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"The Assessment of cost management practice; the case of some selected building construction projects in Addis Ababa"

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Assessment of Project Cost Management Practices: in the case of selected Building construction in Addis Ababa.

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Declaration

I, the undersigned, hereby declare that this research entitled "**The Assessment of cost management practice; the case of some selected building construction projects in Addis Ababa**" is my original work and that all sources of materials used for this study have been identified and acknowledged as complete references. This research study has not been previously submitted in full or partial fulfillment for a degree in this or any other recognized educational institution. This research study is being submitted in partial fulfillment of the requirement for Master of Arts in Project Management.

Hana Sintayehu	_____	_____
Author	Date	Signature

STATEMENT OF CERTIFICATE

This is to certify that Hana Sintayehu carried out this research on the topic entitled, "**The Assessment of cost management practice; the case of some selected building construction projects in Addis Ababa."** This work is original in nature and is suitable for submission for the award of the Master of Arts in Project Management.

Adane Atara (PhD)	_____	_____
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ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
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ASSESSMENT OF PROJECT COST MANAGEMENT PRACTICES: IN THE CASE OF SELECTED BUILDING CONSTRUCTION IN ADDIS ABABA.

By: Hana Sintayehu

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Abbreviations and Acronyms

GTP	Growth and Transformation Plan
BIM	Building Information Modelling
EVM	Earned Value Management
CPI	Cost Performance Index
SPI	Schedule Performance Index
SPSS	Statistical Package for Social Science
WBS	Work breakdown Structure
PMP	Project Management Professional

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Abstract

The purpose of the study was to evaluate how well building construction projects in Addis Ababa used project cost management. In order to collect data that was both quantitative and qualitative, a mixed research approach was used, which included interviews and a descriptive survey. The Oromia Police Commission building, the National Theatre, the Alert Hospital Expansion, and the Germen Square New Hope Real Estate were the four main construction projects that were investigated. The study exposed serious flaws in the resource planning, cost estimating, budgeting, and cost control procedures used in these projects' cost management techniques. It was discovered that more sophisticated cost management technologies were frequently eclipsed by conventional techniques and gut feelings. Creating thorough cost management plans, enhancing cost control mechanisms, fusing estimation techniques with budgeting, and deeply integrating cost management into project activities were among the suggestions made in order to increase efficiency and accuracy in cost management practices

Key Words: Resource planning, project cost management, cost estimation, budgeting, cost overrun, and cost control

CHAPTER ONE

1. Introduction

1.1. Background of the study

The construction industry is recognized as a segment with extraordinary commitment to the financial and social improvement of a nation, especially due to the number of coordinate and backhanded occupations created and its impact on a few other segments, which create materials, hardware & administrations in its generation, prepare.

The Ethiopian construction industry has appeared quick development coming about in venture victory differentiating that of creating nations. The 10-year estimate of the Ethiopian development industry of 10.5% other is the speediest development rate in sub Saharan Africa and the second-fastest industry development universally .The construction industry in Ethiopia is a vital sector that helps to the country's infrastructure and economic growth. For both residential and commercial projects, as well as large-scale infrastructure developments, the construction industry is essential in supplying employment opportunities and driving economic progress. According to a report by the African Development Bank Group, Ethiopia's building sector has been experiencing significant growth in recent years, supported by government investments in infrastructure projects. This growth has also attracted foreign investment and expertise, further enhancing the industry's capabilities and capacity.

Although Ethiopia's construction sector is expanding, efficiently completing projects on schedule, within budget, and with high quality is still a difficult task. Successful construction projects are achieved by applying knowledge-based, crucially important components. The degree to which each organization has developed its project management expertise determines the efficacy of the sector. There is different type of construction sectors in Ethiopia, which are building construction, Road Construction, Bridge construction and other construction types. From these construction industry types the study was focus on Building construction industry.

Building construction projects in Ethiopia play a significant role in the country's economic development and urban transformation. With a growing population and increasing urbanization, there is a high demand for residential, commercial, and infrastructure developments in Ethiopia.

Building construction industry may be a noteworthy supporter of financial and social advancement in worldwide, territorial and national economy. It has gigantically affected the economy, the environment and the society. In spite of the fact that the building development industry plays critical part in socio-economic improvement of the country, the industry has confronted a few issues and challenges .the failure to total ventures inside budget proceeds to be a incessant issue around the world and is declining from time to time (Ahmed, 2002). Moreover, (Azhar and Farouqui, 2008) watch that the issues of administration is common around the world which it is more severe in creating nations. Due to these challenges the talk about within the development industry on how to oversee fetched has been examined for a few time among experts, clients and/or conclusion clients, and the arrangement producers. Development specialists in the field generally agree on the significance of well managed development initiatives. Cost is the allocated use for which the client has agreed to pay in order to establish or purchase the necessary development office (Chitkara, 2011). Furthermore, Youthful &Ibbs (2002) stated that cost management as a process of regulating the consumption on a development extends at every stage, from inception to completion, inside the endorsed budget. It is the method by which costs brought about on a extend are formally recognized, endorsed and paid (Chris, 2008).

Cost plays a significant role in building construction projects in Ethiopia, as it directly influences the success and viability of these endeavours. Effective cost management is crucial to ensure that projects are completed within budget and on schedule. Weak Cost Management can lead to financial strain, delays, and potential project failure. Therefore, accurate cost estimation, budgeting, and cost control are essential for the successful delivery of construction projects in Ethiopia. Yossef T., (2016).

As the intensive construction in Ethiopia today becomes more complex, the demand for housing and project management services is increasing. During the housing construction project management in practice: progress versus timeliness, expenses against bids or budgets, and quality against specifications is can be confusing for all parties involved in the construction process.

One of the main tenets of project management is cost management, which controls how financial resources are allocated and used to meet project goals within predetermined spending limits (Kerzner, 2017). Its importance stems from its capacity to reduce financial risk, maximize resource allocation, and uphold project viability (Kwak & Anbari, 2006). Effective cost management techniques are increasingly crucial as projects get larger and more complicated (PMBOK Guide, 2021). Nonetheless, there are opportunities and obstacles in putting advanced cost management methods into practice because of how corporate settings are dynamic and because project management approaches are always changing (Mir &Pinnington, 2014). The goal of this study is to perform a thorough evaluation of present project cost management methods in order to pinpoint any shortcomings and suggest cutting-edge methods for improving cost control.

1.2. Statement of the problem

Even while efficient cost management is crucial for construction projects, there is still a big knowledge and application gap when it comes to best practices, especially building construction projects in Addis Ababa, Ethiopia. The absence of thorough evaluations tailored to this region makes it more difficult to pinpoint the main obstacles and chances for project cost management advancement. In the modern world of project management, cost management may be a one of the most crucial abilities a project manager can have, given that cost overrun is the construction industry's biggest concern. The topic of controlling the intrinsic costs of most undertakings has received more attention in recent years (Kerzner 2006). Although extensive literature exists on cost, and general cost management practices , research addressing cost management approaches in building construction specifically is relatively very few(Meredith&Mantel,2009). Guy and Henneberry (2002) state that managing costs is crucial for those in the building construc tion industry.When building costs spiral out of hand, there may be significant waste and subsequ ent pressure on property management.A wellmanaged budget has implications for the entire buil dingconstruction development process.

In Ethiopia, although some researches have been studied in the field of project cost management, from survey of relevant literature, it was evident that some research conducted on the empirical investigation of cost management practices in building project constructions in Addis Ababa, Ethiopia,. Elias (2021) conducted research about the impact of project cost management on

project success on selected building construction projects in Addis Ababa. Alula (2020), are conducted a study to examine the methods and difficulties associated with project cost estimation in a few chosen Grade One Building Construction Companies in Addis Ababa. Sirgut (2018) conducted a study to determine the factors that, in the instance of Nashcon Construction PLC, affect efficient project cost management. More so, Taye (2016); Zinabu and Getachew (2016) and Fetene (2008) conducted a study to identify factors that cause cost overrun in construction project. However, these and other studies in the area of project cost are mostly focus on the cause of project cost overrun, or the effect of project cost management practices on project success, not focus on the actual cost management practices. It came out strongly that there was of lack of comprehensive and detail analysis of each element of project cost management practices. Thus, the study aims to fill this gap in literature by assessing in detail the project cost management practices with in the context of building projects construction companies in Addis Ababa. As a result, it is imperative to assess the state of project cost management procedures in the chosen Addis Ababa building construction projects. The objective of this evaluation is to ascertain the most often used approaches, instruments, and tactics, along with the difficulties that arise when estimating costs, creating budgets, keeping track of, and managing projects over their whole duration. By understanding these dynamics, stakeholders can address deficiencies, optimize resource allocation, mitigate risks, and enhance project performance and sustainability. As project-based businesses, construction companies must strengthen their project management capabilities to successfully complete projects and firm goals. Apart from the primary cost management responsibilities, which include budgeting, cost controlling, budgeting, and estimating, the study's findings also made on contractors' performance with regard to winning contracts and securing adequate profit.

Clients ,contractors, and consultants all commonly view the timely finishing of a building project as a critical component of project success. It has been widely observed, according to Newcombe et al. (1990), that the construction sector has not been able to complete projects on schedule. According to Nedo (1983), a construction project's timely completion requires a disciplined management effort, which was also help to manage expenses and quality. This essentially means that the goals of the client can be met by a management approach that acknowledges the interconnectedness of cost, time, and quality.

1.3. Research questions

In line with the problem statement, the study attempts to address the following basic research questions.

i. How project resource planning is handled by building construction projects?
ii. How project cost estimation is practiced among building construction projects?
iii. How project cost budgeting is practiced among building construction projects?
iv. How project cost control is practiced among building construction projects?

1.4. Research objectives

1.4.1. General Objective

The general objective of the study is to assess the project cost management practices of building construction in Addis Ababa.

1.4.2. Specific Objective

The Specific objectives of the study include the following:

i. To examine project resource planning practices of some selected building constructions in Addis Ababa.
ii. To determine project cost estimating practices of some selected building constructions in Addis Ababa.
iii. To examine project cost budgeting practices of some selected building constructions in Addis Ababa.
iv. To assess project cost control practices of some selected building constructions in Addis Ababa.

1.5. Significance of the study

The study was making an effort to address the assessment of cost management practices that have an impact on Addis Ababa building construction projects. The study was make important suggestions for a number of reasons. Construction professionals will find the study valuable in understanding cost management strategies, which will help them efficiently control project expenses, optimize budgets, and reduce cost overruns. Additionally, the study will suggest putting cost management techniques into practice, which will raise project profitability by cutting down on wasteful spending, making the most use of available resources, and improving

project efficiency. The other is that by using cost management techniques, experts may detect any hazards that could have an influence on project expenses and create proactive mitigation plans to deal with them. Knowledge of cost management practices empowers stakeholders to make informed decisions regarding project investments, resource allocation, and procurement strategies.

By studying cost management practices, construction professionals can continuously evaluate and improve their processes, identify areas for cost savings, and enhance project performance over time. In conclusion, understanding cost management techniques in the building sector is crucial for attaining financial success, reducing risks, coming to wise judgments, and completing projects successfully in a construction market. Construction experts may optimize project budgets, increase profitability, and complete successful building projects within budgetary limits by putting these cost management techniques into practice successfully.

Good cost management techniques provide financial stability, satisfy client expectations, and accomplish project objectives, all of which support the ultimate achievement of building construction projects.

1.6. Scope of the study

The notion of cost management practice in construction projects is so broad that it cannot be restricted to a company's building projects alone. This research was limited to building construction projects in the selected grade 1 Contractors in the industry. The scope of the work includes the analysis of Planning, cost estimation, budgeting and cost control of some selected building constructions in Addis Ababa.

The study was delimited on four major areas (conceptual, geographical, methodology, time).

The study's conceptual scope attempts to investigate, characterize, and elucidate real project cost management practices in Addis Ababa building construction projects. The study evaluates the cost planning, estimating, budgeting, and controlling techniques of project cost management.

In a Geographic Scope the study was solely concentrate on a few chosen Addis Ababa building construction project businesses. The survey was not include enterprises located outside of Addis Ababa due to financial constraints and geographic barriers impeding the collection of data from all employees nationwide.

It was make use of a mixed research approach, whereby qualitative data were gathered through interview techniques and quantitative data from the questionnaire. And the needed data were collect in 2024.

1.7. Organization of the study

There are five chapters in this paper. The first chapter is the introduction, which provides basic information about the research. It include background of the study, statement of the problem, research question, objective of the study, significance of the study, research method, and scope of the study and the limitations of the study. The second chapter is the literature review from different sources which provide theories and discussions related to project cost management in construction. The third chapter is the methodologies to achieve research objective. It shows the Description of the study area, research design, approach population and sample, data collection instrument, method of analysis and presentation. The fourth chapter presents the results, which include data analysis and interpretation obtained from questionnaire and interview. The fifth chapter is the conclusions and recommendations.

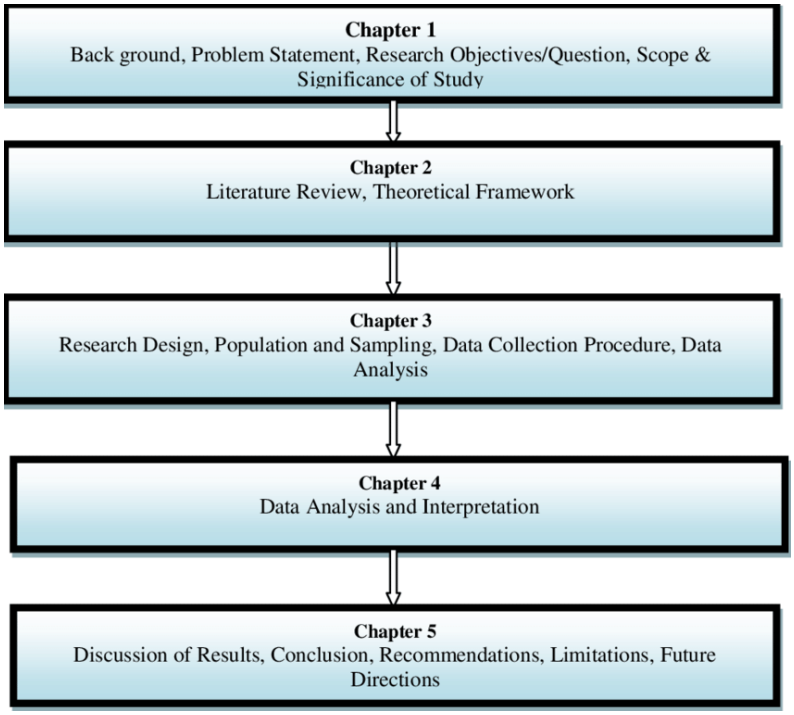

Fig. 1.7

CHAPTER TWO

2. Literature Review

This chapter presents a literature review of the research work that was done by various scholars in the field of performance of building construction project. The researcher examines pertinent literature on theoretical, empirical topics and conceptual frame that are deemed crucial to the investigation in this chapter. Thus, in order to provide a strong foundation for the research, the first portion covered theoretical literature pertaining to the study variables. After that, a succinct synopsis of some relevant earlier research is given. The chapter ultimately presents the gap in literary works.

2.1. Theoretical Review

The theoretical underpinnings of fundamental concepts and theories pertaining to construction projects in general and building construction projects in particular are covered in this introductory section. Talk about the project has cost management as well. Depending on their intended use and the context in which they are employed, terms have different meanings in different studies. The detailed explanations of fundamental ideas and theories make it evident how the study makes use of them. The next section explains the key ideas and hypotheses that this study examines.

The study assessed project cost management practice. Hence, the study considered key elements of project cost management processes. Cost management process described by Project Management Institute (2013), was choose for the purpose of this project see Figure 2.3.

Figure 2.1 Source: (PMI, 2013)

As illustrated in the figure 2.3, from the standard perspective PMI (2013) cost management consists of four components that are hierarchically associated with each other that include resource planning, cost estimating, cost budgeting and cost control (Project Management Institute, 2013). Each of these cases consists of three parts: input, processing and output and the output of each section is the input of next section. Resource planning determine resources, including manpower, materials, equipment, and their number in order to complete each of the project's activities. Cost estimates, estimates from the costs of the resources needed to complete project activities which are associated with uncertainty. Cost budgeting is the process of allocating costs to a certain chunk of the project, such as individual tasks or modules, for a specific time period. Cost control is the process of measuring cost variances from the baseline and taking appropriate action, such as increasing the budget allocated or reducing the scope of work, to correct that gap. (PMI, 2013).

2.1.1. Building construction and construction process

The building sector plays a major role in determining a nation's progress and wealth and significantly improves the stability and security of a state (Ismail, et al., 2013). The reason for this could be that the industry covers nearly every part of the nation, including irrigation, concrete construction, communication networks, and other associated civil engineering projects and efforts. As a result, it has broad use in a variety of industries, including utilities, commerce, housing, health, education, and agriculture. All of these industries are tied to the advancement of infrastructure and its development. As a result, it can be said that the construction industry is made up of a variety of organizations that have different effects on the construction process.
Construction projects, according to Chitkara (2011), are high-value, time-bound, special construction missions that involve building a facility or providing a service. These projects have predetermined performance objectives that are defined in terms of quality specifications, budgeted costs, completion dates, and other specified constraints.

From project inception to project completion, the building construction process entails a number of actions involving different stakeholders, resources, and management strategies. Key elements of the building construction process, such as project management, cost control, sustainability, and technology integration, are discussed in this overview of the literature.

Project management is crucial to the timely completion, quality control, and cost-effectiveness of the building construction process. According to (Kerzner ,2017), effective project management requires strategic planning, resource allocation, risk management, and stakeholder communication. The PMBOK Guide (Project Management Institute, 2021) outlines best practices for managing construction projects, including how to initiate, plan, execute, supervise, and oversee them. Furthermore, (Chitkara ,2011) emphasizes that project team members must schedule, coordinate, and interact in order to speed the building process and minimize any delays and conflicts.

Cost management, which aims to keep expenses under control and ensure that projects don't go over budget, is an essential element in the building process. (Ahmed ,2002) highlights the challenge of cost overruns in the construction industry and the need for effective cost control measures. (Azhar and Farooqui ,2008) stress that case studies should be examined and used as a source of knowledge to improve cost management strategies. (Chris ,2008) also provides insights on building cost management techniques like forecasting, analysis, and budgeting in order to optimize resource allocation and lower financial risks.

Sustainability has emerged as a crucial factor in the building process in recent years, with an emphasis on reducing the negative effects on the environment, preserving resources, and boosting energy efficiency. The importance of green building techniques and sustainable design in improving the environmental performance of construction projects is covered by (Millington ,2000). Furthermore, taking stakeholder, market, and regulatory pressures into account, (Guy and Henneberry ,2002) stress the importance of raising awareness of cost and its management in sustainable building construction project. Technological developments have revolutionized the building industry by facilitating increased productivity, precision, and creativity. (Zhen ,2008) talks on how Building Information Modelling (BIM) and information technology can be used for cost control and project management. Furthermore, (Young and Ibbs ,2002) investigate the possible advantages of technology adoption and project management maturity models. and technology adoption in enhancing construction project performance.

The studied literature emphasizes how the process of building a structure is complex and involves many different aspects, such as technology integration, project management, sustainability, and cost control. While cost control strategies aid in cost management and risk

mitigation, effective project management approaches are critical to project success. While technology integration presents prospects for increased efficiency and innovation in construction projects, sustainability issues are becoming more and more significant in the promotion of environmental stewardship.

The building construction process involves several key stages from initial planning to completion. Here is an overview of the typical building construction phases:

Phase 1: Pre Design (project initiation)

Pre-design, often referred to as the planning or initiation phase by some businesses, is the initial stage of a construction project. This stage includes all of the time leading up to the design and creation of schematics for the building or structure. Project managers and their teams assess the project's needs, goals, and general viability during the pre-design stage, after which they set a project budget to operate within. Because it gives stakeholders the opportunity to choose whether moving on with the project is a smart idea, this initial phase is vitally essential to the project overall. Furthermore, should the project proceed, it establishes a strong framework for carrying out every facet of the endeavour.

Phase 2: Design (Pre-Construction)

The design stage, sometimes referred to as the pre-construction stage, is the second part of a construction project. This is when all of the preparation needed to start construction is completed, including the creation of detailed plans for the structure's final design. To illustrate what must be done and how it will be done, for instance, a project roadmap will be made. Estimates of costs will be assessed and blueprints created. In order to select the appropriate tools and materials for the procurement step, the design development work completed at this point is essential

The majority of building projects typically entail the following tasks during the design stage:
1.Selecting contractors: Using design-bid-build contracts, the project manager chooses which contractors to hire based on submitted structural designs.

2. Creating the chain of command: To ensure that everyone is aware of their roles and to establish the project team structure, the project manager conducts a pre-construction meeting.

3. Construction cost estimation: After discussing and settling on a contract, the project manager and project owner estimate all costs.

4. Risk assessment: Risk assessment and contingency planning are carried out to guarantee the project runs well.
5. Handling the documentation: Contractors and other project participants handle any further papers needed to start the project. As an illustration: acquiring the required building permissions and entitlements, as well as submitting paperwork to local authorities, in order to start work Testing environmental conditions (soil, for example) putting together a thorough safety management plan negotiating modifications to the final project plan or design, such as change orders.

Phase 3: Procurement

Building on the work completed in the design phase, the procurement phase uses this preparation to efficiently locate, buy, and transport the required supplies, machinery, and services. Depending on the project, renting heavy gear and equipment from a company that offers rentals may be more economical than buying it.
Typical actions during the procurement phase include
1. Purchasing supplies: In order to fulfil the project's budget projections and schedule of completion, supplies are located and acquired, and team members are synchronized.
2. Assembling the team: All contractors and team members who are required are employed. Subcontractors could also need to be employed for specific tasks (based on a bidding procedure), depending on the project's scope.

Phase 4: Construction and Monitoring

At this point, the structure's actual construction gets underway. As a result, the majority of the work during the building and monitoring phase is done by contractors and subcontractors going about their regular business, which includes erecting foundations, constructing structures, and setting up different utilities and systems. Any project's construction phase typically entails three essential tasks:
1. **Building the structure:** Teams must continue to be held accountable for the project's overall strategy and its guidelines. To make sure everything runs properly, construction project managers are in charge of organizing everyone's schedules, assessing the work, and answering inquiries from the project's stakeholders.

2. **Maintaining** documentation**:** To monitor the project's development and guarantee the caliber of the job, managers must also keep correct records.

Phase 5: Post-Building (Closeout)

The last phase of the construction process is called closeout or post-construction. The construction project manager inspects the work after it is finished and then turns it over to the client. The following tasks are typically included in the post-construction phase:
1. Talking over the project with the customer: The construction project manager makes a construction punch list of the areas that require improvement. When necessary, they then collaborate with the contractors and subcontractors to fix the mistakes.

2. **Finalizing project documents:** which include Finalized contractor payments, inspection certificates, and an occupancy certificate.

3. **Transferring ownership and** deliverables**:** The client receives the packed documents. Records may include technical submittals and the outcomes of quality control inspections, allowing the client to confirm that the contractor fulfilled all project specifications

Overall, the building construction process is complex and involves coordination between multiple stakeholders, including owners, architects, engineers, contractors, subcontractors, and regulatory authorities. Effective communication and project management are essential to ensurea successful construction project.

fig. 2.1.2

Ethiopia's building construction sector is one of progress, potential, and challenges. The industry has grown significantly, but there are still many challenges facing it, such as inadequate finance, out-dated infrastructure, and regulatory constraints. The utilization of modern building methods, government support, and investments in sustainable practices, however, may help Ethiopia's construction sector expand and flourish even further. Cost control for projects
A crucial component of project management is project cost management, which includes a number of procedures used to estimate, budget, control, and maximize expenses over the course of the project. In order to examine important ideas, approaches, and industry best practices in project cost management, this literature review draws on both scholarly and professional publications.

Various methods and techniques are employed in project cost management to facilitate accurate cost estimation, budgeting, and control. Commonly used techniques include Analogous Estimating, Parametric Estimating, and Bottom-Up Estimating for cost estimation (Kerzner, 2017).Earned Value Management (EVM) is a widely adopted technique for cost control, providing insights into project performance by integrating cost, schedule, and scope metrics (Fleming &Koppelman, 2016). Additionally, tools such as Cost Performance Index (CPI) and Schedule Performance Index (SPI) are utilized to assess project cost and schedule performance relative to the baseline plan (PMI, 2021).

Effective project cost management is essential., but there are still obstacles in the way of its application. Cost overruns and project delays can result from a variety of factors, including imprecise estimation, scope modifications, and unanticipated risks (Cleland & Ireland, 2006). Effective cost management is further complicated by the dynamic nature of projects and outside market variables (Kwak & Anbari, 2006).However, technological developments like project management software and Building Information Modelling (BIM) present chances to boost collaboration, increase the accuracy of cost estimation, and enable real-time cost tracking (Mir &Pinnington, 2014).

Project Cost Management

In general Project cost management is a fundamental aspect of project management, essential for ensuring project success and delivering value to stakeholders. By employing robust methodologies, techniques, and tools, project managers can effectively estimate, budget, and control costs throughout the project lifecycle. While challenges exist, continuous improvement efforts and technological advancements offer opportunities for enhancing cost management practices and achieving project objectives within budgetary constraints.

Project cost and control are crucial management duties since construction projects, in general, and building construction projects in particular, are time-sensitive endeavors requiring significant money and resource expenditures. In practical application, construction professionals are generally aware of the importance of effective cost management of projects. Cost is the agreed-upon budgeted amount that the client must spend in order to build or purchase the intended construction facility (Chitkara, 2011). Cost is the sum of a contractor's overhead and profit-sharing charges as well as the costs of labor, materials, services, utilities, etc. (Chris, 2008). Cost is defined for the purposes of this thesis as the amount of money that a developer has spent or incurred in order to build the desired construction facility.

In order to control project costs, project cost management is a management activity that deals with forecasting, planning, control, cost finding, analysis, and contractor evaluation (Zhen, 2008). Similarly, Young & Ibbs (2002) described cost management as the act of managing project expenses over the whole life of a construction project, from inception to conclusion, while staying within the allocated budget. It is the procedure via which project-related costs (expenses) are officially recognized, authorized, and paid (Chris, 2008). Project cost management, as defined by PMI (2013), is primarily concerned with the cost of the resources needed to carry out the project's scheduled activities throughout the execution stage. This includes the cost of the resources used for the project's construction, maintenance, and support.

The book also describes the sub processes that make up the project cost management process, including planning, estimating, budgeting, financing, managing and controlling costs, and collaborating to finish within the agreed budget. Pereira and Imriyas (2010) added that a wide range of tasks, including financial control, resource costing, scheduling, estimating, and cost control, are included in construction cost management. Furthermore, according to Abeselom (2008), cost management for construction projects is a procedure that supports the general roles

of financial control, scheduling, estimating and tendering, and cost control. As a result, contractors must have an integrated cost management system that includes estimating, tendering, budgeting, and controlling from the start of the project to the finish.

Similarly, Karim (2012) defined construction cost management as the complete procedure that guarantees the contract amount stays within the client's approved budget. 24 Overall, the definition above makes clear that construction project cost management includes a set of project goals that can be achieved, subject to resource constraints, by carrying out a number of procedures. In actuality, this is a difficult undertaking with the possibility of conflicts between the goals that have been set in terms of scale, cost, time, and quality and the limitations placed on all of the necessary physical resources (Chris, 2008). It entails identifying, measuring, and valuing the different components of direct and indirect costs, which are going to be covered in the following.section,

2.1.4.1. Component of Cost Management

The procedures necessary to guarantee that the project is finished within the authorized budget are included in project cost management. Four essential components of cost management were recognized by Owens (2009). In order to finish the project within the authorized budget, cost management comprises the procedures for cost estimation, budgeting, and regulating. The fourth component of it is resource planning, which is figuring out what resources (people, tools, and materials) to utilize and in what amounts to complete project tasks (Owens, 2009).

According to PMI (2013), cost management may be viewed as consisting of four components: resorce planning ,cost estimating ,cost budgeting and controlling.These components are arranged in a hierarchical manner. These examples are all composed of three sections: input, processing, and output, with each section's output serving as the subsequent section's input. Planning resources involves figuring out how much labor, supplies, machinery, and other resources are needed to finish each task on the project. Cost estimates are derived from the estimated costs of the resources required to finish project tasks that are ambiguous.

The technique of assigning expenditures for a specified time period to a particular portion of the project, such as individual tasks or modules, is known as cost budgeting. Measuring cost deviations from the baseline and correcting the gap with suitable actions like raising the budget or narrowing the scope of work is the process of cost control. (PMI, 2013) Although cost management is generally seen as an ongoing process, the PMBOK and the majority of academics

(Owens, 2009; Odeck, 2004; Frimpong, 2003) divide it into four parts or steps: 25 o Cost estimation, budgeting, control, and resource planning. The aforementioned phases are primarily sequential, but it's possible that midway during the project, some resource changes occur, requiring the budgets to be adjusted. Alterations to the estimate may be necessary in response to deviations noticed throughout the control process. Let's take a closer look at each of these four procedures. i. Resource Planning for Projects The process of determining the resources needed to start and finish a project is known as resource planning (Odeck, 2004). Project resources are one of the frequent aspects that have been discussed in relation to project cost management, according to Zhen (2008). This is due to the fact that project management involves costs associated with all project resources. Project resources must therefore be directed in order to finish each project. The most crucial factor in project management is resources, which are taken into account at the planning stage when the project manager has to ascertain what resources are required.

According to Frimpong (2003), resources include both people and equipment. People include contractors and employees, while equipment includes huge construction vehicles, specialized equipment that is in limited supply, and infrastructure. Resource planning is carried out before the start of a project, prior to the start of any real work, according to Owens (2009). Project managers must first prepare the work-breakdown structure (WBS) before they can begin. Examining each subtask in the WBS, they must determine how many workers, what kind of talents, and what kind of tools or supplies are needed to complete the task (Owens, 2009). The goal of resource planning is to list every resource needed for the project.

It is crucial to project management since it was let the manager to assess the work being done on the project and ascertain what supplies, labor, and machinery are required to finish it (Zhen, 2008). In addition, resource planning helps determine the anticipated amount of resources required in order to compute the estimated cost (Odeck, 2004). Richard (2014) states that the enterprise environmental variables, organizational process assets, activity attributes, resource availability, and project management plan are the six components that make up the resource planning inputs. He went on to list other methods and instruments used in resource planning, such as bottom-up estimation, expert opinion, alternative analysis, published estimate data, and project management software.

Lastly, he listed the outputs of resource planning, which include updated activity attributes, resource requirements, updated resource breakdown structure (WBS), updated resource calendar, and requested modifications. The work breakdown structure (WBS), historical data, scope statement, resource pool description, organizational policies, and activity duration estimations are the six inputs to resource planning, according to Project Management Professional (PMP). Project management software, alternative identification, and expert judgment are the foundations of the tools and methods employed. The result of this resource planning is the resource need (Project Management Professional).

ii. Estimating the Cost Estimating the expenses of physical and human resources for each project activity is the second part of cost management.

The process of calculating the expenses related to each resource needed to complete the project is known as cost estimating. It can be summed up as the process of figuring out how much each resource was cost for the project. Activity cost estimates, foundation of estimates, and project document updates are the primary products of the cost estimating process (Schwalbe, 2011). This step is frequently taken during the planning stage, and project managers should be aware of the approximate costs associated with each task. (Young & Ibbs ,2002) state that as precision is crucial in this process, cost estimation is perhaps the most challenging step in cost management.

It also needed to take into account elements like overhead, inflation, time value of money, and fixed and variable costs. An increase in the difference between estimated and actual costs was decrease the likelihood that a project was successful. On the other hand, there are numerous estimating methods available (Young & Ibbs 2002). The tool and techniques utilized are based on analogous estimating, parametric modeling, bottom-up estimating, and computerized tools, as per PMBOK (2013). Top-down approaches are additional tools that are usually useful when historical cost data is available (Young & Ibbs, 2002). The work breakdown structure, resource requirements, resource rates, activity duration estimations, and historical data are the five elements that make up the input for cost estimating.

The results of this resource planning include cost estimates, supporting documentation, and a cost management strategy (PMI, 2013). The three primary outcomes of the cost estimating process were determined by (Schwalbe ,2011) to be activity cost estimates, basis of estimates, and project document updates. iii. Budgeting for costs Making a realistic project budget is the next stage in project cost management. Cost budgeting can be seen as either an independent

procedure or a component of estimating. The technique of assigning expenses to a particular portion of the project, such as distinct tasks or modules, for a predetermined amount of time is known as budgeting (Schwalbe, 2011). Cost budgeting, according to (Richard ,2014), is assigning the total cost estimates to specific work items in order to create a cost baseline for project evaluation. Three elements make up the input to cost budgeting, according to (PMI ,2013): the project schedule, work breakdown structure, and cost estimates. Budgets for work items are created using the same instruments and methods as project cost estimates. The result of this resource planning is the cost baseline (PMI, 2013). (Richard, 2014), however, states that the cost performance baseline, project financing requirement, and project document changes are the primary outcomes of the project budgeting process. iv. Management of Costs Cost control is the final step in the project cost management process.

Measuring cost deviations from the baseline and correcting the gap with suitable actions like raising the budget or narrowing the scope of work is the process of cost control. It is a continuous procedure that is carried out all the way through a project. Here, reporting that is clear and on time is just as important as measuring (Richard, 2014). The goal of cost control is to make sure that project expenses are tracked and maintained within the company's guidelines and project goals (Wilson, 1983). Accurate cost and schedule forecasts are the results of a successful project control method, according to (Bent and Humphreys ,1996). (Wilson,1983) notes that the core components of cost control are knowledge and action. A project manager can control project costs using a variety of tools. The first is the task cost system, a useful tool for managing information that assists the project manager in acquiring data (Halpin, 1985). According to (Halpin ,1985), gathering the information needed to estimate future projects is only one more duty of task cost control. The second tool is the cost accounting system, which serves two vital purposes: first, it keeps track of and regulates expenses in relation to desired costs and values; second, it gathers information for project estimation in the future (Halpin, 1985).

To enable management to get timely feedback, a well-structured cost and control system should be designed, developed, and put into place (Kerzner, 1995). In order to guarantee a successful conclusion, practically every project needs to be managed in order to control project costs and budgets, supply enough staff, schedule, oversee and supervise, and coordinate all parties (Leibing, 2001). According to (Halpin ,1985), defining project-level cost centers is the first stage in setting up a cost control system for a construction project. The creation of the cost plan is the

initial action in the cost control cycle (Halpin, 1985). According to (Killingsworth ,1988), project planning is the first step in developing an efficient cost control system. Additionally, he says that cost estimations and construction scheduling must to be done simultaneously. The following components make up cost planning and control procedures (Brandon & Ferry, 1984):

o An first approximation based on the whole building cost. This is only an approximation and might be missing certain details.

o Preliminary cost plan: The project benefits from having the cost plan prepared after the initial design drawings since the customer may assess if the initial specifications fall within project budgetary constraints.

o Cost plan: This can be created using cost components that show building unit costs and can be contrasted with various project designs. Work breakdown structure is a strategy for controlling project cost control, according to (Neil ,1982). As he puts it, "the theory behind project control through work packaging is simple to manage an operation as a whole, you manage and control its parts, which in the case of construction are work packages." He also says that the contractor can immediately compare actual resource and financial expenditures to budgeted amounts by using a control system focused on work packages throughout construction.(Schwalbe ,2011) states that cost control is a method for managing modifications to the project budget. At this point, it's critical to consistently track and evaluate the budget's performance and update projections as needed to maintain efficient cost limits.

(Richard ,2014) asserts that the cost management strategy is a crucial component of cost control, in addition to the cost baseline. The four elements that make up the input to cost control are the cost baseline, performance reports, change requests, and cost management plan, according to (PMI ,2013). Work performance measures, budget projections, organizational process asset updates, change requests, project management plan updates, and project document updates are the primary outputs at the conclusion of the cost control process, according to (Richard ,2014). According to (Mohammad ,2014), cost escalation issues in construction projects persist despite the widespread use of the cost management and control strategies covered above. As (Odeck ,2004), stated too many complexities in construction projects do not allow managing of the probable costs of projects. Cost escalation or cost overrun is a major issue in project performance which was discuss in next section.

The procedures necessary to guarantee that the project is finished within the authorized budget are included in project cost management. Four essential components of cost management were recognized by (Owens ,2009). In order to finish the project within the authorized budget, cost management comprises the procedures for cost estimation, budgeting, and regulating. The fourth component of it is resource planning, which is figuring out what resources (people, tools, and materials) to utilize and in what amounts to complete project tasks (Owens, 2009).

According to (PMI ,2013), cost management may be viewed as consisting of four components: resource planning cost estimating, cost budgeting and cost controlling. These components are arranged in a hierarchical manner. These examples are all composed of three sections: input, processing, and output, with each section's output serving as the subsequent section's input. Planning resources involves figuring out how much labor, supplies, machinery, and other resources are needed to finish each task on the project. Cost estimates are derived from the estimated costs of the resources required to finish project tasks that are ambiguous.

The technique of assigning expenditures for a specified time period to a particular portion of the project, such as individual tasks or modules, is known as cost budgeting. Measuring cost deviations from the baseline and correcting the gap with suitable actions like raising the budget or narrowing the scope of work is the process of cost control. (PMI, 2013) Although cost management is generally seen as an ongoing process, the PMBOK and the majority of academics (Owens, 2009; Odeck, 2004; Frimpong, 2003) divide it into four parts or steps:

- Resource planning,
- Cost estimation,
- Cost budgeting and
- Cost control.

Although the aforementioned phases are largely consecutive, it is possible that midway during the project, certain resource changes may occur, necessitating an adjustment to the budgets. Alterations to the estimate may be necessary in response to deviations noticed throughout the control process. Let's take a closer look at each of these four procedures.

Project Resource

Organizing the process of determining the resources needed to start and finish a project is known as resource planning (Odeck, 2004). Project resources are one of the frequent aspects that have

been discussed in relation to project cost management, according to (Zhen ,2008). This is due to the fact that project management involves costs associated with all project resources. Project resources must therefore be directed in order to finish each project. The most crucial factor in project management is resources, which are taken into account at the planning stage when the project manager has to ascertain what resources are required. According to (Frimpong ,2003), resources include both people and equipment. People include contractors and employees, while equipment includes huge construction vehicles, specialized equipment that is in limited supply, and infrastructure.

Resource planning is carried out before the start of a project, prior to the start of any real work, according to (Owens ,2009). Project managers must first prepare the work-breakdown structure (WBS) before they can begin. Examining each subtask in the WBS, they must determine how many workers, what kind of talents, and what kinds of tools or supplies are needed to complete the task (Owens, 2009).

The goal of resource planning is to list every resource needed for the project. It is crucial to project management since it was let the manager to assess the work being done on the project and ascertain what supplies, labor, and machinery are required to finish it (Zhen, 2008). In addition, resource planning helps determine the anticipated amount of resources required in order to compute the estimated cost (Odeck, 2004). (Richard ,2014) states that the enterprise environmental variables, organizational process assets, activity attributes, resource availability, and project management plan are the six components that make up the resource planning inputs.

He went on to list other methods and instruments used in resource planning, such as bottom-up estimation, expert opinion, alternative analysis, published estimate data, and project management software. Lastly, he listed the outputs of resource planning, which include updated activity attributes, resource requirements, updated resource breakdown structure (WBS), updated resource calendar, and requested modifications.

The work breakdown structure (WBS), historical data, scope statement, resource pool description, organizational policies, and activity duration estimations are the six inputs to resource planning, according to Project Management Professional (PMP). Project management software, alternative identification, and expert judgment are the foundations of the tools and methods employed. The result of this resource planning is the resource need (Project Management Professional).

Cost Estimation

The estimation of human and material resource costs for each project activity is the second part of cost management. Quantifying the expenses related to all the resources needed to complete the project is the process of cost estimate. It is the process of figuring out all the costs associated with the resources used in the project. According to Schwalbe (2011), the primary results of the cost estimating process are project document updates, basis of estimates, and activity cost estimates. Project managers should be aware of the approximate costs associated with each task as this step is frequently included in the planning stage.

Young & Ibbs (2002) state that as precision is crucial in this process, cost estimation is perhaps the most challenging step in cost management. It also needed to take into account elements like overhead, inflation, time value of money, and fixed and variable costs. An increase in the difference between estimated and actual costs was decrease the likelihood that a project was successful. On the other hand, there are numerous estimating methods available (Young & Ibbs 2002). The tool and techniques utilized are based on analogous estimating, parametric modeling, bottom-up estimating, and computerized tools, as per PMBOK (2013). Top-down approaches are additional tools that are usually useful when historical cost data is available (Young & Ibbs, 2002).

The work breakdown structure, resource requirements, resource rates, activity duration estimations, and historical data are the five elements that make up the input for cost estimating. The results of this resource planning include cost estimates, supporting documentation, and a cost management strategy (PMI, 2013). The three primary outcomes of the cost estimating process were determined by Schwalbe (2011) to be activity cost estimates, basis of estimates, and project document updates.

Cost Budgeting

Making a realistic project budget is the next stage in project cost management. Cost budgeting can be seen as either an independent procedure or a component of estimating. The technique of assigning expenses to a particular portion of the project, such as distinct tasks or modules, for a predetermined amount of time is known as budgeting (Schwalbe, 2011). Cost budgeting, according to Richard (2014), is assigning the total cost projections to specific work items in order to create a cost baseline for gauging project performance. Three elements make up the

input to cost budgeting, according to PMI (2013): the project schedule, work breakdown structure, and cost estimates.

Budgets for work items are created using the same instruments and methods as project cost estimates. The result of this resource planning is the cost baseline (PMI, 2013). Richard (2014), however, states that the cost performance baseline, project financing requirement, and project document changes are the primary outcomes of the project budgeting process.

Cost Control

Cost control is the final step in the project cost management process. Measuring cost deviations from the baseline and correcting the gap with suitable actions like raising the budget or narrowing the scope of work is the process of cost control. It is a continuous procedure that is carried out all the way through a project. Here, reporting that is clear and on time is just as important as measuring (Richard, 2014). The goal of cost control is to make sure that project expenses are tracked and maintained within the company's guidelines and project goals (Wilson, 1983). Accurate cost and schedule forecasts are the results of a successful project control method, according to Bent and Humphreys (1996) 28. Wilson (1983) points out that information and action are the heart of cost control.

A project manager can control project costs using a variety of tools. The first is the task cost system, a useful tool for managing information that assists the project manager in acquiring data (Halpin, 1985). According to Halpin (1985), gathering the information needed to estimate future projects is only one more duty of task cost control. The second tool is the cost accounting system, which serves two vital purposes: first, it keeps track of and regulates expenses in relation to desired costs and values; second, it gathers information for project estimation in the future (Halpin, 1985).

To enable management to get timely feedback, a well-structured cost and control system should be designed, developed, and put into place (Kerzner, 1995). In order to guarantee a successful conclusion, practically every project needs to be managed in order to control project costs and budgets, supply enough staff, schedule, oversee and supervise, and coordinate all parties (Leibing, 2001). According to (Halpin ,1985), defining project-level cost centers is the first stage in setting up a cost control system for a construction project. The creation of the cost plan is the initial action in the cost control cycle (Halpin, 1985). According to (Killingsworth ,1988), project

planning is the first step in developing an efficient cost control system. Additionally, he says that cost estimations and construction scheduling must to be done concurrently.

Cost Planning and Control Procedures consist of the following elements (Brandon & Ferry, 1984):

- Preliminary estimate based on the cost of total construction. This is an approximate estimate which may lack some information.
- Preliminary cost plan: Preparing the cost plan after the first design drawings provides an advantage for the project since the client can see whether the initial specifications are within project cost limits.
- Cost plan: This plan can be established from cost elements which were illustrate the unit prices of the construction and can be compared to project design alternatives.

Work breakdown structure is a strategy for controlling project cost control, according to Neil (1982). As he puts it, "the theory behind project control through work packaging is simple – to manage an operation as a whole, you manage and control its parts, which in the case of construction are work packages." He also says that the contractor can immediately compare actual resource and financial expenditures to budgeted amounts by using a control system focused on work packages throughout construction. (Schwalbe ,2011) states that cost control is a method for managing modifications to the project budget. At this point, it's critical to consistently track and evaluate the budget's performance and update projections as needed to maintain efficient cost limits.

(Richard ,2014) asserts that the cost management strategy is a crucial component of cost control, in addition to the cost baseline. The four elements that make up the input to cost control are the cost baseline, performance reports, change requests, and cost management plan, according to (PMI ,2013). Work performance measures, budget projections, organizational process asset updates, change requests, project management plan updates, and project document updates are the primary outputs at the conclusion of the cost control process, according to (Richard,2014).

According to (Mohammad ,2014), cost escalation issues in construction projects persist despite the widespread use of the cost management and control strategies covered above. According to (Odeck ,2004), managing the likely costs of a project is impossible when there are excessive complexity involved in construction projects. One of the main problems with project performance is cost overruns or escalation, which we was talk about in the next section.

2.2. Empirical Review

This empirical review investigates the current state of project cost management practices in selected building construction projects in Addis Ababa, Ethiopia. The study aims to provide insights into the effectiveness of cost management strategies employed in the local construction industry, identify challenges faced by project managers, and propose recommendations for improvement. Many researchers have exercised cost management practices in their country through questionnaire survey or through inter-viewed and other relevant methods. Numerous factors affect construction costs in Addis Ababa, including:

(Eshetie, 2017) states that Fluctuations in the prices of construction materials, such as cement, steel, and aggregates, significantly impact project budgets. Accordingly, the intricacy of architectural and engineering designs can increase construction costs (Beyene et al., 2016). And also as mentioned by (Fekadu & Abegaz, 2020) Compliance with building codes, permits, and regulatory requirements adds to project expenses.

There are still issues with cost management procedures despite efforts to enhance them: Skills Gap: It can be difficult to execute efficient cost control measures due to a lack of professionals with cost management experience and skilled labor (Gebrehiwot & Assefa, 2018). Project delays and higher logistical costs can result from inadequate infrastructure, especially in the areas of utilities and transportation networks (Asmare & Yirga, 2017).

The successful completion of building construction projects in Addis Ababa depends on efficient cost management. Stakeholders can optimize resources and produce cost-effective project outcomes by comprehending the local elements influencing construction costs, using suitable cost management measures, and learning from case studies and best practices. However, improving cost management techniques in the regional building sector depends on tackling issues including infrastructural limitations and skills shortages

(Nabil and Adnan's ,2004) study examines the project cost management strategies used in the Gaza Strip by public owners and contractors. The extent to which project cost management methods and technologies are used is also examined in this paper. Survey questions have been used in this investigation. Twenty-five questionnaires were given to public owners while seventy-three questionnaires were given to contractors. We received and examined sixty questionnaires from contractors and twenty-three from public owners. The findings show that contractors and public owners do not frequently use project cost management tools and approaches. Applications for cost estimation and control are still not being used to a satisfactory degree. The study's findings indicate that the establishment of a professional organization, like the Chartered Institute of Buildings, is desperately needed in order to assess regional cost management techniques and provide recommendations for necessary training courses. While contractors' training should concentrate on using parametric estimate, analogous estimate, cost variations, and earned valve, owners' ability to use detailed estimating, cost variance, and earned value concepts should be improved by the current training effort. (Harrison ,2004) carried the research in the context of Botswana titled "An evaluation of construction project cost management for public works: A case for Botswana." The study evaluated the methods used to control construction costs on projects. This entails establishing how project costs were planned, how projects costs were controlled and reported and finally how project costs at completion were analysed. This was done through questionnaires. The major findings were that of inadequate planning for project costs. This includes determining the methods for project cost planning, control, and reporting, as well as for project cost analysis upon completion. Questionnaires were utilized for this purpose. The primary conclusion was that project costs were not adequately planned for. This might be explained by the fact that, even though the cost plan included the main cost planning components specifications and the statement of work (Scope)they weren't finished when the plan was created. As a result, they were the main reasons for cost variations at the post-contract phase. Moreover, inadequate cost control was applied to projects. As a result, it is advised that the government offer a thorough brief and specifications to validate the project's requirements and implement uniform cost-control procedures for projects.

2.3. Gaps in Literatures

There are certain limitations even if all of the aforementioned research, in different ways, contributed to a deeper knowledge of the issues related to cost management in construction projects. The aim of the study was to pinpoint the variables that most affect project cost overruns. The four components of cost management, namely resource planning, cost estimating, cost budgeting and cost controlling, were not covered in their discussion of the actual cost management methods. There appears to be an unspoken belief that increasing the effectiveness of each component of cost management procedures is crucial for raising project costs overall. It is necessary to validate this clearly. The activities involved in project management as a whole are intimately linked to project cost management. The literature, however, is lacking in information on how cost management techniques can be integrated with more comprehensive project management systems and approaches, such Agile or Lean Construction. Investigating the overlaps between project management and cost management techniques may yield insightful results. When analysing cost management techniques, research generally take the viewpoints of project managers or construction experts into consideration. Research that methodically documents the viewpoints and demands of other stakeholders, including suppliers, subcontractors, contractors, and clients, is lacking. Comprehending the heterogeneous requirements and preferences of stakeholders may augment the efficacy of cost management methodologies.

CHAPTER THREE

3. Research Design and Methodology

3.1. Introduction

The research methodology, which describes each step involved in carrying out a study, is an essential part of the research process. Subsequently, the research might be viewed as a driving force behind the growth of the field under study. According to (Brynard ,2006), research methodology is concerned with the choices a researcher makes during the research process in order to carry out a study successfully. This part provides more succinct information about the research approach, tools, and techniques that was used to carry out this research . It focuses on topics including the kind of study, target audience, sample size, sampling methodology, data sources, data collection tools, data collection processes, data analysis techniques, and reporting for presentations.

3.3 Research Approach

The study's main focus is on the cost management practice of building construction projects in Addis Ababa, Ethiopia. As a result, the quantitative research approach, which deals with using statistics and data to answer the previously stated research objectives, served as the foundation for this study. Data collection using a quantitative and qualitative technique is formalistic and systematic. Measurable facts that can be expressed as numbers or other quantities describe quantitative procedures. According to (Muijs ,2004), this provides a foundation for the presentation of frequencies, distributions, and correlations.

3.2 Research Design

The research for this project was done using descriptive research design. For the simple reason that doing descriptive research allows the researcher to characterize the situation as it is in the specific community under investigation (Kothari, 2004). The data gathered during the descriptive research is necessary to finish a research report. As a result, this method also enables researchers to create a report depending on the context that has been studied (Kothari, 2004). Because the information/data was provided in percentages, statistics, and tables, the researcher employed a quantitative study design. Additionally, the researcher adopted a qualitative study strategy in

order to collect data that could be verbally conveyed, maintain long-term contact with a holistic approach to the field, and draw on participant lived experiences.

Three categories of research approaches have generally been recognized by the literature: mixed, qualitative, and quantitative. A mixed-methods research strategy was used for this study. The researcher uses a combination of quantitative and qualitative methods in this technique. research techniques. As a result, the survey questionnaire yielded quantitative data, which was supplemented by qualitative information obtained from semi-structured interviews with respondents who were purposefully chosen. This strategy was chosen because it combines the benefits of both qualitative and quantitative approaches. The researcher can triangulate results from both quantitative and qualitative methodologies by employing this strategy, which strengthens the study's conclusion.

3.2.1. Research Type

This research was categorized as exploratory, explanatory, and descriptive. The research was exploratory in character since it is grounded on actual problems which related to cost management that the construction industry faces and aims to address them. It was also attempt to explain or characterize the nature of the relationship between the practical assessment of cost management practice of building construction projects at on certain Grade 1 Contractors, making it both descriptive and explanatory.

3.2.2. Data Source and Type

Primary as well as secondary data types were used in this thesis. Both primary and secondary sources of data were employed in this investigation. According to Kothari (2004), primary data are those that are newly and initially collected, making them unique in nature. According to (Dawson ,2009), secondary research data is information gathered from studies that other researchers have conducted on a certain topic. This study makes use of both data sets.

The primary data was obtained through the survey method, while the secondary data was derived from the review of literature. The primary data was include data collected through direct interview, and questionnaires submitted and collected from respondents. The secondary data type was including different literatures and previous studies done related to cost management practice in construction projects.

A questionnaire was the main tool used in the study to gather primary data. (Schwab ,2005) described questionnaires as measurement tools that require respondents to provide a series of 36 ask inquiries or address a series of statements. When working with a big sample, a questionnaire is a research tool used for data collecting (Kombo, et al., 2002). Because a questionnaire is convenient and simple to use, it is recommended.

According to Kothari (2004), questionnaires have a number of benefits, including the ability to be used without the interviewer's bias, low cost even for large and geographically dispersed universes, ample time for respondents to provide thoughtful responses, ease of reaching out to difficult-to-approach respondents, and the ability to use large samples to increase the reliability and dependability of the results. Due to the benefits and the requirement for additional data collection, questionnaires were sent to CEOs and cost managers to get their opinions on project cost management practices.

The study also included semi-structured interviews as a qualitative strategy. The objective is to delve further into the subjects that surfaced from the analysis of practitioner experiences and data from questionnaire surveys. The research was conducted with the same cohort as was utilized for the quantitative phase. Additionally, the offices of the businesses to which the questionnaires were given during the quantitative study were called. The purpose of the research was explained, and a request was made for a relevant contact such as the CEO, project cost representatives, senior project managers, etc. Who could be interviewed. Eight respondents in all submitted pertinent practitioners for interviews as part of the study.

3.4 Target Population

The target population is the group of people to whom research proposal results to apply and study population. Populations are the set of all the entities concerning which statistical inference are to be drawn. The population of this research consists 95 numbers of respondents who was selected from New Hope Real-estate construction undertake by Mariacon real estate construction plc site located at Germen Square, Oromia police commotion building construction Located Kera Lancha which is constructed by Shangi construction and furniture Plc , National Theatre constructed by Ovid Construction Plc site located around National theatre ,Addis Ababa and Alert hospital Expansion project by Etete construction company to get necessary information about the cost management practice in building construction Project. Estimated Total number of population was around 100.

From the construction project management professional in Addis Ababa city and engineers, project managers, project site supervisors, Contractors and other professionals involve in the construction project work.

3.5. Sample size and Sampling Procedure

This study has intent to assess the practice of construction project management in Addis Ababa. Survey research is a means of gathering information, usually through self-report using questionnaires or interviews. Its purpose is to generalize from a sample to a population so that inferences can be made and it is also economical and rapid turnaround in data collection.

Selective sampling techniques were used in the sample selection that involves the selection of a group from the population on the bases of available information thought and it is to be representative of the total population. Representatives' numbers of respondents was selected from New Hope Real-estate construction undertake by Mariacon real estate construction plc site located at Germen Square, Oromia police commotion building construction Located Kera Lancha , National Theatre constructed by Ovid Construction Plc site located Addis Ababa, National theatre and Alert hospital Expansion project by Etete construction company to get necessary information about the cost management practice in building construction Project. Estimated Total number of population was around 100.

3.6 Data Collection

Data collection is any process of preparing and collecting data, for example, as part of a process improvement or similar project. The purpose of data collection is to obtain information to keep on record, to make decisions about important issues, or to pass information on to others. Data are primarily collected to provide information regarding a specific topic. Data collection usually takes place early on in an improvement project, and is often formalized through a data collection plan. Data collection include types of data of which primary and secondary data was evaluate and data collection methods that was comprised questionnaires, interviews, observations and documentation.

3.6.1 Types of Data

The primary and secondary types of data were the two approaches of data interpretation employed by the researcher.Data is thought to be the lowest unit of information from which other measurements and analysis can be done. Data can be numbers, images, words, figures, facts or ideas. Data cannot be comprehended in and of itself; meaning must be assigned to the data in order to extract information from it.

3.6.2 Data Collection Methods

In collecting data for this study, the all four instruments was used which are observation, questionnaires, interview and documentation.

Observation is the research technique, which utilizes direct contact between the researcher and the phenomena under investigation. The researcher was visit the target areas/sites and see the daily implementation of the on-going building construction projects and was observed effective performance. Thus, avoid biases and prejudice by subjects, overcome language barrier and was used at any time.

The word questionnaire of questions that are answer by number of people so that information can be collected from the answers. Furthermore, these questions are open ended and restricted/closed questions for respondents to answer on a sheet of paper.

Documentation is a written or printed material that has been produced in some form or another annual reports, art work, bill, books and so on. The researcher fined the advantages of using the instrument because it is easily accessible economical and removes biasness.

3.7. Data Processing and Analysis

After the data are collected from different sources, it is organized and presented in different forms. Important numerical results are presented using tables and charts. Data that are used for qualitative analysis were presented in statement forms as part of the interpretation. This study uses both qualitative and quantitative analysis. Qualitative models are applied for describing and interpreting responses from different respondents.

To measure central tendency means and modes was apply so as to have representative values for responses of questionnaires. For the quantitative analysis SPSS (Statistical package for social

science) was used simplify cumbersome mathematical efforts.The researcher used parallel mixed methods data analysis for this study (Graff, 2013), which involved data analysis using statistical techniques appropriate for the variables (QUAN analysis) and data analysis using qualitative approaches appropriate for the variables and the research question (QUAL analysis). The two studies were carried out independently of one another in parallel and connect, combine, or integrate the results from the QUAL and QUAN analyses to offer information about the phenomena. Furthermore, the outcomes of the two types of analyses—qualitative and quantitative complement one another to strengthen, elucidate, show, or shed light on conclusions drawn from the other strand.

questionnaire is the main source of data for this study. After collecting the questionnaires, the data needs to be edited, cleaned, encoded, and checked for mistakes. This pertains to the data processing inquiry. The act of verifying, organizing, transforming, integrating, and extracting data into the proper output form for later use is known as data processing. Because of this, a thorough data processing of the gathered questionnaire was carried out. This made it easier to examine and analyze the data by compressing and grouping it into manageable chunks. Descriptive statistics were then used to assess the primary data from the questionnaire that had been gathered and processed.

The study employed descriptive statistics, including mean scores, percentages, frequency distribution, and grand mean, to characterize the attributes of the variables of interest. A 39-itemized Likert rating scale (1: Strongly Disagree, 2: Disagree, 3: Neutral, 4: Agree, and 5: Strongly Agree) was used to create a range of means. The researcher interpreted the data using the guidelines provided by Shrestha (2015), showing that the mean intervals of 1.00–1.80 is very low, 1.81–2.60 is low, 2.61–3.40 is medium, 3.41–4.20 is high, and 4.21–5.00 is very high.

3.8. Ethical Consideration

Before the research conducted, the researcher informs the participants of the study about the objectives of the study, and consciously considers ethical issues in seeking consent, avoiding deception, maintaining confidentiality, respecting the privacy, and protecting the anonymity of all respondents. A researcher considered these points because the law of ethics on research condemns conducting research without the consensus of the respondents for the above listed

reasons. The ethical issues which are addressed are the following:

1. First of all, the plan of the study was review by the research advisor.

2. The objectives of the study is clearly stated in the questionnaires and the participants was inform about those objectives.

3. The study was conduct in such a way that it was not interfering with the business activities of the study sites.

3.9. Reliability test

According to Saunders, et al. (2007), reliability refers to the extent to which data collection techniques or analysis procedures is yield consistent findings. Reliability of a scale is often assessed by test-retest reliability or by internal consistency. The first indicator, the test-retest, is assessed by administering the same scale of measure to the same respondents on two various occasions, and computing the correlation between the two scores obtained. The second indicator, the internal consistency, is the degree to which the items constituting the scale are all measuring the same underlying attribute.

3.10. Data Validity

Validity refers to the truth of the measurementIt is the extent to which the variable that the measurement procedure purports to measure is measured. To ensure the validity of data, the researcher have been afforded respondents the chance to discuss the themes of the research and make sure that respondents are alert of the privacy afforded to their answers. This is important to ensure that questions were come back with sincerely without fear of repercussions thereby increasing the validity of the research. The relationship between the researcher and the respondents also has the consequence on validity. The researcher was ensure that respondents recognize what it means is by the research through testing the research tool on a small group before the research.

CHAPTER FOUR

4. DATA PRESENTATION, ANALYSIS & INTERPRETATIONS

Introduction

The data that was gathered via questionnaires and semi-structural interviews with the project manager and team members is presented, analyzed, and interpreted in this chapter. By merging and summarizing the findings, both quantitative and qualitative analysis was used to examine the data that was gathered in accordance with the study's main goal.

4.1 Response Rate

There were one handred (100) questionnaires distributed by the researcher. Of these, Ninety five (95) surveys were finished and sent back. This indicates a 95.0% response rate and a 5.0% response rate of none respond questionnaires. A response rate of 50% is regarded as good, and a rate of more than 70% is regarded as very good, according to Mugenda (2003). As a result, the 95.0% response rate is thought to be a very excellent sample of respondents, offering sufficient data for analysis and conclusion-making.

Table 4.1: Response Rate

Statistics

Response rate	*Sample size*	*Percentage*
Returned questionnaires	*95*	*95%*
Not Returned questionnaires	*5*	*5%*

4.2 General information of respondents

This part evaluates the respondents' general data. Questions on gender, age, education level, position, and length of service in current organization were posed to the respondents. While this data may not be crucial for accomplishing the goals of the study, they did offer significant data that aids in the researcher's assessment of the respondent's capacity to make a significant contribution to the study. Table 4.2 displays the outcome.

Gender of respondent

	N	%
Male	61	64.2%
Female	34	35.8%

Table 4.2 a

Educational Background

	N	%
Master's degree or above	42	44.2%
Bachelor's degree	45	47.4%
College Diploma	5	5.3%
High school Completed	3	3.2%

Table 4.2 b

Role in the Construction Project

	N	%
Project Manager	4	4.2%
Construction Engineer	28	29.5%
Contract Admin/Office Engineer	18	18.9%
Other	45	47.4%

Table 4.2 c

Years of Experience

	N	%
< 5 years	52	54.7%
5 to 10 Years	24	25.3%
10 to 15 Years	8	8.4%
15 Years	11	11.6%

Table 4.2 d

The gender distribution of the study participants is displayed in Table 4.2a above. Table 4.2a indicates that there were 35.8% of females and 64.2% of males. The results demonstrated that male respondents outnumbered female respondents, indicating that men predominated in the Building construction sector.

With respect to educational background on Table 4.2b, 47.4% of respondents had a first degree, 44.2% held a second degree, 5.3% held a diploma, and 3.2% respondent had only completed secondary school. Consequently, this indicates that the study's participants were educated and well-informed enough to complete the questionnaire. When asked about the length of time they had worked for the current company, respondents gave the following answers: 54.7% had been there below five years, 25.3% had been there for Five to ten years, 8.4% had been there for more than ten years up to fifteen years, and 11.6% had been there for fifteen years which is showed in Table 4.2d. This may have suggested that the respondents had a great deal of experience working for their organization and were therefore familiar with its cost-control procedures.

4.3. Current project cost management practices

Information on the project cost management procedures that a few Building construction companies currently use is presented in this section. Key components of each project cost management component, derived from several literatures, are included in the data. The information was gathered via surveys, semi-structured interviews, and the examination of secondary sources.

Descriptive statistics or central tendency was employed to analyze the data obtained from the questionnaire; the researcher then used the mean scores for each variable. The primary goals of this measurement were to determine the grand mean of each dimension and to show the average replies of respondents for each question included under each dimension of the predictor variable. In order to fulfill the study's partial research objectives, the grand mean of each independent dimension is finally used to interpret the data.

Using an itemized Likert rating scale, a range of means was created. The result shown in Table 4.3 was interpreted by the researcher using the guidelines provided by Shrestha (2015). Every single item, which ranges from 1 to 5, has a mean that falls within the following interval:

Interval of Means	*Interpretation*
1.00 – 1.80	*Very Low*
1.81 – 2.60	*Low*
2.61 – 3.40	*Medium*
3.41 – 4.20	*High*
4.21 – 5.00	*Very High*

Table 4.3 Source: (Shrestha, 2015)

The majority of academics (Owens, 2009; Odeck, 2004; Frimpong, 2003) and PMI divide cost management into four parts or stages: resource planning, cost estimate, cost budgeting and cost control. Generally speaking, cost management is seen as an ongoing process. Although most of these procedures are in order, there is a chance that certain resource changes will occur in the middle of the project. The cost management procedures used by the chosen building construction project companies at each of these four stages are covered in more detail in the section that follows.

4.3.1. Project Resource Planning Practices

The study's primary goal was to evaluate the project resource planning procedures of actual firms that construct building construction project in Addis Ababa. The process of project planning is strongly linked to resource planning, which is the first step in project cost control. It's the

procedure for determining the resources needed to start, carry out, and finish a project (Odeck, 2004). When it comes to project management, resources are the most crucial factor to take into account at the planning stage, when the project manager has to ascertain what resources are required. Resource planning is carried out before the start of a project, prior to the start of any real work, according to (Owens, 2009).

The first step in the project cost management process, resource planning, is the framework in which respondents report on their project cost management methods, as Table 4.4 demonstrated. In the context of resource planning, the grand mean response for project cost management practice is 3.22, which is considered reasonable by (Shrestha, 2015). This suggests that while there are some areas that require work, the company's project cost management practices are generally moderate when compared to resource planning. In particular, the results showed that there are notable gaps in the use of all necessary specific resource planning inputs, as indicated by the mean value (2.93), and in the suitably establishment of all necessary resource planning outputs, as indicated by the mean value .

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Planning resources effectively has a big impact on how much buildings cost to build.	*95*	*3.00*	*4.00*	*3.2105*	*.40985*
Cost management results in building construction projects are significantly impacted by key elements impacting resource allocation decisions.	*95*	*3.00*	*4.00*	*3.2105*	*.40985*
In building projects, several resource-planning techniques (such as lean construction and the critical path method) have a significant effect on budgetary results.	*95*	*3.00*	*4.00*	*3.2105*	*.40985*

Technology (such as project management software and building information modeling) is a major factor in maximizing resource planning for cost effectiveness in building projects.	*95*	*3.00*	*4.00*	*3.2105*	*.40985*
Strategies for managing costs and allocating resources in the construction of buildings are significantly impacted by changes in project scope and scale.	*95*	*3.00*	*4.00*	*3.2105*	*.40985*
Cost overruns in building construction projects are efficiently mitigated by integrating resource planning with risk management.	*95*	*3.00*	*4.00*	*3.2105*	*.40985*
Resources and cost management in building construction projects are greatly impacted by external factors including market and regulatory changes.	*95*	*3.00*	*4.00*	*3.2105*	*.40985*
Cost-effective building projects have a lot of options when using sustainable resource planning techniques.	*95*	*3.00*	*4.00*	*3.2105*	*.40985*
The methodologies used in building construction projects for resource planning and cost management are influenced by various organizational structures, such as joint ventures, general contractors, and subcontractors.	*95*	*3.00*	*4.00*	*3.3789*	*.48770*
Effective case studies on the application of resource planning offer important insights for enhancing industry standards in building construction projects	*95*	*2.00*	*3.00*	*2.9368*	*.24454*
Valid N (listwise)	*95*				

Descriptive Statistics

	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
Resource planning	*95*	*2.90*	*3.60*	*3.3053*	*.13634*
Valid N (listwise)	*95*				

Table 4.3.1

The quantitative results showed that there is a moderate level of agreement when it comes to the mean value for whether the projects were recognized as having all the necessary resources (materials and equipment) to complete these tasks, which is 3.23. Interviewees were asked if all tasks/activities needed to complete the project were identified during the resource planning stages of project cost management. They all replied that, yes, the major tasks of the project were

identified during resource planning, but not all detail activities and tasks needed to execute and complete the project were identified.

According to every interviewee, the project created a work breakdown structure (WBS) that was used as a resource planning input. But it also became out that there were gaps in terms of utilizing all necessary inputs while planning resources. The quantitative results also showed that there are large gaps in the use of all necessary precise resource planning inputs. The work breakdown structure (WBS) and overall project management plan were the primary sources of information used by the project for resource planning.

Regarding the instruments and techniques used in resource planning, the interviewee indicated that the most crucial tools and approaches utilized by the project during resource planning are historical data and expert intuitive judgment. However, there was a lack of use of more sophisticated methods and instruments for resource planning in projects, such as project management software, alternative analysis, and publicly available estimate data. These results are especially noteworthy since they imply that there is still a great deal of evidence supporting the old approach of intuitive judgment.

According to the respondents' responses and the examination of the supporting documents, sample building construction project organizations typically handle resource planning as a component of creating the overall project management plan. Resource planning was prepared for the majority of the projects as part of the project management strategy. The project's primary tasks have been determined, and the equipment, materials, and human resources needed to carry them out and finish the project have been quantified. Still, there are a lot of things that could be done better in order to improve resource planning procedures. Only key tasks were recognized throughout the work breakdown structure (WBS) development process, so all the specific activities and subtasks required to execute and complete the project were not fully identified. During the resource planning process, there were problems in utilizing all of the necessary inputs. Additionally, there was a constraint on the application of more modern tools and procedures for project resource planning because the conventional approach of applying intuitive judgment is still widely used. This implied that most businesses used their own judgment and experience as the main source of information when it came to project resource planning.

Because they lack the knowledge or expertise to apply more sophisticated approaches, or because they believe intuitive judgment to have greater time and cost benefits, businesses may

choose to use their gut feeling as the basis for resource planning tasks. However, this can lead to the absence of vital data and resources needed to carry out the project. As a result, it's critical to take into account other alternative tools while using resource planning.

4.3.2. Project Cost estimating Practices

The study's second particular goal was to evaluate Addis Ababa building project construction project cost estimation methods. Estimating the expenses of physical and human resources for each project activity is the second part of cost management. The process of calculating the expenses related to each resource needed to complete the project is known as cost estimating. It is a prognostic procedure used to estimate, value, and cost the resources needed to complete the project. Since precision is essential in this process, estimation is perhaps the most challenging of the cost management processes. Project managers must also take into account variables, overhead, inflation, and the time worth of money in addition to fixed and variable expenses. The study evaluates the sample building construction project in Addis Ababa's project cost estimate practices as one facet of project cost management. A summary of respondents' opinions regarding project cost estimating techniques is shown in Table 4.3.2.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
The methods and approaches used in cost estimation have a big influence on how accurate estimates are in building construction projects.	95	3.00	4.00	3.0632	.24454
The accuracy of cost estimates in construction projects is significantly influenced by a number of factors, including project location, complexity, and scale.	95	3.00	3.00	3.0000	.00000
The utilization of historical data and benchmarking is imperative in improving the precision of cost estimations in building construction endeavors	95	3.00	4.00	3.0105	.10260
Technological developments like machine learning and artificial intelligence have a big influence on how accurate and effective cost estimating is in building projects.	95	3.00	3.00	3.0000	.00000
Enhancing accuracy in building construction projects can be greatly facilitated by integrating Building Information Modeling (BIM) with cost estimation procedures.	95	3.00	4.00	3.0211	.14432

In building projects, the accuracy of cost predictions is greatly impacted by different procurement strategies.	*95*	*3.00*	*3.00*	*3.0000*	*.00000*
When predicting costs for building construction projects, handling uncertainties and contingencies poses a number of difficult issues.	*95*	*3.00*	*3.00*	*3.0000*	*.00000*
Throughout the course of a construction project, stakeholder collaboration and communication are critical to improving the accuracy of cost estimates	*95*	*3.00*	*4.00*	*3.0105*	*.10260*
It is crucial to address potential biases and ethical issues in cost estimating procedures for building construction projects.	*95*	*3.00*	*4.00*	*3.0105*	*.10260*
Valid N (listwise)	*95*				

Descriptive Statistics

	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
Cost estimating	*95*	*3.00*	*3.67*	*3.2678*	*.12812*
Valid N (listwise)	*95*				

Table 4.3.2

4.3.3. Project Cost Budgeting Practices

Evaluating building construction companies in Addis Ababa's project cost budgeting procedures was the third explicit goal of the study. Project cost budgeting is the third phase or element of project cost management. The process of assigning expenses to a specific portion of the project, like single tasks or modules, for a predetermined amount of time. It mostly entails assigning the total cost estimates to specific work items in order to create a cost baseline for evaluating the execution of the project. The study evaluates the sample building construction projects in Addis Ababa's project cost budgeting practices as one aspect of project cost management. An overview of respondents' opinions regarding project cost estimating techniques is shown in Table 4.3.2

The third step in the project cost management process, cost budgeting, is the framework in which respondents report on their project cost management practices, as Table 4.3.3 demonstrated. According to Shrestha (2015), the grand mean reaction for project cost management practice in the context of project cost budgeting is 3.33, which is a moderate response. This indicates that while there are certain areas that might be improved, the company's project cost management processes are generally reasonable in terms of project cost budgeting.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
The total financial success of building construction projects is strongly impacted by the efficacy of cost budgeting techniques	95	3.00	4.00	3.1895	.39396
The accuracy of cost budgets in construction projects is heavily influenced by a number of factors, including project scope, complexity, and duration.	95	3.00	4.00	3.1895	.39396
Building construction projects can increase the accuracy of their cost budgets by utilizing historical cost data and lessons gained	95	3.00	4.00	3.1895	.39396
Building construction projects are more accurate and efficient when cost budgeting is done with the use of advanced software tools.	95	3.00	4.00	3.1895	.39396
The accuracy and visualization of building projects can be greatly enhanced by integrating Building Information Modeling (BIM) with cost budgeting procedures	95	3.00	4.00	3.1895	.39396
In building construction projects, various procurement tactics (e.g., cost-reimbursable contracts, lump sum contracts) affect how successful cost planning techniques are.	95	3.00	4.00	3.1895	.39396
In constructing construction projects, addressing contingencies and risk management is essential to creating realistic cost budgets.	95	3.00	4.00	3.1895	.39396
In construction projects, stakeholder participation and communication are critical to matching cost budgets with project objectives and expectations.	95	3.00	4.00	3.0947	.29440
Transparency and ethical issues play a significant role in cost budgeting procedures in building construction projects	95	3.00	4.00	3.1368	.34550
Valid N (listwise)	95				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Cost Budgeting Practice	95	3.00	3.78	3.3287	.16362
Valid N (listwise)	95				

Table 4.3.2

As part of project cost planning, interviewees were asked if they had experience setting up a cost baseline for tracking project performance. Their responses determined the cost baseline, which was also generated at the project's kickoff phase, which was used to gauge project performance.

The interviewees went on to say that while creating a cost baseline; the expenses of all the project's scheduled activities are distributed over time. Budgeting for project costs was done on an annual, quarterly, and monthly basis. It was also noted that, in the majority of the projects, there was a discrepancy between project cost budgeting and actual costs based on the interview and document analysis.

Regarding the methods and instruments utilized for project cost budgeting, the interviewee stated that the expert intuitive judgment and top-down estimate method the same methods utilized for cost budgeting were the same. The use of more sophisticated methods and resources for project cost budgeting, such as electronic tools, was restricted.

4.3.4. Project Cost Control Practices

Cost control is the final step in the project cost management process. The process of determining, tracking, and assessing project costs in order to minimize costs and increase income for a company is known as cost control. It is executed by comparing the project's actual financial performance to the budgeted expectations. It is an ongoing procedure carried performed all the way through the project lifecycle. Here, reporting in a timely and transparent manner is just as important as measuring. The study evaluates the sample building construction projects in Addis Ababa's project cost control practices as one aspect of project cost management. The summary of respondents' opinions on project cost control techniques is shown in Table 4.3.4.

The final phase in the project cost management process, cost control, is the setting in which respondents report on their project cost management methods, as Table 4.3.4 demonstrated. According to (Shrestha, 2015), the grand mean answer for project cost management practice in the context of project cost control is ***3.0371***, which is considered moderate. This implies that, in terms of project cost control, the company's project cost management procedures are modest.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
The financial performance of building construction projects is greatly influenced by effective cost management measures.	95	3.00	4.00	2.9847	.21440
Construction project cost control efficacy is greatly impacted by a number of factors, including labor fluctuations, material pricing, and changes in project scope.	95	3.00	4.00	3.0526	.22448
Maintaining project budgets in building construction projects is facilitated by putting into practice cost management procedures that are predicated on precise forecasting and monitoring	95	3.00	4.00	3.000	.29440
Building construction projects can achieve more precision and efficiency in their cost management efforts by employing cost tracking software and solutions.	95	3.00	4.00	3.0526	.22448
Gaining significant insights into project performance and cost variance in construction projects is possible by incorporating earned value management (EVM) tools into cost control processes.	95	3.00	4.00	3.0737	.26264
The efficiency of cost management techniques in building construction projects is influenced by various contract types (e.g., cost-plus contracts, fixed-price contracts).	95	3.00	4.00	2.9537	.21264
Effective cost control in building construction projects requires proactive risk mitigation and management techniques.	95	3.00	4.00	3.0053	.30852
Improved cost control and decision-making in construction projects are facilitated by regular communication and collaboration among project stakeholders	95	3.00	4.00	3.0895	.39396
Integrity and openness are two of the most important ethical factors to take into account when developing cost control strategies for construction projects.	95	2.00	4.00	3.0900	.42776
Adherence to industry norms and regulatory regulations is essential for the effective execution of cost management in building construction projects	95	3.00	4.00	3.0684	.37623
Valid N (listwise)	95				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Cost Control	95	2.70	3.90	3.0371	.21601
Valid N (listwise)	95				

Table 4.3.4

According to the conversation during the interview, it was also noted that the majority of the companies did not establish a preliminary cost management strategy, which is one aspect of cost control methods. Only one of the four projects established a preliminary cost management strategy. The project's estimate, allocation, and control of costs for the resources needed to finish all project tasks are outlined in a cost management plan. In general, the cost management plan examines the financing, scheduling, and control of the project's expenses.

CHAPTER FIVE

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter addressed the study's summary of findings, conclusions, and recommendations. Firstly, it presents the data driven conclusion regarding the cost management practice; secondly, it presents recommendations, which consist of additional steps that the study suggests to enhance the project's cost management practice.

5.1. Summary of Major Findings

Recall that one of the main goals of the study was to look into how building project construction companies in Addis Ababa now handle project costs. The case project's cost variance issue, the practice's overall, and the requirement to identify specific areas that require interventions were the primary reasons for the necessity to conduct a thorough study into the current practice. Each of the four project cost management process components resource planning, cost estimating, cost budgeting, and cost controlling practices was thoroughly evaluated in this study. As a result, specific problems that call for improvement interventions were made evident. In accordance with each of the research objectives, the study's primary conclusions are based on the data examined in Chapter 4.

5.1.1. Project resource planning practices

The study's primary goal was to evaluate the project resource planning procedures used by Addis Ababa building project construction companies. According to Shrestha (2015), the grand mean answer for project cost management practice in the context of resource planning is *3.3053*, which is modest in terms of resource planning practices. This suggests that, despite certain areas in need of improvement, the company's project cost management procedures are generally moderate when compared to resource planning. It was discovered that in order to prepare the overall project management plan, the project plans its resources. The project's primary tasks have been determined, together with the resources (materials, labor, and equipment) and quantities needed to carry them out to completion. To achieve better resource planning techniques, there are still a number of important areas that require improvement. Only key tasks were recognized throughout the work breakdown structure (WBS) development process, so all the specific activities and subtasks required to execute and complete the project were not fully identified. During the resource planning process, there were problems in utilizing all of the necessary

inputs. Additionally, there was a constraint on the application of more sophisticated tools and procedures for project resource planning because the conventional approach of applying intuitive judgment is still widely used.

5.1.2. Project cost estimating practices

The study's second particular goal was to evaluate the building project construction cost management practice cost estimating method in Addis Ababa. According to Shrestha (2015), the grand mean answer for project cost estimating is *3.2678*, which is considered reasonable. This indicates that while there are certain areas that may be improved, the company's project cost management methods are generally moderate in terms of project cost estimation. It was discovered that the majority of businesses complete the cost estimation process as a component of creating the project management plan as a whole. The study found that the conventional or standard estimating method is widely used for cost estimation. Because this approach produces deterministic (single value numbers) outputs, it frequently overlooks or fails to account for the implications of risks and uncertainties, which can have a detrimental impact on the estimate's accuracy. It takes a tremendous amount of data on resource costs, consumption and productivity norms, and other qualitative items to compile, retrieve, and manipulate such a precise estimate.

According to the study, the information sources and items used to prepare the estimates primarily focused on information about the direct cost components, with insufficient attention paid to the indirect cost components and qualitative information items, which, if properly and carefully considered, can either significantly affect the accuracy of the estimates or increase it. Using other sophisticated estimating techniques has its limitations. However, the quality and accuracy of the estimates produced by the standard method can be raised by applying statistical and/or probabilistic estimating techniques, such the range estimating methodology. The investigation also discovered that there was a discrepancy in this project's estimated and actual costs.

5.1.3. Project Cost budgeting practices

Evaluating the project cost budgeting procedures of Addis Ababa building construction companies was the third particular goal of the research. Overall, it was noted that the project performed really well in terms of cost budgeting procedures. As a result, the majority of the nine elements in the item lists used to evaluate the efficacy of the project's cost budgeting method had

comparatively higher mean values. The project cost management practices of the organization in relation to project cost budgeting are reasonable, although there are certain areas that might be improved, according to the grand mean response for project cost management practice, which is *3.3287*. The results specifically showed that there are large gaps in the way that project financing requirements, project baselines, and project document updates are established as an output to cost budgeting.

According to the report, the project prepares the entire project management plan, which includes the cost budgeting work. The research also revealed that, while the project cost budgeting process assigned the overall project costs estimates to specific work items and established a cost baseline for monitoring project performance, there were limitations with regard to the application of more sophisticated tools and techniques because the conventional approach of using traditional techniques is still widely used. As a result, it was discovered that there was a discrepancy in this project's real expenses and budget. Based on the baseline, the cost-controlling system should be able to monitor and recognize actions that show a significant departure from allocated spending.

5.1.4. Project Cost controlling practices

Evaluating the project cost control procedures used in Addis Ababa building construction projects was the third specific goal of the study. The company's project cost management practices in terms of project cost control are modest, as evidenced by the grand mean response of *3.0371*for project cost management practices in the context of project cost control. even if there are certain places that might use improvement.

The outcome also showed that the sample organizations' cost-controlling strategies were mostly concentrated on and restricted to providing data on profitability alone. A cost-controlling system's scope, however, ought to go beyond this and include additional relevant goals and functions. An effective cost-controlling system should update resource planning and costing standards, provide early warning of unprofitable operations, and provide information that can increase resource productivity. In addition, it need to facilitate comprehension of time and cost behavior and offer input on real productivity standards and production costs to the estimating process. However, the projects' cost-controlling procedures did not take these roles into account; instead, they were primarily concerned with ensuring profit.

5.2. Conclusion

In conclusion the evaluation of cost management techniques in building construction projects, emphasizes the vital part effective financial planning and control play in guaranteeing project success. It is clear from thorough study and evaluation that efficient cost control affects the project's overall quality, timeliness, and stakeholder satisfaction in addition to its financial feasibility.

The study has made significant progress in examining the project cost management practices of building construction projects in Addis Ababa. Due to their project-based nature, building construction companies must enhance their ability to control costs and manage resources in order to successfully complete projects and meet organizational goals. In order to uncover the flaws and restrictions connected to each function, the cost management procedures currently in use for resource planning, cost estimating, budgeting, and cost controlling were evaluated. The study draws conclusions from its findings. The study found that the conventional or standard estimating method is widely used for cost estimation.

The study also came to the conclusion that in some ways the cost control system is unable to recognize or identify operations or activities that are conducted unprofitably along with the underlying causes. The budget that was created for the projects was not integrated with the process of regulating project costs. Furthermore, it isn't done in a way that gives the estimating process input. The investigation also found that there was a discrepancy in this project's estimated and actual expenses.

5.3. Recommendation

The study's suggestions, which can enhance current cost management procedures, are discussed.

- Building construction projects cannot be successful unless they employ efficient cost control techniques. During the estimation step, it starts with a careful analysis of expenses, using past data and industry standards to ensure accuracy. After a budget has been set, it's critical to distribute cash throughout project phases in a way that allows for future revisions. Value engineering is essential to a project's success because it constantly looks for ways to reduce costs without compromising quality. Getting the best value for goods and services through negotiation and careful vendor selection should be the top priority for procurement strategies. Strong risk management procedures can aid in

identifying and reducing possible financial effects, such as changes in material prices or unforeseen site circumstances.

- The study suggests using decision-supporting estimation methods in building project construction companies. Building construction companies are strongly advised to employ other estimation methods in addition to the conventional method. The standard estimation approach runs the danger of overestimating or underestimating; hence it is deterministic in nature and rarely takes uncertainties into account. The range estimating technique is one that the business can apply in its estimating procedure. Because range estimating can give information on the likelihood of cost overruns, their potential magnitude, and strategies for mitigating or eliminating them such as how much contingency to include in the estimate it can be utilized as a decision support tool. However, when time is of the essence, parametric estimating can be employed to determine the project value's order of magnitude. Additionally, it can help the business ascertain the approximate value of a project and confirm the correctness of their detailed cost estimates, which are generated using the conventional procedure.
- The formats and methods for estimating should be combined with those for cost control and budgeting. In addition to unit costs, the formats should specify the total cost and number of resources that will be used, both of which are essential for creating the project budget. Building construction companies should, if at all possible, utilize off-the-shelf or standard estimating software because it saves man hours and offers advantages in terms of speed, accuracy, and reliability of the estimate. Furthermore, since the details of the estimates created during the planning stage can act as benchmarks for the cost-controlling procedure, it is strongly advised that businesses maintain documentation of these estimates.
- The scope of a cost-controlling system should include monitoring resource efficiency, which is measured against the output rates used for estimating criteria, in addition to project profitability. Whether or not to conduct a thorough cost analysis can be decided with the use of the profitability check or test.
- Enhancing the utilization of project works breakdown or classification system is strongly advised for organizations in order to facilitate the cost controlling and overall cost management processes. The most effective way to manage a building construction project

is through work packages, which are best organized and overseen by activities. Depending on the project's nature and complexity, the project work plan, and the anticipated level of control, different breakdown levels should be implemented. Additionally, a preset code unique to each level or category of work or activity designated for a project should be used to identify it. There are benefits to coding and work breakdown in terms of preparing estimates and managing costs.

5.2.1 Recommendations for further studies

The study has revealed significant inadequacies in the project cost management methodologies employed by the representative building construction projects in Addis Ababa concerning resource allocation, cost estimation, budgetary control, and cost containment. Furthermore, the research has produced theoretical interventions and suggestions that can enhance practice and enhance project outcomes. But because the study's scope is so broad, it became challenging to provide every pertinent intervention in a thorough and exhaustive manner. It is therefore advised that the following areas be thoroughly evaluated, as they may serve as focal points for additional research aimed at enhancing the project's cost management procedures.

- Creating and implementing a contextual project task breakdown or classification system to help with the management and control of project costs.
- Applying different estimating approaches or bringing statistical and/or probabilistic estimating methodologies to Ethiopia's building sector.
- creating an estimating handbook or system that combines codes, resource productivity standards, and resource costs in order to support project cost management systems.

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Appendix I

Reliability test table for the overall questions based on the four project cost management practices.

Case Processing Summary

		N	%
Cases	Valid	95	100.0
	Excluded[a]	0	.0
	Total	95	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.849	38

APPENDIX I I: QUESTIONNAIRE

Dear Respondents,

Data collection for the postgraduate Master of Project Management Program study "Assessment of project cost management practices: the case of some selected Building construction projects in Addis Ababa" is the goal of this questionnaire. It is necessary to fill this out. to help decide what the study's goals are. Nobody will be able to identify the source of the information because your privacy will be protected in an anonymous manner. The information you submit will be kept strictly confidential and used only for academic purposes. As such, you are cordially asked to respond to the various questions that follow. I appreciate your willingness to take part in this study in advance.

General Instruction: - Circle your response or indicate "√" in the box beneath for closed-ended questions among the provided alternatives. You don't need to write your name.

Part I. General Profile

Gender

- Male ☐
- Female ☐

Educational Background

- Master's degree or above ☐
- Bachelor's degree ☐
- College Diploma ☐
- High school Completed ☐

Role in the Construction Project

- Project Manager ☐
- Construction Engineer ☐

- Contract Admin/Office Engineer ☐
- Other ☐

Years of Experience

- < 5 years ☐
- 5 to 10 Years ☐
- 10 to 15 Years ☐
- 15 Years ☐

Part II. Research Related Questions:

1.Is there a separate department that handles Cost management in your organization?

- Yes ☐
- No ☐

2. How would you rate the importance of cost management in building construction projects?

- Very important ☐
- Important` ☐
- Neutral ☐
- Not important ☐

3. What cost estimation methods do you commonly use in your building construction projects?

- Historical data ☐
- Analogous estimating ☐
- Parametric estimating ☐
- Bottom-up estimating ☐
- Other ☐

3. How often do you conduct cost reviews and updates during the project lifecycle?

- Weekly ☐
- Monthly ☐
- Quarterly ☐
- Other ☐

4. How do you track and monitor project costs during construction?

- Cost tracking software ☐
- Manual records ☐
- Other ☐

5. Have you encountered any challenges related to cost management in building construction projects?

- Yes ☐
- No ☐

6. Are you satisfied with the current cost management practices implemented in your building construction projects?

- Satisfied ☐
- Dissatisfied ☐

7. Do you involve all stakeholders (clients, contractors, suppliers) in cost management discussions and decisions?

- Yes ☐
- No ☐

Part III. Rating Scale Questions:

Here under are the General Cost management practices of the project: Please tick on the space you feel is appropriate for the following. Scale rating description: 5= Very Strongly Agree, 4= Strongly Agree, 3= Agree, 2= Strongly Disagree, 1= Very Strongly Disagree.

No.		*Very Strongly Agree*	*Strongly Agree*	*Agree*	*Strongly Disagree*	*Very Strongly Disagree*
	A. Resource planning					
1	*Planning resources effectively has a big impact on how much buildings cost to build.*					

2	*Cost management results in building construction projects are significantly impacted by key elements affecting resource allocation decisions.*					
3	*In building projects, several resource-planning techniques (such as lean construction and the critical path method) have a significant effect on budgetary results.*					
4	*Technology (such as project management software and building information modelling) is a major factor in maximizing resource planning for cost effectiveness in building projects.*					
5	*Strategies for managing costs and allocating resources in the construction of buildings are significantly impacted by changes in project scope and scale.*					
6	*Cost overruns in building construction projects are efficiently mitigated by integrating resource planning with risk management.*					

7	*Resources and cost management in building construction projects are greatly impacted by external factors including market and regulatory changes.*					
8	*Cost-effective building projects have a lot of options when using sustainable resource planning techniques.*					
9	*The methodologies used in building construction projects for resource planning and cost management are influenced by various organizational structures, such as joint ventures, general contractors, and subcontractors.*					
10	*Effective case studies on the application of resource planning offer important insights for enhancing industry standards in building construction projects.*					
	B. Cost estimating					
11	*The methods and approaches used in cost estimation have a big influence on how accurate estimates are in building construction projects.*					

12	*The accuracy of cost estimates in construction projects is significantly influenced by a number of factors, including project location, complexity, and scale.*					
13	*The utilization of historical data and benchmarking is imperative in improving the precision of cost estimations in building construction endeavours.*					
14	*Technological developments like machine learning and artificial intelligence have a big influence on how accurate and effective cost estimating is in building projects.*					
15	*Enhancing accuracy in building construction projects can be greatly facilitated by integrating Building Information Modelling (BIM) with cost estimation procedures.*					
16	*In building projects, the accuracy of cost predictions is greatly impacted by different procurement strategies.*					

17	*When predicting costs for building construction projects, handling uncertainties and contingencies poses a number of difficult issues.*					
18	*Throughout the course of a construction project, stakeholder collaboration and communication are critical to improving the accuracy of cost estimates.*					
19	*It is crucial to address potential biases and ethical issues in cost estimating procedures for building construction projects.*					
	3. Cost Budgeting Practice					
20	*The total financial success of building construction projects is strongly impacted by the efficacy of cost budgeting techniques.*					
21	*The accuracy of cost budgets in construction projects is heavily influenced by a number of factors, including project scope, complexity, and duration.*					

22	*Building construction projects can increase the accuracy of their cost budgets by utilizing historical cost data and lessons gained.*					
23	*Building construction projects are more accurate and efficient when cost budgeting is done with the use of advanced software tools.*					
24	*The accuracy and visualization of building projects can be greatly enhanced by integrating Building Information Modelling (BIM) with cost budgeting procedures.*					
25	*In building construction projects, various procurement tactics (e.g., cost-reimbursable contracts, lump sum contracts) affect how successful cost planning techniques are.*					
26	*In constructing construction projects, addressing contingencies and risk management is essential to creating realistic cost budgets.*					

27	*In construction projects, stakeholder participation and communication are critical to matching cost budgets with project objectives and expectations.*					
28	*Transparency and ethical issues play a significant role in cost budgeting procedures in building construction projects.*					
	4.Cost Control					
29	*The financial performance of building construction projects is greatly influenced by effective cost management measures.*					
30	*Construction project cost control efficacy is greatly impacted by a number of factors, including labor fluctuations, material pricing, and changes in project scope.*					
31	*Maintaining project budgets in building construction projects is facilitated by putting into practice cost management procedures that are predicated on precise forecasting and monitoring.*					

32	*Building construction projects can achieve more precision and efficiency in their cost management efforts by employing cost tracking software and solutions.*					
33	*Gaining significant insights into project performance and cost variance in construction projects is possible by incorporating earned value management (EVM) tools into cost control processes.*					
34	*The efficiency of cost management techniques in building construction projects is influenced by various contract types (e.g., cost-plus contracts, fixed-price contracts).*					
35	*Effective cost control in building construction projects requires proactive risk mitigation and management techniques.*					
36	*Improved cost control and decision-making in construction projects are facilitated by regular communication and collaboration among project stakeholders.*					

37	*Integrity and openness are two of the most important ethical factors to take into account when developing cost control strategies for construction projects.*					
38	*Adherence to industry norms and regulatory regulations is essential for the effective execution of cost management in building construction projects.*					

APPENDIX I I I: INTERVIEW QUESTION

The goal of this interview is to gather data for the study titled "Assessment of Project Cost Management Practices: the case of some selected Building construction projects in Addis Ababa."

To help determine the goals of the study, this interview is necessary. It is voluntary for you to participate in this survey. Your provided information will be kept totally confidential and used only for the purpose of the study. For this reason, we respectfully ask that you answer the following questions honestly. I appreciate your cooperation in advance for this interview.

Part I: General Question

1. What is your position in the project?

2. Your experience in the project?

Part II: About Assessment on project cost management practice

1. What aspects do you take into account when figuring out how much and what kind of resources is required for a project?

2. Could you describe a time when you had to modify the way resources were allocated to account for modifications to the project's scope or timeline?

3. Which methods or instruments do you employ for cost estimation?

4. When predicting expenditures, how do you take unforeseen events or uncertainties into account?

5. How do you allocate the expenses of a building project among its many stages or tasks?

6. How can you make sure your budget is both reasonable and realistic?

7. Could you give an instance of a time when you had to make budget adjustments for a project? What was your approach to it?

8. How do you keep monitoring on project costs to make sure they don't go over budget?

9. Which techniques do you use to find and fix cost overruns?

10. Could you give an example of a particular situation in which you successfully applied cost control measures?

11. How do you communicate the financial status of a construction project to stakeholders?

12. Which important indicators or metrics are included in your cost reports?

13. Have you ever had to inform stakeholders of unfavorable financial news? What strategy did you use?