ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

FACTORS AFFECTING THE PERFORMANCE OF CONSTRUCTION PROJECTS: A CASE OF TNELA CONSTRUCTION PLC

Prepared By: Abas Ayoub Abdi

Advisor: Dr. Abdurazak Mohammed

A project work submitted to the school of graduate studies of Addis Ababa University in partial fulfillment of the requirement for the Degree of Master of Arts in Project management

June, 2021
Addis Ababa, Ethiopia

Addis Ababa University

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

DEPARTMENT OF PROJECT MANAGEMENT

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DECLARATION

This is to approve that this research report is my original work, prepared under the guidance of Dr. Abdurazak Mohammed (PHD.). The researcher further confirm that the research has not been submitted either in part or in full to any other higher learning institution for the purpose of receiving any degree. And has not been presented for a degree or any award in any other university.

Abas Ayoub Abdi

Date June, 2021

Signature _____

Addis Ababa University, College of commerce

Addis Ababa, Ethiopia

LETTER OF CERTIFICATION

This is to confirm that the project work entitled **"Factors Affecting Performance Of Construction Projects In Case Of Tnela Construction PLC**" is completed under my supervision and direction by Abas Ayoub Abdi. This work is original and, I believe it is appropriate for submission as part of the requirements for the award of a Master of Arts Degree in Project Management.

Advisor: Dr. Abdurazak Mohammed (PHD)

Date: _____

Signature: _____

Addis Ababa University, College of commerce

Addis Ababa, Ethiopia

Approval by Examining Board

Members of board of examiners approve that this research project titled, **"Factors Affecting Performance Of Construction Projects In Case Of Tnela Construction PLC**" undertaken by Abas Ayoub Abdi and it fulfils the requirements for the Degree of Master of Arts in Project Management and is acceptable with regards to the standards and regulations of the University.

Approved by:

_____	_____
Advisor	**Signature**
_____	_____
Internal Examiner	**Signature**
_____	_____
External Examiner	**Signature**

DEDICATION

This research is dedicated to all the people who inspired, supported and encouraged me. Special thanks go to my dear Mother Shukria Mohammed for her inexhaustible support and encouragement throughout my studies and life because she is my motivation behind all of this.

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First of all I want to sincerely thank the almighty ALLAH lord of the world, the most gracious and most merciful for the gift of life, health and strength to complete this research. These acknowledgements also attempt to thank people who in some way supported, guided and encouraged me along the way to completing this research.

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Abbreviations and Acronyms

CPM: - Critical path method

GDP: - Gross Domestic Product

GTP: - Growth and Transformation Plan

KPI: - Key performance indicators

NBE: - National Bank of Ethiopia

PLC: - Private Limited Company

PWC: - Price Water-house Coopers

SSA: - Social Science Association

UK: - United Kingdom

WBS: - Work Breakdown Structure

Abstract

To complete a given project successfully, the project must be completed at expected time, with expected cost and desired quality too. Unfortunately, some projects may not meet the desired performance parameters. Construction projects are among those that fail to attain the desired schedules, cost speculations and anticipated quality too. This study was done with the intention to identifying factors affecting construction projects in Addis Ababa in a case of Tnela Construction PLC. To identify those factors, quantitative research design was employed and data were collected from 41 target sample respondents from a population of 273 employees of the company using questionnaire. To analyze the data, descriptive analysis like frequencies, percentages, charts, bars and tables were used and analysis was conducted using SPSS version 26. This study has mainly analyzed the environmental factors, time performance factors, cost performance factors and quality performance factors of the projects. Finally this study recommends the company to have the practice of immediate decision making practice regarding the purchase of materials needed, to make materials available the company should also hold stock for the necessary materials needed like reinforcing bars, sheet metals, wire rods… etc. for Environmental factors, Regarding time performance of the project, the company should hire experienced personnel, by implementing clear goal through focusing on effective site management and monitoring. Concerning the cost performance factors of the organization, the company should focus on management of wastes and at the same time it should also make sure that there are sufficient availability of resources. Finally, on the issue of quality performance of the construction project, it was recommended that effective monitoring and recommendation on project's performance by project participant is critical to encourage integrity and trust among members and it is also better to have quality assurance system backed by manager's willingness to improve quality.

Key Words*:* Environmental factors, time, cost, quality.

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CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

Projects are most often unique endeavors that have not been attempted before and might never be attempted again. Projects have specific start and end dates. In some cases, the design of certain projects can be somewhat similar or equivalent, and they may be repetitive, but those are the exceptions rather than the rule. (Kerzener, 2010). A project is a set of similar activities that, when completed in the correct order, result in the project's completion. They are temporary, usually culminating in the development of a concrete object or effect, which is a collection of interconnected projects that can be replicated or continually to sustain an ongoing operation.

A construction project, sometimes just referred to as a 'project', is the organized process of constructing, renovating, refurbishing, etc. of a building, structure or infrastructure. Construction is an act or a process of constructing. It consists of a series of actions to produce either a new set of buildings and infrastructure or may involve alterations in the existing buildings and infrastructure (Radosavljevic and Bennett 2012). A construction project is a piece of work that is being attempted or completed in the construction industry. If it's a shopping mall or a single-family home, construction ventures are extremely structured endeavors. They have a lot of moving pieces and staff that need to be organized perfectly. The project phase usually begins with a broad prerequisite that is carefully thought out into a brief, feasibility studies, alternative studies, planning, funding, and construction. Construction project management, like any other project, has stages, from architecture to preparation to scheduling to the actual construction. Any of these steps is difficult enough on its own, but when combined with the rest of the project, they become significantly more difficult.

Construction projects are typically characterized by large investment, long-time duration, and numerous stakeholders (Taietal, 2009). According to Navon (2005) construction industry has complexity in its nature because it contains large number of parties such as clients, contractors, consultants, stakeholders and regulators. For instance contractors are one of the most crucial players in the market and the creators of the finished product, so any industry growth and innovation programs must identify ways to increase their flexibility and capabilities.

Project performance can be measured and evaluated using a large number of performance indicators that could be related to various dimensions (groups) such as time cost, quality, client satisfaction, client changes, business performance, health and safety (Detr 2000; Cheung et al. 2004; Enshassi et al. 2009). Time, cost, and quality, also known as the "iron triangle," are the three most important performance assessment dimensions in the building industry. However on the contrary Garbharran et al. (2013) states that an assumption is made that if a project is completed on time, within the agreed budget and set quality, also referred to as the 'golden/ iron triangle', then the project is deemed successful. Evidence indicates that this is not the case. Hence, the construction industry needs to pay attention to critical success factors, besides the golden/iron triangle (Toor and Ogunlana 2005; Garbharran et al. 2013).

Ogunsanmi (2013) states that KPI (key performance indicators) can also be referred to as key success indicators, measuring a project's success is more than making sure it's completed. Traditionally, success is defined as the degree to which project goals and expectations are met (Elattar, 2009; Garbharran et al. 2013). It can be seen from a range of angles, including scientific, economical, educational, social, and professional concerns, as well as the goals of individuals. Evidently, determining project effectiveness is a difficult challenge because success is elusive and difficult to define. In the building industry, where multiple people are concerned, such as the customer, the builder, the contractor, and various surveyors and engineers, such a pattern often occurs. Each project participant will have his or her own view of success. Out of the commonly used project performance criteria the quality compliance has come second next to schedule compliance (Jha, 2004). In the short term, reduced quality can result in lost production, increased expenses for rework and repair, re-inspection, and retesting. Bad quality may damage a company's image over time, and if it persists in this manner, it will be forced to close its doors due to a lack of new ventures. One of the considerations that make up the project completion criterion is KPI. Swan and Kyng (2005) view KPI as the measure of a process that is critical to the success of an organization and/or project. According to a publication by Price Water-house Coopers (PWC), KPI means actors by reference to which the development, performance or position of the business of the company can be measured effectively. Thoor and Ogunlana (2010), together with Humaidi and Said (2011), suggested that KPIs may be used to assess real and anticipated project results in terms of productivity, production, and workmanship and product consistency.

Regardless of the planned contributions, construction projects in Addis Ababa face many obstacles, including good governance delays and corruption; contractor and consultant capability issues; a loss of teamwork and professional competence; and a lack of benchmarking practice from either the media's involvement, resource-related factors and the nature of the industry and industry's vision for its own development, respectively. Due to the above challenges, construction projects performance problem appears in many aspects in the projects which compromises their performance in time, cost and quality.

Therefore, this study is intended to identify factors affecting the performance of construction projects in case of Tnela Construction PLC.

1.2. Background of the company

Tnela construction PLC is an emerging construction company in Ethiopia which is established in 2014 in capital of Ethiopia i.e. Addis Ababa as a share company. The company is level 5 Construction Company which is engaged in constructing buildings to private clients and public authorities. The company also provides its engineering service to private companies and others who are in need of constructing buildings.

To maintain its strong market position, the company is committed to providing quality work and completing its projects on time by hiring qualified professionals. The Company has completed more than eight projects in the last seven years and currently, it is under taking the construction of more than thirteen projects including Real state.

1. **Vision: -**
   In line with the government policy on national developments, the company's vision is to be successful and establish enlightened contractor supported by committed management, skilled professional & modern technologies participating in construction industry internationally within provision of high quality, safe and sound construction products/services that fulfill the requirements and satisfaction of customers.
2. **Mission: -**

   To provide systematic and organized construction services in every aspect of quality and excellence and timely completion to the satisfaction of client's needs supported by our versatile leadership, skilled & committed team work incorporating latest technologies approach and innovative engineering solutions.

3. **Core values: -**
   - ***Excellence*** *– we constantly pursue excellence through hard working and teamwork, customer satisfaction, innovation and prudent resource management.*
   - ***Integrity*** *– we will conduct our work with integrity, honestly and fairness. We will also meet the highest ethical and professional standards.*
   - ***Respects*** *– we respect the worth, quality, diversity, and importance in each person with legal entity, who works with or is served by.*
   - ***Responsibility*** *– we take responsibility for our action and hold our services accountable for the results and outcomes.*
   - ***Trust*** *– we strive to be reliable in the construction industry and build trust and confidence in our ability to anticipate and respond to the client needs and to what the contract urges on.*

1.3. Statement of the problem

There are quite a lot of reasons for the achievement or failure of a project. Atkinson et al (2007) reveals that client's will be not satisfied if the end product fails to meet their price, quality, time frame, functionality and delivery performance standard. For this reason, contractors and providers might not always agree to provide the appropriate goods and services to customers or any business that does not provide them with a fair return on their time and capital expenditure. Consequently, end-users would be dissatisfied if the actual outcome doesn't really fulfill their success expectations in terms of time, cost, and quality. In order to guarantee ongoing collaboration and cooperation in a development project, effective partners' output must be assessed and monitored. The construction industry, unlike many other sectors, has the potential to make a greater effect with its final goods. It is understood that maximizing success factors while minimizing failure factors can ensure that the construction sector achieves its efficiency objectives.

There are several internal reasons known as causes of bad success in the building industry, such as having an unknown target, which leads to coordination difficulties, scope shift or creeping, which leads to budget dings, as well as having the wrong team or unskilled team, and eventually, poor communication, which leads to project failure. Rwelamina & Savile (1994) identified a lack of management expertise and worker participation, and Tam &Harris (1996) added equipment and quality management of the team as a major cause. Atkinson (1999), Love & Li (2000), and Odeh & Battaineh (2002) further identified human error, inadequate workmanship, and contractual arrangements are all significant causes of performance errors, with the impact of partnership management on project performance in construction being highlighted. These studies are conducted in the case of business projects and they fail to include all the key performance indicators.

Unlike these business construction projects, include different stakeholders such as micro and small enterprises, inexperienced contractors and consultants and clients that are not an end-user. According to Enshassi, *et al.*, (2009) in developing countries like Ethiopia, poor productivity was seen as a major concern in the construction industry.

Performance of building projects are concern of employers, contractors and consultants and even end-users. It is also important to pay proper attention to different factors that have been affecting high performance of construction projects for improved and increased efficiency.

Hiwot (2012) states that poor quality construction due to poor performance, cost overrun and time delay are the main distinctiveness of most of construction projects in Ethiopia and further indicated that construction quality defects are observed in completed housing unit's buildings in Addis Ababa which are subject to unpredicted maintenance costs and economical issue at large. According to (Yimam, 2011) construction industry plays a major role in Ethiopia and also in other developing countries but there is poor level of performance of the industry in those countries, improving the performance of the industry needs to be a priority action.

There are several factors that contributed to the above issues. Some of the issues include a lack of shared priorities and expectations between the head office and the project's workers, a lack of cash flow, a shortage of foreign currency that caused the importation of supplies to be delayed, and so on. These and other problems that are not mentioned originated from lack of clear success factors for the performance of projects.

Construction projects are often affected by performance metrics that can assist project parties in achieving their desired targets more quickly. The present thesis is inspired by these research holes. As a result, this research is useful in identifying several success drivers that affect project success as well as determining the factors that contribute significantly to project success in the corporation's programs.

Therefore, this study is intended to identify factors affecting performance of construction projects in the case of Tnela construction PLC in Addis Ababa by including all key performance indicators and by using adequate sample.

1.4. Research questions

Since the study is intended to assess factors affecting performance of the construction project in a case of Tnela construction PLC, the research raised the following research questions.

- What are Environmental challenges related to construction projects in a case of Tnela construction plc?
- What are the project characteristics that affect the time performance of construction projects in the case of Tnela construction plc?
- What are the cost performance factors influencing on construction projects in the case of Tnela construction plc?
- How project management actions that affect quality performance factors of construction projects in the case of Tnela construction plc?

1.5. Objectives of the study

1.5.1 General objective

General objective of this study is to identify factors affecting the performance of construction projects in the case of Tnela construction plc.

1.5.2 Specific objectives

To meet the general objective, the study focuses on the following specific objectives:-

- To discover Environmental challenges that affects the performance of construction projects in the case of Tnela construction plc.
- To identify the project characteristics that affect the time performance of construction projects in the case of Tnela construction plc.
- To analyze the cost performance factors influencing on the construction projects in the case of Tnela construction plc; and finally
- To determine the effect of project management action on the quality performance of construction projects in the case of Tnela construction plc.

1.6. Scope of the study

The study is bounded to examining the performance challenges regarding Tnela construction plc. Because construction projects face so many challenges that require particular consideration, this study focus solely on the three most common performance review dimensions in the construction industry: project cost, project schedule, and project quality.

The study is concentrated on only five project sites in Addis Ababa, the country's capital, that are currently under construction .i.e. Kality/Kilinto, Bole Sub-city (Megenagna), Atobis Tera (Sebategna), Kera around Pepsi and Meskel Flower project sites. Despite the number of data collection instruments, questionnaire is used to cover the sample. Contractors, architects, and consultants are the main respondents in this study.

1.7. Significance of the study

Since the inspiration to conduct the research on factors affecting performance of the construction project in a case of Tnela construction plc is to assess the current situation of the company practices and identify the problem if there.

This study is significant for the following reasons:

- It helps the company to check and evaluate its project management methodologies.
- To understand factors affecting the performance of the company.
- Since this study will address the main reasons of challenges affecting performance of the company, it will enable the company to perform better.
- This study helps also to identify external factors affecting performance of the company.
- The findings of the study will also contribute to other organizations know the importance of project management practices in construction projects and help researchers, planners as an input for further investigation.
- Finally, the study is helpful to that organization other researchers for conducting further research.

1.8. Limitations of the study

Since this study is conducted with an intention to identify factors affecting performance of construction projects the case of Tnela Construction PLC in Addis Ababa, it utilized only construction projects in Addis Ababa the capitol of Ethiopia. Even though different construction projects are constructed in the city, this study will focus only 5 projects that are currently under-construction (i.e. Kality/Kilinto, Bole Sub-city (Megenagna), Atobis Tera (Sebategna), Kera around Pepsi and Meskel Flower project sites) to easily access the targeted respondents.

1.9. Definition of terms

Project: - is a temporary endeavor that is needed to produce a unique outcome or result at a pre-specified time using predetermined resources Megh Bahadur KC (2020).

***Project scheduling*: -** a method for improving the allocation of materials and resources within a project in order to reduce or eliminate waste by improving coordination with all parties involved.

Project management: - is concerned with the life cycle of the project through planning and controlling the project from inception to completion Roberts and Wallace (2004).

Construction project management: - the direction, regulation, and supervision of a project from early development to completion. Walker explained it as "The preparation, coordination, and control of a project on behalf of a client from inception to completion, requiring the recognition of the client's goals in terms of utility, purpose, efficiency, time, and cost, and the establishing of resource interactions, the integration, tracking, and management of project participants and their performance, and the evaluation and selection of alternatives in the pursuit of the client's satisfaction with the project outcome".

Analysis of the project: - is the clarification of the different objectives and limitations for the upcoming project.

Estimation of the budget: - Organizing the spending and adhering to a strict schedule.

Monitoring of the cost: - is keeping an eye on project costs as soon as possible to detect any potential misuses of resources before it's too late.

Performance:- is an act of staging or presenting a play, concert, or other form of entertainment. It is also defined as the action or process of carrying out or accomplishing an action, task, or function. Performance of the construction industry is considered as a source of concern to both public and private sector clients Okuwoga (1998).

Key performance indicators (KPI): - are factors such as **time**, **cost**, **quality**, client satisfaction, client changes, business performance and safety in order to enable measurement of project and organizational performance throughout the construction industry. It allows for a study of various programs and businesses to recognize the presence of specific trends.

Performance measurement: - is a comparison between the desired and the actual performances Navon (2005). It is the process of quantifying the efficiency and effectiveness of actions. For a performance measurement system to be regarded as a useful management process, it should act as a mechanism that enables assessment to be made, provides useful information and detects problems, allowing judgment against certain predetermined criteria to be performed (Neely, 2005;basheka & Tumutegyereize, 2011:3766).

Project success: - is the completion of a project within acceptable time, cost and quality and achieving client's satisfaction Pheng and Chuan (2006). The project's progress can be measured by how well the project's metrics or project performance indicators do.

Project environments: -External and internal effects on the development process are similar to physical, technological, socio-political, and industrial affairs, and they operate at a national or local level, as well as in the public and private sectors in various ways.

1.10. Organization of the study

This report is organized in five chapters.

- Chapter one is the introduction which includes the background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, delimitations of the study, basic assumptions and the definition of significant terms.
- Chapter two of the study consists of the literature review with information from other articles which are relevant to the researcher.
- The approach or methodology to be used in the study is covered in Chapter three.
- Chapter four discusses data analysis, presentation and interpretation.
- Chapter five consists of summary of findings, discussions, conclusions and recommendations.

CHAPTER TWO

Review of related literature

2. Introduction

A literature review: - is a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners.

This chapter presents about the review of related literatures in the study area is differentiated by three subsections: theoretical review, empirical review and conceptual framework. Theoretical views about factors affecting performance of projects are reviewed from different books and websites.

2.1. Theoretical review

2.1.1. Project

According to Megh Bahadur KC (2020) project is a temporary endeavor that is needed to produce a unique outcome or result at a pre-specified time using predetermined resources. A project is a distinct collection of planned activities with distinct beginning and ending points that are performed by a person or agency to achieve particular goals under specified time, budget, and performance parameters. Projects may be conducted to increase income, such as implementing strategies for improving cash flow, or they may be infrastructure projects that necessitate extra investment and resources to change the organization's capital base.

It must meet three fundamental criteria:

- The project must be completed on **time**;
- The project must be accomplished within the budgeted **cost**;
- The project must meet the prescribed **quality** requirements.

The well-known project triangle will graphically reflect these conditions. Few organizations like to use the term "efficiency" instead of "quality," but the idea remains the same: the project's operating criteria must be met.

Figure 1 Project triangle

Time-bound project: - a scoreboard for a prestigious tennis tournament must be finished in time for the opening match, even if it costs more than anticipated and the display of some secondary information, such as the speed of the service, has to be abandoned. To put it another way, expense and success will have to be lost in order to reach the tournament's unchangeable start date. (In fact, the higher cost can be negotiated more, and the momentarily postponed show may normally be inserted later during non-playing hours.)

Cost-bound project: - a local authority housing development will have to reduce the number of housing units and even extend the initial construction schedule, but the project expense cannot be exceeded, since the housing grant allotted by the central government for this form of building has been capped at a set amount. Instead of decreasing the number of units, another approach to this issue would be to minimize the specification of the internal fittings.

Performance (quality)-bound project: - an armaments manufacturer has been contracted to design and manufacture a new type of rocket launcher to meet the client's performance specification in terms of range, accuracy and rate of fire. Even if the delivery has to be delayed to carry out more tests and the cost has increased, the specification must be met. Again if the weapons were required during a war, the specification might be relaxed to get the equipment into the field as quickly as possible.

The construction sector is the world's largest industry. It's more like a service industry than a production one. Growth in this industry is, in fact, a leading indicator of a country's economic health. This is due to the fact that the building industry employs a large number of people. While the manufacturing sector produces high-quality goods, delivers services on schedule, charges a fair price, and has low failure rates, the construction sector is the complete opposite.

In general, the construction industry is more challenging than other industries due to: its unique nature; every project is one-of a kind; many conflicting parties are involved; projects are constrained by time, money and quality; and high risk.

2.1.2. Characteristics of a project

Projects are unique in nature: - They don't entail any cycles that are repeated over and over again. Every initiative is distinct from the last, while organizational operations often entail repeating (the same) procedures.

Have a defined timescale: - Projects have a specific start and completion date on which the deliverables must be completed in order to satisfy a customer demand.

Have an approved budget: - Projects are given a budgetary limit under which they must complete their deliverables in order to satisfy a specific client demand.

Have limited resources: -A predetermined amount of labor, machinery, and supplies is assigned to a project at the beginning.

I*nvolve an element of risk*: -Projects are inherently unpredictable, and therefore pose a business risk.

A*chieve beneficial change*: -Typically, the aim of a project is to boost an organization by implementing business transformation.

2.1.3. Project management processes

Regardless of its unique features, every project follows a typical life cycle. This arrangement can be broken down into four stages:

- **Project initiation**

The goal and feasibility of the project are decided during the first process. This is a critical step in the process and it will determine whether or not the project is a good fit. A feasibility review is undertaken if necessary, and a proposed solution/plan is released based on the findings.

A project initiation document is prepared after everything has been determined. One of the most important artifacts of project management is the project initiation guide, which lays the foundations for the building schedule.

- **Planning phase**

At the project planning stage, the team identifies all of the tasks that must be completed. It's still going on, and we're getting around to the end of the project. During the preparation process, the most important considerations are the project's timeline, budget, and finances. The team is designing the approach that must be pursued based on those conditions.

Scope management is another term for this. A work breakdown structure (WBS), a checklist that separates all necessary work into smaller, more manageable groups, is another essential document that must be prepared (you can do that in our construction scheduling software).

The project is almost ready to start once the budget, timeline, and scope of work have been established. Risk assessment is the next step in this crucial phase. The team can now look at all of the project's future challenges and come up with solid ideas. Finally, a communication plan is, also, necessary as it will establish an efficient information flow between the project stakeholders.

- **Execution phase**

In the execution phase, the construction project management plan is put to work. As a rule, this step is usually split into two processes: executing and monitoring (controlling). The project team ensures that all of the necessary activities are completed. At the same time, progress is being monitored and adjustments are being made as required.

In general, a project manager spends the majority of his time monitoring, and then redirecting activities and maintaining project control based on the input he receives.

- **Closing phase (closure)**

The project's official completion is represented by the final stage. The project manager is taking note of what went right and pointing out any possible mistakes. Finally, the team prepares a project summary, estimates the final budget, and provides updates about any projects that are yet to be completed.

The project study, along with the review of possible failures, would provide useful recommendations for future construction projects.

Figure 2 project management process

2.1.4. Project scheduling

Many risks which can arise during a construction projects can be avoided with reliable scheduling. The primary aim of scheduling is to optimize a project's material and resource distribution. Any future delays can be eliminated in this manner, and improved coordination with both sides can be assured.

A project manager can choose from a variety of scheduling methods, including the following:

I. **Gantt charts**: is one of the most useful tools a project team can have at its hands. A Gantt chart will provide you with a high-level view of a development project and alert you to projects that have been missed or are not being finished on schedule.
II. **Line of balance scheduling**: is a very helpful tool for routine tasks. It can be of great assistance in terms of attaining deadlines and properly allocating funds.
III. **Critical path method**: is one of the most widely used scheduling programs, and it aids in the efficient allocation of resources and the precise estimation of schedules. In a nutshell, a critical route approach will help you finish your construction project sooner, or at least on schedule.
IV. **Q-scheduling**: This construction scheduling approach is becoming increasingly popular in recent years, as it helps project managers to prioritize many, often overlapping tasks.

2.1.5. Construction project management

Project management is the basis on which every construction project is founded. Roberts and Wallace (2004), state that project management is concerned with the life cycle of the project: planning and controlling the project from inception to completion.

Construction project management could be defined as the direction, regulation, and supervision of a project from early development to completion. Walker defined it as "the planning, co-ordination and control of a project from conception to completion on behalf of a client requiring the identification of the client's objectives in terms of utility, function, quality, time and cost, and the establishment of relationships between resources, integrating, monitoring and controlling the contributors to the project and their output, and evaluating and selecting alternatives in pursuit of the client's satisfaction with the project outcome". The ultimate goal of construction project management is the full satisfaction of the client's demands for a viable project both in terms of functionality and budget. There is a wide range of construction project types, such as commercial, residential, industrial and heavy civil.

2.1.6. Major types of construction projects

The wide range of built facilities can be divided into four main divisions, each with its own set of characteristics.

A. **Residential housing construction**: - includes houses and high-rise apartments. Residential housing designs are usually performed by architects and engineers, and the construction executed by builders who hire subcontractors for the structural, mechanical, electrical and other specialty work.
B. **Institutional and commercial building construction**: - encompasses a great variety of project types and sizes, such as schools and universities, medical centers and hospitals, sports facilities, shopping centers, warehouses and light manufacturing plants, and skyscrapers and hotels. Owners of such buildings may or may not be familiar with construction business standards, but they are normally capable of selecting qualified technical consultants and arranging funding for the construction facilities themselves.
C. **Specialized industrial construction**: -usually involves very large scale projects with a high degree of technological complexity, such as oil refineries, steel mills, chemical processing plants and coal-fired or nuclear power plants. Here the owners are normally heavily interested in the construction of a project and tend to cooperate with designers and builders in order to reduce the project's overall completion period.
D. **Infrastructure and heavy construction**: - includes projects such as Dams, roads, tunnels, bridges, pipelines, irrigation facilities, and water treatment plants as examples of the projects. The majority of these schemes are government-owned and thus funded by bonds or taxation.

Project management is critical to the continuity of the whole procedure and construction programs need constant changes. In order to maneuver through the project and create a cohesive relationship with the various departments, a construction project manager must acquire a range of skills and competencies.

According to the National Bank of Ethiopia (NBE), construction accounts for half of all the nation's industry. Data from the NBE also suggests that during 2013/14 the building sector grew 37%. Industrial activity accounted for 15% of Ethiopia's total output. Using these status, it can be seen that construction accounted for 7.5% of Ethiopia's total GDP during this period. According to African economic outlook, this equates to 9.4% of total output at current prices. This would give the construction industry a market value of around $6 billion. The government has outlined other strategic goals related to development of the construction industry. As explained in GTP ii, the government is planning to:

- Reduce the cost of projects by increasing the capacity, efficiency and effectiveness of contractors.
- Implement Kaizen and construction project management system tools: - Kaizen is a Japanese business philosophy of continuous improvement of working practices, personal efficiency and so on.

These strategic directions are designed to foster a competitive construction industry in Ethiopia. Project management itself offers scope for international contractors to enter the Ethiopian market.

The most important activities of construction project management could be summarized as follows:

- Specification of the project goals and the plans including drawing of scope, scheduling, budgeting, deciding upon achievement requisites and choosing project participants.
- Boost of the resource effectiveness through the acquisition of the workforce and of the necessary equipment.
- Conduction of numerous operations through legitimate coordination and management of contracting, planning, estimating, design, and construction during the whole procedure.
- Efficient development of solid communication between the agents for resolving any conflicts that may arise.

2.1.7. The role of a construction project manager

A construction project manager is responsible for planning, coordinating, budgeting and supervising projects from the beginning to the end.

In short, a construction project manager has to take care of the following:

- Put together the budget and negotiate cost estimates.
- Arrange the work timetables.
- Choose the most efficient construction method and strategies.
- Stay in touch with the clients for work or budget-related issues.
- Discuss technical and contract details with workers and other professional parties.
- Keep an eye on the personnel in construction onsite.
- Cooperate with building and construction specialists.

2.1.8. Budget in construction project management

When you are putting together a construction project, one of the most important parameters to remember is the budget. Cost calculation can be a complex process, but when performed properly, it can be one of the keys to performance. As a rule, there are four basic parameters that a project manager should keep in mind:

- **Analysis of the project**: Clarification of the various goals and constraints for the forthcoming project is the first step that must be taken. If you've done so, you'll have a great sense of what you want to do and who you'll need to help you get there.
- **Estimation of the budget**: Once you've organized all of your project's goals, it's time to plan your budget and create a solid timetable. It's also a good time to obtain offers from contractors that are involved.
- **Monitoring of the cost**: It's important to start keeping track of project expenses as soon as the building project is up and running. The quicker you begin, the better, because you will be able to spot any possible resource usage until it is too late.
- **Accounting**: It is important to have a well-trained accounting staff. They will be responsible for ensuring that all financial agreements are carried out according to schedule in cooperation with the project team.

2.1.9. Performance management in construction projects

A play, concert, or other type of entertainment is staged or presented as a performance. It may also be defined as the act or method of performing or completing a task, action, or function.

Borman and Motowidlo (1993) distinguish between task and contextual performance. Performance of a project can be considered as a result of the processes as well as the presence of processes.

There is a strong relation between project management and project performance. Okuwoga (1998) stated that the performance of the construction industry is considered as a source of concern to both public and private sector clients. Karim and Marosszeky (1999) studied performance measurement using key performance indicators (KPI). KPI enable a comparison between different projects and enterprises to identify the existence of particular patterns.

Key performance indicators (KPI) include factors such as time, cost, quality, client satisfaction, client changes, business performance and safety in order to enable measurement of project and organizational performance throughout the construction industry.

Management in construction industry is considered as one of the most important factors affecting performance of works. Brown and Adams (2000) studied a new approach to the measurement of the effect of building project management (bpm) on time, cost and quality outputs using 15 `cases' derived from UK data. The evaluation undertaken demonstrates that bpm as it is presently implemented in the UK fails to perform as expected in relation to the three predominant performance evaluation criteria; time, cost and quality.

Samson and Lema (2002) stated that KPI are very important in order to deliver value to stakeholders. So, companies must be sure they have right processes and capabilities in place. The

KPI also allow to trace which processes and capabilities must be competitively and distinctive, and which merely need to be improved or maintained.

Navon (2005) defined performance measurement as a comparison between the desired and the actual performances. Ugwu and Haupt (2007) classified the key performance indicators as site-specific and project-specific.

2.1.10. Measurement of project performance

Al-Momani (2000) stated that the success of any project is related to two important features, which are service quality in construction delivered by contractors and the project owner's expectations. Managing the construction so that all the participants perceive equity of benefits can be crucial to project success.

Performance measurement is the process of quantifying the efficiency and effectiveness of actions. For a performance measurement system to be regarded as a useful management process, it should act as a mechanism that enables assessment to be made, provides useful information and detects problems, allowing judgment against certain predetermined criteria to be performed (Neely, 2005;basheka & Tumutegyereize, 2011:3766).

It is discovered that a total lack of focus on the happiness of the owner leads to bad results. Weak output is also caused by declining market shares, low production and competitiveness, and the rapid rise in construction costs.

KPI are one of the factors that constitute the project success criteria. Swan and Kyng (2004:11) view KPI as the measure of a process that is critical to the success of an organization and/or project.

Pheng and Chuan (2006) defined project success as the completion of a project within acceptable time, cost and quality and achieving client's satisfaction. Project success can be achieved through the good performance of indicators of the project. So, success refers to project success and performance refers to performance of indicators such as project managers.

To summarize shortly:-

Project management is the science and art of planning, organizing, and managing resources to accomplish clear mission priorities and targets to the best of one's ability. Project management is a lengthy process that necessitates the participation of multiple people as well as an effective plan; without both, a project will descend into turmoil.

The construction industry has been criticized in recent years for adopting a traditional approach to work and a lack of creativity, innovative approaches, and imaginative strategies of undertaking construction programs that are needed to be executed in new technological ways.

The start and end stages in each step of the project life cycle are critical because they are important project decision points. In between the different steps are decision points where an explicit decision is made on whether the next phase can be followed and whether the prior stage is completed properly as expected from the beginning.

2.2. Empirical Review

Chan and Kumaraswamy (2002) remarked that project performance measurement includes time, budget, safety, quality and overall client satisfaction. Kuprenas (2003) stated that project performance measurement means an improvement of cost, schedule, and quality in design and construction stages. Navon (2005) defined performance measurement as a comparison between the desired and the actual performances.

Mohammad, (2012) identified factors affecting performance of a building construction project by collecting data through questionnaire from contractors and consultants and analyzed the data through factor analysis method. According the study, the factors that affect the quality of the projects are characteristics of site layout, skill and experience of site staff, characteristics of design documents, and using equipment, materials, quality and labor management systems and the owner quick response in taking decisions. Type of awarding system and the political environment are also among the factors effecting quality.

Amusan and Adebile, (2011) studied factors affecting construction cost performance in Nigerian construction sites. He discovered from the analysis that factors such as contractor's inexperience, inadequate planning, inflation, incessant variation order, and change in project design were critical to causing cost overrun, while project complexity, shortening of project period and fraudulent practices are also responsible.

Iyagba, Odusami and Omirin, (2003) did a research on the relationship between project leadership, team composition and construction project performance in Nigeria. The tests of the hypotheses led to the conclusion that there was significant relationship between the project leader's professional qualification, his leadership style, team composition and overall project performance. No significant relationship was found between the project leader's profession and overall project performance. Iyer and Jha (2005) did a research on factors affecting cost performance evidence from Indian construction projects and found out that the project manager's competence and top management support are found to contribute significantly in enhancing the quality performance of a construction project. Nyangilo, (2012) did an assessment of the organization structure and leadership effects on construction projects' performance in Kenya, he found out that lack of appropriate project organization structures, poor management systems and leadership are the major causes of poor project performance.

2.3. Conceptual Framework

A conceptual framework developed from a literature review shows the four perceived factors that could affect project performance. (i.e. External environment, Time, Cost and Quality). The research will revolve around this four constructs or independent variables which are Environmental factors, Time performance factors, Cost performance factors and Quality performance factors. Under Environmental factor there are six influencing factors that affect the project performance or the dependent variable like political, economic, technological advancement…etc.

Time performance factors comprises issues like Project's scope, Personnel with experience, Members dedication, Effective site management and monitoring, Clearly defined goal, Support of top management, Communication and Cooperation and Rapid decision making.

Cost performance factors includes cost related factors like Management of waste, Resource availability, Effective contract administration, Availability of sufficient fund, Participant's relationship, project site management and supervision, Regular meeting on project performance and Give early decision.

Quality performance factors includes issues resembling Quality of equipment and materials, Availability of expertise, Favorable working environment, Member's integrity, Manager's willingness to improve quality, Project participant's effective monitoring and recommendation on project, Effective quality assurance system in the organization.

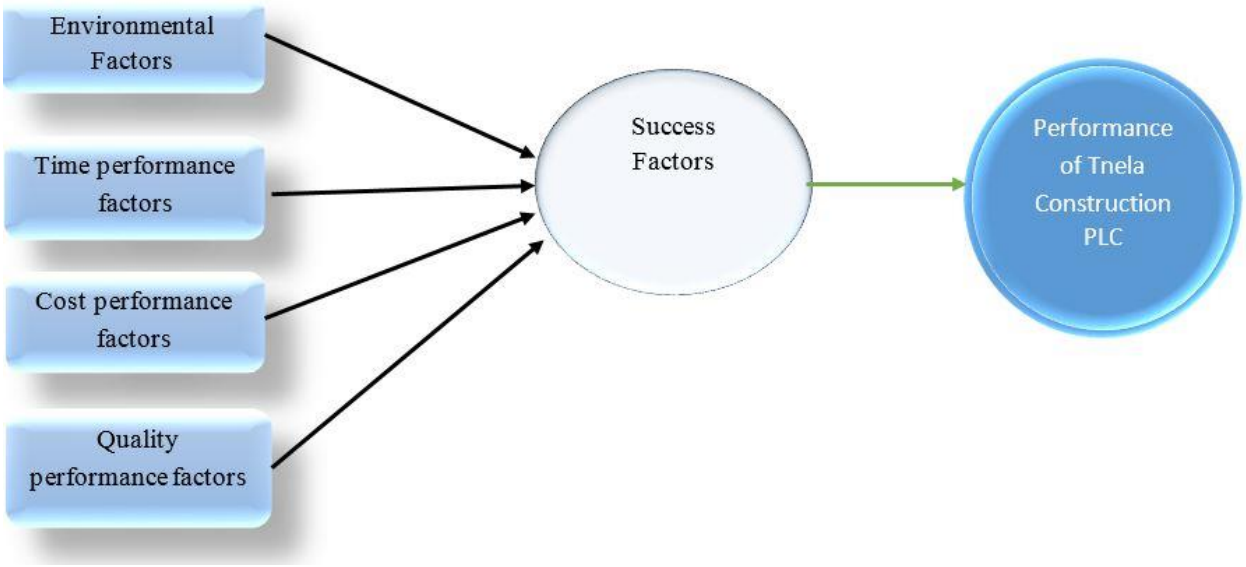


Figure 3 Conceptual framework

CHAPTER THREE

3. RESEARCH METHODOLOGY

Introduction

This chapter describes the methodology that has been used in conducting the study. It covers the research subject, research style, target audience, sample size and selection, research instruments to be used, their reliability and validity, data collection methods, and data analysis techniques.

3.1. Research Design

The study uses a descriptive research design to gather information on factors affecting construction projects. Descriptive survey is a means of gathering information by interviewing or conducting a questionnaire to a group of people, according to (Orotho, 2003). Explanatory research design, on the other hand, is used to provide a greater understanding of a situation, but it does not provide definitive findings. According to (Nemanja Jovancic, 2020), Explanatory research design is used to further expand, explore, and explain the researcher's ideas and theories. This type of research design is used to elaborate on the unexplored aspects of a particular topic and try to explain the missing pieces.

A descriptive and explanatory analysis design has been used in this report. As previously mentioned, the primary goal of descriptive analysis is to describe the current state of affairs. The analysis then goes on to explain and evaluate the factor affecting the performance of construction projects in a case of Tnela Construction PLC. To explain the factors affecting the project's performance, frequencies, ratios, graphs, charts, and factor analysis techniques are applied.

3.2. Research Approaches

Research approaches:

- **Qualitative**: - concerned with subjective assessment of attitudes, opinions and behavior.
- **Quantitative**: - involves the generation of data in quantitative form which can be subjected to rigorous quantitative analysis in a formal and rigid fashion.

Since a quantitative approach attempts to produce "real answers" from "hard data", where as a qualitative approach is concerned with subjective evaluation of opinions, behaviors and attitudes. According to (Higgins, 2009), Qualitative methods are not good at giving direct answers, but are good at developing more questions, because of consistent use of "soft data". For that reason in this research, more of quantitative approach for closed ended questionnaires and some of qualitative approach for open ended questionnaires have been implemented.

3.3. Population and Sampling Method

3.3.1. Population of the Study

According to (Kombo and Tromp, 2006), A population is a group of individuals, objects or items from which samples are taken for measurement. The population of the research contains the project Architects of active construction projects, project Engineers, project managers, project supervisors…Generally speaking, the population of the research includes total number of employees actively working in construction sites of Tnela Construction PLC. i.e. 273 employees. This study has been conducted on 5 project sites i.e. Kality/Kilinto, Bole Sub-city (Megenagna), Atobis Tera (Sebategna), Kera around Pepsi and Meskel Flower project sites.

3.3.2. Sampling Method

To identify factors that affect the performance of construction and understand their impact according to their significance, the respondents should be skilled and should directly involve on the implementation practice. Since there were a limited number of skilled staffs (41 skilled personals) on all projects, the researcher has implemented census survey which is recommended for small number target population.

3.4. Data collection

In order to achieve the General and Specific objectives, the researcher will use both **primary** and **secondary data.**

The **Primary data** has been collected using

- Questionnaire (including open ended and closed ended question).

The **secondary data** has been gathered through

- Reviewing company documents, broachers and magazines.

3.5. Data analysis and presentation

The researcher presents the collected data of the current factors affecting performance of construction projects in case of Tnela Construction PLC by using tables, bars and charts which are expressed in the form of frequency and percentage. Then, descriptive analysis technique is used to interpret and analyze the organized data.

3.6. Ethical considerations

Ethical guidelines, according to the Social Science Association (SSA) (2003), enable researchers to make independent ethical choices and decisions that are consistent with research ethics. Autonomy, beneficence, fairness, informed consent, anonymity, security, and reverence for individuals are the fundamental ethical standards. Though study may be well-intentioned, there is always the risk of inadvertently causing psychological, financial, or social harm by interactions with respondents. According to Singer (2008), the most significant risk of harm to respondents in survey polling is the violation of secrecy and lack of privacy, as well as the result of such violations. Such a breach may cause loss of employment, reputation, or civil or criminal suits. In this study, all participants were granted their consent during the sampling stage where upon limited personal information has been requested by the researcher to guide the administration of questionnaire.

The researcher assured that the information given would be kept private and not disclosed to any third parties until the member and those involved in the study gave their informed consent. The researcher gathered data in an ethical manner. Permission has been obtained by both the project administration and the respondents, along with justifications for how the study will help to improve proper project management processes. During the study, the respondents' privacy, confidentiality, and integrity were respected. The respondents' names kept confidentially. The participants were not be compensated in any way for their involvement in the research, either financially or materially. They would, however, be made aware of the value of taking part in such research.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4. Introduction

This chapter focuses on analyzing the data gathered for the purpose of this study and discuss the findings as revealed by the results of the analysis. The objectives of the study were to determine factors affecting performance of construction projects in case of Tnela Construction PLC. A total of 41 questionnaires were sent to the field for data collection and they were all completed and returned for analysis. The response rate was therefore 100%. The researcher counted this as a great success in his research as it would enhance the level of accuracy of the research.

The data was analyzed using SPSS (Statistical Package for Social Scientists). 4 Engineers, 3 Managers, 2 Administrators, 5 Architects, 7 Foremen, and the rest of 20 other employees were considered for this study totaling to 41 respondents. The collected data were analyzed in two groups based on the methods that have been collected.

4.1. Part one:-Demographic data

Gender of the respondents

According to the questionnaire distributed for the research data collection purpose, the first part was items requiring respondents to provide their demographic profile including age, sex, educational background and years of service. According to the collected data the overall staffing is dominated by male employees. So the respondents were 90.8% male and 9.2% were female.

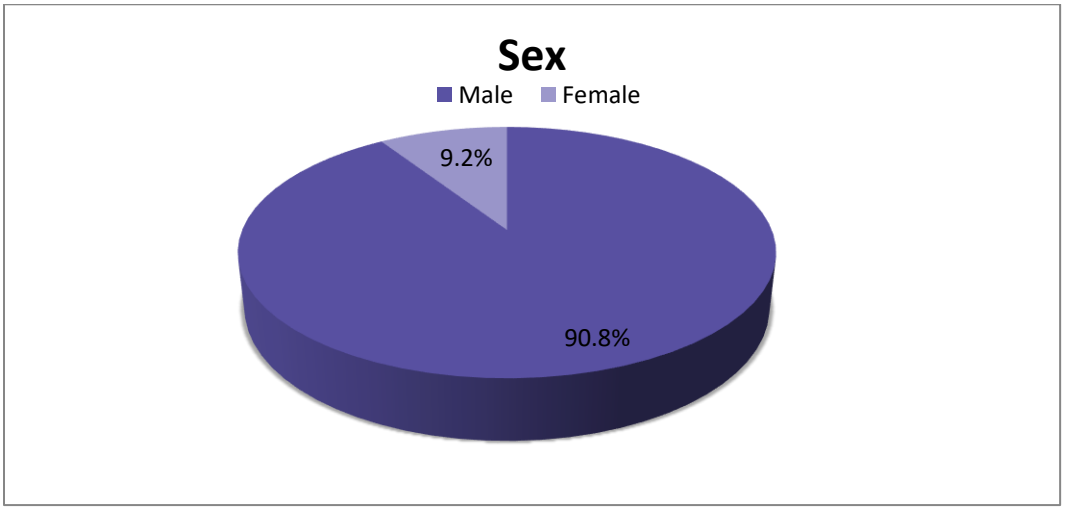


Figure 4 Gender of respondents

Own Surveys, calculated using SPSS, 2021

Age Distribution of Respondents

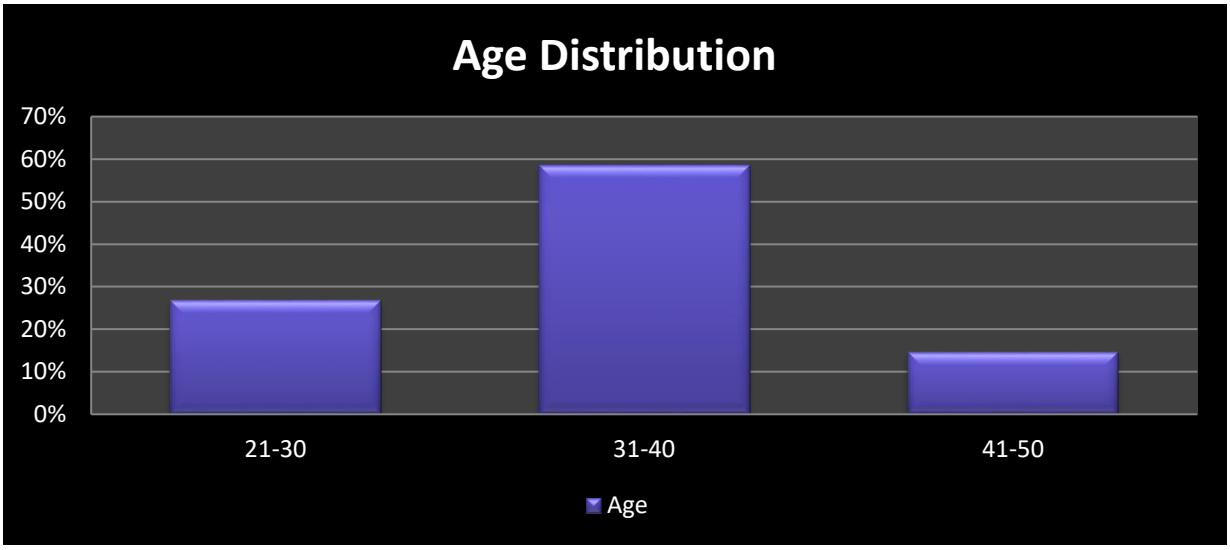


Figure 5 Age of respondents

Own Surveys, calculated using SPSS, 2021

The above age distribution bar shows that majority of the population that participated in the study was between ages31-40 years making 58.5% .This was followed by 26.8% & 14.6% for ages 21-30 and 41-50respectively.

Educational Level of Respondents

The study sought to establish the level of education of the respondents since engineers, foremen, managers, contractors, architects etc. were part of the population.

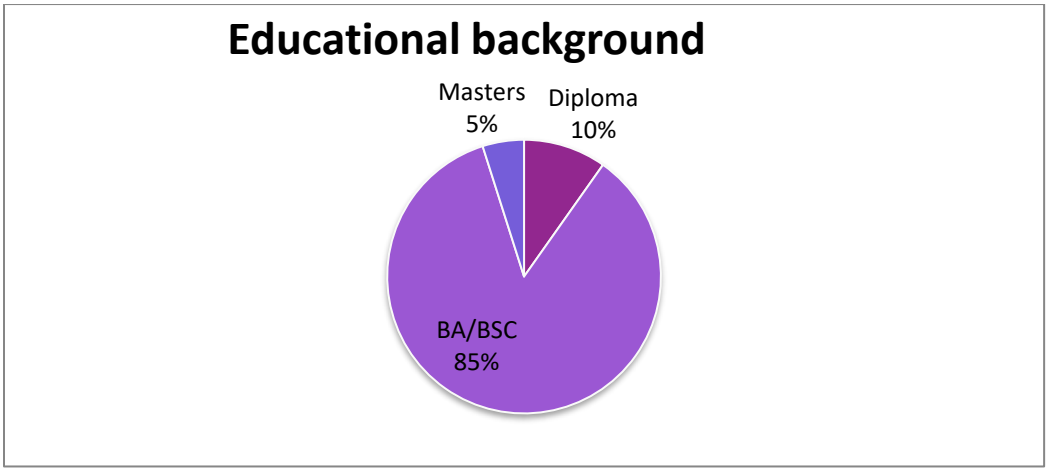


Figure 6 Educational background

Own Surveys, calculated using SPSS, 2021

Regarding educational level of the respondents, 10% are diploma holders, 85% are BA/BSC degree holders and the remaining 5% are master's degree holders. Therefore the majority of the respondents have at least first degree.

Experience of the respondents

With the reflection of the collected data about years of services 50% of the respondents are 0-5 years, 45% are 5-10 years and 5% of the respondents say that they work exactly 10 years. The company comprises all categories of employees in terms of work experience. But it is dominated by 5-10 years of experienced workers.

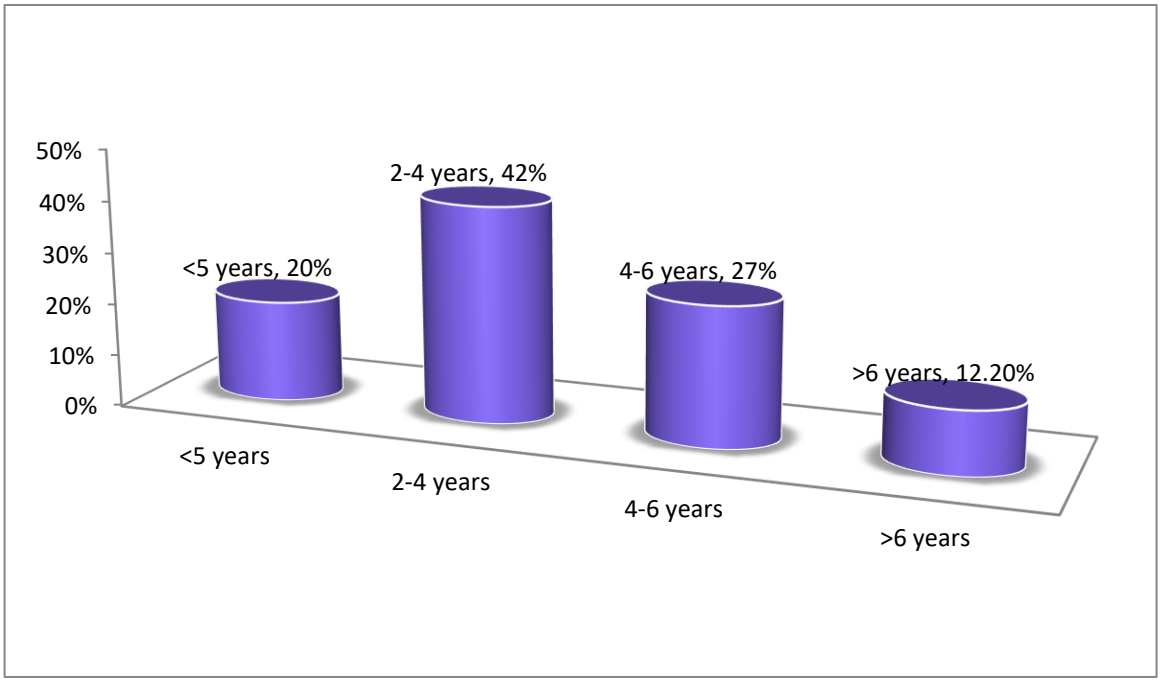


Figure 7 Experiences

Own Surveys, calculated using SPSS, 2021

Mainly used software

Regarding software used by the resonant of the company most of them uses MS Excel for conducting their works. Out of the total respondents of 41 employees, 29 of them utilizes both MS Excel and MS Project and 5 of them uses only MS project, Only 2 of them uses only project power and the remaining 10 of the respondents utilize none of the software.

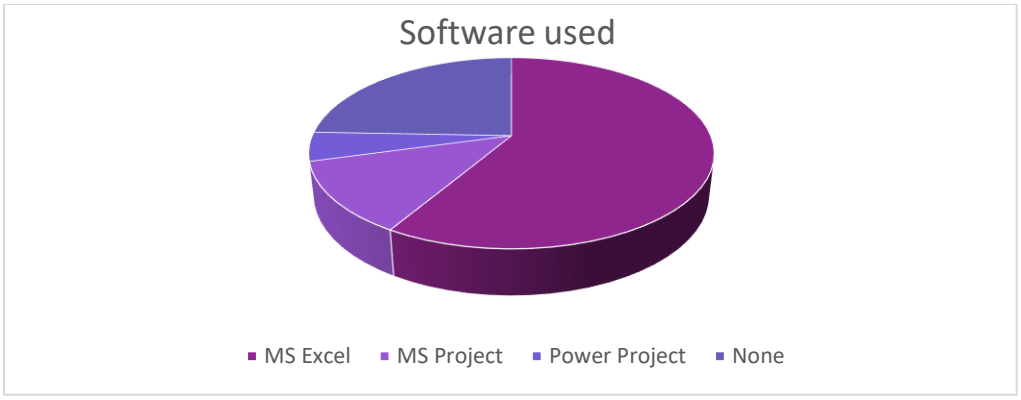


Figure 8 Software used

Own Surveys, calculated using SPSS, 2021

A project currently working on (Site)

This question presents and analysis the project sites that the target respondents are working on. From all the respondents 8 of them said that they are operating at Kality/Kilinto site, 7 of them said that they are operating at Atobis Tera (Sebategna) site, 3 of them said that they are operating at Meskel Flower site, 6 of the respondents say that they are operating at Bole Sub-city (Megenagna) site, 5 of the respondents say that they are operating at Kera around Pepsi site and the remaining12 of the respondent say that they are operating at all of the five sites.

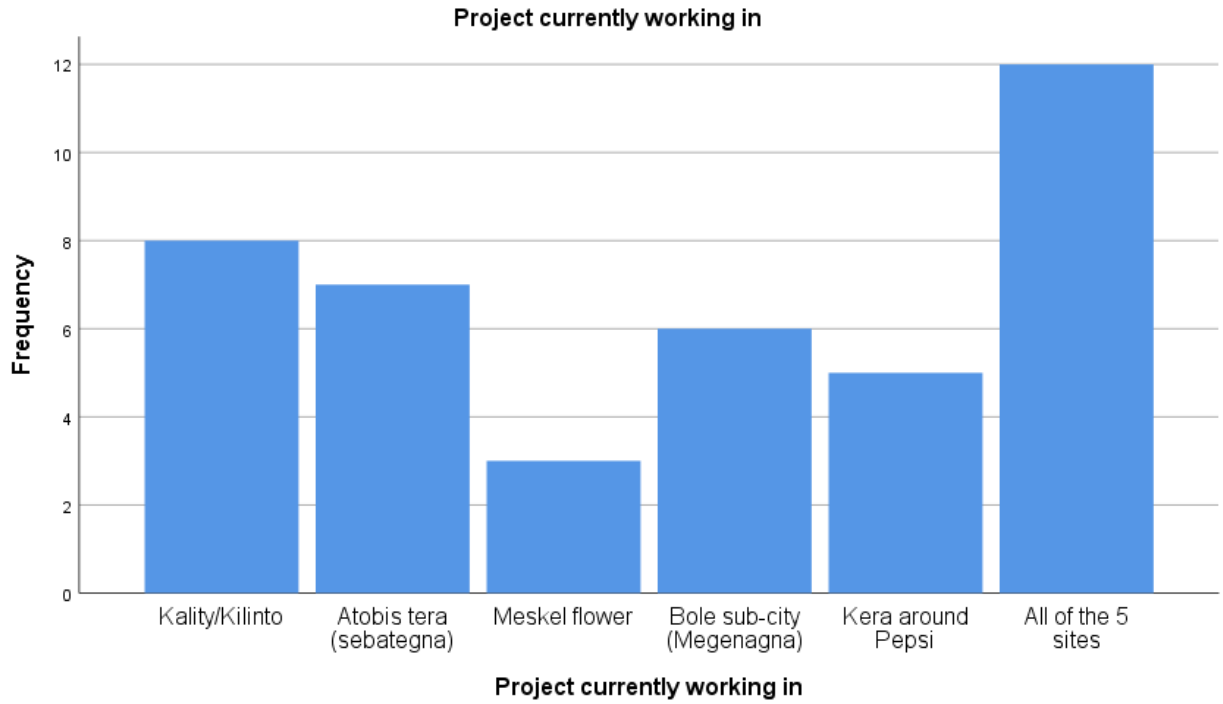


Figure 9 Projects currently working on

Own Surveys, calculated using SPSS, 2021

Current working position of the target respondents

This part tries to check the legibility of the target respondents since the study is about factors affecting performance of construction projects in case of Tnela construction plc. The respondents must have the know-how and knowledge about those factors that have positive or negative impacts on construction sectors.

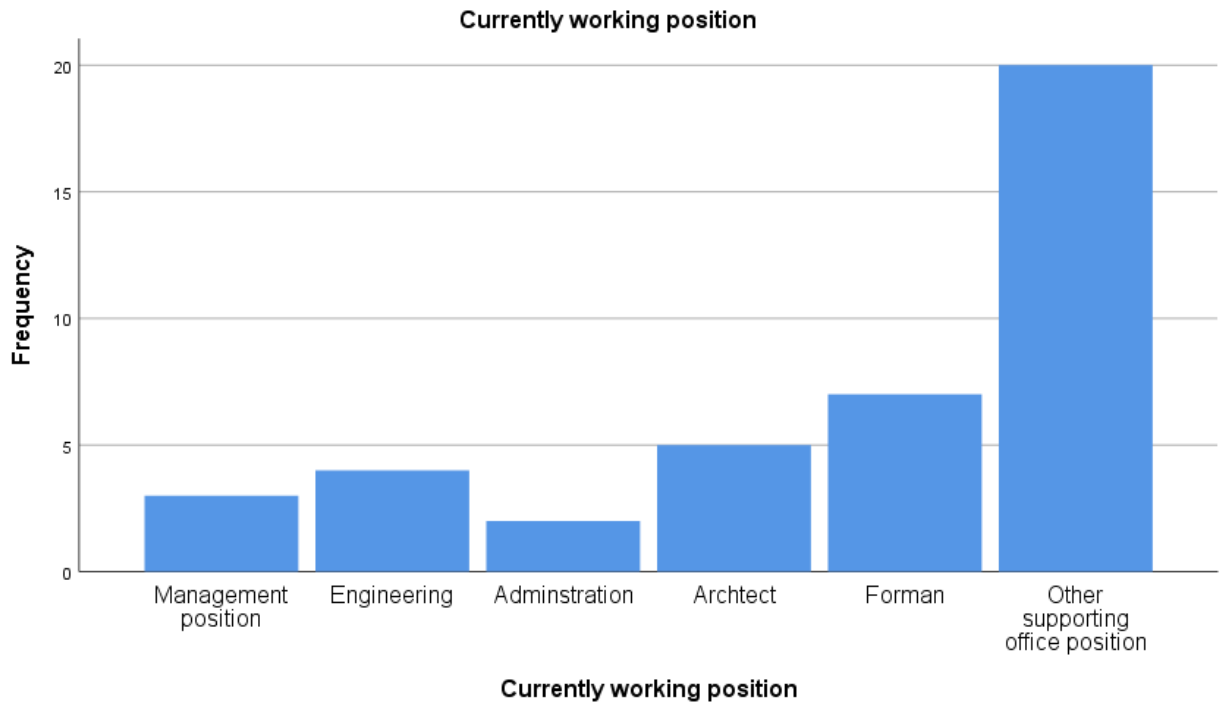


Figure 10 Currently working position

Own Surveys, calculated using SPSS, 2021

The above bar shows that the respondents are very much related to construction to respond to the questionnaire, most of the respondents are experienced to provide relevant data on factors affecting construction performance. Since the target respondents are the subset of different professions like Management position, Engineers, Administration, Architects, Forman and other supporting office personnel this will be ideal to get relevant information on factors affecting construction progress in the organizations.

4.2. Part two:-General Findings

In this part of the questionnaire different variables were utilized to ask the respondent's about factors affecting performance of construction projects in the case of Tnela construction PLC. These variables were Least significant, Slightly significant, Moderately significant, Very significant & Extremely significant.

Frequency has been utilized to determine the group of participants who agreed on the relevant rating point, whereas percentage is also used to determine the proportion of all participants who agreed.

4.2.1. Environmental Factors

Political environment

	Frequency	Percent	Valid Percent	Cumulative Percent
Least significant	5	12.2	12.2	12.2
Slightly significant	10	24.4	24.4	36.6
Moderately significant	12	29.3	29.3	65.9
Very significant	14	34.1	34.1	100
Total	41	100	100	

Economic factor

	Frequency	Percent	Valid Percent	Cumulative Percent
Slightly significant	3	7.3	7.3	7.3
Moderately significant	18	43.9	43.9	51.2
Very significant	16	39	39	90.2
Extremely significant	4	9.8	9.8	100
Total	41	100	100	

Technological advancement

	Frequency	Percent	Valid Percent	Cumulative Percent
Slightly significant	14	34.1	34.1	34.1
Moderately significant	23	56.1	56.1	90.2
Very significant	4	9.8	9.8	100
Total	41	100	100	

Effective waste pollution control				
	Frequency	Percent	Valid Percent	Cumulative Percent
Least significant	13	31.7	31.7	31.7
Moderately significant	20	48.8	48.8	80.5
Very significant	8	19.5	19.5	100
Total	41	100	100	
Variation in economy's exchange rate				
	Frequency	Percent	Valid Percent	Cumulative Percent
Moderately significant	5	12.2	12.2	12.2
Very significant	9	22	22	34.1
Extremely significant	27	65.9	65.9	100
Total	41	100	100	
Incapability of labor market to supply skill workers				
	Frequency	Percent	Valid Percent	Cumulative Percent
Least significant	13	31.7	31.7	31.7
Slightly significant	5	12.2	12.2	43.9
Moderately significant	19	46.3	46.3	90.2
Very significant	4	9.8	9.8	100
Total	41	100	100	
Project's physical location				
	Frequency	Percent	Valid Percent	Cumulative Percent
Least significant	8	19.5	19.5	19.5
Slightly significant	7	17.1	17.1	36.6
Moderately significant	5	12.2	12.2	48.8
Very significant	21	51.2	51.2	100
Total	41	100	100	

Own Surveys, calculated using SPSS, 2021

Political Environment

In the case of political environment out of 41 respondents, 5 of them states that it is least significant, 10 says that it is slightly significant, while 12 of them say that it is moderately significant and the remaining 14 of the respondent's states that political environment is very significant. So from this data we can learn that the political environment has some degree of effect on construction projects.

Economic Factors

The above table shows that the respondent's perception on the effect of economy on construction project and most of the respondents say that the economy is moderately and very significant but there are also respondents who think that it is slightly significant besides also some believes that it is extremely significant too.

Technological Advancement

Regarding the technological advancement out of 41 respondents 23 of them responded that it is moderately significant, 14 and 4 of them states that it is slightly significant and very significant respectively. This data shows us that technological advancement is moderately significant factor.

Effective waste pollution control

Here, most of the respondent states that effective waste pollution control is moderately significant followed by least significant.

Variation in economy's exchange rate

Concerning the variation in economy's exchange rate, most of the respondents i.e. 27 of them says that it is extremely important, 9 says it is very important and the remaining respondents says that it is moderately significant. This finding shows us that variation in economy's exchange rate highly affect the construction sector.

Incapability of labor market to supply skilled workers

According to the capacity of the labor market for supplying skilled workers, most of the respondents agree that it is moderately significant.

Project's Physical location

The last assessment question regarding the environmental factors was about the project's physical location and out of the target respondents, 21 of them agreed that it is very significant, 5 says it is moderately significant, 7 says it is slightly significant and the remaining respondents think that it is least significant factor.

Environmental Factors mean and standard deviation table

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Political environment	41	0	3	1.85	1.038
Economic factor	41	1	4	2.51	.779
Technological advancement	41	1	3	1.76	.624
Effective waste pollution control	41	0	3	1.56	1.141
Variation in economy's exchange rate	41	2	4	3.54	.711
Incapability of labor market to supply skill workers	41	0	3	1.34	1.039
Project's physical location	41	0	3	1.95	1.224
Valid N (list wise)	41				

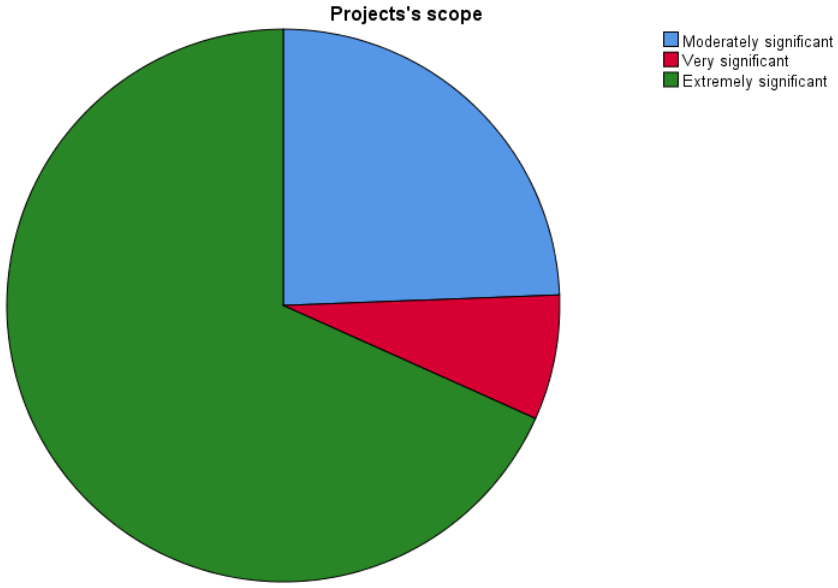
Own Surveys, calculated using SPSS, 2021

4.2.2. Time Performance Factors

To understand the time performance factors of a construction projects, the research has raised issues like Project's scope, Personnel with experience, Members dedication, Effective site management and monitoring, Clearly defined goal, Support of top management, Communication and Cooperation and Rapid decision making because they are directly or indirectly related to the effectively utilization of time in a construction projects.

Project's scope

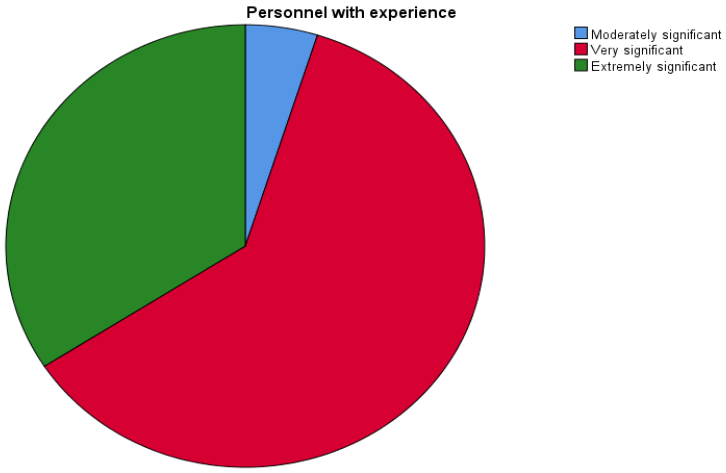
In case of the impact of the project's scope on the performance of a time, 68.3% of the respondents say that it is extremely significant, 24.4% of them described it as it is moderately significant and the remaining 7.3% of them thinks that it is very significant. By referring these responses, we can say that Project's scope can highly affect the performance of time for completion of a construction project.



Own Surveys, calculated using SPSS, 2021 Fig. 18 Project's scope

Personnel with experience

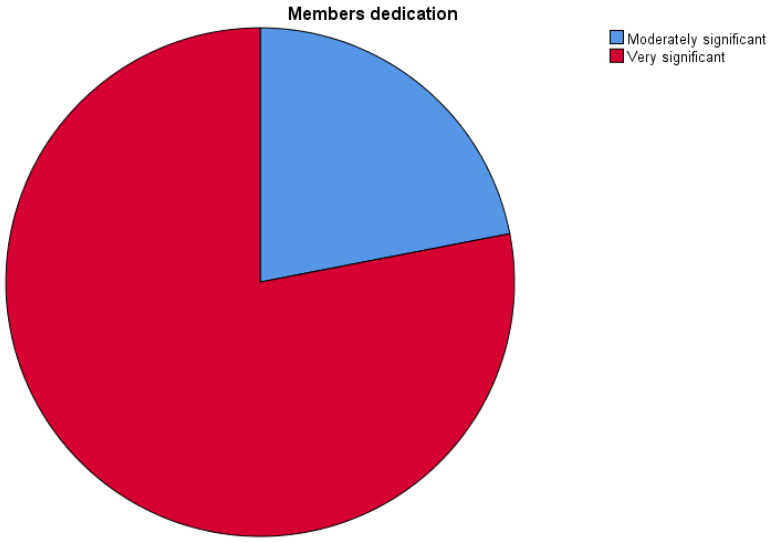
According to the experience of personnel on the performance of time of a project the study shows that most of the respondents think that it is very significant and some of them think that it is extremely significant but little percentage of the respondents think that it is moderately significant with the percentages of 61%, 34.1% & 4.9% of the respondents. This shows us that the experience of personnel is also vital in achieving time performance of a construction project.



Own Surveys, calculated using SPSS, 2021 Fig. 19 Personnel with experiences

Member's dedication

Regarding the important of member's dedication on realizing the time performance of a construction projects, the chart below clearly shows that from the total of 41 respondents 78% of them says that it is very significant and the remaining respondents states that it is moderately important. For this reason we can understand that member's dedication is highly important factor in achieving the desired time performance of a construction project.

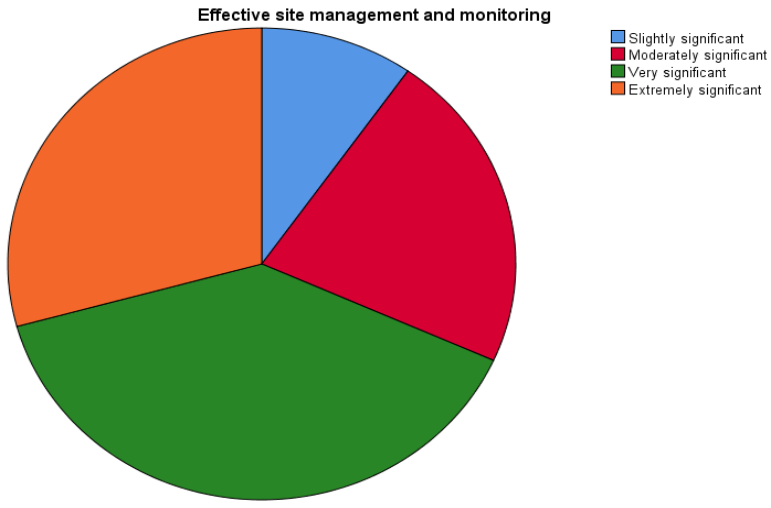


Own Surveys, calculated using SPSS, 2021

Fig. 19 Members dedication

Effective site management and, monitoring

Regarding the effective site management and monitoring of a project with respect to the time performance of a construction project, all of the respondents have been separated to different perspectives with the higher percentage of responses of very significant to extremely significant followed by moderately significant and for some percentage of respondents describing that slightly significant with the percentage rates of 39%, 29.3%, 22% and 9.8%.

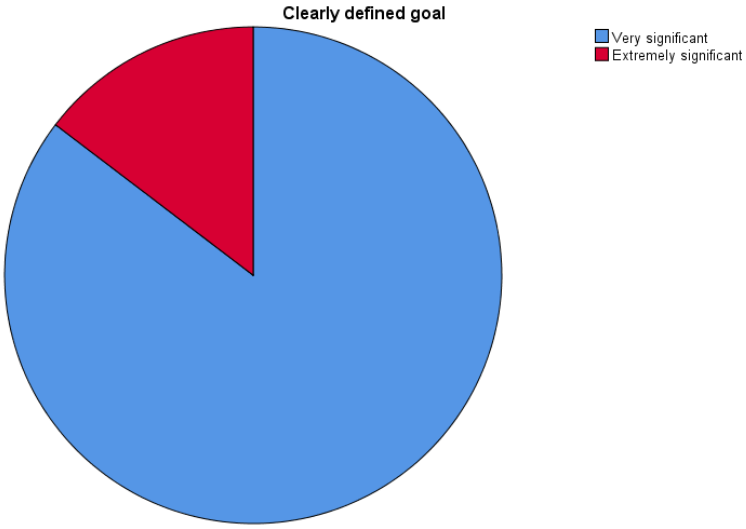


Own Surveys, calculated using SPSS, 2021

Fig. 20 Effective site management and monitoring

Clearly defined goal

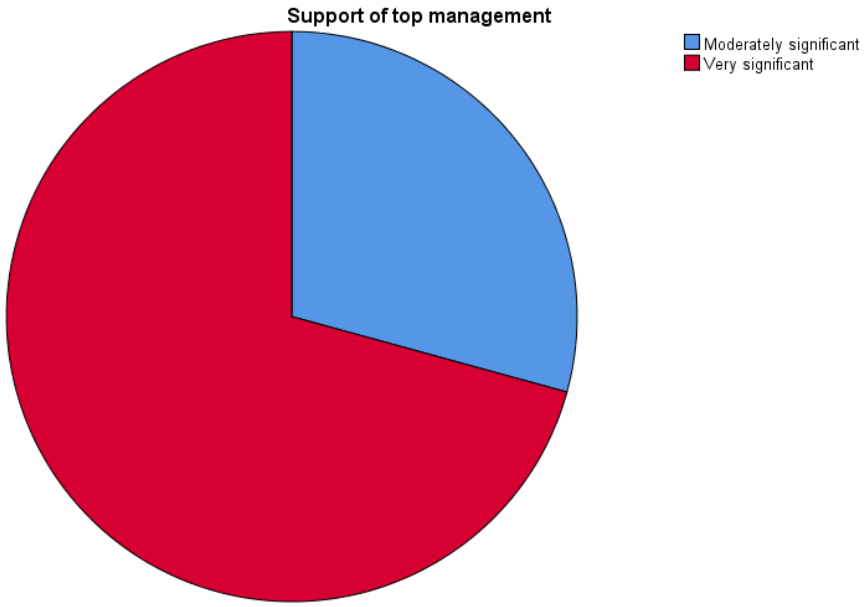
Having a clearly defined goal is highly and extremely significant on the view of the target respondents because 85.4% of the respondents think that it is very important and the remaining thinks that it is extremely important. For this reason, we can say that having a defined and clear goal has important role in achieving the time performance of a construction project.



Own Surveys, calculated using SPSS, 2021 Fig. 21 clearly defined goal

Support of top management

When we see the management part of a time performance of a project, most of the respondents with the percentage of 70.7% of them agreed that it is very importance but some of the remaining 29.3% thinks it is moderately important.

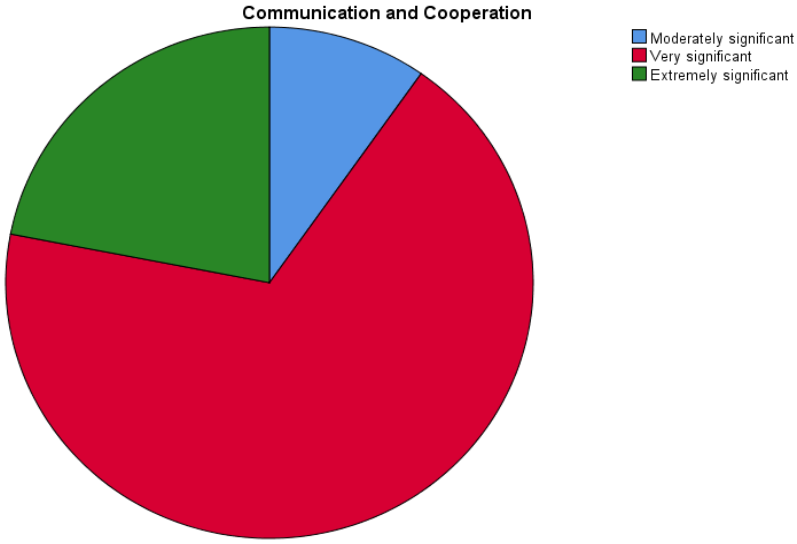


Own Surveys, calculated using SPSS, 2021 Fig. 22 Support of top management

Communication and Cooperation

Since communication and cooperation are vital elements of any activities, the study tries to check their importance under the time performance of a project. In doing so, out of 41 respondents 68.3% of them thinks that both of them are very significant followed by 22% of the respondents saying that they are extremely important and the remaining 9.8% responded as

moderately important. By considering these responses, we can say that communication and cooperation are very important in attaining the time performance of a construction projects.

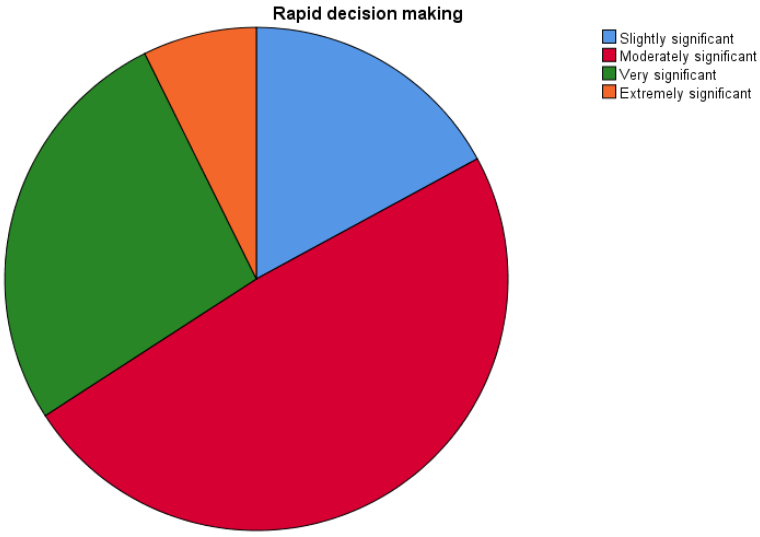


Own Surveys, calculated using SPSS, 2021

Fig. 23 Communication and Cooperation

Rapid decision making

With respect to rapid decision making on the time performance of a construction project, the respondent's response rate described in the chart below that shows from the higher to lower is moderately significant, very significant, slightly significant and extremely significant with the percentage rate of 48.8%, 26.8%, 17.1% and 7.3% respectively.



Own Surveys, calculated using SPSS, 2021

Fig. 24 Communication and Cooperation

Time performance Factors mean and standard deviation table

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Project's scope	41	2	4	3.44	.867
Personnel with experience	41	2	4	3.29	.559
Members dedication	41	2	3	2.78	.419
Effective site management and monitoring	41	1	4	2.88	.954
Clearly defined goal	41	3	4	3.15	.358
Support of top management	41	2	3	2.71	.461
Communication and Cooperation	41	2	4	3.12	.557
Rapid decision making	41	1	4	2.24	.830
Valid N (leastwise)	41				

Own Surveys, calculated using SPSS, 2021

4.2.3. Cost Performance

This part of the study more focuses on the cost performance factors of a construction project because cost in one of the KPIs of a project performance. Within this part, the study tries to check about cost performance factors of a construction projects like Management of waste, Resource availability, Effective contract administration, Availability of sufficient fund, Participant's relationship, project site management and supervision, Regular meeting on project performance and Give early decision to have full understanding about their effects in the performance of a construction projects.

Management of waste

	Frequency	Percent	Valid Percent	Cumulative Percent
Very significant	27	65.9	65.9	65.9
Extremely significant	14	34.1	34.1	100
Total	41	100	100	

Resource availability

	Frequency	Percent	Valid Percent	Cumulative Percent
Moderately significant	6	14.6	14.6	14.6
Very significant	35	85.4	85.4	100
Total	41	100	100	

Effective contract administration

	Frequency	Percent	Valid Percent	Cumulative Percent
Moderately significant	24	58.5	58.5	58.5
Very significant	17	41.5	41.5	100
Total	41	100	100	

Availability of sufficient fund

	Frequency	Percent	Valid Percent	Cumulative Percent
Very significant	21	51.2	51.2	51.2
Extremely significant	20	48.8	48.8	100
Total	41	100	100	

Participant's relationship				
	Frequency	Percent	Valid Percent	Cumulative Percent
Least significant	18	43.9	43.9	43.9
Slightly significant	13	31.7	31.7	75.6
Moderately significant	7	17.1	17.1	92.7
Very significant	3	7.3	7.3	100
Total	41	100	100	
project site management and supervision				
	Frequency	Percent	Valid Percent	Cumulative Percent
Moderately significant	29	70.7	70.7	70.7
Very significant	12	29.3	29.3	100
Total	41	100	100	
Regular meeting on project performance				
	Frequency	Percent	Valid Percent	Cumulative Percent
Slightly significant	22	53.7	53.7	53.7
Moderately significant	17	41.5	41.5	95.1
Very significant	2	4.9	4.9	100
Total	41	100	100	
Give early decision				
	Frequency	Percent	Valid Percent	Cumulative Percent
Slightly significant	12	29.3	29.3	29.3
Moderately significant	27	65.9	65.9	95.1
Very significant	1	2.4	2.4	97.6
Extremely significant	1	2.4	2.4	100
Total	41	100	100	

Own Surveys, calculated using SPSS, 2021

Management of waste

As stated in the above table on the respondents replies about the importance of waste management on cost performance, 65.9% of them replies it is very important and the remaining 34.1% replies that it is extremely important. So, we can say that management of waste is highly important in attaining cost factor of a construction projects.

Availability of resource

In this part of the cost factors, almost all of the respondents i.e. 85.4% agreed that resource is highly significant, but the remaining only 14.6% of the respondents think that it is moderately significant. This shows us that having sufficient resource is very important in attaining cost performance factors of a construction projects.

Effective contract administration

In response to this part of the study, the response of the respondents have been divided to two ideas with 58.5% rate of moderately significant and 41.2% of very significant as positioned in the above table.

Availability of sufficient fund

While talking about the effect cost performance factors in a construction projects, it is crucial to talk about the availability of sufficient fund. In this regards, the response of almost all of the target respondents was almost the same and it was between 51.2% very significant and 48.8% extremely significant. This response rate clarify us that availability of sufficient fund is highly and extremely important part of cost factors that have impact on the performance of a construction project.

Participant's relationship

Regarding the participant's relationship as shown on the above table 43.9% of the respondents say that it is least significant, 31.7% of them says that it is slightly important, 17.1% says that it is moderately important and only 7.3% of the respondents states that it is very important. So, we can say that participant's relationship has not that much influence on the cost performance of a construction projects.

Project site management and supervision

Here the respondent's perception was between moderately significant with response rate of 70.7%and very significant with response rate of 29.3%. Consequently, we can say that project site management and supervision is moderately important.

Regular meeting on project performance

According to the target respondents, regular meeting doesn't have that much effect on the cost performance of a construction projects since the response rate was slightly, moderately and very important with the percentage rate of 53.7%, 41.5% and 4.9% respectively.

Give early decision

Out of the total target respondents of 41 personnel, 65.9% of them thinks that early decision is moderately significant, 29.3% says it is slightly significant and the others 2.4% of each says that it is very and extremely significant as illustrated on the above table. With this responses we can conclude that giving early decision has not high importance on the cost performance of a construction projects.

Cost performance Factors mean and standard deviation table

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Management of waste	41	3	4	3.34	.480
Resource availability	41	2	3	2.85	.358
Effective contract administration	41	2	3	2.41	.499
Availability of sufficient fund	41	3	4	3.49	.506
Participant's relationship	41	0	3	.88	.954
project site management and supervision	41	2	3	2.29	.461
Regular meeting on project performance	41	1	3	1.51	.597
Give early decision	41	1	4	1.78	.613
Valid N (leastwise)	41				

Own Surveys, calculated using SPSS, 2021

4.2.4. Quality Performance

Since quality performance factors are the other KPI of a project factors, this part was a crucial issue for understanding the factors that affect the construction projects. For this reason, under the sub-set of quality performance factors the study has raise the issues resembling Quality of equipment and materials, Availability of expertise, Favorable working environment, Member's integrity, Manager's willingness to improve quality, Project participant's effective monitoring and recommendation on project, Effective quality assurance system in the organization, Management leadership in promoting high process quality to have deep understanding.

Quality of equipment and materials

Quality of equipment and materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	14	34.1	34.1	34.1
	Very significant	23	56.1	56.1	90.2
	Extremely significant	4	9.8	9.8	100.0
	Total	41	100.0	100.0	

Own Surveys, calculated using SPSS, 2021

The above table shows that the respondents action on the effect of quality of equipment and materials and the response was more of high significant with 56.1%, moderately significant with 34.1% and extremely significant with 9.8% rate showing that it is highly important to have quality of equipment and materials in attaining the quality performance of a construction projects.

Availability of expertise

Availability of expertise

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	10	24.4	24.4	24.4
	Very significant	19	46.3	46.3	70.7
	Extremely significant	12	29.3	29.3	100.0
	Total	41	100.0	100.0	

Own Surveys, calculated using SPSS, 2021

As indicated on the above table, out of the 41 total respondents, 19 of them thinks that availability of expertise is highly important, followed by 12 respondents agreeing that it is extremely important and the remaining 10 of them says that it is moderately significant.

Favorable working environment

Favorable working environment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	4	9.8	9.8	9.8
	Slightly significant	16	39.0	39.0	48.8
	Moderately significant	20	48.8	48.8	97.6
	Very significant	1	2.4	2.4	100.0
	Total	41	100.0	100.0	

Own Surveys, calculated using SPSS, 2021

Here in the issue of favorable working environment, out of the target respondents 20 of them says that it is moderately important, 16 of them says it is slightly significant, 4 of them says that it is least significant and only one person said that it is very significant. Therefore, we can say that favorable working environment is moderately and slightly important in achieving the quality performance factors of a construction projects.

Member's integrity

Member's integrity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	7	17.1	17.1	17.1
	Moderately significant	13	31.7	31.7	48.8
	Very significant	14	34.1	34.1	82.9
	Extremely significant	7	17.1	17.1	100.0
	Total	41	100.0	100.0	

Own Surveys, calculated using SPSS, 2021

According to the issue of member's integrity on a construction projects the response rate was from higher to lower 34.1% very significant, 31.7% moderately significant and 17.1% each slightly and extremely significant. For this reason we can conclude that member's integrity has a direct impact in achieving the quality performance factors of a construction projects.

Manager's willingness to improve quality

Manager's willingness to improve quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	5	12.2	12.2	12.2
	Slightly significant	3	7.3	7.3	19.5
	Moderately significant	6	14.6	14.6	34.1
	Very significant	18	43.9	43.9	78.0
	Extremely significant	9	22.0	22.0	100.0
	Total	41	100.0	100.0	

Own Surveys, calculated using SPSS, 2021

Concerning the issue of manager's willingness to improve quality, the respondent's response on the above table was from very important to extremely important followed by moderately, least and slightly important with a frequency rate of 18, 9, 6, 5 & 3 respectively. We can understand that manager's willingness to improve quality is highly important factor in achieving the quality performance factors of a construction projects.

Project participant's effective monitoring and recommendation on project

Project participant's effective monitoring and recommendation on project

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	2	4.9	4.9	4.9
	Slightly significant	3	7.3	7.3	12.2
	Moderately significant	8	19.5	19.5	31.7
	Very significant	20	48.8	48.8	80.5
	Extremely significant	8	19.5	19.5	100.0
	Total	41	100.0	100.0	

Own Surveys, calculated using SPSS, 2021

When we look the response rate of the respondents on the issue of Project participant's effective monitoring and recommendation on project, out of 41 responses 20 says it is very significant, each of 8 of them says that it is moderately and extremely important, 3 of them says it is slightly significant and the other 2 of them says it is least significant. With the above information, we can conclude that Project participant's effective monitoring and recommendation on project is an important factor in achieving the quality performance factors of a construction projects.

Effective quality assurance system in the organization

Effective quality assurance system in the organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	5	12.2	12.2	12.2
	Moderately significant	7	17.1	17.1	29.3
	Very significant	17	41.5	41.5	70.7
	Extremely significant	12	29.3	29.3	100.0
	Total	41	100.0	100.0	

Own Surveys, calculated using SPSS, 2021

The above table shows the influence of effective quality assurance system in the organization. Out of the target respondents 41.5% of them says that it is very important, 29.3% of them said that it is extremely important followed by 17.1% and 12.2% saying moderately important and slightly important respectively. For the above reasons we can say that it is highly important have effective quality assurance system in the organization if we want to accomplish the quality performance factors of a construction projects.

Management leadership in promoting high process quality

Management leadership in promoting high process quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	5	12.2	12.2	12.2
	Moderately significant	4	9.8	9.8	22.0
	Very significant	27	65.9	65.9	87.8
	Extremely significant	5	12.2	12.2	100.0
	Total	41	100.0	100.0	

Own Surveys, calculated using SPSS, 2021

The last issue raised in the quality performance section of this study was management leadership in promoting high process quality. As illustrated in the above table, out of the target respondents 27 of them says it is very important, 10 of them (5 of each respondents) says that it is extremely and slightly significant and the rest 4 of them says it is moderately important. With this we can conclude that management leadership in promoting high process quality is highly affect the quality performance factors of a construction projects.

Quality performance Factors mean and standard deviation table

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Quality of equipment and materials	41	2	4	2.76	.624
Availability of expertise	41	2	4	3.05	.740
Favorable working environment	41	0	3	1.44	.709
Member's integrity	41	1	4	2.51	.978
Manager's willingness to improve quality	41	0	4	2.56	1.266
Project participant's effective monitoring and recommendation on project	41	0	4	2.71	1.031
Effective quality assurance system in the organization	41	1	4	2.88	.980
Management leadership in promoting high process quality	41	1	4	2.78	.822
Valid N (list wise)	41				

Own Surveys, calculated using SPSS, 2021

Chapter 5

5. Conclusions and recommendations

5.1. Summary of Findings

In the case of political environment out of 41 respondents, 5 of them states that it is least significant, 10 says that it is slightly significant, while 12 of them say that it is moderately significant and the remaining 14 of the respondent's states that political environment is very significant. The respondent's perception on the effect of economy on construction project and most of the respondents say that the economy is moderately and very significant but there are also respondents who think that it is slightly significant besides also some believes that it is extremely significant too. Regarding the technological advancement out of 41 respondents 23 of them responded that it is moderately significant, 14 and 4 of them states that it is slightly significant and very significant respectively. Most of the respondent states that effective waste pollution control is moderately significant followed by least significant. Concerning the variation in economy's exchange rate, most of the respondents i.e. 27 of them says that it is extremely important, 9 says it is very important and the remaining respondents says that it is moderately significant. According to the capacity of the labor market for supplying skilled workers, most of the respondents agree that it is moderately significant. Finally, regarding the project's physical location and out of the target respondents, 21 of them agreed that it is very significant, 5 says it is moderately significant, 7 says it is slightly significant and the remaining respondents think that it is least significant factor.

In case of the performance of a time, the impact of the project's scope on the performance of a time, 68.3% of the respondents say that it is extremely significant, 24.4% of them described it as it is moderately significant and the remaining 7.3% of them thinks that it is very significant. According to the experience of personnel on the performance of time of a project the study shows that most of the respondents think that it is very significant and some of them think that it is extremely significant but little percentage of the respondents think that it is moderately significant with the percentages of 61%, 34.1% & 4.9% of the respondents. Regarding the important of member's dedication on realizing the time performance of a construction projects, from the total of 41 respondents 78% of them says that it is very significant and the remaining respondent's states that it is moderately important. Regarding the effective site management and monitoring of a project with respect to the time performance of a construction project, all of the respondents have been separated to different perspectives with the higher percentage of responses of very significant to extremely significant followed by moderately significant and for some percentage of respondents describing that slightly significant with the percentage rates of 39%, 29.3%, 22% and 9.8%. Having a clearly defined goal is highly and extremely significant on the view of the target respondents because 85.4% of the respondents think that it is very important and the remaining thinks that it is extremely important. When we see the management part of a time performance of a project, most of the respondents with the percentage of 70.7% of them agreed that it is very importance but some of the remaining 29.3% thinks it is moderately important. Since communication and cooperation are vital elements of any activities, the study tries to check their importance under the time performance of a project. In doing so, out of 41 respondents 68.3% of them thinks that both of them are very significant followed by 22% of the respondents saying that they are extremely important and the remaining 9.8% responded as

moderately important. With respect to rapid decision making on the time performance of a construction project, the respondent's response rate described in the chart below that shows from the higher to lower is moderately significant, very significant, slightly significant and extremely significant with the percentage rate of 48.8%, 26.8%, 17.1% and 7.3% respectively.

In case of cost performance factors, the respondents replies about the importance of waste management on cost performance, 65.9% of them replies it is very important and the remaining 34.1% replies that it is extremely important. Regarding the availability of resources, almost all of the respondents i.e. 85.4% agreed that resource is highly significant, but the remaining only 14.6% of the respondents think that it is moderately significant. In response to effective contract management, the response of the respondents have been divided to two ideas with 58.5% rate of moderately significant and 41.2% of very significant as positioned in the above table. While talking about the effect cost performance factors in a construction projects, it is crucial to talk about the availability of sufficient fund. In this regards, the response of almost all of the target respondents was almost the same and it was between 51.2% very significant and 48.8% extremely significant. Regarding the participant's relationship 43.9% of the respondents say that it is least significant, 31.7% of them says that it is slightly important, 17.1% says that it is moderately important and only 7.3% of the respondents states that it is very important. The respondent's perception on project site management and monitoring was between moderately significant with response rate of 70.7%and very significant with response rate of 29.3%. According to the target respondents, regular meeting doesn't have that much effect on the cost performance of a construction projects since the response rate was slightly, moderately and very important with the percentage rate of 53.7%, 41.5% and 4.9% respectively. Out of the total target respondents of 41 personnel, 65.9% of them thinks that early decision is moderately significant, 29.3% says it is slightly significant and the others 2.4% of each says that it is very and extremely significant as illustrated on the above table. With this responses we can conclude that giving early decision has not high importance on the cost performance of a construction projects.

Regarding the quality factors of performance, the respondents action on the effect of quality of equipment and materials and the response was more of high significant with 56.1%, moderately significant with 34.1% and extremely significant with 9.8% rate showing that it is highly important to have quality of equipment and materials in attaining the quality performance of a construction projects. Out of the 41 total respondents, 19 of them thinks that availability of expertise is highly important, followed by 12 respondents agreeing that it is extremely important and the remaining 10 of them says that it is moderately significant. In the issue of favorable working environment, out of the target respondents 20 of them says that it is moderately important, 16 of them says it is slightly significant, 4 of them says that it is least significant and only one person said that it is very significant. According to the issue of member's integrity on a construction projects the response rate was from higher to lower 34.1% very significant, 31.7% moderately significant and 17.1% each slightly and extremely significant. Concerning the issue of manager's willingness to improve quality, the respondent's response was from very important to extremely important followed by moderately, least and slightly important with a frequency rate of 18, 9, 6, 5 & 3 respectively. The response rate of the respondents on the issue of Project participant's effective monitoring and recommendation on project, out of 41 responses 20 says it is very significant, each of 8 of them says that it is moderately and extremely important, 3 of them says it is slightly significant and the other 2 of them says it is least significant. Regarding the influence of effective quality assurance system in the organization. Out of the target

respondents 41.5% of them says that it is very important, 29.3% of them said that it is extremely important followed by 17.1% and 12.2% saying moderately important and slightly important respectively. The last issue raised in the quality performance section of this study was management leadership in promoting high process quality. Out of the target respondents 27 of them says it is very important, 10 of them (5 of each respondents) says that it is extremely and slightly significant and the rest 4 of them says it is moderately important.

5.2. Conclusions

The main concern of this study was to collect necessary information about factors affecting performance of construction projects in case of Tnela construction PLC. Its major purpose is to understand factors affecting performance of construction projects factors by analyzing environmental factors, cost performance factors, time performance factors and quality performance factors and to identify and recommend if there is any additional practices or activities that may enhance the performance of the organization.

From the analysis in the previous chapter the following conclusion are given.

- The political environment has some degree of effect on construction projects.
- The respondent's perception on the effect of economy on construction project and most of the respondents say that the economy is moderately and very significant.
- From the data collected on technological advancement, it is moderately significant factor.
- Regarding to waste pollution control, most of the respondents states that effective waste pollution control is moderately significant followed by least significant making it slightest factor.
- This finding shows us that variation in economy's exchange rate highly affect the construction sector.
- According to the capacity of the labor market for supplying skilled workers, most of the respondents agree that it is moderately significant.
- Regarding the project's physical location most of the respondents agreed that it is very significant.
- Project's scope can highly affect the performance of time for completion of a construction project.
- According to the experience of personnel on the performance of time of a project the study shows that most of the respondents think that it is very significant and some of them think that it is extremely significant and this shows us that the experience of personnel is also vital in achieving time performance of a construction project.
- Regarding the importance of member's dedication on realizing the time performance of a construction projects, member's dedication is highly important factor in achieving the desired time performance of a construction project.
- Regarding the effective site management and monitoring of a project with respect to the time performance of a construction project, all of the respondents have been separated to different perspectives with the higher percentage of responses of very significant to extremely significant followed by moderately significant and for some percentage of respondents describing that slightly significant.

- Having a defined and clear goal has important role in achieving the time performance of a construction project.
- When we see the management part of a time performance of a project, most of the respondents agreed that it is very importance
- Since communication and cooperation are vital elements of any activities, the study tries to check their importance under the time performance of a project. Considering the responses of the respondents, we can say that communication and cooperation are very important in attaining the time performance of a construction projects.
- With respect to rapid decision making on the time performance of a construction project, almost half of the respondent's response is moderately significant.
- On the respondent's replies about the importance of waste management on cost performance, most of them replies it is very and extremely important. So, we can say that management of waste is highly important in attaining cost factor of a construction projects.
- Having sufficient resource is very important in attaining cost performance factors of a construction projects.
- The response rate clarify us that availability of sufficient fund is highly and extremely important part of cost factors that have impact on the performance of a construction project.
- By looking the response of respondents we can say that participant's relationship has not that much influence on the cost performance of a construction projects.
- According to the target respondents, regular meeting doesn't have that much effect on the cost performance of a construction projects.
- Early decision has low importance on the cost performance of a construction projects.
- It is highly important to have quality of equipment and materials in attaining the quality performance of a construction projects.
- Favorable working environment is moderately and slightly important in achieving the quality performance factors of a construction projects.
- We can conclude that member's integrity has a direct impact in achieving the quality performance factors of a construction projects.
- Concerning the issue of manager's willingness to improve quality, we can understand that manager's willingness to improve quality is highly important factor in achieving the quality performance factors of a construction projects.
- When we look the response rate of the respondents on the issue of Project participant's effective monitoring and recommendation on project, we can conclude that Project participant's effective monitoring and recommendation on project is an important factor in achieving the quality performance factors of a construction projects.
- Regarding effective quality assurance system, it is highly important to have effective quality assurance system in the organization if we want to accomplish the quality performance factors of a construction projects.
- Finally, we can conclude that management leadership in promoting high process quality is highly affect the quality performance factors of a construction projects.

5.3. Recommendation

- Out of the environmental factors that affect performance of the construction projects, variation in the economies exchange rate has the great influence on the performance of Tnela construction PLC and it will also put the projects performance into jeopardy by compromising the cost which will directly have impact on the quality of works to be done. So to tackle this gap, the company should have the practice of immediate decision making practice regarding the purchase of materials needed, to make materials available the company should also hold stock for the necessary materials needed like reinforcing bars, sheet metals, wire rods… etc. Since, the organization is an emerging one, it may not have the capacity to purchase all the materials needed but it should also try to get the materials from the suppliers on credit bases so that to create a smooth working condition and to finish the project at planned schedule.
- Regarding time performance of the project, the company should hire experienced personnel who is dedicated in accomplishing the projects at scheduled time, having clear goal, the company should also focus on effective site management and monitoring. Changes in projects scope are the main factors that hinder the project accomplishing at speculated time, the company should avoid accepting change in project scope. But if it is crucial, the company should implement additional strategies like working overtime, having experienced personnel and specialists, so that the project is finished at a speculated time.
- Concerning the cost performance factors of the organization, the company should focus on management of wastes and at the same time it should also make sure that there are sufficient availability of resources because if the company is facing on shortage of resources and availability of sufficient funds which hinder the company from attaining its goal by sinking the its performance.
- Finally, on the issue of quality performance of the construction project, the organization should have quality assurance system backed by manager's willingness to improve quality, effective monitoring and recommendation on project's performance by project participant is also crucial to promote integrity and trust among members.

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Appendix

Date _____

Abas Ayoub

Addis Ababa, Ethiopia
E-mail = abasayoub9@gmail.com

Dear Respondent

My name is Abas Ayoub, a master's student in project management at Addis Ababa University School of Commerce.
It is a requirement to undertake a research on particular area of interest. In line with my studies, I am conducting research on factors affecting performance of construction projects in case of Tnela Construction PLC.

This research will use a questionnaire to collect information in order to understand the situation as it is in the subject under review. It is for this reason that I kindly request for your assistance in offering your consent for the questionnaires and interviews as well as giving honesty responses to the questions.

The questionnaire includes both closed and open ended questions. Please fill free to write your answers on the space provided for open ended questions and select the option that is most suitable to reflect your opinion in a more accurate way.

The information you provide will only be used for academic purpose and is confidential. So, please do not hesitate to provide the necessary information to the best of your knowledge about the subject matter. Do not write your name.
If you have any ambiguity or a question contact me

Looking forward to your corporation.

Regards!

Abas Ayoub

+251-912-650-270.

Questionnaire

INTRODUCTION: Please kindly indicate your preference among alternative answers for each question by ticking in the appropriate box. Where alternative answers are not provided, fill in the gaps provided.

Part One: Open ended and closed ended demographic questions

1. **Sex** Male ☐ Female ☐
2. **Age:** below 20 ☐ 21 - 30 ☐ 31 - 40 ☐ 41 - 50 ☐ Above 50 ☐
3. **Educational background**

   12th and below ☐ Technic and Vocational Trained ☐ Diploma ☐
   BA/BSC ☐ Masters ☐ PHD ☐

4. **Service year (work experience)**_____
5. Mainly used software to manage a project

   MS Excel ☐ MS Project ☐ Primavera Asta ☐ Power Project ☐

   None ☐ Others_____

6. A project you are currently working on? (you can select more than one site)

   Kality/Kilinto ☐ Atobis Tera (Sebategna) ☐ Meskel Flower ☐

   Bole Sub-city (Megenagna) ☐ Kera around Pepsi ☐

Part Two: Factors Affecting the Performance of Construction Projects

Below are numbers of factors affecting the performance of construction projects. From your experience, please express your opinion on the importance of the following factors as key performance indicators of construction projects within Tnela Construction PLC. (Please tick the √ in appropriate box).

Environmental factors						
N.O	Key environmental Factors	Least significant	Slightly significant	Moderately significant	Very significant	Extremely significant
1	Political environment					
2	Economic factors					
3	Technological advancement					
4	Effective waste pollution control					
5	Variations in the economy's exchange rate					
6	Incapability of the labor market to supply skilled workers					
7	The project's physical location (site)					

Time Performance						
N.O	Key Individual Factors	Least significant	Slightly significant	Moderately significant	Very significant	Extremely significant
1	The project's scope					
2	Personnel with background knowledge (experience)					
3	Members' dedication and engagement					
4	Effective Site management and monitoring					
5	Clearly defined goals					
6	Support of top management					
7	Effective communication and cooperation between members					
8	Rapid decision making					

Cost Performance						
N.O	Key Individual factor	Least important	Slightly important	Moderately important	Very important	Extremely important
1	Management of waste					
2	Resource availability					
3	Effective contract administration and management					
4	Availability of sufficient funds					
5	Participants' relationships in the project					
6	Effective project site management and supervision					
7	Meetings on project performance on a regular basis					
8	Give early decisions					

Quality Performance						
N.O	Key individual factors	Least important	Slightly important	Moderately important	Very important	Extremely important
1	Quality of equipment and materials					
2	Availability of expertise					
3	Favorable working environment					
4	Members integrity on the project					
5	Management's willingness to improve quality					
6	Project participants effective monitoring and recommendations on project.					
7	Effective quality assurance system in the organization					
8	Management leadership in promoting high process quality					

Thank You!!!!

List of Tables

Demographic tables

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	37	90.2	90.2	90.2
	Female	4	9.8	9.8	100.0
	Total	41	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-30	11	26.8	26.8	26.8
	31-40	24	58.5	58.5	85.4
	41-50	6	14.6	14.6	100.0
	Total	41	100.0	100.0	

Educational background

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	4	9.8	9.8	9.8
	BA/BSC	35	85.4	85.4	95.1
	Masters	2	4.9	4.9	100.0
	Total	41	100.0	100.0	

Work Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<2 years	8	19.5	19.5	19.5
	2-4 years	17	41.5	41.5	61.0
	4-6 years	11	26.8	26.8	87.8
	>6 years	5	12.2	12.2	100.0
	Total	41	100.0	100.0	

software implemented

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MS Excel	24	58.5	58.5	58.5
	MS Project	5	12.2	12.2	70.7
	Power project	2	4.9	4.9	75.6
	None	10	24.4	24.4	100.0
	Total	41	100.0	100.0	

Project currently working in

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Kality/Kilinto	8	19.5	19.5	19.5
	Atobis tera (sebategna)	7	17.1	17.1	36.6
	Meskel flower	3	7.3	7.3	43.9
	Bole sub-city(Megenagna)	6	14.6	14.6	58.5
	Kera around Pepsi	5	12.2	12.2	70.7
	All of the 5 sites	12	29.3	29.3	100.0
	Total	41	100.0	100.0	

Currently working position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Management position	3	7.3	7.3	7.3
	Engineering	4	9.8	9.8	17.1
	Administration	2	4.9	4.9	22.0
	Architect	5	12.2	12.2	34.1
	Forman	7	17.1	17.1	51.2
	Other supporting office position	20	48.8	48.8	100.0
	Total	41	100.0	100.0	

Environmental Factors

Political environment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	5	12.2	12.2	12.2
	Slightly significant	10	24.4	24.4	36.6
	Moderately significant	12	29.3	29.3	65.9
	Very significant	14	34.1	34.1	100.0
	Total	41	100.0	100.0	

Economic factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	3	7.3	7.3	7.3
	Moderately significant	18	43.9	43.9	51.2
	Very significant	16	39.0	39.0	90.2
	Extremely significant	4	9.8	9.8	100.0
	Total	41	100.0	100.0	

Technological advancement

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	14	34.1	34.1	34.1
	Moderately significant	23	56.1	56.1	90.2
	Very significant	4	9.8	9.8	100.0
	Total	41	100.0	100.0	

Effective waste pollution control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	13	31.7	31.7	31.7
	Moderately significant	20	48.8	48.8	80.5
	Very significant	8	19.5	19.5	100.0
	Total	41	100.0	100.0	

Variation in economy's exchange rate

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	5	12.2	12.2	12.2
	Very significant	9	22.0	22.0	34.1
	Extremely significant	27	65.9	65.9	100.0
	Total	41	100.0	100.0	

Incapability of labor market to supply skill workers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	13	31.7	31.7	31.7
	Slightly significant	5	12.2	12.2	43.9
	Moderately significant	19	46.3	46.3	90.2
	Very significant	4	9.8	9.8	100.0
	Total	41	100.0	100.0	

Project's physical location

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	8	19.5	19.5	19.5
	Slightly significant	7	17.1	17.1	36.6
	Moderately significant	5	12.2	12.2	48.8
	Very significant	21	51.2	51.2	100.0
	Total	41	100.0	100.0	

Time performance Factors

Project's scope

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	10	24.4	24.4	24.4
	Very significant	3	7.3	7.3	31.7
	Extremely significant	28	68.3	68.3	100.0
	Total	41	100.0	100.0	

Personnel with experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	2	4.9	4.9	4.9
	Very significant	25	61.0	61.0	65.9
	Extremely significant	14	34.1	34.1	100.0
	Total	41	100.0	100.0	

Members dedication

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	9	22.0	22.0	22.0
	Very significant	32	78.0	78.0	100.0
	Total	41	100.0	100.0	

Effective site management and monitoring

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	4	9.8	9.8	9.8
	Moderately significant	9	22.0	22.0	31.7
	Very significant	16	39.0	39.0	70.7
	Extremely significant	12	29.3	29.3	100.0
	Total	41	100.0	100.0	

Clearly defined goal

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very significant	35	85.4	85.4	85.4
	Extremely significant	6	14.6	14.6	100.0
	Total	41	100.0	100.0	

Support of top management

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	12	29.3	29.3	29.3
	Very significant	29	70.7	70.7	100.0
	Total	41	100.0	100.0	

Communication and Cooperation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	4	9.8	9.8	9.8
	Very significant	28	68.3	68.3	78.0
	Extremely significant	9	22.0	22.0	100.0
	Total	41	100.0	100.0	

Rapid decision making

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	7	17.1	17.1	17.1
	Moderately significant	20	48.8	48.8	65.9
	Very significant	11	26.8	26.8	92.7
	Extremely significant	3	7.3	7.3	100.0
	Total	41	100.0	100.0	

Cost Performance Factors

Management of waste

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very significant	27	65.9	65.9	65.9
	Extremely significant	14	34.1	34.1	100.0
	Total	41	100.0	100.0	

Resource availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	6	14.6	14.6	14.6
	Very significant	35	85.4	85.4	100.0
	Total	41	100.0	100.0	

Effective contract administration

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	24	58.5	58.5	58.5
	Very significant	17	41.5	41.5	100.0
	Total	41	100.0	100.0	

Availability of sufficient fund

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very significant	21	51.2	51.2	51.2
	Extremely significant	20	48.8	48.8	100.0
	Total	41	100.0	100.0	

Participant's relationship

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	18	43.9	43.9	43.9
	Slightly significant	13	31.7	31.7	75.6
	Moderately significant	7	17.1	17.1	92.7
	Very significant	3	7.3	7.3	100.0
	Total	41	100.0	100.0	

project site management and supervision

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	29	70.7	70.7	70.7
	Very significant	12	29.3	29.3	100.0
	Total	41	100.0	100.0	

Regular meeting on project performance

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	22	53.7	53.7	53.7
	Moderately significant	17	41.5	41.5	95.1
	Very significant	2	4.9	4.9	100.0
	Total	41	100.0	100.0	

Give early decision

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	12	29.3	29.3	29.3
	Moderately significant	27	65.9	65.9	95.1
	Very significant	1	2.4	2.4	97.6
	Extremely significant	1	2.4	2.4	100.0
	Total	41	100.0	100.0	

Quality Performance factors

Quality of equipment and materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	14	34.1	34.1	34.1
	Very significant	23	56.1	56.1	90.2
	Extremely significant	4	9.8	9.8	100.0
	Total	41	100.0	100.0	

Availability of expertise

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Moderately significant	10	24.4	24.4	24.4
	Very significant	19	46.3	46.3	70.7
	Extremely significant	12	29.3	29.3	100.0
	Total	41	100.0	100.0	

Favorable working environment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	4	9.8	9.8	9.8
	Slightly significant	16	39.0	39.0	48.8
	Moderately significant	20	48.8	48.8	97.6
	Very significant	1	2.4	2.4	100.0
	Total	41	100.0	100.0	

Member's integrity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	7	17.1	17.1	17.1
	Moderately significant	13	31.7	31.7	48.8
	Very significant	14	34.1	34.1	82.9
	Extremely significant	7	17.1	17.1	100.0
	Total	41	100.0	100.0	

Manager's willingness to improve quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	5	12.2	12.2	12.2
	Slightly significant	3	7.3	7.3	19.5
	Moderately significant	6	14.6	14.6	34.1
	Very significant	18	43.9	43.9	78.0
	Extremely significant	9	22.0	22.0	100.0
	Total	41	100.0	100.0	

Project participant's effective monitoring and recommendation on project

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Least significant	2	4.9	4.9	4.9
	Slightly significant	3	7.3	7.3	12.2
	Moderately significant	8	19.5	19.5	31.7
	Very significant	20	48.8	48.8	80.5
	Extremely significant	8	19.5	19.5	100.0
	Total	41	100.0	100.0	

Effective quality assurance system in the organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	5	12.2	12.2	12.2
	Moderately significant	7	17.1	17.1	29.3
	Very significant	17	41.5	41.5	70.7
	Extremely significant	12	29.3	29.3	100.0
	Total	41	100.0	100.0	

Management leadership in promoting high process quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Slightly significant	5	12.2	12.2	12.2
	Moderately significant	4	9.8	9.8	22.0
	Very significant	27	65.9	65.9	87.8
	Extremely significant	5	12.2	12.2	100.0
	Total	41	100.0	100.0	