4.03, which implies most of the respondents lean towards very significant the poor contract management cause for the cost overrun in the construction project.

In item 11 (Slow response from the management of the project), the mean score is 3.33 implying that most respondents moderately significantly agree that one of the causes for cost overrun is Slow response from the management of the project.

4.2.3. Respondents Perception on the External factors

As external factors are one of the causes that the organization faced. Regarding the external factors, the institute has to overcome them for the project to be finished at the appropriate cost. The below table shows the questions answered by the respondents and have calculated the mean of the respondents' score to know which one is the most cause of the cost overrun.

Table 4.3.3.1 shows the means score based on the response of the participants concerning the factors related to external causes leading to cost overrun is presented.

Questionnaires' Items	N	Mean	Std. Deviation	RII	Rank
Bureaucracy in government agencies	30	2.83	1.315	0.567	9
Political Factors	30	3.17	1.440	0.633	8
Increase in the cost of labor	30	3.30	1.291	0.660	7
Economic Conditions; local or global	30	3.37	1.377	0.673	5
Inadequate experience staff and poor labor productivity within the project team	30	3.50	1.480	0.700	4
Escalation of exchange rate	30	3.67	1.184	0.733	3
Inflation or increase in the cost of construction materials	30	4.03	1.098	0.807	2
Escalation of Material price	30	4.17	0.950	0.833	1

Contractors' inefficient knowledge about the country law and Regulation	30	3.33	1.446	0.667	6

(Source: Own Survey, 2022)

In item 1 (Bureaucracy in government agencies), the mean score is 2.83 which implies most of the respondents lean to slightly significant to the cause of cost overrun by the bureaucracy in government agencies.

In item 2 (Political Factors) the mean score is 3.17 which implies most of the respondents tend to say moderately significant that cost overrun may result due to political factors.

In item 3 (Increase in the cost of labor), the mean score is 3.30 which implies most of the respondents choose moderately significant that an increase in the cost of labor stage is one of the causes for cost overrun.

In item 4 (Economic Conditions; local or global), the mean score is 3.37 which implies most of the respondents choose moderately significant that cost overrun could be caused as a result of economic conditions.

In item 5 (Inadequate experience staff and poor labor productivity within the project team), the mean score is 3.50 implying that most respondents claim that inadequate experience staff and labor is moderately significant for the cause of cost overrun.

In item 6 (Escalation of the exchange rate) the mean score is 3.67 which implies that most respondents claim that escalation of the exchange rate very significantly affects the cause of cost of the construction project which leads to cost overrun.

In item 7 (Inflation or increase in the cost of construction materials) the mean score of 4.03 indicates most of the respondents tend to say that inflation or increase in the cost of construction materials very significantly causes cost overrun.

In item 8 (Escalation of Material price), the mean score of 4.17 indicates that most of the respondents tend to say escalation of materials price is very significant to cause of cost overrun.

In item 9 (Contractors' inefficient knowledge about the country's law and Regulation), the mean score of 3.33 shows that most respondents moderately significantly cause cost overrun in the construction project

4.4 Discussion

The survey aggregated the top professional factors according to ratings and set out to identify the top five internal and external reasons for cost overruns based on respondents' responses. Using the relative importance index method and the expert's response, it was possible to list the top five reasons for cost overruns, as indicated in the table below.

Table 4.4.1 The Five Most Important internal cause of cost overrun in construction project

No	Item	RII	Rank
1	Poor contract Management	0.77	1
2	Procurement process is ambiguous & without planning	0.75	2
3	Lack of timely decision and corrective actions	0.67	3
4	Slow response from the management of the project	0.67	4
5	Complexity of Construction projects	0.63	5

(Source: Own Survey, 2022)

This finding shows that poor contract management is the first and most important cause of cost overrun on a construction project with an RII of 0.77. These revealed that proper contract management of a project is an essential part of the project to be finished within the appropriate cost and if project objectives must be met.

The second important factor ranked by the groups of respondents is procurement process is ambiguous & without planning an RII of 0.75. Change in procurement procedures is impeded by clients' habitual behavior (Laedre et al., 2006). Although procurement procedures need to be tailored to enhance the fulfillment of different project objectives (Cox and Thompson, 1997, Love et al., 1998, Wardani et al., 2006), clients tend to choose those procurement procedures they have a habit of using, regardless of any differences between projects (Laedre et al., 2006). To enhance change, an increased understanding of how different procurement procedures affect different

aspects of project performance is vital. When the procurement process is done properly with proper planning and collecting the performance correctly it will lead to the cause of cost overrun.

Lack of timely decisions and corrective actions is found to be the third most important cause of cost overrun in a construction project with an RII of 0.67. The management should give timely decisions for the work to be done on time and at the proper cost to reduce the cost that will be occurred due to the delay of the decision for the management also if there is a correction that needs to be done the necessary corrective action has to be taken to avoid the cost that will occur as a result of the work that has not done properly.

Slow response from the management of the project was ranked to be the fourth most important cause of cost overrun on a construction project with an RII of 0.67. This cause is the same as the third one which leads to cost overrun if the management does not give a response appropriately.

The complexity of Construction projects was ranked to be the fifth cause of cost overrun on a construction project with an RII of 0.63. The concept of complexity is not only associated with the size or cost of the projects which is a main attribute of mega projects but rather complexity may also be associated with innovation which may demand a lot of toils and other dimensions (Williams, 2005). According to the Project Management Institute, "complexity is a characteristic of a program or project or its environment that is difficult to manage due to human behavior, system behavior, and ambiguity" (PMI, 2014, p.12). Therefore, organizations should assess project complexity properly to allocate the necessary resources for project success.

Table 4.4.2 The five most important external cause of cost overrun in construction project

No	Item	RII	Rank
1	Escalation of Material price	0.833	1
2	Inflation or increase in the cost of construction materials	0.807	2
3	Escalation of exchange rate	0.733	3
4	Inadequate experience staff and poor labor productivity within the project team	0.700	4
5	Economic Conditions; local or global	0.670	5

(Source: Own Survey, 2022)

This finding shows that escalation of material price is the first most important external cause of cost overrun on construction project in RII of 0.833. These revealed that during cost estimation the escalation of the materials price needs to be considered.

The second important factor ranked by the groups of the respondents is inflation or increase in the cost of construction materials in RII of 0.807.

Escalation of exchange rate is found to be the third most important cause of cost overrun in construction project with RII of 0.733.

Inadequate experience staff and poor labor productivity within the project team was ranked to be the fourth most important cause of cost overrun on construction project with RII of 0.700.

We can say that escalation of material price, inflation or increase in the cost of construction materials, and change in exchange rate are a national problem which will cause cost overrun not only in construction projects but also in other projects. This confirms Kerzner (2003) points that the highest challenges of executives in the next decades would be escalation of factors for salaries and raw materials. The people participating in the construction have no influence over these extraneous variables. However, they should incorporate backup plans into their projections as this will help to lessen the impact of outside influences.

Economic Conditions: local or global was ranked to be the fifth cause of cost overrun on construction project with RII of 0.67. The economic conditions as a country and global has its own effect on the construction of different projects war, covid, inflation and other factors has significant effect on the project of the construction to be executed in the proper time and cost as they affect the different aspect of the industry.

4.5. Regression Analysis

To examine the cause of cost overrun in the construction project linear regression was conducted. However, before preceding the regression analysis all the relevant assumptions must be tested. Therefore, the researcher has examined the following assumptions before heading to the regression.

Assumption Test 1: Linearity Test

The linearity test aims to determine the relationship between independent variables and the dependent variable is linear or not for the regression model to be good there should be a linear

relationship between independent variables and the dependent variable. If the value of sig. for deviation from linearity >0.05, then the relationship between the independent variables is linearly dependent. Whereas if the value of sig. for deviation from linearity <0.05 then the relationship between the independent variables is not linearly dependent.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.279	20	.164	1.662	.219[b]
	Residual	.888	9	.099		
	Total	4.167	29			

a. Dependent Variable: Level of cost overrun

b. Predictors: (Constant), External and Internal causes/factors

Based on the above ANOVA output table, value sig. deviation from linearity of 0.219 > 0.05, it can be concluded that there is a linear relationship between cost overrun and internal and external causes. The linearity assumption can also be tested by inspecting the Normal Probability Plot (PP) of the Regression Standardized Residual Scatter plot. As shown in figure 4.4.1 the scatter plot of residuals showed that the points laid in a slightly straight line from bottom left to top right. Therefore, we can say that the assumption of linearity was not violated.
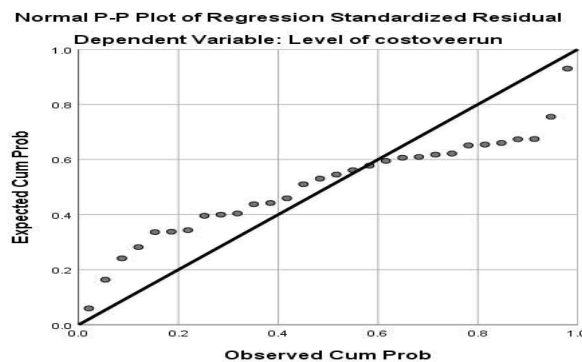

Figure 4.4.1 Normal P-P Plot of Standardized Residual.

Assumption Test 2: Normality Test

A normality test was used to determine whether the error term is normally distributed. The frequency distribution of the standardized residuals was also compared to a normal distribution. As can be seen from figure 4.4.2, although some residuals are relatively far away from the curve, many of the residuals are fairly close. Moreover, the histograms are bell-shaped which leads to inferring that the residual (disturbance or errors) are normally distributed for all the models. Thus, it can be said that the assumption of a normally distributed error term is not violated.
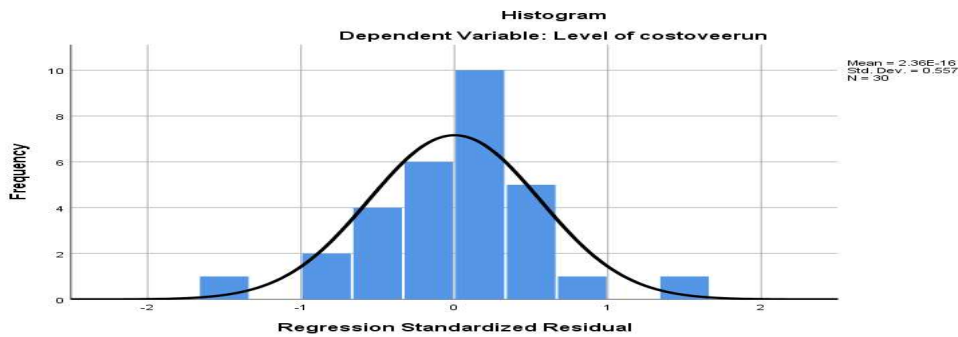
Figure 4.4.2 Frequency Distribution of Standardized Residual

Assumption Test 3: Test of Multicollinearity

Multicollinearity will occur if some or all of the independent variables are highly correlated with one another (Brooks; 2008). If multicollinearity problem is too serious in a model, either additional important variable should be added or unimportant independent variable should be dropped.

The presence of multicollinearity in the model detected by using Variance Inflation Factor (VIF), which is a measure of the reciprocal of the complement of the inter-correlation among the independent variables. If variance inflation factor exactly or exceeds 10 then there is a problem of multicollinearity. Tolerance (TOL) is a statistical used to show the variability of the specified independent variable is not explain by another independent variable in the model and used to check degree of collinearity. The decision rule for tolerance is a variable whose TOL value is less than 0.1 shows the possible existence of a multicollinearity problem. As shown in the table 4.5.1 below, the output of VIF showed that a value of less 10 for all of the independent variables and all tolerance (T) is greater than 0.1, therefore, this study has no multi-collinearity problem.

Table 4.5.2 Multicollinearity Test

No	Model	Unstandardized Coefficients Beta	Collinearity Statistics	
			Tolerance >0.1	VIF <10
	(Constant)	-1.47		
1	internal cause of cost overrun	0.008	.287	3.484
2	External cause of cost overrun	0.04	.0166	6.019

(Source: Own Survey, 2022)

Simple Regression Analysis

After testing the classic assumptions of linear regression for the data used, the researcher conducted a linear regression to examine the cause-and-effect relationship between cost overrun and the cause of the cost of cost overrun. The output obtained from the analysis is presented and interpreted as follows.

Table 4.5.2   Multiple regression analysis

Model Summary [b]							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	Sig
1	0.887	0.787	0.314	0.314	0.787	1.662	0

(Source: Own Survey, 2022)

In the above table, it is revealed that F is 16.62 with a p-value of 0 which, is statically significant at α=0.01 which, tells us that there is less than 1% that an F-ratio of this amount would happen. Therefore, it can be said, that the regression model overall predicts the effect on project cost overrun significantly well.

The results of regression analysis indicate a positive and significant relationship between the project cost overrun causes and project cost overrun. This means the predictive variables (independent variables) such as

the internal and external factors jointly determine the dependent variable project cost overrun. Hence the external (escalation of material price, inflation or increase in the cost of construction materials, escalation of exchange rate) and internal (poor contract management, the procurement process is ambiguous & without planning, lack of timely decision and corrective actions) causes related jointly determine (explain) 78.7% of the variance in project cost overrun. Whereas 21.3% of the project cost overrun was explained by variables that were not included in the study.

Table4.5.2 Summary of Coefficient for internal causes

Coefficients [a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.171	0.284		4.123	.000		
	Poor contract Management	0.109	0.081	0.404	1.348	0.019	0.336	2.973
	Procurement process is ambiguous & without planning	0.008	0.063	0.028	0.131	0.008	0.645	1.550
	Lack of timely decision and corrective actions	0.081	0.059	0.293	1.375	0.018	0.667	1.498
	Slow response from the management of the project	0.180	0.103	0.488	1.748	0.009	0.388	2.579
	Complexity of Construction projects	0.134	0.063	0.416	2.137	0.043	0.799	1.252

(Source: Own Survey, 2022)

The effects of each independent variable on the dependent variable are represented by the values of the unstandardized beta coefficients (β). Additionally, when the variance explained by all other independent variables in the model is controlled, the values of the unstandardized beta coefficients in the Beta column of

Table 4.5.2 above show which independent variable (cause of cost overrun) contributes most significantly to explaining the dependent variable (project cost overrun). Whether or not the independent variable significantly influences the dependent variable's prediction is shown by the t value and the sig (p) value.

The results of regressions, as presented in Table 4.5.1 above, revealed that project poor contract management factor had a positive and significant effect on project cost with (β =0.0109, t = 1.348 & p<0.05). These figures suggest that the project cost would be reduced by 1.09 % if the institute gave 1% more attention to the poor contract management. As a result, issues relating to contract management had a detrimental impact on the project's cost.

Related to procurement process factor, it had a positive and significant effect on project cost with (β =0.008, t = 0.131 & p<0.05). This figure suggests that the project cost would be reduced by 0.8% if the owner gave 1% more attention to the ambiguous and without planning procurement process. Therefore, issues relating to the procurement process had significant impact on the cost overrun.

Lack of timely decision and corrective actions is the other facto which affects the construction cost in which (β =0.081, t = 1.375 & p<0.05). This figure suggests that the project cost would be reduced by 8.1% if the institute gave 1% attention to the late decision and corrective action, which shows that it has significant impact on the construction cost.

Related to slow response from the management of the project has a positive impact on the project cost overrun (β =0.180, t = 1.748 & p<0.05). This value suggest that the project cost would be reduced by 18% if the institute gave 1% attention to the slow management response which can affect the cost of the construction if they don't give attention.

Complexity of Construction projects is one of the problems many constructions industries face as the work by itself is a complicate then it will affect it the cost in which (β =0.134, t = 2.137 & p<0.05). In this case the beta coefficient describes that keeping the other variables constant, in this model a one % unit change in the complexity of construction the consequence would be made change cost in project by 13.4 %.

Table 4.5.3 Summary of Coefficient for external causes

Coefficients [a]								
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	0.960	0.341		2.813	.000		
Escalation of material price	0.037	0.103	0.092	0.357	0.007	0.497	2.013
Inflation or increase in the cost of construction materials	0.133	0.107	0.385	1.244	0.022	0.345	2.897
Escalation of exchange rate	0.086	.068	0.270	1.269	0.021	0.733	1.363
Inadequate experience staff and poor labor productivity within the project team	0.047	0.056	.183	0.830	0.041	0.683	1.646
Economic condition; local and global	0.090	0.074	0.324	1.218	0.023	0.459	2.180

(Source: Own Survey, 2022)

The results of regressions, as presented in Table 4.5.3 above, revealed that project escalation of material price factor had a positive and significant effect on project cost with (β =0.037, t = 0.357 & p<0.05). These figures suggest that the project cost would decrease by 3.7 % if the institute gave 1% more attention to the escalation of material price. As a result, issues relating to the escalation of material price had a detrimental impact on the project's cost. The conclusions support those made by Duran (2006), Luu et al. (2009), Abdul Rahman (1993), and Nihal Jawad (2015), who note that the following factors always contribute to cost escalation: The budget

deficit was brought on by pricing fluctuations. Al-Hindawi and Awad (2007) used escalation and the low unit price (unit rate) of civil works to estimate the cost and cost growth on various components.

Inflation or increase in the cost of construction materials factor, had a positive and significant effect on project cost with (β =0.133, t = 1.244 & p<0.05). This figure suggests that the project cost would be decreased by 13.3% if the institute gave 1% more attention to the inflation or increase in the cost of construction materials. Therefore, issues relating to inflation or an increase in the cost of construction materials had a significant impact on the cost overrun.

Escalation of the exchange rate is the other factor that affects the construction cost in which (β =0.086, t = 1.269 & p<0.05). This figure suggests that the project cost would be reduced by 8.6% if the institute gave 1% attention to the escalation of the exchange rate, which shows that it has a significant impact on the construction cost.

Related inadequate experience staff and poor labor productivity within the project team have a positive impact on the project cost overrun (β =0.047, t = 0.830 & p<0.05). This value suggests that the project cost would be reduced by 4.7% if the institute gave 1% attention to the inadequate experience staff and poor labor productivity.

Economic condition: local and global projects are one of the problems many construction industries face as then it will affect the cost in which (β =0.090, t = 1.218 & p<0.05). In this case, the beta coefficient describes that keeping the other variables constant, in this model a one % unit change in the economic condition consequence would be made change cost in a project by 9 %.

4.6 Hypothesis Testing

H1: The project original duration and contract amount are affected by the project cost management practice. Accepted

As reviewed different secondary documents and from the observation additionally from the questioner survey the original contract amount and final cost of project has different which means affected the construction cost.

H2: There is a positive and statistically significant relationship between project cost overrun cause and overall project cost - Accepted

As obtained from the result of the regression analysis, the relationship between cause of cost overrun and its effect on project cost is significant. In agreement with the finding of this research which shows that there is a significant relationship between cause of cost overrun and its effect on project cost, in which increased cause of cost overrun results in an increased effect on project cost.

CHAPER FIVE
SUMMARY OF FINDINGS, CONCLUSION AND
RECOMMENDATIONS

5.1 Introduction

This chapter is the final chapter which is divided into three sections. The study's key findings are summarized in the first section, conclusions are presented in the following section, and recommendations are made in the final section based on the findings and conclusions that may apply to the construction sector.

5.2 Summary of Findings

The objective of this study was to study the causes of cost over-run in a construction project of the accommodation and training center construction project of the KAIZEN institute with a specific objective to

- To assess the extent of cost overrun in construction projects concerning the project's original duration and contract amount.
- To evaluate the existing problems associated with construction project completion cost.
- Identifying the responsible bodies that, contribute to critical causes of cost overruns.
- To forward recommendations about minimization or avoiding cost overrun

Based on the study objectives, research question, and hypotheses, questionnaires measuring research variables were developed and organized. From the 30 questionnaires distributed, 30 (100%) valid questionnaires were collected and used for analysis. Participants in this study were construction site professionals. Project managers, civil engineers, accountants, and others with organizational experience from less than 1 year to 15 years were the professionals who participated in completing the questionnaire. The collected data were analyzed using the Social Science Software (SPSS) statistical package. A simple regression analysis was used to test the hypothesis.

Descriptive analyzes were calculated and presented in the table. before applying the regression

Assumption tests such as analysis, linearity, and normal distribution were performed. We analyzed respondents' opinions on prevalence, causes, and effects using descriptive statistics such as frequency, percent mean, and standard deviation, and ranked them using the Relative Importance Index (RII). Based on descriptive statistical analysis, most respondents agree that the problem exists and occurs frequently at the KAIZEN Institute.

Based on data obtained from the descriptive analysis, the most important causes and effects of cost overruns are ranked using the Relative Importance Index (RII), and the most frequently assessed causes of cost overruns

are poor contract management and examined its impact. After testing all assumptions, a regression analysis of project cost overruns was performed and found that cost overruns have a significant impact on project performance with $R^2 = 0.787$, F–ratio = 16.62 & sig= $0.004 < 0.05$, and p-value < 0.01. Finally, based on the results of the ANOVA table the alternative hypothesis was accepted.

5.3 Conclusions

Cost overruns have the adverse effect of impacting the financial viability of the project. The problem of cost overruns is exasperated when the necessary funding to cover increased costs cannot be arranged promptly. Delays in arranging the funding necessary to cover cost overruns will only increase costs further, which can get the project into trouble and eventually cause the project to end and never a start.

The objectives of the study have been successfully identified. Most of the factors that cause cost overrun were identified, among these factors most important factors that contributed to the cause of cost overrun include poor contract management, the procurement process being ambiguous and without planning, lack of timely decision and corrective actions, Slow response from the management of the project, the complexity of the project, escalation of materials price and inflation in the cost of construction materials, escalation of exchange rate and inadequate experience staff and poor labor productivity within the project team are the main cause of the project cost overrun. As the regression analysis showed there is a strong, positive, and significant relation between the cause of the cost overrun and project cost.

5.4 Recommendations

Aligned with the above conclusion, the researcher proposes the following recommendations that should be considered by the institute

- There are factors which can be controlled and improved by the company however, there are also factors which are beyond the control of the contractor like currency exchange, economic instability, transportation cost, labor cost, delay in progress payment, incremental price of materials and complexity of the construction project.
- Efficient contract management, site management, and inspection should be developed.
- The procurement process should be done properly and with the appropriate planning.

- The responsible parties must estimate costs realistically because increment is a reality of life in the modern world.
- Carrying out identifications of factors for cause of cost overrun and then identifying the significance and importance of each of the identified the most sever cause prior to planning to address these causes for effectiveness.
- Escalation in material price should be considered during planning and estimating.
- The recruitment of the employees needs to do with the proper qualification and the selection process has to be done with enhancement.
- The project managers have to give timely and appropriate decisions regarding the matters which occurred during the construction.
- The project manager must keep up to date with today's life and manage the projects properly.

Based on Ibbs et al. (2001) suggestion of having a systematic approach to managing project change, it is advised to have a balanced change culture, recognize the change before its occurrence, evaluate the change, and implement approved change with continuous improvements.

Implication for Further Research

- While this study only examined cost overrun factors, future research might include looking at time overrun factors, how they relate to cost overrun factors, and time overrun mitigation strategies.
- The result of this study relates to construction projects, and additional research should be conducted on other projects to identify and contrast the causes of cost overruns.

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APPENDIX 1

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUD

MASTER'S PROGRAM IN PROJECT MANAGEMENT

CAUSES OF COST OVER-RUN IN CONSTRUCTION PROJECT: THE CASE OF
ACCOMMODATION AND TRAINING CENTER CONSTRUCTION PROJECT OF THE
KAIZEN INSTITUTE

BY

NARDOS BEKELE

ADVISOR: MARU SHETE (PHD)

FOR THE PARTIAL FULFILLMENT FOR THE DEGREE OF MASTER OF ARTS IN
PROJECT MANAGEMENT

JANUARY 2023

GENERAL INFORMATION

I am a graduate student of St Mary's University, Project Management Program. I am conducting research about "Causes of Cost Over-run in Construction Project: The case of Accommodation and Training Center Construction Project of the KAIZEN Institute", which I had chosen as a topic to conduct research on it for my master's project. Hence, I request you kindly to fill up this questionnaire which will be of immense help in my study. Please take a look at the required information and try to answer correctly and accurately. I thank you for your valuable time and efforts and I want you to know that the information you provide will only be used for academic purpose.

Tel: 0955330720

Email: nardinardos16@.com

Section one: Basic attribute of the performer

Please indicate your answers.

1) Your gender   Male_____   Female_____

2) Your Educational background

   1. Master's Degree   2. Bachelor's degree   3. Diploma   4. Other (please specify)
_____

3) Please state your position in the organization which you work.

   1. Project Manager   2. Engineer   3. Accountant   4. Other (please specify)   _____

4) How many years have you been working in construction projects?

   1. Less than 1 year   2. 1-5 Year   3. 6 to 10 years   4. 11 to 15 years   5. Over 16 years

5) In your professional career, what is the average percentage level of cost overrun in your

past projects?

   1. 0 – 10%   2. 11% - 20%   3.21% - 30%   4. 31% - 40%   5. More than 40%

6) Does the institute face cost overrun?

   1.Yes   2. No

Section two: Factors influencing Cost Overrun

Please indicate the significance rate of the following factors by circling the appropriate number in the box. (N.B- Numbers symbolize the following:

    1 – Not significant 2 – Slightly significant 3 – Moderately significant

    4 – Very significant 5 – Extremely significant

1	The procurement process is ambiguous and without Planning	1	2	3	4	5
2	Poor contract Management	1	2	3	4	5
3	Slow response from the management of the project	1	2	3	4	5
4	Poor communication and coordination with employees, the consultant and client	1	2	3	4	5
5	Delayed approval of payments	1	2	3	4	5
6	Mistakes and discrepancies in contract documents	1	2	3	4	5
7	Fraudulent practices and kickbacks	1	2	3	4	5
8	Inadequate experience staff and poor labor productivity within the project team	1	2	3	4	5
9	Lack of consultation with the client	1	2	3	4	5
10	Lack of timely decision and corrective actions	1	2	3	4	5
11	Increase in the cost of labor	1	2	3	4	5
12	Escalation of material prices	1	2	3	4	5
13	Change in exchange rate	1	2	3	4	5
14	Political factors	1	2	3	4	5
15	Lack of communication or integrity between different parties	1	2	3	4	5
16	Economic conditions; local or global	1	2	3	4	5
17	Inflation or increase in the cost of construction materials	1	2	3	4	5
18	Complexity of construction projects	1	2	3	4	5
19	Contractors' inefficient knowledge about the country law and Regulation	1	2	3	4	5
20	Bureaucracy in government agencies	1	2	3	4	5

Other (please specify) _____

Thank you for your valuable time and efforts!