ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

EFFECT OF PROJECT TIME MANAGEMENT ON PROJECT PERFORMANCE IN THE CONSTRUCTION INDUSTRY: THE CASE OF RAMA CONSTRUCTION PLC.

By Abenezer Abadi

ID: GSR/5985/14

A Thesis submitted to Addis Ababa University, School of Commerce in partial fulfillment of the requirements of the degree of Master of Arts in Project Management (MAPM)

Advisor: Seifu Mamo (PhD.)

June 2023

Addis Ababa, Ethiopia

Addis Ababa University
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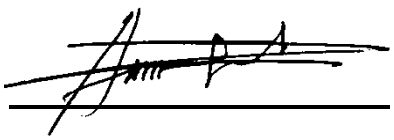
Afework Getachew (PhD)		**10/07/2023**
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Declaration

I hereby declare that the project thesis entitled "*Effect of Project Time Management on Project Performance in the Construction Industry: A Case of Rama Construction PLC.*", has been carried out by me under the guidance and supervision of Seifu M. (PhD). This is to certify that this research project report is my original work and has never been presented for a degree or any other academic award in this or any other university.

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Certificate

This is to certify that the thesis entities "*Effect of Project Time Management on Project Performance in the Construction Industry: A Case of Rama Construction PLC.*", submitted to Addis Ababa University School of Commerce for the award of degree in Master of Project Management and is a record of bona fide research work carried out by Mr. Abenezer Abadi, under my guidance and supervision. Therefore, I hereby declare that no part of this thesis has been submitted to any other university or institution for the award of any degree or diploma.

Advisor Name	Signature	Date
Seifu Mamo (PhD)		

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Thank you!!!

Table of Contents

List of Tables

List of Figures

List of Acronyms and Abbreviations

α	-	Cronbach Alpha
β	-	Standardized Estimates
AVE	-	Average Variance Extracted
CFA	-	Confirmatory Factor Analysis
CFI	-	Comparative Fit Index
CID	-	Construction Industry Development
CMIN	-	Chi-Square
CR	-	Composite Reliability
CSF	-	Critical Success Factor
df	-	Degree of Freedom
EC	-	Effective Communication
EFA	-	Explanatory Factor Analysis
ETM	-	Effective Project Time Management
GDP	-	Gross Domestic Product
KMO	-	Kaiser-Meyer-Olkin
KPI	-	Key Performance Indicator
MI	-	Modification Indices
MS	-	Microsoft
NBE	-	National Bank of Ethiopia
p	-	Significance
PLC	-	Private Limited Company
PLS-SEM	-	Partial Least Square- Structural Equation Modelling
PM	-	Procurement Method
PMBOK	-	Project Management Book of Knowledge
PMI	-	Project Management Institute
PP	-	Project Performance
PPql	-	Qualitative Project Performance
PPqn	-	Quantitative Project Performance
PTM	-	Project Time Management
RM	-	Risk Mitigation Plan
RMSEA	-	Root Mean Square Error of Approximation
SEM	-	Structural Equation Modelling
SP	-	Stakeholder Participation
SPSS	-	Statistical Package for Social Sciences
SRMR	-	Standardized Root Mean Residual
TMP	-	Project Time Management Process
WBS	-	Work Breakdown Structure

Abstract

Studies show that in Ethiopia only 8.55% of construction projects have been finished to the original completion date. Effective project time management (ETM) is a critical success factor for projects. Therefore, an effective time management for the construction project is important in managing risk of the delayed completion project. To date, much of the literature has focused on the project time management analysis was very limited to the direct and indirect relationships between project time management process (TMP) and project performance (PP). Therefore, the aim of this study is to fill these research gaps by empirically examining the relationship between ETM and PP. The objectives of this study are to assess the project time management practice implemented in Rama Construction PLC and explore the effect of Project Time Management on project performance. Moreover, the study considered stakeholder participation, effective communication, project time management process, risk mitigation, and procurement method to measure the project time management practice. To achieve these objectives, there were ninety six questionnaire sets distributed to the respondents. Both quantitative and qualitative survey tools were used to collect the data from respondents. Out of the total respondents 84 responses were obtained, accounting to 87.5 % response rate. The quantitative data analysis was conducted using structural equation modelling, and the qualitative data was analyzed using conceptual qualitative content analysis. The findings suggest that project time management affect the ability to achieve both sets of quantitative PP (i.e., project time, and project cost) and qualitative PP (i.e., project quality, and stakeholder satisfaction) positively. These findings suggest that implementing effective project time management increase the ability to achieve the desired project performance and that effective project time management is in fact advantageous to construction projects. So high value should be given to project time management in the construction industry.

Key words: Effective project time management, Stakeholder participation, effective communication, project time management process, risk mitigation, procurement method, project performance

CHAPTER ONE

1. INTRODUCTION

The impact of project time management on project performance is the study's main focus. Assessing the current project time management practice implemented in Rama Construction PLC is the aim of the study. Besides, the study focused to investigate the cause and effect relation between project time management and project performance. This chapter does so by setting the study topic in a larger context and by providing background data on the research problem. The background of the organization is covered in the second section. The problem statement is covered in the third section. The subsequent sections include the research questions, significance of the study, scope of the study, study limitations, and organization of the study. The chapter concludes by presenting the definitions of important key terms in the study.

1.1. Background of the Study

Project performance can have different meanings depending on who is evaluating (Toor & Ogunlana, 2010) and when the evaluation is carried out (Cleland & Ireland, 2006). Simply put, performance is meeting client expectations or adhering to their specifications with regard to schedule, quality, and budget constraints (Johnson, 2020).

A successful project is a project that meets its goal, and the output is of value to the client. A project is likely to be perceived as an overall success if it meets the technical specifications and/or the mission to be performed and if the key people in the project team and the main users or customers of the project work are very satisfied with the project results (Watt, 2014). The construction industry is considered one of the oldest industries organized on a project basis (Vrijhoef, 2008). The successful completion of construction projects add a high value to the economic growth of a nation. Completion alone does not constitute success for the project owner. The Performance and success of projects are measured by the triple project constraints (Cost, time, and quality). For a project to be successful it needs to be completed on time, within budget, and within specifications (Kerzner, 2022).

Key Performance Indicators (KPI) in a construction project show how successfully the project has been executed (Bhattarai & Rijal, 2022). The factors that contribute to the success of

projects are referred to as success factors. In order to evaluate the success of a project's performance, critical success factors (CSFs) are required (Ishak et al., 2018). Numerous lists and models of Critical Success Factors (CSFs) have been proposed by many researchers. Mbugua et al. (2005)and Chan and Chan (2004), identified five primary CSFs: project management actions, external environment, project-related factors, human-related factors and project procedures. Nguyen et al. (2004) identified five CSFs: Access to resources, providing adequate financial resources, competent project manager, Commitment to the project and competent project team. Abraham (2012) identified seven CSFs they are political environment, employee/ organizational enhancement, competitive strategy, economic environment, process benchmarking, market analysis and technical application.

One of the biggest project failure ever occurred in the world is the Millennium Dome project in London, England. The main objective was for celebrating the third millennium, which was to occur from January 1st 2001 to December 31st 3000. Akinradewo et al. (2022) stated that the project was not properly planned, poor execution, lack of sufficient operational expertise, marketing strategies not in place, and financial mismanagement. Another example of project failure can be seen from the Ryugyong hotel in North Korea. During the 1980s, the government decided to build the tallest building in the world. The construction began in 1987, and estimated to cost $230 million but the project experienced delay and cost overruns. Cost escalated from $230 million to $750 million, which was 2% of North Korea's entire GDP (Akinradewo et al., 2022). The project was pre maturely closed due to its high cost, leading to financial constraints, poor structural integrity, and economic issues (Freal, 2018). In the Ethiopia's context the most recent mega project has to be Yayu Multi-Complex industries. The factory was supposed to lie on 54,000sqm and consisting two Urea manufacturing plants, one DAP manufacturing plant, a coal mining and chemical manufacturing plant that will manufacture chemical inputs for the fertilizer factories. In 2017 the project was terminated due to cost overrun and delay. As reported by Tadesse (2018) in the Addis Fortune Magazine, the engineering, civil, electromechanical, human resources and research capacity of the organization undertaking the project was week. Apart from Yayu, 10 sugar projects in the nation have been terminated. These projects demonstrate the poor performance of the projects, which eventually led to their premature closure.

Project management practitioners working in the construction industry need to be better acquainted with different roles for the successful completion of the project. What makes them reliable is having the required skills to bring a project to success. The skills needed in the

construction industry include knowledge of project management methodologies, proficient with project management software, team management, time management, project planning, project scheduling, project budgeting, risk management, cost management, and task management. Leadership skills, communication skills, negotiation skills, organization skills, problem-solving skills, teamwork, adaptability, critical thinking, and interpersonal skill are among the skills needed in the construction industry (Landau, 2021).

Construction has been facing numerous issues and one of them is time management issues which have caused delayed completion of a project. According to Solis & Corona-Suárez (2016), delays on project deliveries are one of the most frequent problems affecting project with close to 47%, resulted from a poor application of project time management. In the construction sector having reliable project time management practices is a must for the successful completion of a construction project (Hogan, 2020). Hence, this study will look into the practice of project time management to minimize and avoid delay in any construction project.

1.2. Organizational Background

Ethiopia is one of Africa's fastest-growing, and most vibrant economy (World Bank, 2022). The construction industry is a major economic growth driver, it is the true power of the national economy. In 2021 market size of the construction industry of Ethiopia was $41 billion, and this market is projected to grow more than 8% during the period 2023-2026 (GlobalData, 2022).

Rama Construction Private Limited Company is a category-one general contractor (GC) engaged in Building, Industry, Electric sub-station civil work, road construction project works and Real Estate development. The Company, which is registered under the minister of construction, was founded in Addis Ababa, Ethiopia in 1995. The company has ISO 9001:2008 and ISO 14001:2004 certifications. Since its founding, the Company has completed a variety of construction projects worth hundreds of millions of Birr for Ethiopia's Federal Government, Regional Governments, and Private Sectors. The Company is currently engaged in a number of construction projects across the nation. There are more than 3700 employees currently working in Rama Construction PLC ranging from unskilled personnel to professionals (Rama Construction, 2022).

Some of the projects performed by Rama Construction PLC include Ashegoda wind farm, 6km road and 11 km pipeline for Corbetti geothermal, Greenfield brewery Kilinto for Heineken brewery factory, Expansion work of Wonji sugar factory, Zeway wine factory, Metehara sugar factory, Bole-Lemi Industry zone, Reservoir civil work for Dangote Industries (Ethiopia) PLC, New wearing apparels and garments factory, Juniper glass factory, UN-ECA new office facility for United Nations, New OPD annex at Harar Hiwot Fana hospital, Hospital and Learning Buildings for Jimma University, OCSCO building, etc.

1.3. Statement of the problem

As the complexities in managing projects are increasing day by day, a similar kind of problem is being faced by the construction projects. According to Koshe, & K.N.Jha (2016), in Ethiopia, only 8.55% of construction projects have been finished to the original completion date. Construction project failure is one of the nation's main issue. The failure ranges from mega infrastructure projects to housing initiative projects. Most construction projects not only run over schedule but also on budget. As reported by Derso (2018) in the Ethiopian Herald, the construction sector account for about 9.5% of the total GDP. This figure reveals the importance of investigating the factors contributing to the failure of construction projects.

Even though the contribution of local contractors is increasing from time to time, there are some issues that prevent the project from being completed within the scheduled time frame (Wondimu, 2017). As Jones (2021) articulated there are different factors for the failure of construction projects: inadequate planning, failure to communicate, scope creep & change orders, productivity issues & delays, and ignoring red flags. Other researchers also articulate that projects fail due to poor production planning, weak project management, defective design, and poor quality.

The Asheghoda wind farm project is one of the projects that Rama Construction PLC had dealt with delays. Although the project was supposed to be completed in 2011, it was actually completed in 2013. Maasho (2013) notes that the project was delayed due to logistical issues. The expansion of the Wonli sugar factory was scheduled to be completed in 2012, however it was actually completed in 2013. While projects, like the Greenfield brewery Kilinto for Heineken brewing facility, were successfully finished on schedule. Overall, it demonstrates how the organization's projects have experienced delays.

The most important factors that contribute to construction project delays, according to Mishra and Aithal (2020), include insufficient numbers of equipment, inaccurate time estimate; monthly payment difficulties, changes orders, inaccurate cost estimate; poor site management and supervision; inadequate modern equipment; shortage of construction materials; incompetent project team; improper project planning and scheduling; and contractor's financial difficulties. Bhattarai et al. (2022) argues that there are other factors that affect construction project performance: poor management and leadership, inappropriate participants, poor relations and coordination, absence of motivation, control, monitor or decision-making systems, inadequate infrastructure, political problems, cultural problems, and economic conditions.

The top five factors that contribute to construction project delay in Ethiopia, according to Tebeje (2016), are cash flow problems during construction, contractor mismanagement, poor planning, slow decision-making, and late delivery of materials and equipment. Building an effective team is one of the biggest challenges faced by Rama Construction P.L.C. when construction projects officially begin, claims G/Egziabher (2021). These challenges may be brought on by poor communication, a lack of leadership, conflict, trust issues, an unmotivated team, etc. According to Wondimu (2017), the main reasons for delays in Rama Construction PLC are improper construction methods implement, low level of equipment-operator's skill, late in revising and approving design documents, late procurement of materials, low productivity and efficiency of equipment, change orders by owner during construction, delay in material delivery, low productivity level of labors, ineffective planning and scheduling of project and delay to furnish and deliver the site. And argues that most of the causes are client related. Most of the factors identified are associated with the practices implemented in the organizations. The major of them all is project time management practices. Project time management is the management of the time spent, and progress made, on project tasks and activities. Time estimate, improper planning and scheduling, late in revising and approving design documents, etc. are related to the project time management practice. This issues an attention to be made to the project time management practice of the organization. An effective time management for the construction project is important in managing risk of the delayed completion project (Chin & Hamid, 2015).

Dino (2022), Agegnehu (2018), and others conducted a study to assess the relationship between project time management practices and project success. These researches focused on the project time management processes and the study indicates that there is statistically strong relationship

between time management practices and project success. Project time management process is one of the project time management practice, there are many other practices that needs to be considered such as communication, procurement method, stakeholder participation, etc. (Alinaitwe et al., 2007; Khoso et al., 2017; Oburu, 2020).

Based on the gaps identified, the purpose of this study is to gain a deeper understanding of the attributes that are important for construction project performance. The purpose of the study is to investigate the influence of time management on construction project management performance and quantify the relationship between those components. The study aims to assess the project time management practice implemented in Rama Construction PLC, and to determine the extent to which project time management affect the project performance in the organization.

1.4. Research Questions

Based on the identified literature gaps and missing connections between various studies, the following three research questions are developed:

1.4.1. What does the current project time management practices implemented in Rama Construction PLC look like?

The first research question is to assess the project time management practice that is implemented under Rama Construction PLC.

1.4.2. How does project time management affect quantitative project performance measure?

The second research question is to find out the effect of effective time management on quantitative project performance. Quantitative project performance variables include time, and cost.

1.4.3. How does project time management affect qualitative project performance measure?

The third research question is to assess the effect of project time management on qualitative project performance. Qualitative project performance variables included project quality and client satisfaction.

1.5. Objective of the study

1.5.1. General Objective of the study

The general objective of this study is to investigate the effect of project time management on project performance in the construction industry.

1.5.2. Specific Objectives of the study

- Assessing the current project time management practice implemented in Rama Construction PLC.
- Investigating the effect of project time management on quantitative project performance measures.
- Investigating the effect of project time management on qualitative project performance measures.

1.6. Significance of the Study

Numerous problems hinder the construction industry, one of which is poor project time management, which results in project delays. Despite its importance in our country, many projects failed to practice time management effectively as a result, many projects face a time overrun problem. This study helps to understand how the time management practices affect the overall project performance by identifying the relationship between time management practice and project performance. The study contributes to the project management body of knowledge in that it develops a conceptual framework consisting of specific components for time management, reveals the impact of time management on performance, and proposes several tools and strategies for enabling effective time management along the project life cycle. A more

significant aspect of the study, however, is identifying potential lessons for management in the development of policy that construction organizations may adopt. The study is also beneficial for project management practitioners' by considering the components proposed and following strategies recommended for construction phases. The study findings will also provide important usable data for future researches that examine the project time management practices of an organization or industry and project performance.

1.7. Scope of the Study

There are various practices and knowledge areas of project management but this study primarily concerned on project time management practice. The study is going to assess the practice of project time management in Rama Construction PLC. As well as the importance of project time management on project performance in the organization. The data will be gathered from ongoing and completed projects from March to May 2023 that Rama Construction PLC have conducted in Addis Ababa. The result of the study will equally be significant to all construction companies.

1.8. Limitation of the Study

There were several limitations to this study. First, as with any similar research type, study findings could be impacted or influenced by the sample size. Also SEM requires relatively larger sample sizes. Second, as all research methods have strengths, weaknesses, and limitations (McGrath, 1981), the hypothesis testing was focused on the quantitative approach; the study may not capture all changing of social reality. As a result, current project management strategies may differ slightly from theories.

1.9. Organization of the Study

There will be five chapters in the study. The first chapter serves as the study's introduction and include the background of the study, statement of the problem, research problem, objective of the study, significance of the study, scope, and limitation of the study. The second chapter discusses a review of relevant literatures related to Project management hard and soft skills, and its relevance to the project's success. The research design and methodology are discussed

in the third chapter of the study. It covers the research design, the sample and sampling techniques, the data-gathering sources and instruments. The fourth chapter will present the study's findings and results and interpret them. The summary of the findings, conclusions, and recommendations will be covered in the last chapter.

1.10. Definition of Terms

Construction projects: refers to the organized process of constructing, remodeling, refurbishing, retrofitting, or adapting a structure, or other built asset such as a tunnel or bridge (Designing Buildings, 2022).

Project Time Management: refers to the management of the time spent, and progress made, on project tasks and activities.

Time Management Practices: is the actual application or use of a method to manage time. Refers to the components of project management that includes the time management processes, stakeholder participation, communication, risk mitigation, and procurement method required to ensure timely completion of the project.

Stakeholder Participation: refers to sharing a common understanding and involvement in the decision-making process of the project (PM4DEV, 2018).

Effective Communication: refers to the process of transferring meanings from one entity or group to another through signs, symbols, and semiotic conventions that are mutually understood (Indeed, 2022).

Project Time Management Process: refers to the processes required to ensure timely completion of the project. It contains of activity definition, activity sequencing, activity duration estimating, schedule development, and schedule control (PMI, 2021).

Risk Mitigation: refers to reducing or controlling the impact of a risk event by minimizing either the probability of the risks happening or the impact (Vige, 2022).

Procurement Method: refers to the creation of relationships with outside vendors and suppliers for goods and services needed to complete a project (Denomme, 2022).

Project Performance: refers to meeting client expectations or adhering to their specifications with regard to schedule, quality, and budget constraints (Johnson, 2020).

CHAPTER TWO

2. LITERATURE REVIEW

The purpose of literature review is to provide foundation of knowledge on the research topic, identify gaps and conflicts in previous studies. Many theories have been proposed to explain what factors that affect project performance. The objective of this study was to determine the influence of project time management on project performance. Although the literature covers a wide variety of such theories, this review focused on four major themes which emerge repeatedly throughout the literatures reviewed. These themes are: project and project management, the increasing importance of construction project and construction management, factors that affect project performance, and the practice of project time management. Although the literature represents these themes in a variety of contexts, this study will primarily focus on project performance and project time management. This chapter reviews related literature with respect to the research objectives and discusses the conceptual framework and the gaps in knowledge in the study.

2.1. Theoretical Review

2.1.1. Understanding Project

Everyone, from a housewife to a manufacturing engineer, is said to manage projects; they all work on various tasks with deadlines. These tasks may have a simple objective that require less resource or they can be very complex. In this section of the study different literatures will be presented to answer what a project is, what constitutes the tasks to be called a project, its classification, characteristics, and so on.

There are several definitions of project in the literature. According to the Oxford Dictionary (2023), a project is a carefully planned individual or collaborative effort to achieve a specific goal. Kerzner (2022) & Lock (2013) defined project as a unique and temporary endeavor which consists of a series of activities and tasks that have a specific objective to be completed within certain specifications. It can be seen from both definitions that a project has a specific aim or objective, which means the tasks and the resources need to be dedicated to a specific purpose or objective. Single purpose, defined constraints (cost, time, and performance), uniqueness, defined beginning and end, temporary activity, and relative complexity are some of the

characteristics of a project (Kerzner, 2022; Lock, 2013; PMI, 2023). Declerck et al. (1997), has a slightly different view of project and defined project as it is in interaction with a politico-socioeconomic environment, oriented and directed towards a goal that is gradually being redefined by the dialectic between thought (the project plan) and reality.

Different authors and researches classified projects in different ways. Projects can be classified by size, type, application, and complexity and uncertainty (Wysocki, 2019). After reviewing project literatures, Prabhakar (2009) provided a classification of projects based on factors such as size, complexity, external or internal customers, level of customer involvement, levels of risk, and major and minor projects within a category. Lock (2013) classified projects into four general types: civil or chemical engineering and construction projects, manufacturing projects, management projects, and projects for pure scientific research projects. This study‘s primary concern is construction projects, with size, application, complexity, and uncertainty having no effect whatsoever. The project types are shown in Figure 2-1.

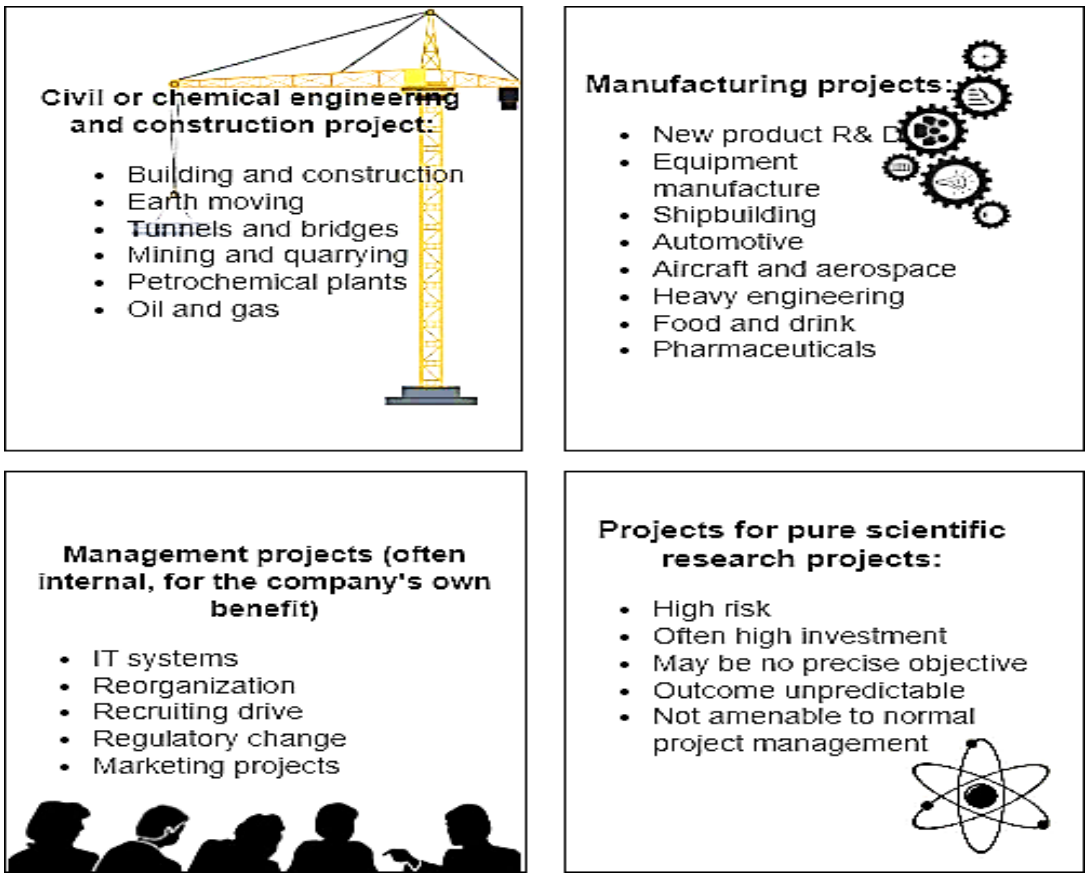

Figure 2-1: Four project types

Source: “[Project Management, 10th Edition]”, by Lock, D., (2013)

2.1.2. Construction Projects

The history of construction is as old as the history of humanity, yet the global construction industry prospect is as promising as ever. The construction industry not only has a direct impact on the global economy but also has important links with other industries. As per Clought et al. (2008), the construction industry not only has a daily impact on almost everyone, but it also plays a critical role in many national economies. Thinking about agriculture, manufacturing, fishery, and other investments without construction facilities is difficult. This means that the impact on GDP and economic growth exceeds the direct contribution of construction activities (Market Prospects, 2021). Figure 2-2 shows the size of the construction market, which in 2020 was valued at $6.4 trillion and is projected to increase by more than twice that amount by 2030 (Statista, 2022).

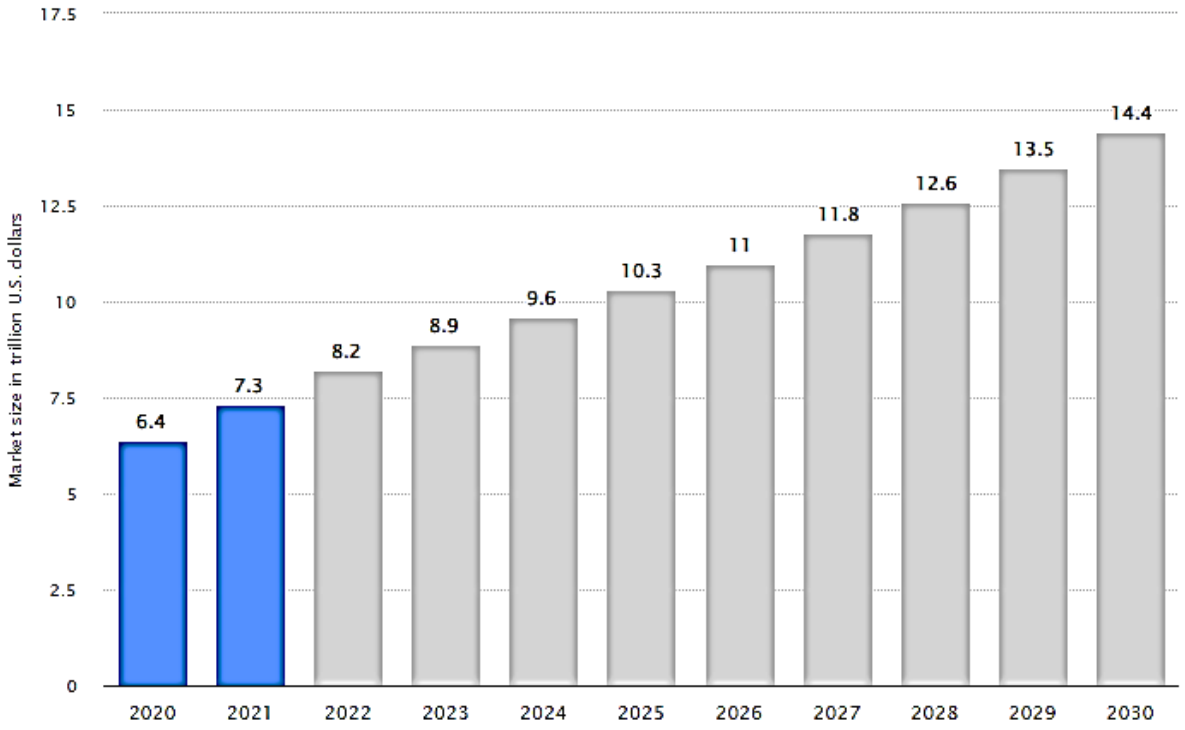

Figure 2-2: Size of the global construction market from 2020 to 2021, with forecasts from 2022 to 2030

Source: "[Global construction market size 2020-2030]" by, Statista, (2022). (https://www.statista.com/statistics/1290105/global-construction-market-size-with-forecasts/)

According to World Bank (2022), Ethiopia is one of Africa's fastest-growing, and most vibrant economy. In Ethiopia, the construction industry is a major economic growth driver, it is the true power of the national economy. In 2021 market size of the construction industry of Ethiopia was $41 billion, and this market is projected to grow more than 8% during the period 2023-2026 (GlobalData, 2022). There are four major classifications of construction that differ significantly from one another: residential, commercial, industrial, and infrastructure. These types of construction are also divided into different disciplines such as electrical, concrete, excavation, piping, and roofing (Wolfe, 2023). According to NBE annual report (2022), the construction industry registered 6.6 percent expansion with 72.2 percent share in industrial output, with roads, railways, dams and residential houses construction, playing a significant role. Ethiopia's GDP from construction can be seen in Figure 2-3 by Trading Economics (2022), which demonstrates that the market is growing.

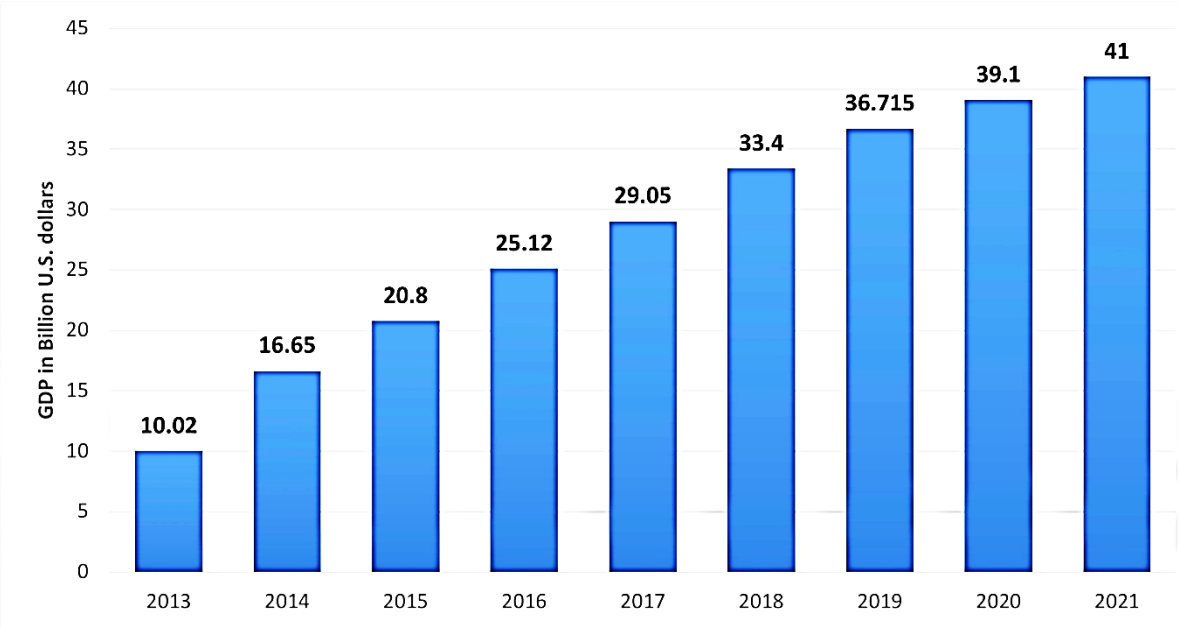

Figure 2-3: Ethiopia's GDP from Construction over the years

Source: "[Ethiopia's GDP from Construction over the years]" by, Trading Economics, (2022). (https://tradingeconomics.com/ethiopia/gdp-from-construction)

Despite playing a significant role in Ethiopia's economy, the construction industry has encountered numerous difficulties. The issues, according to Girma and Mahesh (2019), are corruption, a delay in the implementation of construction industry development (CID) policies, weak capacity of contractors and consultants, a lack of teamwork and professionalism, and a

lack of benchmarking for CID practices from the perspective of the government, resource-related factors, the nature of the industry, and the industry's vision for its own development. The failure ranges from mega infrastructure projects to housing initiative projects. According to Koshe, & K.N.Jha (2016), in Ethiopia, only 8.55% of construction projects have been finished to the original completion date.

The Construction industry nowadays is in an environment of permanent change, determined by the development of globalization, multinational companies, foreign investments, and information systems. Contractors of varying sizes and specialties carry out construction projects (Clough et al., 2008). Some contractors may concentrate on a particular task or aspect of the construction project. No matter how large or specialized the contractor is, there must be some form of tools and techniques to utilize during the construction project. This brings up the managerial aspect of managing a construction project.

2.1.3. Theory and practice of construction project management

i. Understanding Project management

Prior to discussing a construction project management, project management must be understood thoroughly. Bredillet (2004) puts project management knowledge as art and science. Project management is the application of knowledge and skills, and the utilization of tools and techniques to project activities to achieve project requirements (PMI, 2023). Kerzner (2022) defines project management as the planning, organizing, directing, and controlling of company resources for a relatively short term objective that has been established to complete specific goals and objectives. As it is easy to understand from the definitions, Project management requires people, resource and system for the attainment of specific goal/deliverable. Project management is more adaptable than ever that must respond to the shifting dynamics of projects, because projects exist in an open environment.

Some confuse project management and change management, they are related but totally distinct disciplines. Project management focuses on the technical side of implementing change while change management focuses on the people side of implementing change. Each require different mindsets, competencies, and skill sets (Advisory, 2016). Project management is also different from general management in different aspects as described in Table 2-1.

Table 2-1: Comparison of Project Management and General Management

Basis for Comparison	Project Management	General Management
Meaning	Project Management refers to the efficient management of the effort of the team for the time-bound and successful accomplishment of the project.	General Management refers to the management of the overall activities and the processes of the organization, to ensure coordination and optimum utilization of resources.
Process	One-time	Continuous
Nature	Non-repetitive and unique	Repetitive and regular
Work location	Within or outside the organizational premises	Within the organizational premises
Line of Authority	Blurred	Defined
Set of tasks	Dynamic	Consistent
Success	Ascertained by the accomplishment of the project within defined criteria.	Ascertained by attainment of the defined goals.

Source: "[Difference Between Project Management and General Management]", by Surbhi, S., (2020), Key Differences. (https://keydifferences.com/difference-between-project-management-and-general-management.html)

Project management, according to PMI (2021), is carried out through procedures including initiating, planning, executing, controlling, and closing. A series of passes must be made for projects, according to PRINCE2 (2017), Pre-feasibility (concept validation); feasibility (depth viability assessment); design; contract (procurement); implementation; commissioning; handover; and operation are the phases. Others such as Archibald & Voropaev (2003) have listed the phases as follows: Concept (initiation, identification, selection.), Definition (feasibility, development, demonstration, design prototype, quantification.), Execution (implementation, realization, production and deployment, design/construct/ commission, installation and test.), and Closeout (termination, including post-completion evaluation.).

PMI (2021) defined ten knowledge areas that are important for the project managers to be successful, irrespective of industry. Table 2-2 provides the descriptions of the knowledge areas.

Table 2-2: Project Management Knowledge Areas

Knowledge Area	Description
Project Integration Management	Includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups.
Project Scope Management	Includes the processes required to ensure the project includes all the work required, and only the work required, to complete the project successfully.
Project Time Management	Includes the processes required to manage the timely completion of the project.
Project Cost Management	Includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so the project can be completed within the approved budget.
Project Quality Management	Includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements, in order to meet stakeholders' expectations.
Project Resource Management	Includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project.
Project Communications Management	Includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project information.
Project Risk Management	Includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.
Project Procurement Management	Includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.
Project Stakeholder Management	Includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

Source: Literature Review, 2023

ii. Overview of Construction Project Management and Process

Ocean (2021) stated that construction management is the most important part of the whole construction process. Construction projects inevitably expand in size as society grows, involving vast numbers of professionals, long life cycles, and complex interfaces (Chou & Yang, 2012). As construction projects become more complex, the challenges of managing those projects become more complicated. Many specialists who are working on subsystems and components of many disciplines have to be coordinated. Construction managers are expected to act as intermediaries between the onsite construction team and the client, ensuring that everyone knows what they are doing and that the end result of the construction process meets the client's expectations. The construction project manager's intermediary role is depicted in Figure 2-4. The need for qualified construction managers is high, and the opportunities for interested parties are great.

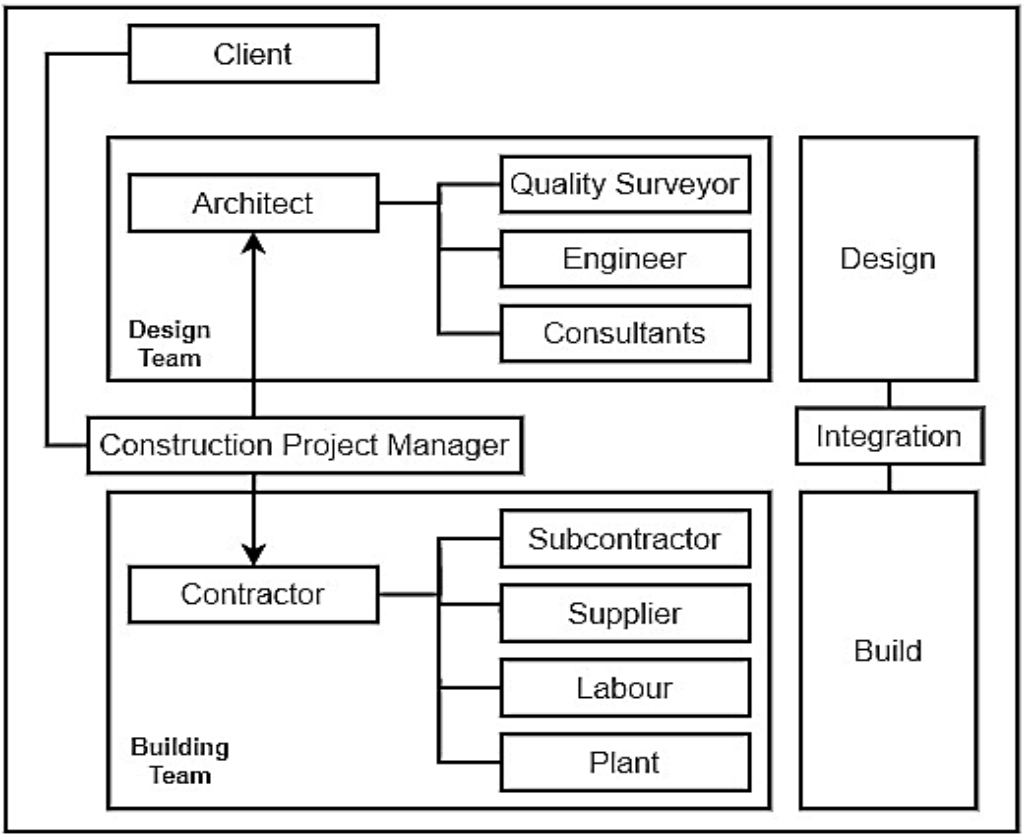

Figure 2-4: Construction Project Management approach

Source: "[The Management of Construction: A Project Lifecycle Approach]", by Bennett, F. L., (2007)

In a project-based industry like construction, effective project management is crucial (Isik et al., 2009; Vrijhoef, 2008). The Project Management Institute created the Project Management Body of Knowledge Guide (PMBOK® Guide), which covers the fundamental, baseline practices that are key to successful outcomes of projects for all businesses, including those in the construction industry. Construction project management is the act of managing a construction project. Construction management is the process of starting, planning, commencing, coordinating, controlling, and completing construction projects (Walker, 2015).

According to Clough et al. (2008), the development phases of a construction project follow a definite sequence: planning and definition, design, procurement and construction. In the planning and definition phase, project definition involves establishing project characteristics such as location, performance criteria, size, configuration, layout, facilities, services and other project requirements needed by the owner to determine the general aspects of the project. The conceptual planning is done with brief detailed design, although a considerable amount of preliminary architectural or engineering work may be required. The design phase includes the architectural and engineering design of the entire project, which includes the preparation of the final working drawings and specifications for the entire construction program. In the final phase, procurement and construction, procurement involves the ordering, shipping, and delivery of key project equipment and materials. And the construction part is the physical erection of the project and the preparation of materials and equipment. This phase involves providing the manpower, construction equipment, materials, supplies, supervision, and management needed to complete the work.

Bennett (2007) identifies six phases in the construction project life cycle, which are shown in Figure 2-5. First, the owner must make certain pre-project decisions. The project's planning and design are then put into action. Next, the contractor is selected, after which the contractor mobilizes in order to carry out the field operations. The field work that the lay person often considers to be ‘construction’ can be considered a separate phase. Finally, the project needs to be finished and closed. As per Chou & Yang (2012), a construction project can be broken down into its five primary components: feasibility study, planning, design, construction, and operation. The ability to assess each stage as a separate project allows for the production of a unique good or service at each stage. These phases help project teams to break down a project into a more manageable pieces which in turn helps to achieve project success.

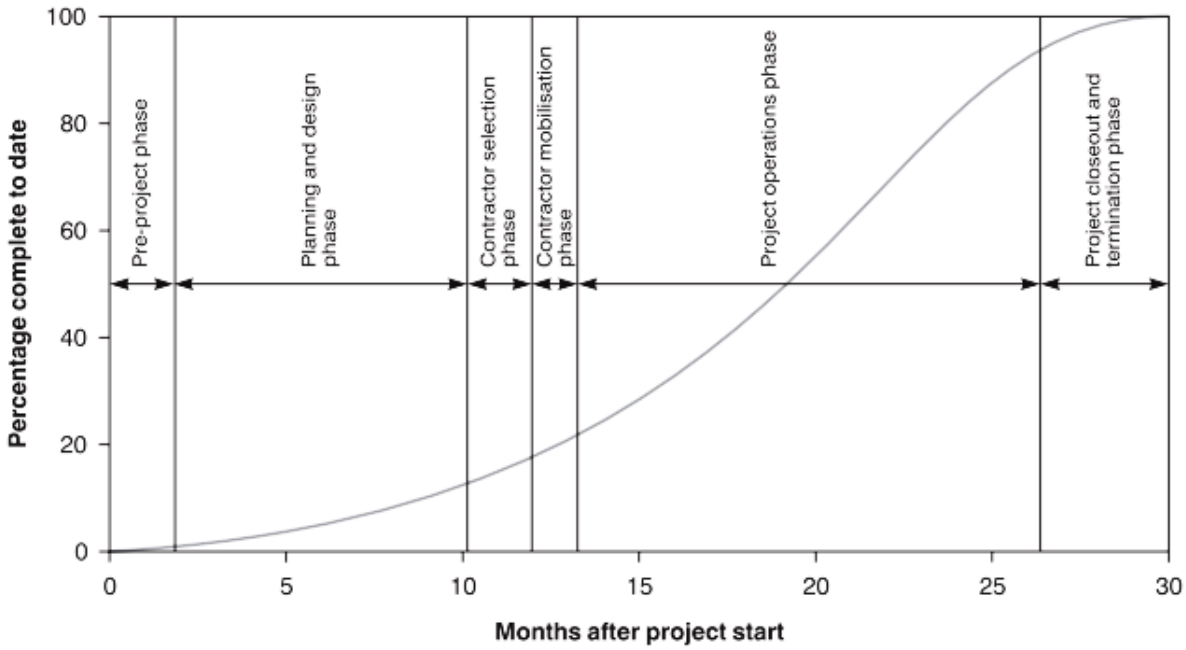

Figure 2-5: Typical construction project life cycle

> *Source: "[The management of construction: a project life cycle approach, 1st Edition]", by Bennett, F. L., (2007)*

2.1.4. Project performance

Project success is a concept related to performance, but not identical. Understanding project success is necessary to understand project performance. No one appears to agree on what defines a project's success. The literature often differentiates between project success and project management success. In addition, several authors distinguish between success criteria and success factors. As stated by Pinto and Slevin (1988) everyone understands the concept of a successful project and yet, within the project management field, inconsistencies abound. There are projects that are finished late and over budget that are regarded as successful projects, just as there are projects that are finished on time and under budget that are deemed failures. There are also projects that are considered as failures and are considered a success in time. These draw attention to the fact that there is some ambiguity surrounding the success of projects. The sections that follow will provide a quick review of project success, measurement of project success, and finally what the necessity are to accomplish a project successfully.

Freeman and Beale (1992) stated that different people or stakeholders define success from their point of view. An architect can see success in terms of aesthetics, an engineer in terms of

technical competence an accountant in terms of under-spending, and so on. Stuckenbruck (1986) argues that the success of a project can be evaluated by different stakeholders: shareholders, managers, customers, employees, etc. There is some agreement with most researchers' definition that the success of a project is a matter of perception and that a project is likely to be perceived as an overall success if it meets the technical specifications and/or the mission to be performed and if the key people in the project team and the main users or customers of the project work are very satisfied with the project results.

Pinto and Slevin (1988) identified two key areas of project success: the project, and the client. The project is all about being on time, within budget, and according to performance. While the client is interested in the use, satisfaction, and effectiveness of the deliverable to their business. The factors that contribute to the success of the projects are referred to as success factors, and the success of the projects is evaluated using the success criteria. According to Stuckenbruck (1986), the criteria for measuring project success must reflect different points of view. Freeman and Beale (1992) identified seven main criteria for measuring the success of projects: technical performance, efficiency of execution, managerial and organizational implications (mainly customer satisfaction), project team member personal growth, project termination completeness, identifying and overcoming technical (includes procedural) problems, and manufacturability and business performance. Today, many project management practitioners view project success according to the outcome criteria of budget, schedule, performance, and client satisfaction (Pinto & Slevin, 1988). Numerous studies show that effective communication, senior management support, involvement of user, project manager and team members, project definition, project planning, project control and change management, technology support focusing on the goal, adherence to a standardized process, and learning from the past are some of the critical success factors (Dong et al., 2004; Jiang et al., 2002).

Table 2-3 (Lally, 2004) summarizes the project success factors identified in the scholarly literature from 1983 to 2002. Table 2-3 clearly shows that there is no general agreement on a set of factors. Most, if not all, of these factors relate to the hard and soft skills possessed by different stakeholders.

Table 2-3: Project success factors

Baker et al. (1983)	Morris and Hough (1987)	Pinto and Slevin (1989)	Turner, J. R. (1993)
• Clear statements of requirements • Proper planning i.e. cost and time estimate • Competent staff • Clear vision & objectives (Business Case and Scope) • Hard-Working Focused Staff • Leadership • Adequate Resources and Funding • Minimum start-up difficulties • Absence of bureaucracy and politics	• Clear statements of requirements • Proper planning • Focused and Competent staff • Adequate Resources and Funding • Minimum start-up difficulties • Absence of bureaucracy and politics	• User Involvement • Execution Management Support • Competent staff • Hard-Working, Focused Staff • Delivered to budget, on schedule, and to technical specification • Satisfies the needs of the owners, users, project team and stakeholders • Leadership • Communication and teamwork • Absence of bureaucracy and politics	• User Involvement • Execution Management Support • Focused and Competent staff • Delivered to budget, on schedule, and to technical specification • Satisfies the needs of the owners, users, project team and stakeholders • Leadership and teamwork • Absence of bureaucracy and politics
CHOAS REPORT (1994)	**Wateridge, J. (1995)**	**Whitaker, B. (1999)**	**Boehm, B. (2002)**
• User Involvement • Execution Management Support • Clear Statement of requirements • Proper Planning • Realistic Expectation • Smaller Project Milestones • Competent staff • Ownership • Clear vision & Objectives • Hard-Working, Focused Staff	• Project achieves its purpose • It provides satisfactory benefit to the owner • Satisfies the needs of the owners, users, project team and stakeholders • It meets its pre-stated objectives • It is produced to specification, within budget and on time. • It satisfied the needs of the project team	• Good project planning • A strong business case • Top management support and involvement • Schedule time keeping • Keeping within budget • Good estimates • Strong definition of requirements • Vendor's ability to meet requirements	• Complete requirements • User Involvement • Resources • Realistic Expectations • Executive Support • No Scope Extension

Source: "[Understanding ITS Project Failure]", by Lally, G.,(2004)

Project performance can have different meanings depending on who is evaluating (Toor & Ogunlana, 2010) and when the evaluation is carried out (Cleland & Ireland, 2006). Simply put, performance is meeting client expectations or adhering to their specifications with regard to schedule, quality, and budget constraints (Johnson, 2020). Thus, the project's schedule, budget, quality and objectives, as well as stakeholder satisfaction may be adopted to evaluate project performance. Samson and Lema (2002) stated that effective and efficient management of contractors' organizational performance requires commitment to effective performance measurement in order to evaluate, control, and improve performance today and in the future.

2.1.5. Key Performance Indicators of Construction Project Management (CPM)

Key Performance Indicators (KPI) in a construction project show how successfully the project has been executed (Bhattarai & Rijal, 2022). They are compilations of data measures used to assess the performance of a construction operation. The failure of the construction project in the past has been due to the failure in achieving the key performance indicators of the project. The performance indicators are divided into various groups like time, cost, quality, design changes, human resources, finance etc., with this, project performance can be measured (Bhuinyan et al., 2020). From the wider perspective, time, cost, and quality factors are considered as major KPI-factor which often fail in the construction project, followed by safety, functionality and client satisfaction (Bhattarai & Rijal, 2022; Bhuinyan et al., 2020). Time, cost, quality, productivity, client satisfaction, user satisfaction, health and safety, and environment are the KPI in the construction industry (Bhattarai & Rijal, 2022). According to Shahrukh and Milind (2016), the measures typically compare the actual and estimated performance in terms of productivity, efficiency, and quality in terms of both workmanship and output. A KPI is a measure of a factors that are critical to the success, productivity, efficiency or the performance of the project. Kerzner (2022) puts scope, time, cost, quality, efficiency, and stakeholder satisfaction as the major KPIs in projects, while PMI (2021) puts scope, time, cost, and quality as the major KPIs. Table 2-4 summarizes the KPIs found form the literatures. Thus, the project's time, cost, quality and objectives, as well as client satisfaction may be adopted to evaluate PP.

Table 2-4: Summary of KPIs from previous researchers

Authors	Time	Cost	Quality	Client Satisfaction	Efficiency	Productivity
PMI (2021)	X	X	X			
Kerzner (2022)	X	X	X	X	X	X
Bhuinyan et al. (2020)	X	X	X			
Bhattarai and Rijal (2022)	X	X	X	X		
Shahrukh and Milind (2016)	X	X	X	X		X

Source: Literature Review, 2023

2.1.6. Factors Influencing Construction Project Performance

According to Westerveld (2003), Critical success factors (CSFs) are necessary in order to assessing the success on the project performance. It is because CSFs are defined as inputs that enhance and direct the project to be achieved successfully whereas, performance measurement are used to judge project success or failure. Numerous lists and models of Critical Success Factors (CSFs) have been proposed in the literature by many researchers. Sadeh et al. (2000) and Belassi et al. (1996) identified four separate dimensions of CSFs in project. According to Sadeh et al. (2000), the four dimensions of success are identified with in a timeframe of expected results. The first dimension has a short term goal of project efficiency which is meeting the two of the triple constraints of project management, namely cost, and time. While, the second dimension has a medium term goal of customer success which is meeting a technical specifications and functional performance. The third dimension has a long term goal of business success in commercial success and gaining increased market share. Finally, the fourth dimension has a very long term goal of preparing for the future in developing new tools, techniques, products, markets etc.

As per Belassi et al. (1996), the four dimension the researchers identified are: meeting design's goals, benefit to the end users, benefit to the developing organization, and lastly benefit to the national technological infrastructure as well as to the technological infrastructure of the firm that was engaged in the development process. Mbugua et al. (2005) and Chan and Chan (2004), identified five primary CSFs: project management actions, external environment, project-

related factors, human-related factors and project procedures. Nguyen et al. (2004) identified five CSFs: Access to resources, providing adequate financial resources, competent project manager, Commitment to the project and competent project team. Abraham (2012) identified seven CSFs they are political environment, employee/ organizational enhancement, competitive strategy, economic environment, process benchmarking, market analysis and technical application.

Ramlee et al. (2016), summarizes the CSFs found in the literature in the study of critical success factors in the construction project. From the summary of the literature review, the researchers conclude that when the project is complete by meeting cost, meeting on time, following the schedule accurately, meeting the quality needed and being managed by the best team members it is considered as a success. Table 2-5 shows the critical success factors summarized from the literature review and Figure 2-6 shows the percentage of the CSFs hold to the success of construction projects.

Table 2-5: Summary of success factors from previous researchers

Author	**CRITICAL SUCCESS FACTORS (CSFS)**									
	COST	**TIME**	**QUALITY**	**SATISFACTON**	**LEADERSHIP**	**SAFETY**	**TECHNOLOGY**	**ORGANIZATION**	**ENVIRONMENT**	**RESOURCES**
Sadeh et.al. (2000)	X	X	X	X	X		X			
Belassi et al. **(1996)**	X	X	X	X			X	X		
Dr. Parviz (2003)	X	X	X	X	X					
Mbugua et al. **(2005)**	X	X	X			X	X	X	X	
Chan et al. (2004)	X	X	X		X	X	X	X	X	
Nguyen et al. **(2004)**					X					X
Abraham **(2012)**									X	
Ramlee et al. **(2016)**	X	X	X	X	X					

Source: Literature Review, 2023

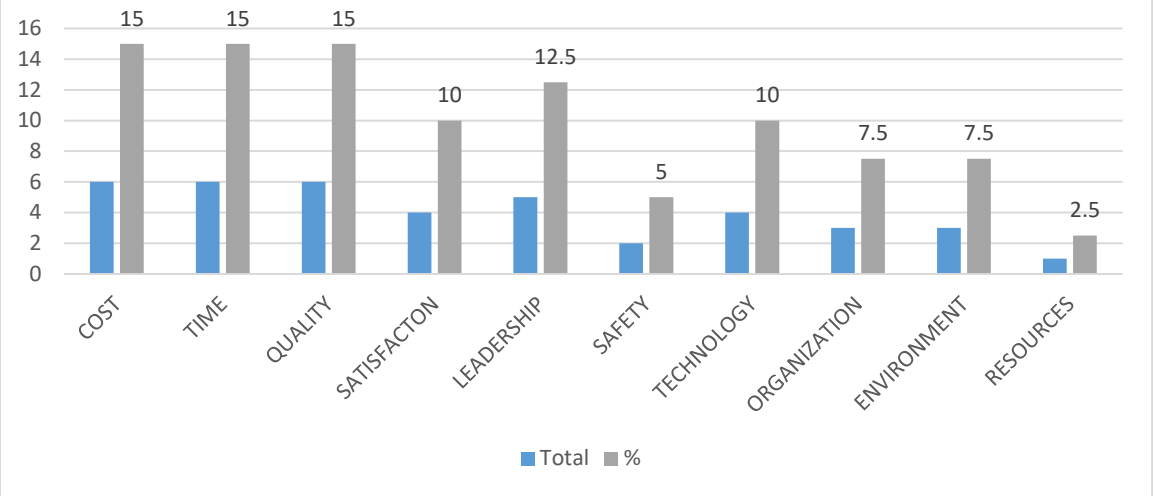

Figure 2-6: The percentage and total of critical success factors (CSFs)

Source: MS Excel Output, 2023

The CSFs identified are related to the project management competence of an organization. The project management competencies are at the core of business, and are often used as a tool to leverage project success (Isik et al., 2009). Professional competency in project management is attained by the combination of knowledge acquired during training, and skills developed through experience and the application of the acquired knowledge (Edum Fotwe and McCaffer, 2000).

Edum-Fotwe et al. (2000), Meredith and Mantel (2011), and Forsberg et al., (2000) outlined the general knowledge areas that construction project practitioners are often expected to possess, which include: project integration management, project scope management, project time management, project quality management, project cost management, project human resource management, project communication, project risk management, and project procurement management. And stressed that a significant portion of the knowledge areas listed are covered by academic programs in project management, but the list of knowledge areas presented are not all-inclusive.

According to Chandra (2017) the knowledge required by project managers include integration management, scope management, cost management, time management, stakeholder management, human resource management, and communication management. Demirkesen and Ozorhon (2017) studied the impact of integration management in the performance of project management, and identified five components of integration management on project management performance. Chin and Hamid (2015) identified two knowledge areas in their

study namely time and cost management and concluded that 8 types of tools are used to manage time.

Miranda and Ghimire (2008) conducted an intensive research and came to conclusion that the desired knowledge for project managers position involves project integration management, project scope management, project time management, project cost management, project quality management, project risk management, project procurement management and project management software competences. As per Crawford (2005) contract management, time management, cost management, procurement management, and human resource management are essential knowledge areas. Isik et al. (2009) identified knowldeges like stakeholder, schedule, cost, quality, human resource and risk management are important for project management practitioners.

Table 2-6: Summary of competencies from literature

Knowledge Areas	Edum-Fotwe et al. (2000)	Meredith and Mantel (2002); Forsberg et al., 2000)	Chandra (2017)	Chin and Hamid (2015)	Ghimire and Miranda (2008)	Crawford (2005)	Isik et al. (2009)
Integration management	X	X	X		X		
Scope management	X	X	X		X		
Time management	X	X	X	X	X	X	X
Cost management	X	X	X	X	X	X	X
Quality management	X	X			X		X
Resource management	X	X	X			X	X
Communications management	X	X	X				
Risk management	X	X			X		X
Procurement management	X	X			X	X	
Stakeholder management			X				X

Source: Literature Review, 2023

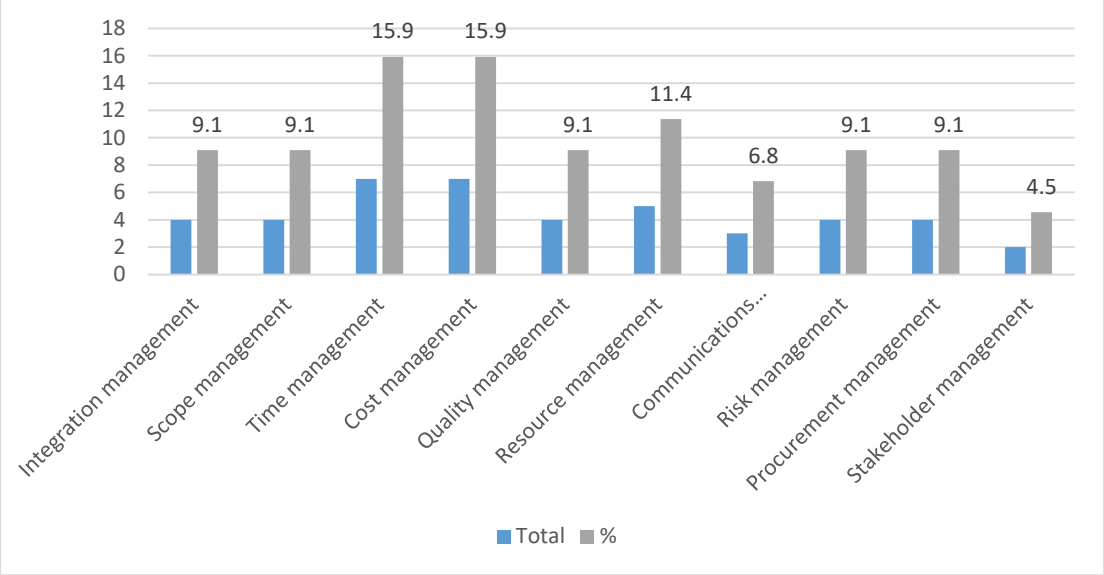

Figure 2-7: The percentage and total of knowledge areas that influence project performance

Source: MS Excel Output, 2023

Table 2-6 presents the competencies or the knowledge areas that affect project performance. It can be seen from Figure 2-7 project time management has one of the highest percentage of the knowledge areas that affect project performance. The next section will discuss project time management in detail.

2.1.7. Project Time Management

Mackenzie and Nickerson (2009) define time management as the function required to maintain appropriate allocation of time to conduct the project by means of the processes of time planning, time estimating, time scheduling, and schedule control. Time management is the process of recording and controlling time spent by staff on the project (Westland, 2007). According to PMI (2021) project time management includes the processes required to accomplish timely completion of the project. Project time management is the act of planning, scheduling and exercising conscious control to increase their effectiveness, efficiency or productivity (Oburu, 2020). Project time management have a direct impact on the quality, scope, and cost of a project, which makes it one of the most important project management knowledge areas (A.C.T, 2022). When what needs to be delivered by the project and why are known, project time management makes it easier to get there smoothly.

According to Solis & Corona-Suárez (2016), delays on project deliveries are one of the most frequent problems affecting project with close to 47%, resulted from a poor application of project time management. In the construction sector having reliable project time management practices is a must for the successful completion of a construction project (Hogan, 2020). The initial objectives of time management are to control time and prepare schedules, networks and so on. An effective time management for the construction project is important in managing risk of delaying project completion project (Chin & Hamid, 2015). The outcome of effective time management is to increase effectiveness and productivity.

In the sections below project time management processes, practices, and tools will be discussed in detail. And finally factors that affect effective project time management will be identified based on the literatures.

i. Project Time Management Process

Project time management process, according to PMI (2021), includes defining project activities, activity sequencing, activity resource estimation, activity duration estimation, developing and finalizing project schedule control. Project time management starts at the initiation of the project by identifying the required project duration and its milestones, before getting a detailed schedule during the planning phase (Hussain, 2014). Table 2-7, presents the process that are defined by PMI (2021).

Table 2-7: Description of Project Time Management Process

Process	Description
Activity Duration	Process of identifying the specific tasks needed to be done in order to produce the project's deliverables. Activity, in project management, is defined as the amount of work performed that convert input to appropriate output. In this process the activity will be defined. Tools that are used in this process include Work Breakdown Structure (WBS) and decomposition. According to PMI (2021), WBS is a hierarchical description of all work that must be done to complete the project and decomposition refers to a technique used for dividing and subdividing the project scope and project deliverables in to smaller and more manageable parts.

Activity Sequencing	Involves figuring out and documenting logical relationships among activities. The main reason for this process is to finalize the interrelationship between activities to finish the project scope and achieve the task objectives. This process allows to determine the dependencies of the project activities. According to Jainendrakumar (2015) there are three types of dependency: Mandatory dependency (hard logic), Discretionary dependency, and External dependencies. Gantt charts, the PERT charts, and the precedence diagramming method (PDM) some of the tools used in sequencing activities.
Activity Resource Estimating	Involves identifying what resources are needed to complete the task and the quantity of each resource needed. There are different tools and techniques applied in this process such as expert judgement, project management software, bottom up estimating, etc.
Activity Duration Estimating	This process takes the activities defined in the WBS and activity list and assesses the number of work periods needed to complete these activities. The main objective of this process is to provide the amount of time each activity will take to complete. Expert judgment, analogous estimating, analogous estimating, and three-points estimating are some of the tools and techniques used in this process.
Schedule Development	Refers to the process of analyzing activity sequences, duration, resource requirement and schedule constraints to create project schedule model. The schedule tells you when each activity should be done, what has already been completed, and the sequence in which things need to be finished (Hussain, 2014). Schedule network analysis, critical path analysis, schedule compression, resource optimization are the tools used to develop schedule.
Schedule Control	Is the process of monitoring the status of the project to update the project schedule and manage changes to the schedule baseline. This process involves four steps: Analyzing the schedule to determine which areas need corrective action, deciding what specific corrective action to be taken, revising the plan to incorporate the chosen corrective action, and recalculating the schedule to evaluate the efforts of planned corrective actions.

Source: Literature Review, 2023

Others such as Kissflow (2022) add plan schedule management as the first process in project time management. Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule. Oburu (2020) categorizes project time management process into two dimensions; Planning and Project control. Where planning includes defining activities, sequencing activities, activity resource estimating, activity duration estimating, and developing schedule. The control involves controlling and managing changes to the project schedule.

ii. Effective Time Management Practices

Time management practices that needs to be incorporated in to projects, according to Kissflow (2022), are creating task lists, prioritizing, avoiding distractions, delegating, and identifying bottlenecks. Vennila (2018) suggests techniques that can be integrated in projects to help manage time effectively and these are: make plan, prioritize, take stock regularly, delegate task, do not waste time, and remind yourself of the value of time. To manage time effectively, Oburu (2020) points out techniques that are derived from Vennila (2018). These techniques are:

- Project team members should arrange their schedule according to project priorities as per the WBS.
- Project team including stakeholders should get over any bad feelings that the project might face during project life cycle, and move beyond them by having a proper risk mitigation plan.
- Communication should be integrated into the organizational culture.

There are different issues in project time management that lead to delay: poor management of time, choice of procurement methods, participation of shareholders, poor planning of construction works, lack of implementation of software, poor site records, etc. (Westland, 2007). Alinaitwe et al. (2007) identified several factors that can challenge effective time management: lack of material, incompetent supervisors, lack of tools and techniques, absenteeism, poor communication, employee turnover, and rework were found to be the most significant factors. More Khoso (2017) identified poor coordination or communication, ineffective planning, scheduling, monitoring, and controlling practices, a shortage of administrative, technical, or interpersonal skills, a delay in preparation of change orders, a change in scope, slow decision-making, a lack of support from stakeholders, and an unrealistic

contract duration as major causes for ineffective time management practices. From the above literature, the researcher identified five major criteria to measure effective time management:

a. Stakeholder Participation

Stakeholders are individuals and organizations that may be affected as a result of the project execution or project completion and may also influence the project outcomes (PMI, 2021). Participation can be viewed as people involvement in decision making process, in implementing and evaluating program they are sharing in the benefit of development program (Emmanuel, 2020). According to Rajablu (2015) the role of stakeholder in project's decision making process is fundamentally critical to project's success. According to Emmanuel(2020), Stakeholder participation may be very expensive, particularly the cost of delays in preparation and implementation arising from the need to consult and negotiate with the other stakeholders.

Participation in project management could involve the identification of problems, the design and application of solutions, the monitoring of results, or the evaluation of performance. Indeed, knowing who is to be involved, and what that involvement may be, can form a strong basis for identifying and including all the stakeholders. When stakeholders participate in project planning they can influence the design of projects to more effectively increase the realization of their rights, their participation in activity execution and monitoring is likely to be more meaningful (Matu et al., 2020).

b. Communication

Communication is used in any project including construction project to share information and/or ideas between workers of the project. Without effective communication, the success of construction projects is unthinkable (Zulch, 2014). Different studies have confirmed that lack of effective communication can cause up to 74% of the main problems occurring in construction projects (Komi-Sirviö & Tihinen, 2005).

c. Risk mitigation

PMI (2021) defines project risk as an uncertainty or condition, if it occurs, has an effect on at least one of the project objectives. The effect is a deviation from the expected can be positive

or negative. There are a number of risks which can be identified in the construction industry and which can be faced in each construction project regardless of its size and scope. Cost escalation, delay in payment/ claims, and changes such as scope change and schedule change are some of the risks that occur in construction projects (S. Jones et al., 2017). These risks need to be managed effectively so that they doesn't cause delays to the project. As Oburu (2020) points out, Project team including stakeholders should get over any bad feelings that the project might face during project life cycle, and move beyond them by having a proper risk mitigation plan.

d. Project time management process

Project time management process, according to PMI (2021), includes defining project activities, activity sequencing, activity resource estimation, activity duration estimation, developing and finalizing project schedule control. The standardization of the project management process contributes to disseminate best practices which implementation depicts a strategy to improve project performance (Liviu & Crisan, 2010). The process is discussed in detail in the previous section.

e. Procurement method

Procurement is the process of finding and agreeing to terms, and acquiring goods, services, or works from an external source, often via a tendering or competitive bidding process. Project procurement management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team (PMI, 2021). Ameln (2008), states project procurement management process are procurement planning, selecting the contract approach, soliciting bids, evaluating bids, awarding the contract and managing the contracts.

In a response to reduce the incidence of time and costs overruns, there are different forms of procurement method that organizations can use (Davis et al., 2008). External factors, client resources, project characteristics, ability to make changes, cost issues, and timing are some of the factors that influence procurement strategy.

2.2. Empirical Review

Many studies have been conducted regarding project performance and time management. According to Johnson (2020), project performance is meeting client expectations or adhering to their specifications with regard to schedule, quality, and budget constraints. Bhattarai and Rijal (2022) conducted a study with an aim to assess key performance indicators for health building construction in Nepal, and their ranking. Data was collected from project stakeholders (contractors and health building section personnel) through a questionnaire survey. The data was summarized, analyzed, and presented in tables using Microsoft Excel. The study found that the stakeholders working in health building construction projects thought quality factor as the most important KPI with the first rank. The cost factor and time factor are correspondingly second and third-ranked, whereas, client satisfaction is the least important KPI.

Rui (2013) conducted a study to provide key performance indicator (KPI) which can evaluate and measure potential contractors for determine their ability and to develop a framework of KPI for housing construction project. The questionnaire survey investigated several issues relating to key performance indicator (KPI) of contractor in the housing construction. The analysis included ranking problem in term of occurrence and level of influence. The study then find out that progress and performance measure ate the important aspect of construction performance. And concluded that a general framework of key performance indicator for housing construction project can be developed and used as a guide to monitor the progress and performance of a project.

Nguyen and Mohamed (2021) used quantitative research design to find the mediation effect of stakeholder management between stakeholder characteristics and project performance. Structural Equation Modelling (SEM) was used in the study and the findings suggest that stakeholder legitimate behavior (LB), opposing behavior (OB), and conflicting interests affect the ability to achieve project performance negatively.

Luo et al. (2023) investigated the effects of organizational leadership on project citizenship behavior and management performance in complex construction projects. Partial least squares-structural equation modeling (PLS-SEM) was used to test the hypotheses. The findings shows that project citizenship behavior partly mediates the influence of organizational leadership on the project management performance, and the effect of organizational leadership on the project management performance is more realized through the mediating role of project citizenship behavior. Fikadu and Kant (2023) examined the effects of project risk management practices

on project performance in west Guji zone on selected projects in Ethiopia. The researchers employed both quantitative and qualitative research approach and descriptive and explanatory research design. The findings shows project risk management practices have positive effect on project performance. Bhuinyan et al. (2020) puts project performance as a crucial issue for the construction industry. The performance indicators are divided into various groups like time, cost, quality, design changes, human resources, finance etc., with this, project performance can be measured.

There are researches that are conducted specifically on time management. Chin and Hamid (2015) conducted a study to examine the practice of time management on construction projects in the Malaysian industry. To achieve their objective a questionnaire survey was conducted in order to assess the respondent's participation in the planning process, investigate how progress records are kept and to identify the process of monitoring the progress of work is done on construction industry. Descriptive research method was conducted and they used SPSS frequency distribution to analyze the questionnaire. The findings show that the project manager has the highest percentage in both drafting a planning method statement and project planning meetings, date constraints were used to constraint the performance to the dates given in the contract documents and float constraints were used to control critically. The majority of the respondents prefer to keep the records on the paper but were immediately input into the database.

Solís-Carcaño (2015) examined the use of PTM processes in fourteen school construction projects in Mexico's Yucatan Peninsula and assessed the relationship between PTM processes and project schedule performance. The results showed a statistical dependence between the two variables. Most on-time projects also made greater use of PTM processes. Dino (2022) also conducted a mixed research design study, descriptive and explanatory, to assess the relationship between project time management practices and project success, a case study in Telecom expansion project that has been launched by ethio-telecom. The research focused on the project time management processes and 120 participants were selected. Finally, the study indicates that there is statistically strong relationship between time management process and project success.

2.3. Conceptual Framework

The conceptual framework (refer Figure 2-8) for this study integrates the Effective time management practices and construction projects performance variables. The framework is extended and modified from the model that integrates different elements that were built as the basis for a project management theory.

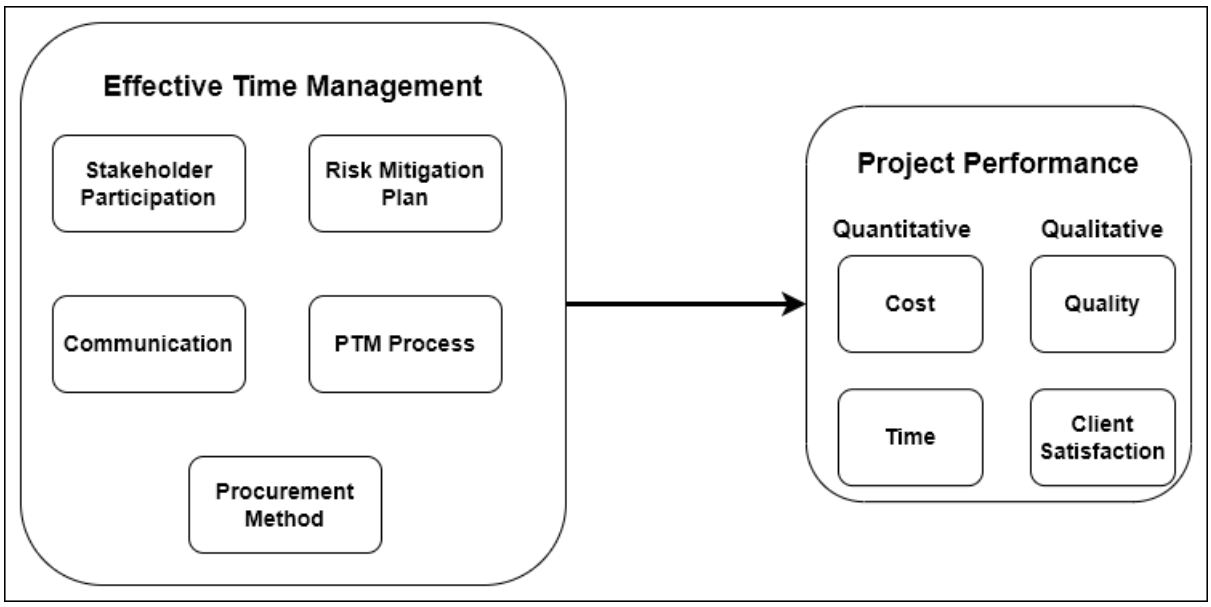

Figure 2-8: The conceptual framework

Stakeholder participation, risk mitigation plan, communication, project time management process, and procurement method were the components of effective time management practices that were selected according to the literatures reviewed. The stakeholder participation was measured with engagement of stakeholder, stakeholder awareness of progress, stakeholder involvement in the planning session, and appropriateness of the feedback mechanism. The indicators for effective communication in the organization were the value given for project communication management, project communication management plan availability, communication between different stakeholders throughout the project, etc. The knowledge of project management process were measured with the availability of tools and techniques that are used for each PTM processes, by the method the activities are identified, Project-Schedule-Network-Diagrams established, and the estimating process.

The risk mitigation practice was measured with the availability of policy on how to manage unexpected uncertainties, risk focused meeting, team member involvement in identifying risks, knowledge on risk mitigation strategies, and the controlling means of the risk. The indicators for procurement method were awareness of the importance of procurement method, availability of training to the team regarding procurement method, availability of documented policies, and standardized process in place. Finally, project performance variables had two sub-factors, including quantitative and qualitative project performance. Quantitative performance variables included the extent to which the project was delivered on schedule and on budget, while qualitative performance variables included the extent to which the project was delivered to the quality required, and to the extent the project stakeholders achieved their desired project outcomes.

2.4. Research Hypothesis

Hypothesis Statements

Hypothesis 1- There is a positive relationship between project time management and quantitative project performance.

Hypothesis 2- There is a positive relationship between project time management and qualitative project performance.

CHAPTER THREE

3. RESEARCH METHODOLOGY

This chapter presents the methodology employed in the course of the study. The variables, independent and dependent, are identified. The research model employed is defined and the type of data with the source of data to complete this study is explained in this chapter. Data collection technique, population of the study, sampling technique, sample size, and ethical considerations are highlighted. The validity and reliability tests and the way both parameters are tested are reflected in this section.

3.1. Research Design, and Research Approach

3.1.1. Research Design

The study employ a cross-sectional survey research design to investigate the existence of a relationship between two or more aspects of a situation (Bryman et al., 2020). Cross-sectional design is a study in which all observations are made at a single point of time. The researcher used both descriptive and explanatory research design for the purpose this study. Descriptive analyses help describe, show or summarize data in a constructive way such that patterns might emerge that fulfill every condition of the data that will make them easy to understand and interpret. The study underwent with the purpose of studying the cause-and-effect relationship of the given variables which put the study under the category of explanatory research. Explanatory research design was used to assess the associations between the project time management practices and project performance. In explanatory mixed method, the researcher first performs quantitative research, evaluates the findings, and then builds on the findings to further explore them through qualitative research (Creswell & Creswell, 2022).

3.1.2. Research Approach/ Method

The study uses a mixed-methods research methodology which is suitable for addressing the research questions in depth. Mixed method research combines quantitative and qualitative approaches by incorporating both quantitative and qualitative data in a single study in order to utilize on the synergy and strength that exist between quantitative and qualitative research methods in order to comprehend a phenomenon more thoroughly than is possible using either of the methods alone (Zohrabi, 2013). There is more insight to be gained from the combination of both qualitative and quantitative research than either form by itself (Creswell & Creswell, 2022). Their combined use provides an expanded understanding of the research problems.

According to Stangor (2014), Qualitative research is focused on observing and describing events as they occur, with the goal of capturing all of the richness of everyday behavior. The study's initial research question was to evaluate the present project time management practices used by Rama Construction PLC, so it makes sense to utilize both quantitative and qualitative approach to describe the situation in depth in order to give a thorough description of the phenomenon. The second and third research questions were to determine the impact of project time management on project performance (cost, time, quality, and client satisfaction). Finding the relationship between several variables were the goal of the research questions. In the Quantitative research approach the data collected are subjected to formal statistical analysis (Stangor, 2014). Quantitative research produces objective data that can be clearly communicated through statistics and numbers (Williams, 2021). Therefore, it is acceptable to claim that a quantitative technique is preferable to employ while answering the second and third questions.

3.2. Description of Study Variables

The study holds a single independent variables and two dependent variable. Project time management is the independent variable, while quantitative project performance and qualitative project performance are the dependent variables. Nguyen and Mohamed (2021) stated that it is critical to separate quantitative and qualitative criteria in evaluating PP. There are several reasons why placing quantitative and qualitative criteria into a single construct PP should be avoided. As per Cox et al. (2003), Quantitative criteria, such as time and cost, are simple, and easy to gather, while not placing a heavy burden on-field personnel, whereas

qualitative performance criteria are subjective and perceived difficulty to be measured. Table 3-1 presents the variables used in the study.

Table 3-1: Description of Study Variables

Variables	Description
Independent Variables • Project Time Management (ETM)	Project Time management is the function required to maintain appropriate allocation of time to conduct the project by means of the processes of time planning, time estimating, time scheduling, and schedule control Mackenzie and Nickerson (2009). Project time management is the act of planning, scheduling and exercising conscious control to increase their effectiveness, efficiency or productivity (Oburu, 2020).
Dependent Variable • Quantitative Project Performance (PPqn)	Quantitative performance variables included project cost and time. Project cost performance is the degree to which a project delivered within the budget. Measures the project financial effectiveness and efficiency. While, project time performance is the degree to which a project is delivered within the planned schedule.
• Qualitative Project Performance (PPql)	Qualitative performance variables included quality, and stakeholder satisfaction. Project quality performance is the degree to which a project deliverable conforms to the quality standards and criteria that were established at the beginning of the project. Stakeholder satisfaction is a measurement of stakeholder perceptions of a project.

Source: Literature Review, 2023

3.3. Description of Target Population, and Sample Size

3.3.1. Population

The study was conducted in Rama Construction PLC; Study participants were employees, and management of the selected organization who have the knowledge of the construction projects undertaken by the organization. The total number of population is 9 senior managers, 20 project manager, and 30 construction/ office engineers and 37 other such as functional managers, auditors and coordinators whom were working on projects in Rama Construction PLC.

3.3.2. Sample Size/ Census Inquiry

3.3.2.1. Qualitative Study

This case study was undertaken at Rama Construction PLC. Interview was done in order to conduct the qualitative study where the participants were the staff of Construction Company. The sampling design selected for the qualitative study was non-probability purposive sampling. According to Creswell (2022) while using purposive sampling respondents are chosen based on their convenience and availability. Thus for the study sample were selected based on people convenience to the issue under investigation.

3.3.2.2. Quantitative Study

Structural Equation Modelling (SEM) was used to analyze the quantitative data. According to Moran (2019), most researches agree that SEM requires relatively larger sample sizes. Some recommend using the ratio of observations to estimated parameters (N: q) as a guide. Scholars such as Kline (2015) suggest 20:1 ratio of N: q, others argue that smaller ratio can be used. Bentler & Chou (1987) suggest 5:1 ratio. Kline (2015) also suggests that the typical sample size in studies where SEM is used is about 200 cases. Barrett (2007) suggested that reviewers of journal submissions routinely reject for publication any SEM analysis where $N < 200$ unless the population studied is restricted in size.

Table 3-2: Minimum sample size required for SEM

Model Characteristics (Number of latent constructs and items)	Minimum sample required
1. Five or less latent constructs. Each latent constructs has more than three measuring items.	100 Sample
2. Seven or less latent constructs. Each construct has more than three items.	150 Sample
3. Seven or less latent constructs. Each construct has less than three items (just identified model).	300 Sample
4. More than seven latent constructs. Some constructs have less than three items (just identified model).	500 Sample

Source: "[Multivariate Data Analysis, 8th Edition]" by Hair et al. (2018)

Hair et al. (2018), suggest for minimum sample size depending on model complexity and basic measurement model characteristics as shown in Table 3-2. The study has seven constructs with each having more than three measuring items, so according to Hair et al. (2018), the minimum sample size will be 150 samples. Due to the population restriction in this study a census method was the appropriate method. A census method is a statistical investigation in which the data are collected for each and every element or unit of the population (Vaus & Vaus, 2013). Thus, this study applied census inquiry due to the small number of population, ninety six, as those respondents were all engaged directly and/or indirectly with the project time management in the organization. Table 3-3 provides the sampling frame for the census study.

Table 3-3: Sampling Frame

Constituency	Target Population
Senior Managers	9
Project Managers	20
Construction/ Office Engineers	30
Others	37
Total	**96**

Source: Survey, 2023

3.4. Method of Data Collection

Secondary data was used for supporting the study and to get the findings of other researchers in the area of the study. Relevant Information was also gathered from different secondary sources such as library books, newspapers and magazines, different communication materials, internet sources, and other written documents and from related research materials. The primary data was gathered via semi-structured interviews and questionnaires from employees and management of the selected organization. The instruments of the quantitative research methodology used mainly include questionnaires for the project managers, senior managers, construction/office engineers, functional managers, and others. The aim of the questionnaire was to evaluate the time management practice and its effect on project performance. Likert scale was used in the questionnaire to measure attitudes presented by the respondents.

The researcher used self-administered questionnaires in the presence of the researcher because the presence of the researcher is helpful in that it enables any queries or uncertainties to be addressed immediately. Further, it typically ensures a good response rate. The researcher used google forms to distribute the questionnaire, this was helpful to ensure all questions are completed where one can not submit without completing all questions. Also, to ensure all questions are filled in correctly (e.g. no rating scale items have more than one entry per item, and no missed items) the researcher set different rules in the google form such as response validation was set to exactly one which ensures only one check box can be checked for a question at a time. It means that the questionnaires are completed rapidly and on one occasion, i.e. it can gather data from many respondents simultaneously.

The questionnaire has two sections: section one collects the demographic characteristics of the target population, while section two is divided into six parts based on the themes of study: the first measured the stakeholder participation using four items, the second part measured effective communication using six items, the third part measured the risk mitigation practice using five items, the fourth part measured the knowledge of project time management process using six items, the fifth part measured the procurement method using five items, and the last part is project performance and its measured with five items. The questionnaire is presented in Annex I.

The items used to measure the stakeholder participation were adapted from Demissie (2021), and Nguyen and Mohamed (2021) with Cronbach alpha greater than 0.772 and 0.884 respectively. The measurement used for effective communication practice was adapted from

Manaye (2021). To measure the risk mitigation practice, the items were adapted from Zenebe (2019) (α= 0.761), and Pimchangthong & Boonjing (2017) (α=0.928). The items used to measure time management process has a Cronbach alpha of 0.715 were adapted from Dino (2022) and Solis & Corona-Suárez (2016). The items used to measure the procurement method were adapted from Ali (2019) (α= 0.713). The items used to measure the project performance were adapted from Nguyen and Mohamed (2021), the Composite reliability which measures the internal consistency of indicator variables loading on the latent variable is 0.726, in which the indicator variables loading on the latent variable have shared variance among them. Table 3-4 provides the source of instrumentation used in the study.

Table 3-4: Instrumentation

Variable	Sources	Items
Stakeholder Participation	Demissie (2021), and Nguyen and Mohamed (2021)	4 Items
Effective Communication	Manaye (2021)	6 Items
Risk Mitigation	Zenebe (2019), and Pimchangthong & Boonjing (2017)	5 Items
Project Time Management Process	Dino (2022), and Solis & Corona-Suárez (2016)	6 Items
Procurement Method	Ali (2019)	5 Items
Project Performance	Nguyen and Mohamed (2021)	5 Items

Source: Literature Review, 2023

3.5. Method of Data Analysis

The data obtained from the interview questions where analyzed using qualitative content analysis, which is a qualitative analysis method that focuses on analyzing recorded communication taken from interviews (Hsieh & Shannon, 2005). Content analysis was used because it is flexible, is a readily-understood and an inexpensive research method and it provides insight into complex models of human thought and language use. The approach used is conceptual qualitative content analysis, this is focused on explicit data where the appearance of words or phrases is looked without any interpretation, and the main concern is the frequency of phrases. Due to the small amount of material to be analyzed manual approach was used rather than computerized.

In this study descriptive statistics was used to summarize and describe quantitative information in meaningful ways and Structural Equation Modelling (SEM) was used for data analysis. SEM combines path models and confirmatory factor models; that is, SEM models incorporate both latent and observed variables. SEM is a multivariate statistical analysis technique that is used to analyze structural relationships. The goal of SEM is to model the relations between measured and latent variables, or between multiple latent variables. In this study to assess the effect of time management on project performance; stakeholder participation, communication, risk mitigation plan, project time management process, procurement method, quantitative project performance and qualitative project performance will be used as latent variables. The reason why SEM was selected for this study was that it offers several advantages in terms of validity, reliability, and complexity. SEM allows use of several indicator variables for a construct simultaneously providing valid conclusions on the construct level. Moreover, SEM takes measurement error into account corresponding to the measurement error portions of observed variables, which in turn lead to unbiased conclusions.

Confirmatory factor analysis (CFA) was conducted for the measurement model to confirm the reliability and fitness of the factor structures of latent variables. SEM was applied to test the structural model for the effect of effective time management on project performance. Model fit using CFA and SEM was determined according to the following indicators: a chi-squared test (χ^2/dof), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA) (Kline, 2015). Chi-squared test (χ2/dof) is dividing the chi-square by the degree of freedom, according to (Ullman, 2001), a value less than 2 is considered as a better fit. CFI reflects not only the difference between a proposed model and a null model, but also the

dispersion of a tested model and central Chi-square distribution. The closer the CFI indicator to 1, the better the non-central Chi-square distribution (Chou & Yang, 2012). The RMSEA measures the difference between a measured observed covariance matrix and an estimated covariance matrix versus the unit degree of freedom (dof). The smaller the RMSEA, the better the model fit (Hair et al., 2018). Table 3-5 presents the summary of the data source and data analysis used for each research questions.

Table 3-5: Data Source and Analysis for the Research Questions

Research Question	Data Sources	Data Analysis
Question 1	Questionnaire and Interview	Descriptive and Conceptual qualitative concept analysis
Question 2	Questionnaire	Structural Equation Modeling
Question 3	Questionnaire	Structural Equation Modeling

Source: Literature Review, 2023

3.6. Reliability and Validity

Factor analysis (Allen et al., 2014) was used to investigate the underlying structure of project performance, stakeholder Participation, communication, risk mitigation plan, project time management process, and procurement method. The measurement model and structural model are shown in Figure 3-1 and Figure 3-2 respectively, Confirmatory factor analysis (CFA) was conducted on each construct using IBM SPSS AMOS Graphics version 26. Cronbach's alpha and Composite reliability test were used to check the reliability of the instrument on the adopted questionnaires based on the internal consistency of the research instruments. The factor loading, t-value, and significance level value of the individual indicator was used for convergent validity. The Fornell & Larcker Criterion was used to assess discriminant validity. The average variance extracted (AVE) score and its square root score were also used to further assess the convergent and discriminant validity. Table 3-6 shows the reliability and convergent validity of the constructs in the study. The reliability and validity results are presented and discussed in detail in the next chapter.

Table 3-6: Reliability, and Convergent Validity

Variables/ Constructs	Items	Cronbach Alpha (α)	AVE
Stakeholder Participation (SP)	4	.83	0.56
Effective Communication (EC)	6	.91	0.63
Risk mitigation plan (RM)	5	.78	0.44
Project time management process (TMP)	6	.92	0.69
Procurement method (PM)	5	.86	0.57
Quantitative Project Performance (PPqn)	2	.91	0.84
Qualitative Project Performance (PPql)	3	.86	0.67

Source: SPSS Version 26 & MS Excel 16 Output, 2023

3.7. Ethical Consideration

The researcher made use of different data collection instruments from different sources. Utmost effort it's exerted to acknowledge materials referred & the researcher takes the responsibility to keep confidentiality of respondents‟ opinions & unanimity of the rest of the information. The researcher thus will ensure that all participants are treated with respect and dignity, after being informed that the study is voluntary and no discrimination will be triggered by failure to participate. Identification codes will be assigned to the filled questionnaires, rather than participant names, to ensure that the participants received absolute confidentiality. The data gathered from respondents will be used exclusively for the purposes of the study and will not be given to third parties for any other purpose. Accordingly, the researcher optimally considers all the ethical perspectives.

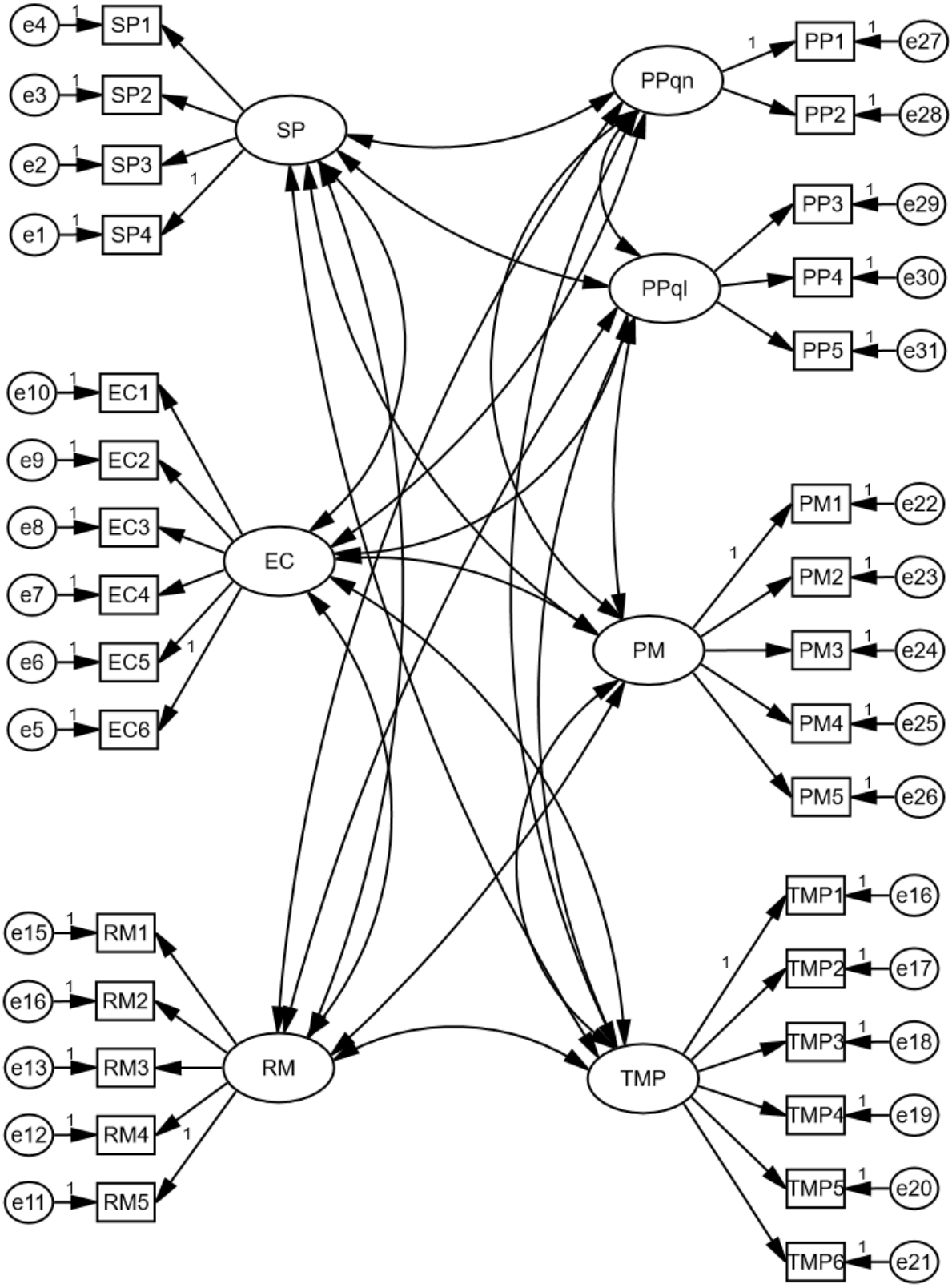

Figure 3-1: Measurement Model

Source: AMOS Version 26 Output, 2023

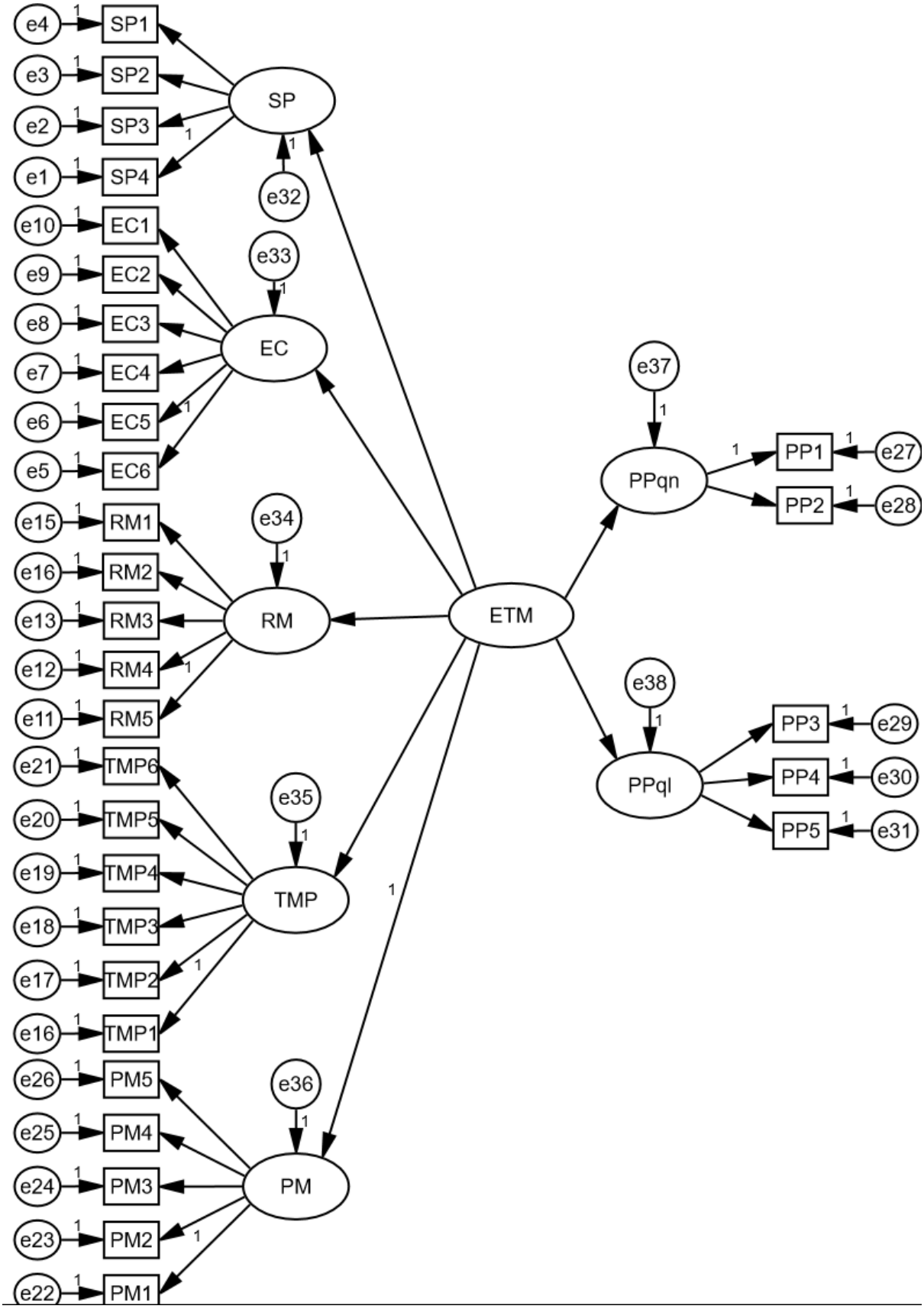

Figure 3-2: Structural Model- Effect of project time management on project performance

Source: AMOS Version 26 Output, 2023

CHAPTER FOUR

4. RESULT AND DISCUSSION

The chapter is devoted to covering the data presentation and analysis, and lastly interpreting the findings of the study. The purpose of this study was to establish and to assess the project time management practice in the construction industry: A case of Rama Construction PLC. Besides, the study focused to study the cause and effect relation between Stakeholder Participation, Communication, Risk Mitigation Plan, Project Time Management Process, Procurement Method, and Project Performance.

In the following sections of the chapter both descriptively and inferentially found results of the study are presented, examined, and interpreted using different statistical and judgmental procedures. Quantitative results are presented and discussed with the help of measurement tools such as; percentage, means, and standard deviations so that, conclusion about the situation is drawn. Whereas, conceptual qualitative content analysis have also been employed to summarize and understand the qualitatively found data. To address the above-mentioned objective of the study, data collection instruments such as questionnaires and interviews were deployed.

4.1. Data Presentation

4.1.1. Response Rate

Study show that a total of 96 questionnaires were distributed to the respondents. As presented in Table 4-1, Out of the total respondents 84 responses were obtained, accounting to 87.5 % response rate, a response of 70% and above is adequate according to Mugenda and Mugenda (2013) hence 87.5 % response rate was satisfactory for data analysis. This response rate was good enough to make a comprehensive and in depth analysis of the research objective.

Table 4-1: Response Rate

Response	Total
No. of questionnaires distributed	96
No of returned questionnaire	84
Response Rate	**87.5 %**

Source: SPSS Version 26 Output, 2023

4.1.2. Demographic Characteristics of Respondents

The background of the respondent determines the extent to which respondents are aware to give satisfactory information on the study variables. The following section indicated the information on demographic characteristics of the respondents so as to determine their maturity, level of understanding, knowledge; it includes their gender, age, educational level, experience, and role of the respondent within Rama Construction PLC.

Table 4-2 presents the demographic data of respondents. The study shows that majority of the respondents 70.2 % were male while minority of the respondent were female 29.8 %, this is not a good representation of sex and shows there is no sex equity. Hence due to the research questions being free of any gender view, it can be concluded that both of their views were considered in the study. The study investigated the composition of the respondent in terms of age. As shown in Table 4-2, majority (46.4 %) of the respondents were aged between 31 and 40 years, while 26.2 % of the respondents were aged between 21 and 30 years, and respondents above 41 years account for 27.4 %, thus indicating that the age were well distributed with the youth being the most participant of the study.

From the data shown in Table 4-2, the respondents found having diploma are 4.8 %; and bachelor degree and above are 95.2 %. This made the researcher to believe that the respondents were educated to the level to understand the issues related to influence of time management on project performance. Table 4-2 also indicates the respondent's role in the organization. From the findings senior managers account for 9.5 % of the respondents, while project managers account for 20.2 %; Construction/office engineers were 38.1 % and others such as architects, auditors, supervisors, coordinators, etc. account for 32.1 % of the respondents. These findings made the researcher believe that the respondents were at a level to understand the issues related to the study objectives. The respondents were also requested to indicate their experience in the

organization. Table 4-2 presents the respondents experience in the organization, 42.9 % of respondents had work experience from 0 to 5 years, 47.6 % from 6 to 10 years, and 9.5 % of the respondents had experience for 11 and above years.

Table 4-2: Demographic Data of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	59	70.2
	Female	25	29.8
	Total	**84**	**100.0**
Age	21 – 30 years	22	26.2
	31 – 40 years	39	46.4
	41 – 50 years	19	22.6
	Above 51 years	4	4.8
	Total	**84**	**100.0**
Level of Education	Diploma	4	4.8
	Bachelor Degree	59	70.2
	M.Sc./ MA	21	25.0
	Total	**84**	**100.0**
Role	Senior Manager	8	9.5
	Project Manager	17	20.2
	Construction/ Office Engineer	32	38.1
	Other	27	32.1
	Total	**84**	**100.0**
Experience	0-5 years	36	42.9
	6-10 years	40	47.6
	11-15 years	8	9.5
	Total	**84**	**100.0**

Source: SPSS Version 26 Output, 2023

4.2. Data Analysis and Interpretation

Three form of analysis types were used namely descriptive analysis, multivariate data analysis, and conceptual qualitative content analysis. Figure 4-1 provides a brief description of each analysis.

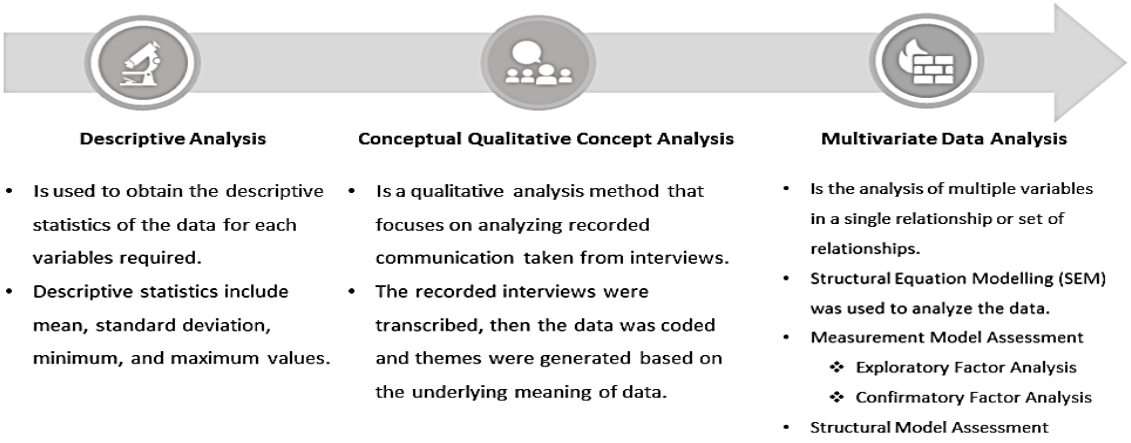

Figure 4-1: The Data Analysis used in the study

Source: Literature Review, 2023

4.2.1. Descriptive Analysis

Initially, the data was screened for problems before analyzing the data. The respondents misconduct was first checked in Microsoft excel by examining the standard deviation of answers for each respondent. The standard deviation is the square root of the total variance in a data set, used as a standard by which to compare individual observations to the mean (Hair et al., 2018). It tells how far each value lies from the mean, a high standard deviation means that values are generally far from the mean, while a low standard deviation indicates that values are clustered close to mean. According to Collier (2020), a standard deviation of respondent less than 0.25 is subjected to deletion. In this study the respondents had a standard deviation ranging from .295 to 1.639, this showed that respondent misconduct was not present.

Then the data was screened for impermissible values using the descriptive menu in SPSS, where no wrong or invalid response was found. Finally, the data was screened for missing

values in SPSS using frequency menu in descriptive statistics and no missing values were found. Table 4-3 presents the valid, minimum and maximum responses for each item.

Table 4-3: Valid, Minimum, and Maximum response for each item

Item	N	Minimum	Maximum
Sex	84	1	2
Age	84	1	4
Edu	84	2	4
Role	84	1	4
SP1	84	1	5
SP2	84	1	5
SP3	84	1	5
SP4	84	1	5
EC1	84	1	5
EC2	84	1	5
EC3	84	1	5
EC4	84	1	5
EC5	84	1	5
EC6	84	1	5
RM1	84	1	5
RM2	84	1	5
RM3	84	1	5
RM4	84	1	5
RM5	84	1	5
TMP1	84	1	5
TMP2	84	1	5
TMP3	84	1	5
TMP4	84	1	5
TMP5	84	1	5
TMP6	84	1	5
PM1	84	1	5
PM2	84	1	5
PM3	84	1	5
PM4	84	1	5
PM5	84	1	5
PP1	84	1	5
PP2	84	1	5
PP3	84	1	5
PP4	84	1	5
PP5	84	1	5

Source: SPSS Version 26 Output, 2023

Descriptive statistics table is the basic representation of the data collected and analyzed in this research like sample size, standard deviation and the mean value of the data. Descriptive statistics also represent large summation of data into organized and summarized form. The details of data assembled under this research study are shown below in the Table 4-4.

Table 4-4: Descriptive statistics of dependent and independent variables

Variables	Sample Size	Mean	Std. Deviation
Project time management (ETM)	84	3.05	.704
Quantitative Project Performance (PPqn)	84	3.45	1.162
Qualitative Project Performance (PPql)	84	3.46	1.054

Source: SPSS Version 26 Output, 2023

Variables names are in first column, the second column is the sample size of the study, and third column shows mean of the gathered data. For all six variables 5 liker scale ranges from 1 to 5 used. The independent variable i.e. Project time management has a mean of 3.05 and a standard deviation of 0.704. The dependent variable Quantitative project performance shows standard deviation and the mean values .345 and 1.162 respectively, whereas Qualitative project performance has a mean of 3.46 and a standard deviation of 1.054. The descriptive statistics for each items used in the variables are presented in the section below.

4.2.1.1. Project Time Management Practice

i. Stakeholder Participation (SP)

Stakeholders are members of the community or individuals who may have an impact on the project's outcome directly or indirectly (Emmanuel, 2020). The study considered Stakeholder Participation of the organization to measure project time management. The respondents were requested to rate various aspects of stakeholder participation in their organization. Table 4-5 presents a descriptive statistics table of stakeholder participation.

Table 4-5: Descriptive Statistics for the items used to measure stakeholder participation

Item	Mean	Std. Deviation
Internal and external stakeholders of the project are engaged throughout the project.	3.35	1.393
Stakeholders are notified about work performance and project changes, and are jointly involved in plan revisions.	3.08	1.407
Feedback mechanisms (to improve performance) are adequate and appropriate.	3.30	1.412
Key stakeholders are empowered to participate in the decision-making process.	3.13	1.412
	Mean	**Median**	**Std.**
Stakeholder Participation	**3.21**	**3.38**	**1.148**

Source: SPSS Version 26 Output, 2023

The findings show that, the mean stakeholder participation in the organization is 3.21, and the median stakeholder participation is 3.38. The data appeared to be skewed to the left, which explains why the median is greater than the mean. Emmanuel (2020) noted stakeholder involvement as one of the fundamental principles of effective project management. The practice of Stakeholder Participation was measured through four items. The findings show that the practice to engage internal and external stakeholders throughout the project is moderate with a mean value of 3.35. In addition, the respondents indicated with a mean of 3.08 and standard deviation of 1.407 that stakeholders are notified about work performance and project changes, and are jointly involved in plan revisions. Further, the finding shows that there is an appropriate and adequate feedback mechanisms and key stakeholders are empowered to participate in the decision-making process.

ii. Effective Communication (EC)

Acquiring all relevant information, understanding it, and effectively getting it to the people who might need to hear it are all parts of communication (Zulch, 2014). The study examined the organization's project related communication practice to measure project time management. The respondents were inquired to rate various communication measures, the descriptive statistics is shown in Table 4-6.

Table 4-6: Descriptive Statistics for the items used to measure communication

Item	Mean	Std. Deviation
High value is given for project communication management in the organization.	3.14	1.253
The organization has project communication management plan and the plan reviewed regularly, and adjusted if needed.	3.06	1.311
The organization developed appropriate project communication approaches and plans to communicate with its stakeholders.	3.06	1.186
The organization encourage two way communications.	3.26	1.204
On-going communication between project proponents and its stakeholders are practiced in the organization.	3.12	1.274
Project manager and stakeholders communicate throughout the project.	3.39	1.242
	Mean	**Median**	**Std.**
Effective Communication	**3.17**	**3.17**	**1.035**

Source: SPSS Version 26 Output, 2023

According to Emmitt (2010), communication is crucial for all parties participating in the project. Findings in Table 4-6 show that, the mean effective communication in the organization is 3.17, and the median effective communication is 3.17. This shows the communication practice is moderate. The mean and median are the same, which shows the data set is normally distributed. According to the respondents, the organization places a high emphasis on project communication management, and it has a project communication management plan that is constantly evaluated and updated as necessary. Additionally, the respondents believed the organization created suitable project communication strategies and plans to interact with its stakeholders.

iii. Risk Mitigation (RM)

Risk mitigation is managing risks to minimize the consequence (PMI, 2021). The third measure used to examine project time management is the risk mitigation practice. The respondents were inquired to rate various risk mitigation measures, Table 4-7 shows the descriptive statistics.

Table 4-7: Descriptive Statistics for the items used to measure risk mitigation

Item	Mean	Std. Deviation
There is a policy or guideline that recommends how to manage unexpected uncertainties.	2.88	1.330
The project team have regular meetings focused on risk.	3.06	1.245
All team members within the project play a role in identifying risk.	3.08	1.301
All team members have knowledge on risk mitigation strategies.	3.20	1.360
Risks that occur within the project are controlled in a way that goes with the goal and objective of the project.	2.89	1.397
	Mean	**Median**	**S.D**
Risk Mitigation	**3.02**	**3.0**	**.968**

Source: SPSS Version 26 Output, 2023

Results from Table 4-7 demonstrate that the organization's median and mean risk mitigation levels are both 3.0. Since the mean and median are basically the same, this demonstrates that the risk mitigation practice is moderate and that the data set is normally distributed. The results show that the respondents claimed there was a policy that offered advice on how to handle unforeseen uncertainty. Additionally, the respondents said that the project team holds regular risk-focused meetings and that everyone in the team participates in risk identification. Finally, the respondents reported that risks within the project are controlled in a way that is consistent with the project's goal and objective with a mean of 2.89 and a standard deviation of 1.397. It received a lower score than the other metrics. Oburu (2020) makes the point that the project team should have a suitable risk mitigation plan and implement it in line with the project's goal.

iv. Project time management process (TMP)

Defining project activities, activity sequencing, activity resource estimation, activity duration estimation, establishing and concluding project schedule control are all included in the project time management process (PMI, 2021). The fourth measure used to examine project time management is the practice of project time management process in the organization. The respondents were inquired to rate various time management process measures, the descriptive statistics is shown in Table 4-8.

Table 4-8: Descriptive Statistics for the items used to measure time management process

Item	Mean	Std. Deviation
The organization provide required tools and techniques that are used for each project time management processes.	2.99	1.266
The activities needed to be implemented to achieve project deliverables are identified and listed properly.	3.00	1.252
Project-Schedule-Network-Diagrams are established based on the dependency between the activities.	3.13	1.259
The estimating process is based on defined activities and established sequence of activities.	3.07	1.269
The schedule captures the relationship between activities that shows how activities fit together and how things may change.	3.14	1.318
Performance report is made for every activity as per the schedule and appropriate corrective actions have been taken for every variance between actual and planned schedule.	2.99	1.294
	Mean	**Median**	**S.D**
Project Time Management Process	**3.05**	**3.0**	**1.095**

Source: SPSS Version 26 Output, 2023

The organization's median and mean time management process levels are close to 3.0, according to Table 4-8's findings. Since the mean and median are basically the same, this demonstrates that the time management process practice is moderate and that the data set has a normally distributed distribution. According to the results, the respondents indicated that the organization provide the tools and methods needed for each project's time management processes, and that the activities that must be carried out in order to meet project deliverables

are properly identified and listed (WBS is created). According to the responders, Project-Schedule-Network-Diagrams are created based on the dependencies between the activities. Furthermore, according to the respondents, the estimation process is built around clearly defined actions and a predetermined order of operations. As stated by Elkhuizen (2023), project management process links all other project operations and fosters project harmony, so high value should be given to it.

v. Procurement method (PM)

The processes involved in acquiring the commodities and services a business requires to run on a daily basis are referred to as procurement (Bano, 2023). The fifth and final measure used to examine project time management is the procurement method. The respondents were inquired to rate various procurement related practice measures, the descriptive statistics is shown in Table 4-9.

Table 4-9: Descriptive Statistics for the items used to measure procurement method

Item	Mean	Std. Deviation
Project teams are aware of the importance of procurement management in the project.	2.83	1.343
Regular training is provided to the concerned project team on procurement management.	2.60	1.281
There are documented policies and procedures on procurement management.	2.75	1.307
There is a standardized (formal) procurement management process in place.	2.71	1.304
There is a procedure that is set for project teams to make a request for goods and services required	3.04	1.339
	Mean	**Median**	**S.D**
Procurement Method	**2.79**	**2.6**	**1.06**

Source: SPSS Version 26 Output, 2023

Results in Table 4-9 indicate that the organization's median effective communication is 2.6 and its mean effective procurement method is 2.79. This demonstrates how slightly less moderate the procurement method practice is. The data looked to be skewed to the right since the mean

was higher than the median. The results show that the respondents replied that there was a written policy on procurement management and that the project teams were aware of its significance. The respondents provided that there is a process in place for project teams to request the necessary goods and services. Additionally, respondents said that the project team receives ongoing training in procurement management, with a mean of 2.60 and standard deviation of 1.281. In comparison to the other metrics, it scored lower. Regularly training the project team on procurement management helps the project team to be efficient and helps understand the overall cost of services and goods required for projects.

4.2.1.2. Quantitative Project Performance (PPqn)

Project performance (PP) measurement variables included budget, schedule, quality, and stakeholder satisfaction. PP variables had two sub-factors, including quantitative and qualitative PP. Quantitative performance variables included project cost and time. The respondents were requested to rate the budget and schedule performance in their organization. Table 4-10 presents a descriptive statistics table of quantitative project performance.

Table 4-10: Descriptive Statistics for the items used to measure quantitative project performance

Item	Mean	Std. Deviation
Extent to which the project delivered on schedule.	3.50	1.227
Extent to which the project delivered on budget.	3.39	1.193
	Mean	**Median**	**S.D**
Quantitative Project Performance	**3.45**	**3.5**	**1.162**

Source: SPSS Version 26 Output, 2023

According to the findings, the respondents indicated with a mean of 3.50 and a standard deviation of 1.227 that the projects are delivered on schedule. In addition, the respondents indicated with a mean of 3.39 and standard deviation of 1.193 that the projects are delivered on budget. The aggregate mean of the construct is 3.45 with 1.162 standard deviation which shows on average the quantitative project performance (time and cost) was rated good.

4.2.1.3. Qualitative Project Performance (PPql)

Qualitative performance variables included project quality and satisfaction. The respondents were requested to rate the quality performance and satisfaction level. Table 4-11 presents a descriptive statistics table of qualitative project performance.

Table 4-11: Descriptive Statistics for the items used to measure qualitative project performance

Item	Mean	Std. Deviation
Extent to which the project's quality objectives met.	3.51	1.125
Extent to which your organization achieved its desired project outcomes	3.46	1.236
Extent to which project stakeholders achieve their desired project outcomes.	3.39	1.213
	Mean	**Median**	**S.D**
Qualitative Project Performance	**3.46**	**3.67**	**1.054**

Source: SPSS Version 26 Output, 2023

According to the findings, the respondents indicated with a mean of 3.51 and a standard deviation of 1.125 that the projects are delivered on to the quality required. In addition, the respondents indicated with a mean of 3.46 and standard deviation of 1.236 that the organization achieved its desired project outcomes. Finally, the respondents indicated with a mean of 3.39 and a standard deviation of 1.213 that project stakeholders achieve their desired project outcomes. The aggregate mean of the construct is 3.46 with 1.054 standard deviation which shows on average the qualitative project performance (quality and stakeholder satisfaction) was rated good.

4.2.2. Conceptual qualitative Content Analysis

The recorded interviews were transcribed, then the data was coded and analyzed using conceptual qualitative content analysis. Relevant data was identified then coding was done and themes were generated based on the underlying meaning of data. Finally these themes were used to address the research question in the next chapter.

i. Project Types

The primary theme is project types, in this theme the type and nature of projects conducted in Rama Construction PLC are mentioned. The respondents replied that Rama construction PLC conduct building, road, and industry construction.

The summarized reply of the all respondents (A, B, C, and D) is as follows:

> *'Rama Construction is engaged in building, road, and industry construction. Rama Construction Plc was involved in building projects such as UN-ECA new office facility for United Nations, New OPD annex at Harar Hiwot Fana hospital, Hospital and Learning Buildings for Jimma University, OCSCO building, etc. Rama Construction Plc was involved in Road projects such as Dangote cement factory access road project, Addis-Adama toll motor way, Tsegede Junction-Ketema Nigus road project, Azezo-Gondar road upgrading project, Bulbula road project, etc. Rama Construction Plc was also involved in Industry project such as Ashegoda wind farm project, Corbetti geothermal project, Heineken brewery factory project, Wonji sugar factory project, Zeway wine factory project, Metehara sugar factory project, Bole-Lemi Industry zone project, Dangote Industries (Ethiopia) PLC project, Juniper glass factory project, etc.'*

ii. Policy

The second theme is policy. Policy refers to standard operating procedures or rules and regulations used. Policies are the foundation of governance, risk, and compliance strategy (Mitratech Holdings, 2021). Respondents were asked whether there is a policy for project time management and procurement management. According to all respondents Rama Construction PLC do not have a written policy on project time management but have a policy on procurement management.

Respondent A commented the following regarding the policy of time management:

> *'We do not have a formally written policy regarding project time management. But there is a culture you can say it is an informal policy, for example what step to follow, what tools and techniques to use, and which software to use to manage time. And everyone use those procedures.'*

Respondent C commented the following regarding the policy of procurement management:

> *'There is a documented policy on procurement management. We have procedures and so the procurement officers are accountable for undertaking them accordingly. There are different laws and regulations that needs to be considered such as Ministry of Finance- Draft Procurement and Contracts (Revised 9 June, 1997) and Ministry of Finance-Procurement Manual (24 March, 1999). And there is also a list of approved vendors.'*

iii. Software

The third theme is software, in this section the software used to manage time are mentioned. The respondents replied that Microsoft Project and Primavera software are used for project time management in Rama construction PLC. Respondent A, B, and D responded the same on the software used to manage project time.

Respondent B responded the following regarding the software used to manage time:

> *'In Rama Construction PLC, Microsoft Project and Primavera are the software's used to define and sequence the activities of the project. These software's are also great to manage resources and keep tract of time. Every two or three month the schedule is revised according to the progress of the project and these software's are used as a reporting tool.'*

iv. Barriers

The fourth theme is barriers, in this section the barriers of project time management are discussed. The respondents replied that skill of the project team, improper scheduling, lack of resource, lack of supervision, and work method are some of the major barriers of project time management.

Respondent A commented on barriers to effective time management:

> *'There are many barriers to manage time effectively but if we are talking about the project team, it has to be poor communication, limitation of problem solving skill, and inadequate risk management. Aside from the project team delay of material by vendor, and delay in payment by the client are the major ones. And cash flow is also one of the obstacle to manage time effectively.'*

Respondent C responded the following regarding the barriers to project time management:

> *'One of the major barrier has to be improper scheduling. Master scheduling is done at the start of every project and due to construction environment is dynamic the schedule needs to be revised accordingly. But not revising them properly is the biggest barrier. The other barrier is definitely lack of resource. Starting from cement to steel and from work force to fuel, there is a scarcity in resource. Even when there is let's say a good schedule due to the lack of resource projects get delayed.'*

Respondent D also responded the following regarding the barriers to project time management:

> *'I think, to me, work method has to be the major barrier to project time management. Tt can be the excavation method or the mixing method or other, when there is an easy and efficient way to do them but choosing improper work method lags the project finish date. And also lack of supervision has to be the other major barrier. Poor supervision leads to conflicts, mismanagement, and so on. This in turn leads to project delay.'*

v. Stakeholder participation

The fifth theme is stakeholder participation, in this section the participation of stakeholders is assessed. The respondents replied that stakeholders are not empowered to participate in the decision-making process but they are engaged throughout the project.

Respondent D and B have the same comment regarding stakeholder participation:

> *'Stakeholders are engaged throughout the project. The engagement differs from stakeholder to stakeholder. Some are informed about the project status and other things, while some participate in the project directly. But stakeholders mostly does not participate in the decision-making process.'*

4.2.3. Project Time Management Practice Implemented in the Organization

Findings on stakeholder participation shows that stakeholders are engaged in the project and they are notified about work performance and project changes. Respondents were not very confident whether stakeholders are empowered in the decision making process. But the interview clarified that stakeholders don't participate in the decision-making process that much. On average the practice was rated good. Findings on communication shows that the organization gives high value to project communication and encourage a two-way communications. However, most of the respondents' rate low on whether if there is an appropriate project communication approach and plan to communicate with the stakeholders. All in all the communication practice can be considered as good.

Findings on risk mitigation shows that the project team members have some role in identifying risk and they have knowledge on risk mitigation strategies. Respondents seems to disagree on whether there is a guideline (policy) on how to manage risks. On average the practice was rated good. Both the questionnaire and interview findings on project time management process reveals that Work Breakdown Structure is done for every project, and the project schedule network diagrams are established based on the dependency between results. Also, the estimating process is based on the defined activities and the established sequence of activities. Respondents were not very confident on whether the organization provide required tools and techniques such as templates that are used for each project time management process, while the qualitative study clarified that the organization provide the necessary tools such as software. The time management process practice was also rated as good. Findings on procurement method shows that project teams are aware of the importance of procurement management in the project and there is a procedure that is set for project teams to make a request for goods and services required. Respondents believe that regular training is not provided sufficiently to the concerned project team on procurement management. The qualitative study shows that there is a list of approved vendors. On average the practice was rated good.

4.2.4. Multivariate Data Analysis

Multivariate data analysis, according to Hair et al., is the analysis of multiple variables in a single relationship or set of relationships. Structural Equation Modelling (SEM) was used to analyze the data. SEM is a multivariate technique combining aspects of factor analysis and multiple regression. Confirmatory factor analysis (CFA) was conducted for the measurement model to confirm the reliability and fitness of the factor structures of latent variables. CFA is a multivariate technique used to test (confirm) a pre-specified structure or relationship. SEM was applied to test the structural model for the effect of effective time management on project performance.

4.2.4.1. Measurement Model Assessment

The measurement model was analyzed in two steps: Step 1 Explanatory Factor Analysis (EFA) was performed as a preliminary analysis of the scale using the Maximum likelihood and Varimax rotation through SPSS. EFA is used to explore the relationships among items to determine if the items can be grouped into a smaller number of underlying factors. Step 2 consisted of further validating the factor structure which was the output of EFA sent to CFA conducted through AMOS.

i. Exploratory Factor Analysis

The Kaiser–Meyer–Olkin (KMO) test was used to determine how suited data is for factor analysis (Nijs, 2019). The test measures sampling adequacy for each variable in the model and the complete model. The higher the proportion, the higher the KMO-value, the more suited the data is to factor analysis. KMO values less than 0.5 indicate the sampling is not adequate and that remedial action should be taken (Dziuban & Shirkey, 1974). Table 4-12, shows that the KMO value is above 0.50 so it indicates the criteria of sampling adequacy is met.

Bartlett's Test of Sphericity compares the correlation matrix to the identity matrix. It tests whether the correlation coefficients are all zero (Zach, 2019). The test computes the probability that the correlation matrix has significant correlations among at least some of the variables in a dataset. Bartlett's Test of Sphericity is a prerequisite for factor analysis to work. The Bartlett’s

test of sphericity is statistically significant ($p < .05$) as shown in Table 4-12, so it shows that the correlation matrix is statistically different from an identity matrix as desired.

Table 4-12: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.773
Bartlett's Test of Sphericity	Approx. Chi-Square	1894.210
	df	435
	p	.000

Source: SPSS Version 26 Output, 2023

Exploratory Factor Analysis using the Maximum likelihood with Varimax rotation was used for analyzing the factor structure and correlation between items included in the scale. The Varimax method makes some of these loadings as large as possible and the rest as little as possible in absolute value by maximizing the variance of the squared loadings for each factor. The rotated factor loadings, which show how the variables are weighted for each factor as well as the correlation between the variables and the factor, are presented in the rotated factor matrix Table 4-13. Initially, the desired results were not met even if none of the items were loading on other factors. This item (RM1) was removed because its loading was less than .5 and the following final result was found. The results of the revised exploratory analysis show that the solution is based on 6 factors, this was not expected since there are 7 constructs but it's understandable that quantitative and qualitative performance items load in the same factor, and all other items are loading on their own factors with no exception. The six-factor solution is explaining 65.375 % variance of the total variance. The results of the exploratory factor analysis show that the factors have good level of validity. For further validation, the Confirmatory Factor Analysis (CFA) is discussed next.

Table 4-13: Rotated Factor Matrix[a]

	Factor					
	1	2	3	4	5	6
SP1					.758	
SP2					.800	
SP3					.715	
SP4					.623	
EC1		.560				
EC2		.672				
EC3		.644				
EC4		.841				
EC5		.829				
EC6		.601				
RM2						.499
RM3						.608
RM4						.961
RM5						.600
TMP1	.688					
TMP2	.797					
TMP3	.819					
TMP4	.818					
TMP5	.861					
TMP6	.779					
PM1				.731		
PM2				.625		
PM3				.667		
PM4				.817		
PM5				.768		
PP1			.809			
PP2			.799			
PP3			.711			
PP4			.816			
PP5			.658			

Extraction Method: Maximum Likelihood.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Source: SPSS Version 26 Output, 2023

ii. Confirmatory Factor Analysis

a. Model Fit

Confirmatory Factor Analysis (CFA) was computed using AMOS to test the measurement model. As part of confirmatory factor analysis, factor loadings were assessed for each item, even though the factor loadings were acceptable (> 0.50), the initial model did not achieve the fitness so five items (SP3, RM1, RM4, TMP2, & PM3) were removed due to high residual covariances (> 2.0) between items, then covariance of error terms were created based on modification indices (MI > 8). The model-fit measures were used to assess the model's overall goodness of fit (CMIN/ df, GFI, CFI, TLI, SRMR, and RMSEA) and all values were within their respective common acceptance levels except for GFI but since the RMSEA was within the acceptance level the model was accepted (Bentler, 1990; Hu & Bentler, 1999; Ullman, 2001). The seven-factor model (Stakeholder participation, Effective communication, Risk mitigation, Project time management process, Procurement method, Quantitative project performance, and Qualitative project performance) yielded good fit (Table 4-14) for the data: CMIN/ df = 1.488, GFI= .745, CFI= .905, TLI= .899, SRMR= .0752, and RMSEA= .077. Figure 4-2 shows the CFA result for the measurement model.

Table 4-14: Model Fit Indices

Fit Indices	Recommended Value	Source(s)	Obtained Value
P	Insignificant	Bagozzi and Yi (1988)	.000
CMIN/ df	<2	Less than 2 (Ullman, 2001) to 5 (Schumacker & Lomax, 2015)	1.488
GFI	>.90	(Hair et al., 2018)	.745
CFI	>.90	Bentler (1990)	.905
TLI	>.90	Bentler (1990)	.899
SRMR	<.08	(Hu & Bentler, 1999)	.0752
RMSEA	<.08	(Hu & Bentler, 1999)	.077

Source: AMOS Version 26 Output, 2023

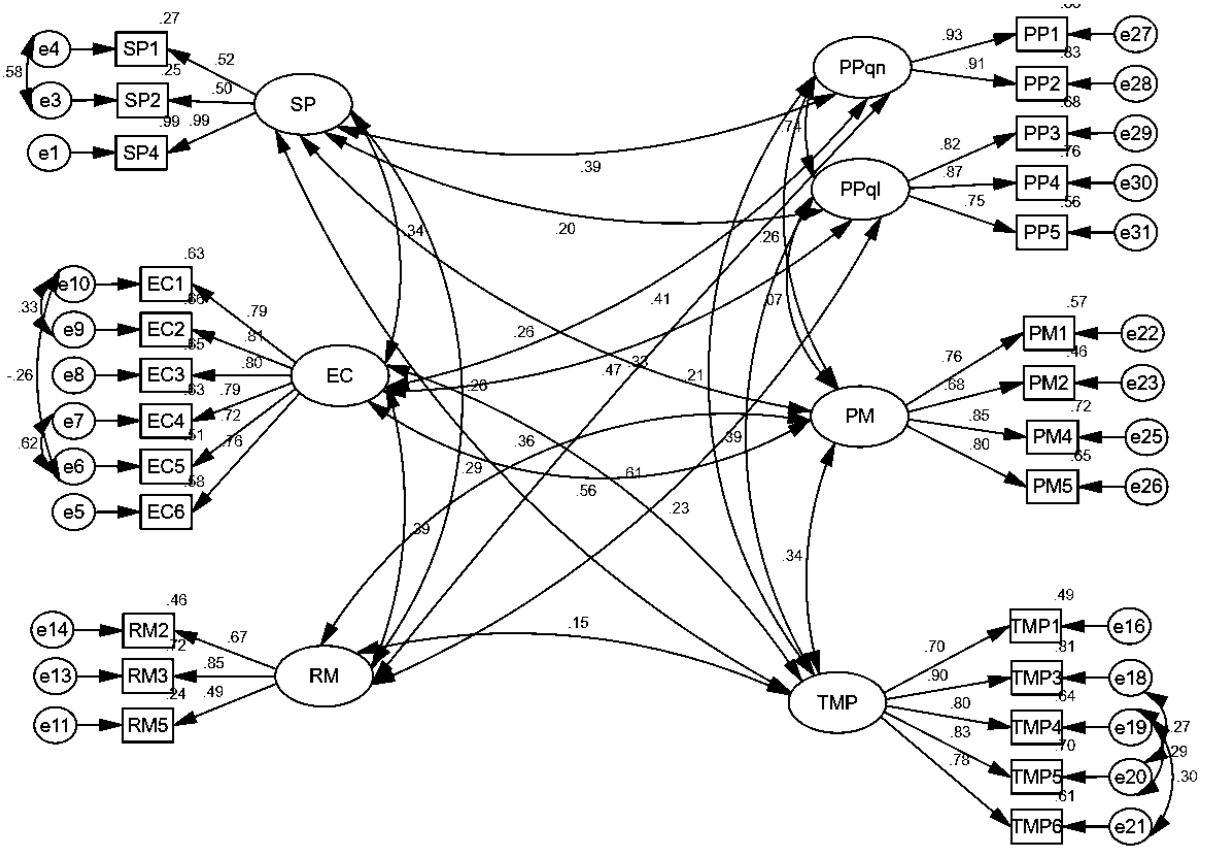

Figure 4-2: CFA results of the measurement model

Source: AMOS Version 26 Output, 2023

Findings from the measurement model as presented in Figure 4-2 show that, the variance in SP1 (27%), SP2 (25%), and SP4 (99%) is accounted by stakeholder participation. The variance in EC1 (63%), EC2 (66%), EC3 (65%), EC4 (63%), EC5 (51%) and EC6 (58%) is accounted by effective communication. The variance in RM2 (46%), RM3 (72%), and RM5 (24%) is accounted by risk mitigation. The variance in TMP1 (49%), TMP3 (81%), TMP4 (64%), TMP5 (70%) and TMP6 (61%) is accounted by project time management process. The variance in PM1 (57%), PM2 (46%), PM4 (72%), and PM5 (65%) is accounted by procurement method. The variance in PP1 (86%), and PP2 (83%) is accounted by quantitative project performance. The variance in PP3 (68%), PP4 (76%), and PP5 (56%) is accounted by qualitative project performance. The remaining percentage of each item variance is accounted for by the unique factor of the error term in the item.

b. Correlation Analysis

According to Hair (2018), correlation analysis is a statistical method used to measure the relationship between two or more variables. It determines the degree to which two variables are related, and the direction of the relationship. Correlation analysis is based on a correlation coefficient, which ranges from -1 to 1. A correlation coefficient of -1 indicates a perfect negative relationship, while a correlation coefficient of 1 indicates a perfect positive relationship whereas a correlation coefficient of 0 indicates no relationship between the variables. Regarding the correlation coefficients of the various constructs, a correlation coefficient larger than 0.7 generally represents a strong correlation, whereas a coefficient between 0.3 and 0.7 represents a moderate correlation, and a coefficient smaller than 0.3 represents low correlation (Chou & Yang, 2012).

Table 4-15: Construct correlation matrix

	SP	**EC**	**RM**	**TMP**	**PM**	**PPqn**
EC	0.336	-				
RM	0.259	0.388	-			
TMP	0.289	0.615	0.449	-		
PM	0.258	0.555	0.36	0.338	-	
PPqn	0.389	0.407	0.471	0.305	0.262	-
PPql	0.204	0.328	0.228	0.494	0.066	0.742

Source: AMOS Version 26 Output, 2023

The correlation matrix listed in Table 4-15 shows that Quantitative Project Performance had strong correlations with Qualitative Project Performance. This constructs had correlation coefficients larger than 0.7. Stakeholder Participation had moderate correlations with Effective Communication, and Quantitative Project Performance. Effective Communication had moderate correlations with Risk Mitigation, Project Time Management Process, Procurement Method, Quantitative Project Performance, and Qualitative Project Performance. Risk Mitigation had moderate correlations with Project Time Management Process, Procurement Method, and Quantitative Project Performance. Project Time Management Process had moderate correlations with Procurement Method, Quantitative Project Performance, and

Qualitative Project Performance. All of the above associations had correlation coefficients between 0.3 and 0.7, representing a moderate association. Conversely, SP showed low correlations with Risk Mitigation, Project Time Management Process, Procurement Method, and Qualitative Project Performance. Risk Mitigation had a low correlation with Qualitative Project Performance. Procurement Method had a low correlation with Quantitative Project Performance, and Qualitative Project Performance. All of the above associations had correlation coefficients below 0.3, representing a low association.

c. Reliability and Validity

Reliability is the measure of internal consistency of the constructs in the study. Construct Reliability was assessed using Cronbach's Alpha and Composite Reliability. A construct is reliable if the Alpha (α) value is greater than 0.70 (Hair et al., 2018). The results revealed that the Stakeholder participation scale with three items (α = .796), Effective communication scale with six items (α = .91), Risk mitigation with three items (α = .701), Project time management process scale with five items (α = .912), and Procurement method scale with five items (α = .855) were found reliable. Similarly, Quantitative project performance scale with two items and Qualitative project performance scale with three items were found reliable (α = .915 & α = .86, respectively). Reliability results are summarized in Table 4-16. Cronbach Alpha for each construct in the study was found over the required limit of 0.70 (Hair et al., 2018). Composite reliabilities ranged from 0.72 to 0.915, above the 0.7 benchmark (Hair et al., 2018). Hence, construct reliability was established for each construct in the study (Table 4-16).

Convergent validity measures how closely a test is related to other tests that measure the same constructs. A low correlation with an item that measures a different construct illustrating discriminant validity. Correlate observed ratings with scores on other variables similar variables (convergent); while with other different variables (discriminant) (Long & Wang, 2022). Convergent validity of scale items was estimated using Average Variance Extracted (Fornell & Larcker, 1981). The average variance-extracted values were above the threshold value of 0.50 (Fornell & Larcker, 1981) for all constructs except Risk mitigation. However, since the CR was well over the required value, we can conclude the Risk Mitigation construct was valid. Therefore, the scales used for the study have the required convergent validity (Table 4-16).

Table 4-16: Loadings, Reliability, and Convergent Validity

Variables/ Constructs	Items	Standard Factor Loadings	Cronbach Alpha (α)	Composite Reliability	AVE
Stakeholder Participation (SP)	SP1	.518	.796	.731	.53
	SP2	.51			
	SP4	.995			
Effective Communication (EC)	EC1	.794	.91	.93	.69
	EC2	.814			
	EC3	.84			
	EC4	.792			
	EC5	.717			
	EC6	.759			
Risk mitigation plan (RM)	RM2	.675	.71	.72	.473
	RM3	.849			
	RM5	.491			
Project time management process (TMP)	TMP1	.71	.912	.92	.65
	TMP3	.899			
	TMP4	.82			
	TMP5	.834			
	TMP6	.782			
Procurement method (PM)	PM1	.758	.855	.857	.61
	PM2	.679			
	PM4	.85			
	PM5	.84			
Quantitative Project Performance (PPqn)	PP1	.928	.915	.915	.844
	PP2	.99			
Qualitative Project Performance (PPql)	PP3	.824	.86	.857	.668
	PP4	.874			
	PP5	.749			

Source: SPSS Version 26, AMOS Version 26 & MS Excel 16 Output, 2023

Discriminant validity in the study was assessed using Fornell & Larcker Criterion in MS Excel 16. According to Fornell & Larcker Criterion, discriminant validity is established when the square root of AVE for a construct is greater than its correlation with the other constructs in the study. In the present study, discriminant validity was entirely established using Fornell and Larcker criterion. There was no high shared variance between constructs, where discriminant validity was found at a satisfactory level. The results of discriminant validity are presents in Table 4-17.

Table 4-17: Fornell and Larcker Criterion

	SP	**EC**	**RM**	**TMP**	**PM**	**PPqn**	**PPql**
SP	0.709						
EC	0.336	0.781					
RM	0.259	0.388	0.687				
TMP	0.289	0.615	0.149	0.806			
PM	0.258	0.555	0.360	0.338	0.775		
PPqn	0.389	0.407	0.471	0.205	0.262	0.919	
PPql	0.204	0.328	0.228	0.394	0.066	0.742	0.817

Source: MS Excel 16 Output, 2023

d. Normality Assessment

A normality test examines whether a sample data is representative of a population that has a normal distribution (Mishra et al., 2019). The normality assessment was made by assessing the measure of skewness and kurtosis for every item. The absolute value of skewness 2.0 or lower indicates the data is normally distributed (George & Mallery, 2010). For kurtosis, the range is -10 to +10 to be considered normally distributed (Collier, 2020). Table 4-18 presents the normality assessment for every items involved in the measurement model. Based on the results it can be seen that both skewness and kurtosis are in an acceptable range to be considered ‘normal’.

Table 4-18: Assessment of normality

Variable	skew	Critical Region (c.r.)	kurtosis	Critical Region (c.r.)
SP1	-0.31	-1.162	-1.113	-2.082
SP2	-0.096	-0.36	-1.292	-2.418
SP4	-0.001	-0.004	-1.327	-2.482
EC1	-0.124	-0.463	-1.063	-1.988
EC2	0.019	0.07	-1.139	-2.131
EC3	-0.072	-0.268	-0.873	-1.633
EC4	-0.139	-0.52	-0.972	-1.818
EC5	-0.084	-0.313	-1.062	-1.987
EC6	-0.171	-0.639	-1.202	-2.249
RM2	0	0	0	0
RM3	0.076	0.285	-1.064	-1.99
RM5	0.059	0.219	-1.306	-2.443
TMP1	0.13	0.486	-1.167	-2.183
TMP3	0.007	0.026	-1.084	-2.027
TMP4	-0.063	-0.237	-1.018	-1.905
TMP5	-0.138	-0.516	-1.163	-2.176
TMP6	0.224	0.836	-1.031	-1.929
PM1	0.186	0.697	-1.171	-2.19
PM2	0.582	2.178	-0.677	-1.266
PM4	0.278	1.042	-1.109	-2.074
PM5	0.086	0.322	-1.221	-2.285
PP1	-0.551	-2.061	-0.542	-1.014
PP2	-0.409	-1.53	-0.675	-1.263
PP3	-0.49	-1.833	-0.608	-1.137
PP4	-0.591	-2.211	-0.662	-1.239
PP5	-0.543	-2.033	-0.69	-1.291

Source: AMOS Version 26 Output, 2023

4.2.4.2. Structural Model Assessment

A structural equation model generated through AMOS was used to test the relationships. A good-fitting model is accepted if the value of the CMIN/ df is < 5, the goodness-of-fit (GFI) indices (Hair et al., 2018); the confirmatory fit index (CFI) (Bentler, 1990) is > 0.90. In addition, an adequate-fitting model was accepted if the AMOS computed value of the standardized root mean square residual (SRMR) < 0.05, and the root mean square error approximation (RMSEA) is between 0.05 and 0.08 (Hair et al., 2018). The fit indices for the model shown in Table 4-19 fell within the acceptable range: CMIN/ df = 1.63, GFI = .735, CFI = .93, SRMR = .050, and RMSEA = .082. The CFI and RMSEA failed to achieve the desired values but the other achieve the desired values.

As stated earlier structural equation modelling (SEM) was conducted in order to examine effect of the project time management on project performance (quantitative and qualitative). The results of this analysis indicate how well effective project time management practice is able to predict both quantitative and qualitative project performance. Furthermore, it shows how much unique variance in the dependent variables; quantitative project performance and qualitative project performance; is explained by the independent variable or project time management. The SEM analysis showed that the model was able to significantly predict quantitative and qualitative project performance. Figure 4-3 shows the structural model of the effect of project time management on quantitative and qualitative project performance.

Table 4-19: Model Fit Indices and Hypothesized Relationships

Hypothesized Relationship	Standardized Estimates	t value	p -value	Decision
H1: ETM → PPqn	.708	3.369	< .001	H1: Supported
H2: ETM → PPql	.620	3.055	.002	H2: Supported
R-Square				
Quantitative Project Performance	.502			
Qualitative Project Performance	.385			
Model Fit				
CMIN/ df = 1.63, GFI = .735, CFI = .93, SRMR = .050, and RMSEA = .082.				

Source: AMOS Version 26 Output, 2023

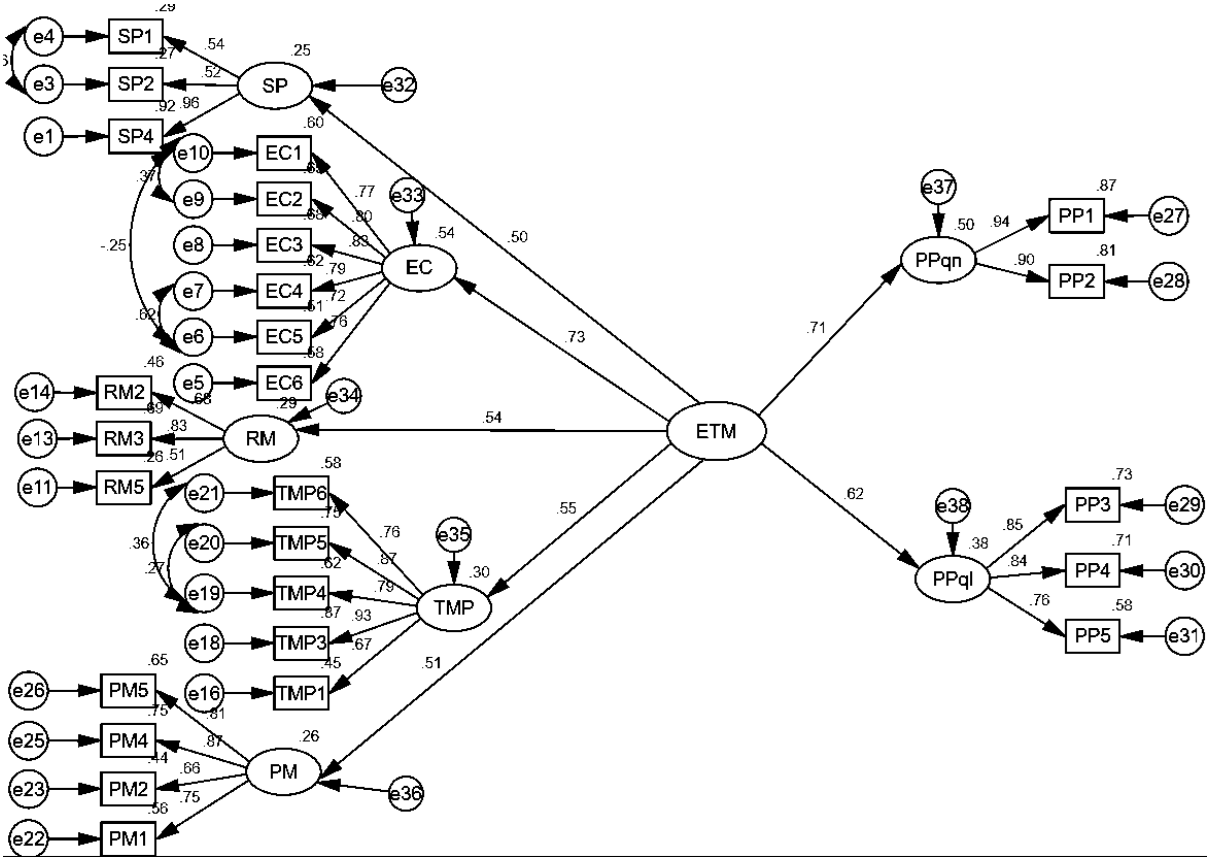

Figure 4-3: Effect of ETM on PPqn and PPql

Source: AMOS Version 26 Output, 2023

4.2.5. The Impact of project time management on quantitative project performance.

The results of the Table 4-19 shows that Project Time management has positive and significant Impact on Quantitative project performance (β = .708, t = 3.369, p < .001), so the first hypothesis (H1. There is a positive relationship between project time management and quantitative project performance) is accepted. The result of the SEM analysis R-square (R^2= 0.502) indicates that 50.2 % of variance in the quantitative project performance function can be explained by project time management, while the remaining 49.8 % are explained by other variables out of this model. The possible explanation for this may be the other factors like cost management, quality management, and other factors beyond the scope of this study. Table 4-20 shows the structural relationship between Quantitative project performance and the observable variables namely time, and cost. PPqn contributes 87.5 % of the unit variance of PP1 (schedule performance). PPqn contributes 81.4 % of the unit variance of PP2 (budget performance).

Table 4-20: Structural relationship b/n PPqn construct

Path	Standardized Estimates	R-Square
PPqn → PP1	.935	.875
PPqn → PP2	.902	.814

Source: AMOS Version 26 Output, 2023

4.2.6. The Impact of project time management on qualitative project performance.

The results of the Table 4-19 shows that Project time management has positive and significant Impact on Qualitative project performance (β = .6208, t = 3.055, p = .002), so the second hypothesis (H2. There is a positive relationship between project time management and qualitative project performance) is accepted. The R-square (R^2= 0.385) was for qualitative project performance, which indicates that 38.5 % of variance in the qualitative project performance function can be explained by project time management, while the remaining 61.5 % are explained by other variables out of this model. The possible explanation can yet be the same as the quantitative such as cost management, quality management, and other factors beyond the scope of this study. Table 4-21 shows the structural relationship between Qualitative project performance and the observable variables namely quality, organizational satisfaction and stakeholder satisfaction. PPql contributes 72.8 % of the unit variance of PP3 (quality performance). While, PPql contributes 70.5 % of the unit variance of PP4 (organization satisfaction) and 57.9 % of the unit variance of PP5 (stakeholder satisfaction).

Table 4-21: Structural relationship b/n PPql construct

Path	Standardized Estimates	R-Square
PPql → PP3	.853	.728
PPql → PP4	.840	.705
PPql → PP5	.761	.579

Source: AMOS Version 26 Output, 2023

CHAPTER FIVE

5. SUMMARY OF FINDINGS, CONCLUSION, AND RECOMMENDATION

The purpose of this study was to determine the influence of project time management on project performance. The results of the study were presented and discussed in the previous chapter. This chapter summarizes the findings and draws conclusions. Recommendations for action are made and areas for further research are identified.

5.1. Summary of Major Findings

This research was conducted to examine the project time management practice in Rama Construction PLC. It also assesses the effect of project time management on both quantitative and qualitative project performance. To measure project time management stakeholder participation in the organization along the course of the project, communication, risk mitigation, project time management process, and procurement method practice within the organization were assessed. Hence, data collected through the questionnaire was analyzed deploying descriptive, and multivariate analysis. While the data collected through the interview was analyzed using conceptual qualitative concept approach. Finally, the researcher come up with the following key summary findings.

The first aim of the study was to assess the project time management practice in Rama construction PLC. The results indicate that the overall project time management practice was good. Findings on stakeholder participation shows that stakeholders are engaged in the project and they are notified about work performance and project changes. But stakeholders do not participate in the decision-making process that much. Findings on communication shows that the organization gives high value to project communication and encourage a two-way communications. However, most of the respondents' rate low on whether if there is an appropriate project communication approach and plan to communicate with the stakeholders. Findings on risk mitigation shows that the project team members have some role in identifying risk and they have knowledge on risk mitigation strategies. Respondents seems to disagree on whether there is a guideline (policy) on how to manage risks. Findings on project time management process reveals that Work Breakdown Structure is done for every project, and the

project schedule network diagrams are established based on the dependency between results. Also, the estimating process is based on the defined activities and the established sequence of activities. Respondents were not very confident on whether the organization provide required tools and techniques such as templates that are used for each project time management process. Findings on procurement method shows that project teams are aware of the importance of procurement management in the project and there is a procedure that is set for project teams to make a request for goods and services required. Respondents believe that regular training is not provided sufficiently to the concerned project team on procurement management. The qualitative study shows that there is a list of approved vendors.

Findings from the structural model show that effective project time management influences both set of project performance positively. The results show that project time management has positive and significant impact on quantitative project performance ($\beta = .708$, $p < .001$). The result of the SEM analysis R-square ($R^2 = .502$) indicates that 50.2 % of variance in the quantitative project performance function can be explained by project time management, while the remaining 49.8 % are explained by other variables out of this model. The finding shows that when project time management practices are implemented effectively it would increase quantitative project performance. This finding agrees with Solis & Corona-Suárez (2016) who stated that there is a statistical dependence between project time management and the project performance regarding timely completion. Hence we can also conclude our first hypothesis as H1: (There is an optimistic positive association between project time management and quantitative project performance).

The findings also shows that project time management has positive and significant impact on qualitative project performance ($\beta = .620$, $p = .002$). The result of the SEM analysis R-square ($R^2 = .385$) indicates that 38.5 % of variance in the qualitative project performance function can be explained by project time management, while the remaining 61.5 % are explained by other variables out of this model. The finding show that when project time management practices are implemented effectively it would increase qualitative project performance. This finding agrees with Dino (2022) who stated that if project time management practices are well practiced, there is a very high possibility of achieving a project that will guarantee a comprehensive business success. Hence we can also conclude our second hypothesis as H2: (There is an optimistic positive association between project time management and qualitative project performance).

The study further explains that the stakeholder participation, communication, risk mitigation strategy, time management process, and procurement practice impact project performance. Stakeholder participation is one of time management practice, and when stakeholders are involved throughout the project and are empowered to participate in the decision-making process it would increase project performance. This finding agrees with Demissie (2021) who stated that giving ample focus to project stakeholder management is important as it determines the performance of a project. Similarly, for the other measure, when there is an effective communication practice, where two-way communications is encouraged and there is an appropriate approach to communicate with stakeholders it would increase project performance. This finding agrees with Manaye (2021) who stated that in the construction industry project communication is the basic pivotal for the success of the project.

The findings also appeared to show when project team members are involved in identifying risk and they have knowledge on risk mitigation strategies and the organization have a guideline (policy) on how to manage risks it would increase project performance. This finding agrees with Pimchangthong & Boonjing (2017) who stated performance was positively influenced by risk identification and risk response planning. Likewise when regular training is provided to the concerned project team on procurement management and there is a procedure that is set for project teams to make a request for goods and services required it would also increase both set of project performance. Also when the organization provide required tools and techniques such as templates that are used for each project time management process and when the activities needed to be implemented to achieve project deliverables are identified and listed properly and Work Breakdown Structure is done for every project, and the project schedule network diagrams are established based on the dependency between results it would increase the project performance. This finding agrees with Dino (2022) who stated that there is a statistically strong relationship between time management process and project success (time, budget, goal, and stakeholder satisfaction).

5.2. Conclusion of the Study

Project time overrun is one of the major issue construction projects face in developing countries like Ethiopia, hence, time related issues in the Ethiopian construction industry are sensitive issues. Therefore, carrying out a research in this area will have a paramount importance.

A critical literature review was conducted to identify the research gaps, develop the research question and propose a research model. The review focused on project time management (ETM), and project performance (PP). It suggested that there could be a correlation among these key aspects. Research gaps exist in terms of empirical testing of the key aspects. Testing has not been conducted of relationship(s) between ETM and PP, by considering stakeholder participation, effective communication, risk mitigation, project time management process, and procurement method to measure the project time management.

Consequently, the three research questions were formed. To answer the research questions, a research model was developed. It consists of two main elements: ETM, and PP. The ETM is represented by five constructs: SP, EC, RM, TMP, RM, and PM. PP consists of two constructs: quantitative PP and qualitative PP.

Several key points have been found in the current study. The primary aim of this study was to assess the project time management practice implemented in Rama Construction PLC. The study showed that the organization has no documented policy on project time management. But the study find out that top management is committed for effective time management. The stakeholder participation, the project communication, the risk mitigation strategy, the time management process, and the procurement method practice are good. The other research aim was to evaluate the impact of the project time management on the performance of construction projects. Project time management has been demonstrated affecting project performance. Project time management affect the ability to achieve both quantitative PP (i.e., project time, and project cost) and qualitative PP (i.e., project quality, and stakeholder satisfaction) positively. These findings suggest that implementing effective project time management increase the ability to achieve the desired project performance.

Following these conclusions, project time management models should continue to be validated and challenged in the future, the results of this research showed that effective project time management is in fact advantageous to construction projects and high value should be given to it.

5.3. Recommendations of the Study

The focus of this study was mainly towards the construction sector. Successful project delivery is only possible if the project performance indicators (time, cost, and quality) are within the acceptable limit. The following recommendations are presented in concordance with the key findings:

- High value should be given to project time management meanwhile the timing and successful completion of projects can greatly improve an organization's competitive condition. As the finding of this study implies project time management has a significant positive impact on project performance. The organization should exploit this situation by making extra efforts by having a documented policy on project time management and give training to the project teams about project time management.
- Effective management of project stakeholders is key to achieve the desired project performance. Ineffective stakeholder management results in dissatisfaction with project outcomes and disruption to budget and schedule. Stakeholder management strategies should be applied to increase the effectiveness of managing different interest and dispositions. Key stakeholders should be empowered to participate in the decision-making process of the project.
- Since the project is attributed to risk and uncertainty, the organization should consider uncertainties that could affect the project schedule and also, they should have a mitigation strategy in order to deal with uncertainties if they become reality. In addition the schedule should be flexible due to construction environment is dynamic.
- The organization should provide tools and techniques such as templates that the project team can use along the course of the project to manage the project schedule. The activities of the project work should be prioritized based on their values in order to use the time efficiently and also the company should confirm the availability of required resources before estimating their duration because the fleetness of the activity is highly depended on the supply of essential resources.
- Finally, the company should properly register the lessons learned during the courses of the project. Since these documents can be analyzed to see what could impact the current project schedule and it can also serve as a document for training and development of project teams.

5.4. Research Limitation and Areas of Future Research

5.4.1. Limitation of the study

There were several limitations to this study. First, as with any similar research type, study findings could be impacted or influenced by the sample size. Also SEM requires relatively larger sample sizes. Second, as all research methods have strengths, weaknesses, and limitations (McGrath, 1981), the hypothesis testing was focused on the quantitative approach; the study may not capture all changing of social reality. As a result, current project management strategies may differ slightly from theories.

5.4.2. Suggestions for future research

There are some directions for future studies.

- Data sample size was limited to construction projects undertaken under Rama Construction PLC due to which proper analysis is still required for forthcoming studies to understand the effect of project time management on project performance in the entire industry. Future studies could adopt this framework for more organizations in the industry.
- The core focus was towards the impact of project time management on project performance only. The measurement used to assess the time management are stakeholder participation, communication, risk mitigation, time management process, and procurement method. There are many dimensions that may contribute to ETM. Other studies could explore different aspects of ETM, such as scope management and documentation of lessons learned.
- The most important thing is that only people working on the projects were interviewed for this particular research and accurate information was received from them. The research criteria should be expanded out of the box, means people working on regular task of the organization should also be contacted.
- As previously stated, the core focus was towards the impact of project time management on project performance only. Further variables can be added to these two variables, project success can be added and see the effect of project time management on project success.

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ANNEX I

QUESTIONNAIRE FOR SENIOR MANAGERS, PROJECT MANAGERS AND OFFICE ENGINEERS.

Abenezer Abadi

Email- abenezerabel@gmail.com

Addis Ababa

Dear respondents,

I am attending a post graduate program in Project Management at Addis Ababa University School of Commerce (AAUSC). As partial fulfillment for the degree, I am conducting a research study on “Factors affecting project performance” specifically on project time management. I would appreciate it if you could spare a few minutes of your time to answer the following questions regarding how the Project time management practice affect project performance.

To meet the study's goal, I respectfully urge that you answer all of the questions in the questionnaire. Any information you supply will be treated with the strictest confidentiality and used solely for academic purposes. It is not necessary to write your name. And, though you are free to stop at any time if you are uncomfortable, your contribution to the study is extremely valuable.

Thank you for your cooperation in advance!

Abenezer Abadi

Addis Ababa University

INSTRUCTION:

i. Please do not write your name on the questionnaire.

ii. Please read each question carefully.

iii. Kindly answer all the questions by ticking or filling in the spaces provided.

SECTION ONE: BACKGROUND INFORMATION

1. Sex: Male ☐ Female ☐

2. Age:

   i. 21- 30 years ☐ iii. 41 – 50years ☐

   ii. 31-40 years ☐ iv. Over 51 years ☐

3. Level of Education

   i. Certificate ☐ iii. Bachelor Degree ☐ v. Above ☐

   ii. Diploma ☐ iv. M.Sc./MA ☐

4. Work Experience in the organization

   i. 0 - 5 years ☐ iii. 10 – 15 years ☐

   ii. 5 – 10 years ☐ iv. Above 15 years ☐

5. What is/was your role in the Organization?

   i. Senior Manager ☐ iii. Construction/office Engineer ☐

   ii. Project Manager ☐ Other _____

6. Position held in the Organization: _____

SECTION TWO: PROJECT TIME MANAGEMENT PRACTICE SYSTEM IN THE ORGANISATION

Please indicate the level of Effective time management practice in your company, and use" Tick (" where you agree on a point scale 1= Strongly Disagree, 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree)

A. Stakeholders Participation

How would you rate the stakeholder participation on projects in your organization in the following areas? Please Tick

Stakeholder participation (SP)		1	2	3	4	5
SP1	Internal and external stakeholders of the project are engaged throughout the project (identification, planning, implementation, monitoring & evaluation, and closure).					
SP2	Stakeholders are notified about work performance and project changes, and are jointly involved in plan revisions.					
SP3	Feedback mechanisms (to improve performance) are adequate and appropriate.					
SP4	Key stakeholders are empowered to participate in the decision-making process.					

B. Effective Communication

How would you rate your organization's project-related communication practices? Please Tick

Effective communication		1	2	3	4	5
EC1	High value is given for project communication management in the organization.					
EC2	The organization has project communication management plan and the plan reviewed regularly, and adjusted if needed.					
EC3	The organization developed appropriate project communication approaches and plans to communicate with its stakeholders.					
EC4	The organization encourage two way communications (feedback from the receiver to the sender).					
EC5	On-going communication between project proponents (project champion or someone who advocate/ speaks in favor of the project) and its stakeholders are practiced in the organization.					

EC6	Project manager and stakeholders (Engineers, Foreman and others) communicate throughout the project.					

C. Development of Risk Mitigation Plan

How would you rate your organization's risk management practice? Please Tick

Development of risk mitigation plan (RM)		1	2	3	4	5
RM1	There is a policy or guideline that recommends how to manage unexpected uncertainties.					
RM2	The project team have regular meetings focused on risks.					
RM3	All team members within the project play a role in identifying risk.					
RM4	All team members have knowledge on risk mitigation strategies.					
RM5	Risks that occur within the project are controlled in a way that goes with the goal and objective of the project.					

D. Project time management process

How would you rate the project time management process in your organization in the following areas? Please Tick

Knowledge of project time management process (TPM)		1	2	3	4	5
TMP1	The organization provide required Tools and techniques (eg. templates) that are used for each project time management processes.					
TMP2	The activities needed to be implemented to achieve project deliverables are identified and listed properly (WBS is developed).					
TMP3	Project-Schedule-Network-Diagrams are established based on the dependency between the activities.					
TMP4	The estimating process is based on defined activities and established sequence of activities.					
TMP5	The schedule captures the relationship between activities that shows how activities fit together and how things may change.					

TMP6	Performance report is made for every activity as per the schedule and appropriate corrective actions have been taken for every variance between actual and planned schedule.					

E. Procurement Method

How would you rate the project procurement method practice implemented in your organization? Please Tick

Procurement method (PM)		1	2	3	4	5
PM1	Project teams are aware of the importance of procurement management in the project.					
PM2	Regular training is provided to the concerned project team on procurement management.					
PM3	There are documented policies and procedures on procurement management.					
PM4	There is a standardized (formal) procurement management process in place.					
PM5	There is a procedure that is set for project teams to make a request for goods and services required					

F. Project Performance

How would you rate the organization's project performance in the following areas? Please tick (1=Very Low, 2=Low, 3=Moderate Contribution, 4=High, and 5=Very High)

Quantitative Project performance (PPqn)		1	2	3	4	5
PP1	Extent to which the project was delivered on schedule					
PP2	Extent to which the project was delivered on budget					

Qualitative Project performance (PPql)		1	2	3	4	5
PP3	Extent to which the project's quality objectives were met					
PP4	Extent to which your organization achieved its desired project outcomes					
PP5	Extent to which project stakeholders achieved their desired project outcomes.					

ANNEX II

INTERVIEW QUESTIONS FOR SENIOR MANAGERS

1. Please describe the nature and types of projects handled by the organization.
2. How does the practice of project time management in RAMA construction look like?
3. Does Rama have a project time management policy?
4. What are the software's used in the project time management process (activity definition, activity sequencing, activity resource estimation, activity duration estimation, schedule development and schedule control)?
5. How do you describe project time management from project performance perspective?
6. How do you describe the top management commitment for effective time management?
7. Please give me a detail explanation on the barriers of effective time management.
8. What procurement strategy is practiced in the organization? And what influence that decisions?
9. How do you manage risks (cost escalation, delay in payment/ claims, scope change and schedule change) in the view of time management?
10. What does stakeholder participation practice in the organization look like? Do you allow key stakeholders participate in decision making?
11. Are there any other issues concerning project time management that have not been covered in the interview and that you wish to bring to our attention?