



**ADDIS ABABA UNIVERSITY SCHOOL OF  
COMMERCE**

**Department of Project Management**

**Factors Affecting Success of Project Execution on Building  
Construction; A Case of Mafer Private Limited Company**

**By:  
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**A project work submitted to the School of Graduate Studies of Addis  
Ababa University in Partial Fulfillment of the Requirements for the  
Degree of Master in Project Management**

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## **Declaration**

I declare that this project work entitled “Factor Affecting Success of project execution on Building Construction: The Case of Mafer PLC” is my original work. This project work has not been presented for any other university and it’s not concurrently submitted to the candidate of any other degree and all sources of material used for project work have been duly acknowledged.

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Signature .....

May, 2024

# Letter of Certification

This is to certify that the Project work is prepared by Mrs. Amenti Chali entitled “Factor affecting the success of project execution on building construction: in the case of Mafer PLC” and submitted in fulfillment of the requirement for the Degree of Masters of Arts in Project Management complies with the regulation of the university and meet the requirement with the respect to originality and quality.

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## **Acknowledgments**

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## ABSTRACT

*This study aimed to examine the factors that affect the success of project execution in building construction within the case of Mafer Private Limited company. Specifically, the study aimed to assess the factors that influence the success of project execution building projects the company implemented. This research seeks to examine the factors that affect the accomplishment of successful outcomes in building construction project implementation within Mafer Plc. The research employs a quantitative data collection and analysis method. The research design is both explanatory and descriptive seeking to form causal relationships between variables while providing a detailed and accurate description of the phenomenon. The study's target population was ten building projects that Mafer Plc implemented. A total of 73 project participants were identified, and a questionnaire was distributed to collect data on project success factors. Of the 73 questionnaires distributed, 69 were returned. The collected data was analyzed using SPSS, and multiple linear regressions were used to identify the factors affecting project execution. The study identifies the Project consultant & project management teams, Client, Contractor, and External factors as key factors for the success of project execution in Mafer plc, with client and contractor-related factors having the most significant impact. The study showed that all five factors of project execution success which are listed above positively influenced. The study recommends that the company to resolve the raised factors by insighting appropriate steps and prioritizing quick actions. The study acknowledges limitations and suggests areas for future research to provide a more comprehensive understanding of the success of project execution for good project implementation and accomplishment. Overall, the study provides valuable insights for organizations seeking to improve their approach to Project execution experience for a better outcome and increase performance success rate.*

**Key words:** Execution, Performance, Success, Project, Construction

## **List of abbreviations**

**ANOVA** - Analysis of Variance

**GDP** – Growth domestic product

**IEEE** - Institute of Electrical and Electronics Engineers

**PM**- Project Management

**PMO**- Project Management Office

**PMI** - Project Management Institute

**PMBOK** - Project Management Body of Knowledge

**PLC** - Private limited company

**SPSS** - Statistical Package for Social Science

## Table of Contents

Declaration.....	ii
Acknowledgments.....	iv
ABSTRACT.....	v
List of abbreviations .....	vi
Chapter One .....	1
1.1 Background of the study .....	1
1.2 Background of the organization .....	4
1.3 Problem Statement .....	4
1.4 Research Question.....	7
1.4.1 Main research question .....	7
1.4.2 Sub-research questions.....	7
1.5 Research Objective.....	8
1.5.1 General Objective .....	8
1.5.2 Specific objectives of the study .....	8
1.6 Significance of the study .....	8
1.7 The scope of the study.....	9
1.7.1 Geography scope:.....	9
1.7.2 Conceptual Scope.....	9
1.7.3 Methodological Scope .....	9
1.8 Limitations of the Study.....	9
1.9 Organization of the Research Report .....	10
1.10 Operational Definition of Terms.....	10
Chapter Two.....	12
2.1 Introduction .....	12
2.2 Theoretical literature reviews.....	12
2.2.1 Concept of the project.....	12
2.2.2 Characteristics of a project.....	13
2.2.3 Project management.....	13
2.2.4 Project Life Cycle .....	14
2.2.5 Project Life Cycle Management .....	15
2.2.6 Construction Project.....	17

2.2.7	Theories related to construction project phases .....	18
2.2.8	The Concept of project execution .....	19
2.2.9	Concept of Project Closeout .....	21
2.2.10	Elements of Success factors of construction projects .....	23
2.3	Empirical Review .....	26
2.4	Conceptual Framework .....	32
Chapter Three.....		33
3.1	Introduction .....	33
3.2	Research Approach and Design.....	33
3.2.1	Research Approach .....	33
3.2.2	Research Design.....	34
3.3	Population and sampling .....	35
3.3.1	Target population .....	35
3.3.2	Sampling Technique.....	35
3.4	Data collection.....	36
3.5	Data Analysis.....	37
3.6	Scale Reliability and Validity .....	38
3.7	Ethical Considerations.....	39
Chapter Four.....		41
4.1	Introduction .....	41
4.2	Response rate.....	41
4.3	Demographic data .....	41
4.4	Result and Analysis .....	44
4.4.1	Results for factor affecting the success of project execution.....	44
4.5	Correlation Analysis.....	56
4.6	Regression Analysis .....	58
4.6.1	Assumption of Regression Analysis Normality .....	59
4.6.2	Linearity .....	60
4.6.3	Homoscedasticity Test .....	60
4.6.4	Multicollinearity Test.....	61
4.6.5	Autocorrelation Test.....	62
4.6.6	Model Summary.....	63

4.6.7	ANOVA.....	64
4.6.8	Multiple Regression Coefficients .....	65
4.7	Discussions of Results.....	67
Chapter Five. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .....		69
5.1	Introduction .....	69
5.2	Summary of Major Findings .....	69
5.3	Conclusions and Recommendations.....	71
5.3.1	Conclusion .....	71
5.3.2	Recommendations.....	73
5.4	Recommendations for Further Studies.....	74
Reference .....		76
Appendixes .....		81

## List of tables

Table 1, Reliability Test Cronbach’s Alpha Results, .....	39
Table 2, Respondents sex, age, educational level, position and year of experience .....	42
Table 4. RII importance level range.....	45
Table 5. Responses regarding project-related factors .....	46
Table 6. Responses regarding consultant and project management team-related factors .....	48
Table 7. Responses regarding consultant and project management team-related factors .....	49
Table 8. Responses regarding Contractor related factors, .....	51
Table 9. Responses regarding External environment-related factors.....	53
Table 10. Responses regarding External environment-related factors.....	55
Table 11. Descriptive Statistics for the Independent and Dependent Variables.....	56
Table 12. Pearson correlation result table. ....	57
Table 13. Multicollinearity Test result table. ....	62
Table 14. Autocorrelation Test result table .....	63
Table 15. Model summary result table.....	64
Table 16. ANOVA results table .....	65
Table 17. Multi-regression result table .....	66

## List of Figures

Figure 1: project development stages .....	15
Figure 2: Project lifecycle Stage .....	15
Figure 3: Project closeout Process .....	23
Figure 4: Conceptual Framework .....	32
Figure 5. Normality Test, .....	59
Figure 6. Linearity Test,.....	60
Figure 7. Homoscedastic Test, .....	61

# **Chapter One**

## **INTRODUCTION**

In this chapter, discusses mainly background information on the subject of research and covers a statement of the problem, research questions, research objectives, and significance of the study. The chapter also covers other sections including the scope and limitations of the study. In the background of the study, it reviews the key concepts and how they relate to one another.

### **1.1 Background of the study**

The construction industry is one of the most important and complex sectors in the world, accounting for a significant portion of the economy and providing essential infrastructure for all other sectors after executing different essential projects. Construction projects can range from building and infrastructure development to civil engineering structures and renovations and are designed to meet specific objectives for different stakeholders (Nyangwara and Datche, 2015). The industry is made up of various stakeholders, including investors, government agencies, businesses, and private citizens, as well as consultants such as architects, engineers, and contractors who are responsible for the implementation of construction projects (Habenom, 2017).

A project in its most basic form, it's a brief undertaking carried out by individuals who cooperate to develop a special good or service within a predetermined time frame and budget while producing identifiable deliverables (Project Management Guide, 2022). To accomplish these main tasks and yield the deliverables, the project will undergo various processes and life cycles from the start of initiation to closeout. In order to project become successful, it should be executed and finished within time, budget and different considerable parameters.

According to Leach (2014), every project follows and goes through the following five phases of project management: identification and initiation phase, planning phase, implementation phase, monitoring and control phase and project closure phase. Project execution is the stage where all planned actions are interpreted and implemented to meet the objective of the project and the performance competencies are confirmed (Ramabodu & Verster, 2013). This is the stage where the project's objectives are fulfilled to the required quality standards through the application of human resources, project funds, infrastructure, technology and stakeholders are kept informed of

the project's progress and forecasts for project schedule and budget, as per the Project Management Body of Knowledge (PMBOK). The purpose of execution is to produce, deliver and deploy the project's outputs. The execution global phase tends to dominate a project in terms of work, elapsed time and expenditure. Although the work of execution is undertaken according to the script represented by the project plan (Zwikael, 2019).

The experience and practice of executing and completing construction projects are minimal referencing the recent repetition. Ethiopian public construction projects were critically affected by factors of public body competence, conflict among project members, poor human resource management, and project managers' unawareness and lack of knowledge (Sinesilassie, Tabish, & Jha, 2017). Currently, most mega public construction projects suffer from unmanaged project planning, operation, and function. Construction projects schedule fails to meet what was planned before, it reaches up to 80%, and the increase of cost than planned ranges up to 40% (Ayalew, Dakhli, & Lafhaj, 2016). Project quality, time overrun, and cost rise due to the inability to do on-time execution for proper completion. This become challenging the economic and construction industry development of the country, and also in different word parts.

Different factors prevent construction companies from executing efficiently within a given scope and agreement with the public body. Many construction projects will be successfully implemented and delivered depending on the execution of the project work and hand over the job to the client within defined time, budget, quality, etc. standard measuring elements. On the other hand, the construction industry is rife with complex execution performance issues and numerous problems. A wide range of topics and variables, including, project-related factors, consultant-related factors, client satisfaction, contractor-related factors, and external factors, which include time, money, quality efficiency, and safety, are related to project execution performance determinants. Due to the numerous parties involved in achieving project objectives, performance has been defined in one sense as a participant's (client, consultant, or contractor) contribution to the execution task necessary to complete the project in construction (Mullins, 2016).

It is important to know that strong project execution culture and commitment of the organization are crucial for completing successful projects, according to a study by the Project Management Institute (PMI 2018). Based on the study, businesses with established project execution cultures are more likely to meet project goals and objectives and are better prepared to deal with risks and

difficulties that may arise (PMI 2018). To guarantee that projects are finished on time, within budget, and to the desired quality standards, a strong project execution culture is imperative. However, several variables can have a negative impact on the culture of project execution, resulting in delays, cost overruns, and poor project results (Radford and Shiferaw, 2019).

In addition, when companies accomplish a project successfully in relation to the goal, it has to be done and handed over to the client or concerned body on time according to set standards. According to Kaul (2014), most projects do not meet their expected deadlines and efficiency levels, particularly during the final stages of completion. Referring to this Mafer plc faces project execution challenges over the last periods and affects the completion time of the project. this leads to a high increase in labor expenses, material consumption, overlapping of logistic facilitation, wastage of material, difficulties in controlling the work progress, and so on. Commonly, the increment of cost happens during failure to execute on time. As Fisk (2004) notes time is a critical factor in construction projects, and contractors incur overhead costs, such as staff salaries, benefits, and equipment expenses, for as long as construction is ongoing. Similarly, project owners bear carrying costs, including construction loan interest, staff salaries, insurance, and rent or mortgage payments for existing facilities during construction. Jared (2012) highlights that both parties' interests are best served by achieving closeout at the earliest possible date.

Furthermore, Wubishet (2004) highlights the challenges faced by the construction industry in Ethiopia, which hinder its development and make it a complex sector. The underlying issues can be categorized into two primary groups. Firstly, the industry lacks an integrated approach and operates with fragmented, unrelated, and often conflicting components. Secondly, there are deficiencies and market price fluctuations in the inputs required for the execution of construction works.

During execution, nowadays it is normal to backlog some works until handover time in construction companies and it is the same way in Mafer. This kind of task has an impact on the time and budget to hand over the project at full scale. According to Carson (2009), despite the fact that the remaining work after Substantial Completion constitutes a small portion of the overall contract (usually less than 1% of the contract value), completing the punch list often takes an unexpectedly long time. Achieving Final Completion after Substantial Completion should be a straightforward process. However, in numerous commercial and industrial construction projects,

Final Completion is not attained by the scheduled date, leading to adverse consequences for all parties involved.

In light of these challenges, this study aims to specifically identify the factors that impact the success of project execution of Mafer plc. The focus is on determining the critical factors that affect the project's execution in terms of the above-raised points for the construction work undertaken by the company in recent years.

## **1.2 Background of the organization**

Mafer plc was established in 1997 with a capital of more than one million Birr and with the aim of professional, timely, and customer-focused service in the construction industry. To only mention the period over the past twenty-seven years the company has been engaged in and constructed a large number of projects of different natures and sizes in different parts of the country, constantly refining its quality of services through experience. Since then, the company has been growing steadily and building its capacity for taking on bigger and more challenging assignments. Mafer registered as a Building Contractor Grade 3 (BC 3) from the Ministry of Urban Development and Construction.

Mafer PLC has experienced staff and up-to-date equipment and different machineries, it is one of the leading construction companies in the country. Its service ranges from; complete construction including finishing works, phase-to-phase construction renovation and remodeling works, interior finishing & decoration works, and manufacturing is facilitated by its fully equipped workshop. Imported items are handled through a company network of very experienced and professional partners in Italy.

## **1.3 Problem statement**

In the construction industry, it is common to look at unsuccessful projects in related different standards and parameters. This case is mainly because of different factors that happened during production and finishing time which affect the growth and profitability of companies. The main production stage in the construction sector is the execution stage. This stage is influenced by different factors more than the rest phases. Like, lack of executing capacity, poor project management, low detail and standard project design, and political interference are some of the main reasons why projects in the construction industry fail, Ejaz et al. (2013). These factors can

lead to delays in project completion and poor performance, which can prevent the industry from achieving effective execution, time, and cost performance. Additionally, Azeb (2016) highlights that the construction industry is particularly prone to project failures due to the complex nature of construction projects, which involve multiple stakeholders and require careful planning and coordination to achieve effective time and cost through the execution period of the project. In addition to these factors, there are different related factors that affect the construction companies like Mafer plc in the execution phase which are not addressed very well as collective factors but their effect is critical to the industry. This paper tries to identify and address these factors, and their effect on Mafer plc by collecting data for the respondent.

The socioeconomic progress of all countries heavily relies on the construction industry. The primary reasons for the failure of any construction project are issues and performance shortcomings. In the construction sector of developing nations, there are three main categories of causes for performance problems. These include deficiencies in industry infrastructure, problems arising from clients and consultants, and issues stemming from contractor incompetence or inadequacy (Mathar et al., 2020). The contractor's performance plays a crucial role in achieving project success. However, it has become a global trend for contractors to fall short of meeting the expectations of project owners. Numerous studies have been conducted to examine the factors that impact the performance of construction projects in developing countries. According to Murithi et al. (2017), construction delays in developing countries, particularly in Sub-Saharan Africa, can be attributed to a lack of skilled labor, insufficient supervision and site management, weak leadership, equipment shortages and malfunctions, and other factors.

Previous research has identified difficulties on performance failures as the main causes of project failure. However, most of these studies have focused primarily on specific aspects of execution of performance, such as cost and time, rather than considering overall execution performance. Idoko (2008) asserts that many construction projects in developing nations suffer from significant time and cost overruns, fail to achieve their intended objectives, or are abandoned either before or after completion. These factors are not only the key element in the construction sector to determine the effective way to execute projects in the industry. There are different related factors which affect the execution of projects, which will be seen in detail with in this paper work.

According to Koshe and Jha (2016), the key factors for successfully completing a project in developing countries like Ethiopia, particularly public projects with limited resources, are time, cost, and quality. However, many public construction projects experience significant delays in their schedules. There are various variables that can affect project objectives differently, including the dynamic nature of the external environment, frequent technological changes, organizational structure and size, project complexity, project cost, organizational culture, individuals involved, and strategy.

Execution contingencies in both budgets and schedules is crucial for project managers to minimize cost and time overruns, providing them with the necessary estimating caution. Effective execution planning and allocation of these contingencies play a vital role in reducing and managing uncertainties within a project (PMI, 2017). The mentioned projects faced considerable challenges in meeting the specified completion time outlined in the contract. Consequently, the extension of time required to complete these projects incurred additional overhead costs and other expenses. Delays in construction projects can lead to extended schedules, increased project costs, and pose risks to quality and safety (González et al., 2013).

Unfortunately, construction projects that have progressed smoothly and adhered to the schedule for the majority of the duration can encounter obstacles during the project closeout phase (Carson, 2009). In such cases, the builder may struggle to achieve complete finalization within the expected timeframe, resulting in the owner occupying the new building while certain unsightly elements, contractor equipment, and materials are still present, and construction workers continue to disrupt facility users. Inadequate execution by the contractor during the closeout phase can harm their relationship with the client and undermine the goodwill established throughout the rest of the construction process. Clearly, there are unidentified factors contributing to this apparent discrepancy between expected performance and the contractor's actual accomplishments.

According to (Feyisa, 2015) even though projects are tools through which development policies and programs are translated into practice, many public-sector development projects implemented usually take more time; require additional budget and customers complain about the quality of project outputs.

Despite the advancements made in construction technology and management practices, numerous building construction projects still encounter difficulties during their execution and phases. These

challenges manifest as delays in project completion, exceeding budgetary limits, and compromising the expected quality of the final project outcome. As discussed above there are challenges and outcomes that are raised from different perspectives of researchers, but it is crucial to identify and comprehend the key factors that influence project execution to improve project outcomes and ensure successful project completion because it is the main basic phase for project completion and success.

Many papers mention and identifies gaps for different causes for the success of project execution including external & internal factors and also, and they emphasize more on time, cost, and quality. Referring to this literature and raised points, here are the additional factors; project-related, consultant/project management, client, contractors, and external factors as general which need to be investigated more and discussed to close the gap related to project execution.

Based on this fact this research paper focuses on investigating these factors within the context of Mafer PLC. The study aims to identify the most significant factors that impact project execution, including project-related factors, project management-related factors, client and consultant-related factors, and contractor-related factors based on identified from an extensive review (Gudienė et al., 2013). By understanding and addressing these factors, the company can enhance project efficiency, mitigate risks, and deliver high-quality building projects within the defined budget and schedule.

Furthermore, the study seeks to bridge a knowledge gap by contributing analysis of factors affecting the success of project execution to the existing body of research, as most studies in the construction project domain are primarily focused on specific issues of construction projects, like time, cost, and others.

## **1.4 Research Question**

### **1.4.1 Main research question**

The main research question of the study is: What are the factors that affect project execution in the case of Mafer PLC?

### **1.4.2 Sub-research questions**

- What factors affect the success of project execution within the Mafer plc.?
- What is the impact of these factors on the success of project execution within Mafer plc.?

- What will be their rank of effect and correlation of these factors as per their importance given by the company respondent?

The answers to these research questions provide valuable insights for practitioners and researchers seeking to improve project management practices and enhance the organization's overall performance.

## **1.5 Research Objective**

### **1.5.1 General Objective**

The general objective of this study is to investigate the factors that affect project execution within the Mafer plc.

### **1.5.2 Specific objectives of the study**

The study aims to address specifically the following objectives:

- To assess factors that affect the success of project execution within the Mafer plc.
- To assess the impact of these on the success of project execution within the Mafer plc.
- To determine their effect rank and correlation of these factors as per their importance given by the company.

## **1.6 Significance of the study**

The significance of the study is to provide insights into the factors that affect project execution in building construction in the case of Mafer PLC. The study aims to contribute to the existing body of knowledge by identifying the challenges faced by the company's project teams in maintaining an effective project execution, as well as the strategies that can be employed to improve it.

The findings of this study will be beneficial to project managers, stakeholders, and policymakers in the construction industry in Ethiopia. This study can aid in the development of strategies for project teams to deal with these difficulties and enhance their performance by identifying the variables that influence project execution. Since it focused on companies that have different cultures from the locals, it will help the investors to formulate and prepare strategies for the future referring to the outcome of the study. The study can also help with the formulation of rules and

regulations for encouraging a culture of successful project execution in the Ethiopian building sector, Kaming and others (2013),

Furthermore, this study can serve as a reference for future research on project execution experience in the context of Mafer PLC, as well as in other similar settings. By building on the findings of this study, future research can explore additional factors that may affect project execution in building construction areas and develop more comprehensive strategies for addressing them.

## **1.7 The scope of the study**

### **1.7.1 Geography scope:**

The study is limited to Mafer PLC, located in Ethiopia. The findings of the study may not be generalizable to other organizations or contexts outside of Ethiopia.

### **1.7.2 Conceptual Scope**

The study focuses on the factors that influence project execution experience within the Mafer PLC, including project-related factors, project management-related factors, client & consultant-related factors, and contractor-related factors. The study does not explore other factors that may influence project execution, such as project scope, project geographical location, or external factors such as political instability or economic conditions due to time constraints.

### **1.7.3 Methodological Scope**

The study employs a quantitative method. The study collects data from primary sources, including a purposive representative sample of employees within the organization.

The scope of the study is determined by resource and skill constraints, such as time and budget limitations, as well as the availability of participants and access to data. The study aims to provide insights into the factors that influence project execution experience within the Mafer PLC, with the hope that the findings can be generalized to other organizations within the Ethiopian construction industry and beyond.

## **1.8 Limitations of the Study**

The risk of respondent bias, where participants may give answers that are biased or inaccurate due to social desirability or other factors, is another possible restriction. Respondent bias can occur in surveys or interviews, as mentioned by Jones et al. (2014), where participants may feel under

pressure to give socially acceptable or expected responses rather than their genuine opinions or experiences.

## **1.9 Organization of the Research Report**

The research report will be organized into several sections, starting with an introduction that provides a background of the problem, research questions, and objectives. The literature review section will follow, which will discuss the theoretical review, empirical review, conceptual framework and previous studies related to project execution experience in the construction industry. The methodology section will then detail the research design, data collection methods, and analysis procedures used in the study.

The study's findings will be presented in the findings section, along with a thorough examination of the variables influencing the project execution experience in the Mafer PLC. The results will be interpreted in the discussion section in light of the research questions and objectives, as well as the implications for the Mafer PLC.

Finally, the conclusion section will summarize the key findings, contributions, and limitations of the study, and provide recommendations for future research and practice in the area of project execution culture in the construction industry. The reference section will list all the sources cited in the report, and appendices may include additional details on the research design and analysis procedures.

Overall, the organization of the research report will follow a logical and structured format to ensure that the information is presented in a clear and accessible manner to the target audience.

## **1.10 Operational Definition of Terms**

**Construction** is something made by man for one purpose or another. It may be a road or a path, a bridge, a dam, a dwelling place, an airport or building etc. It is also defined as; a wide range of activities related to building, altering, or repairing structures. It encompasses tasks such as site preparation, excavation, drilling, seismic investigations, material supply, equipment installation, and fixture repair. However, it specifically excludes professional consulting services related to construction contracts unless they are part of the procurement process.

**Execution** is the process of working through the project plan. This involves putting your project plan into action. It is also defined as; a Process group consisting of those processes performed to complete the work defined in the project management plan to satisfy the project requirements. It involves coordinating resources, managing stakeholder engagement, and integrating and performing the activities of the project in accordance with the project management plan.

**Project completion** is the process of completing the project. it is also defined as; a process(es) performed to formally complete or close a project, phase, or contract. It verifies that the defined processes are completed within all of the processes to close the project or phase, as appropriate, and formally establishes that the project or project phase is complete. It is an accomplishment and achievement of a lot of work.

## **Chapter Two.**

### **RELATED LITERATURE REVIEW**

#### **2.1 Introduction**

This section covers the review of related literature of different scholars and authors that have been reviewed in the area of construction projects with a special focus on factors affecting the performance of construction projects. It deals with both theoretical and practical findings of various researchers' concepts related to performance in project execution in construction projects and factors affecting the performance of construction projects. It deals with the review of related kinds of literature gathered from different secondary sources such as published books, articles, and related websites.

#### **2.2 Theoretical literature reviews**

##### **2.2.1 Concept of the project**

A project was characterized in a variety of ways by project management researchers. According to PMBOK (2017), a project is described as a transient activity undertaken to provide a unique good, service, or result. A project is a brief endeavor with a predetermined start and finish date. In other words, the lifetime of a project depends on its kind; it is limited but not always tiny. Projects have a finite lifespan since they are not continuous. Additionally, as most projects are started to produce a long-term outcome, the term "temporary" typically does not apply to the project's product or services. The idea behind the term "unique" is that every project is different in some manner. The project is distinctive in spite of some shared aspects since it has a different owner, design location, and facilities. Repetitive aspects don't affect the entire effort's essential uniqueness because each project's result is distinctive in its own right (Hackett et al, 2005).

Lewis (2005), another scholar, defined a project as an assignment that is completed once, with specific start and end dates, a budget, a well-defined scope of work, and the capacity for multitasking. According to Wysocki (2003), a project is an assemblage of independent, intricate, and interrelated activities with a common goal or purpose that needs to be completed within the allotted time, money, and requirements.

### **2.2.2 Characteristics of a project**

A project is not the same as a program or regular job. A project is different from a program in that it has unique qualities. Seven project characteristics, according to Nicholas and Herman (2008), are as follows:

1. A project has a single, clearly defined objective, end product, or outcome that is often described in terms of budget, time, and performance.
2. Every project is unique since it requires a different approach than those used in the past. Even common projects like building a house are made special by factors like location, accessibility, zoning laws, labor availability, public utilities, and local utilities. A project is an isolated action that is never precisely repeated.
3. Projects are transient activities. An ad hoc organization of people, resources, and facilities is formed to achieve a certain goal, generally within a given time frame; after that goal is met, the organization is either dissolved or reorganized to focus on a different objective.
4. Because they need the expertise of people from different companies and professions, projects transcend organizational boundaries. The intricacy of modern technology sometimes leads to task interdependencies that might result in novel and uncommon problems, which in turn intensifies project complexity.
5. A project involves some unfamiliarity as it differs from previous efforts. It could include modern technology and carry a significant amount of risk and uncertainty for the organization carrying it out.
6. When an organization embarks on a project, it typically has something to lose. Because failure might put the company or its objectives in risk, the task could need more attention or effort.
7. Lastly, a project is the act of working toward an objective; projects go through a number of distinct phases, which are collectively referred to as the project life cycle. When the project transitions from one phase to the next, the tasks, individuals, groups, and other resources change.

### **2.2.3 Project management**

Project management is the application of expertise, skills, tools, and methods to project operations to achieve project requirements, according to PMBOK (2017). The five phases of project management include planning, executing, controlling, and closure. According to Jason Westland (2006), project management is the set of abilities, instruments, and procedures needed to carry out

a project successfully. This idea is also expressed by James P. Lewis (2011), who claims that project management involves people, tools, and systems.

Meeting business objectives, meeting stakeholder expectations, being more predictable, increasing chances of success, delivering the right products on time, resolving issues and problems, promptly responding to risks, making the best use of organizational resources, determining whether projects are failing, trying to salvage them, or end them; manage restrictions (e.g., scope, quality, timeline, budget, resources).

Missed deadlines, cost overruns, poor quality, rework, uncontrolled project expansion, loss of the organization's reputation, disgruntled stakeholders, and failure to meet the project's goals are all possible outcomes of poorly managed projects (PMBOK® Guide, 2017).

#### **2.2.4 Project Life Cycle**

PMBOK, (2017 describes the project life cycle which serves to define the beginning and the end of a project.

##### **Project life cycle generally defines;**

Feasibility - Project formulation, feasibility studies, and strategy design and approval.

Planning and design- base design, cost and schedule, contract terms and conditions, and detailed planning. Major contracts are let at the end of this phase.

Construction- manufacturing, delivery, civil works, installation, and testing. The facility is substantially complete at the end of this phase.

Closeout and startup final testing and maintenance; The facility is in full operation at the end of this phase.

##### **Stage in Project Lifecycle;**

A project has a lifecycle that progresses from conception to completion, beginning, middle, and end. Because projects in real life tend to differ from one another, the project lifespan may vary (Lock, 2007). However, these models are helpful in determining and providing guidance from the start of the project until its completion. (Lock, 2007)

According to Lock (2007) and PMI (2013), the traditional project development stages are initiation, planning and design, executing, monitoring and controlling, and closing. An atypical full project life cycle comprises the following phases: conceptualization, planning and design, implementation, handing over, operation and maintenance, and project termination.

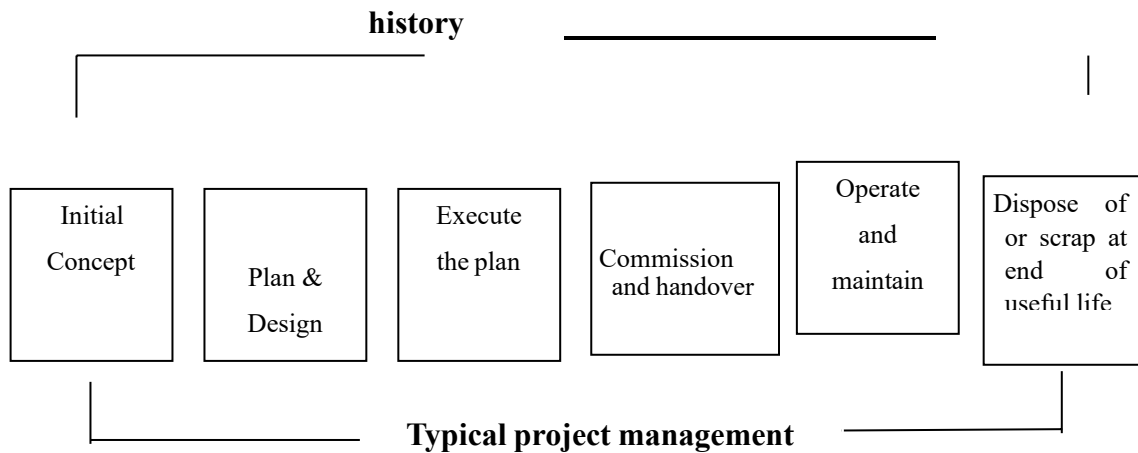
Initiation	Planning and Design	Executing	Monitoring & Controlling	Closing
1	2	3	4	5

**Figure 1: project development stages (PMI, 2013)**

Field and Keller (2007) elaborate a basic five phased model having following stages – define, plan, organize, execute, and close.

Lock (2007) presents the following life cycle for project.

**Typical full life**



**Figure 2: Project Lifecycle Stage**

It is helpful to quickly examine how staffing and resource requirements evolve throughout a project when talking about the lifecycle of a project. As the figure illustrates, the execution and closeout phases are consecutive and interconnected where manpower to execute the planned work, material, teamwork, different work methodologies, teamwork, and costs are needed during the execution and closeout phase. This implies a steady rise throughout implementation, and then a decline as the project comes to an end (PMI, 2010).

**2.2.5 Project Life Cycle Management**

Project management is the art of directing and coordinating resources, both human and material, throughout a project's lifecycle. It utilizes modern management techniques to achieve predetermined objectives related to scope, cost, time, quality, and stakeholder satisfaction

(PMBOK, 2017). In essence, it's the practice of initiating, planning, executing, controlling, and closing a project's work to achieve specific goals and success criteria within a set timeframe.

Westland (2006) defines project management in the context of the project life cycle as the combination of skills, tools, and management processes needed for successful project execution. These three components are crucial for setting up, maintaining, and successfully closing a project.

**Skills:** This refers to the knowledge and abilities required by project managers and team members to effectively execute a project. It encompasses technical, leadership, communication, and problem-solving skills.

**Tools:** This includes the software, hardware, and other resources used to support the project management process. Examples include project management software, communication tools, and planning and execution tools.

**Management processes:** This refers to the methodologies and processes used to manage the project. This includes the project management life cycle (initiating, planning, executing, controlling, and closing) and other processes like risk management, quality management, and stakeholder management.

By effectively utilizing these three components, project managers can ensure the successful completion of projects on time, within budget, and to the desired quality, ultimately achieving stakeholder satisfaction.

Project management success hinges on the continuous improvement of skills, tools, and processes. These elements are essential for managing any project, and their effective application drives successful project completion through the five phases of initiation, planning, execution, monitoring and controlling, and closure.

Kerzner (2017) identifies these five phases as the guiding principles of project management namely; project initiation, project planning, project execution, project monitoring and control and project closure. Additionally, the Project Management Institute (PMI) outlines ten knowledge areas that are applicable to all projects and crucial for project managers to master for successful project implementation: Project Integration Management, Project Scope Management, Project Time Management, Project Quality Management, Project Human Resource Management, Project

Communications Management, Project Risk Management, Project Procurement Management, and Project Stakeholder Management (PMI, 2013, 2017).

By consistently improving skills, tools, and processes, and by leveraging the ten knowledge areas, project managers can significantly increase the success rate of projects, ensuring timely completion within budget and to the desired quality, ultimately achieving stakeholder satisfaction.

Projects, with their shorter durations and higher risks compared to ongoing business operations, play a critical role in achieving strategic goals by focusing on delivering a defined set of deliverables within agreed cost, time, and quality parameters. Project managers (PMs) are tasked with identifying and maximizing the strategic value of project outputs and returns.

To achieve this, projects are designed as temporary, flexible organizational structures. This enables efficient coordination, direction, and oversight of related tasks and activities, ensuring that outputs and returns align with the organization's strategic objectives.

Project success often hinges on collaboration and active participation from multiple organizations. This collaborative approach ensures the delivery of outputs that generate measurable results and are perceived as advantageous by stakeholders.

### **2.2.6 Construction Project**

Project-based production dominates the construction industry, and production organizations are made up of comparatively independent members of sporadic, ever-changing coalitions of businesses. This has had an impact on the processes and structure of the business, resulting in a highly fragmented sector with a wide variety of firm types. As a result, building production has relatively high levels of complexity and poor levels of efficiency (Vrijhoef & Koskela, 2005).

The act of constructing anything is called construction. It entails several phases that might result in the construction of new structures, roads, and other infrastructure, or it could entail modifications to the already existing structures, roads, and infrastructure (Radosavljevic and Bennett 2012).

Construction projects is defined as exceptional, time-bound, high-value construction missions with predefined performance goals (Chitkara 2005).

Because there are many project participants, including clients, consultants, contractors, stakeholders, stockholders, and regulators, the construction sector is inherently complex. This industry is subject to substandard contract performance because of its complexity, fragmentation, and extremely casual labor force (Helen L. and Steve R., 2005).

### **2.2.7 Theories related to construction project phases**

Contingency theory, also known as the situational approach, is a leadership theory that suggests that there is no one-size-fits-all approach to managing projects. Instead, the theory argues that the most effective way to manage a project is to tailor the management approach to the specific characteristics and environment of the project. According to Sawega (2015), each construction project is unique and has its own complexities, which means that a tailored approach is necessary to ensure success. This approach rejects the idea of a universal "best way" to manage projects, as the management situations vary from project to project. Mutema (2013) highlights the importance of contingency theory in considering the interaction and interrelation between the project and its environment. This means that project managers need to take into account the environmental factors that may impact the project, such as stakeholder expectations, resource availability, and regulatory requirements. Generally, contingency theory suggests that project managers should adopt a flexible approach to managing construction projects, taking into account the unique characteristics and environment of each project. This approach can help ensure that projects are delivered on time, within budget, and to the desired quality.

Based on general system theory, A project can also be viewed as a system with inputs, processes and outputs. a project can be viewed as a system made up of interconnected components or subsystems, which work together to achieve a common goal. The success of the project depends on the harmonious interaction of these components, and any dysfunction or miscommunication between them can lead to problems and delays. One way to understand the interdependencies among the various components of a project is to use a systems thinking approach. This involves analyzing the project as a whole, identifying the key components and their relationships, and understanding how they interact with each other. By taking a holistic view of the project, project managers can identify potential issues and opportunities for improvement, and make informed decisions about how to allocate resources and manage the project's progress. Another important aspect of general system theory is the concept of feedback loops. These occur when the output of a system is fed back into the system as input, creating a cycle of cause and effect. In the context of

a project, feedback loops can be used to monitor and control the project's progress, identify issues and problems, and make adjustments as needed. Memon et al. (2013) emphasizes the importance of effective communication and collaboration among the various parties involved in a project. When different groups or individuals work together seamlessly, they can achieve greater success than if they worked in isolation. This is because collaboration allows for the sharing of knowledge, skills, and resources, and enables the project team to respond more effectively to changing circumstances and unexpected challenges.

Utility theory suggests that the value of a project is determined by its utility, which is a measure of how desirable or satisfying the project's outcomes are to the stakeholders. The utility of a project depends on the specific circumstances of the stakeholders, and it's important to consider the long-term impacts of the project when defining its success criteria. According to Al-Carlos (2014), utility theory should be an important element in defining project lead time, which is the time it takes for a project to deliver its intended benefits. A project's lead time can be longer or shorter depending on the level of utility it provides to stakeholders. The Project Management Institute (PMI, 2013) suggests that project managers can use a utility-based approach to develop a long-range contingency allocation plan. This approach considers the relationship between the expected utility of the project's outcomes and the challenges in allocating cost and time contingencies. By considering the expected utility of the project's outcomes, project managers can ensure that their contingency plans are aligned with the project's overall goals and objectives.

### **2.2.8 The Concept of project execution**

Project execution theory provides a comprehensive framework for effective project management, outlining the guiding principles, frameworks, and best practices for successful project delivery. It equips project managers and team members with a range of techniques, procedures, and best practices to efficiently plan, execute, monitor, and control projects (PMI, 2017). This theory emphasizes the importance of a structured approach, encompassing five key phases: planning, organizing, executing, controlling, and closing (Kerzner, 2017).

According to the Project Management Institute (2017), the project planning phase involves identifying the project's objectives, constraints, and requirements, including the timeline, budget, and resources necessary for successful completion. The project organization phase focuses on building a project team, defining roles and responsibilities, establishing communication channels,

and setting up decision-making processes. During project execution, the project plan is put into action, progress is monitored, and adjustments are made as needed to ensure the project stays on track.

Ballard et al. (2014) discovered that employing an adaptive management approach results in better project outcomes. A project's success depends on the alignment of governance and the adoption of a contract strategy. Proper communication among the project team, partners, and external stakeholders, such as the local community and national government, is essential for a successful project. Regular stakeholder meetings and forums help build consensus and ensure engagement and approval from local policymakers.

Effective governance and procedures, along with project management tools and risk management, are crucial for the successful completion of project tasks. Project control involves monitoring project progress, detecting potential issues, and taking corrective action to ensure that the project is completed within the defined scope, timeframe, and budget. Project closure entails wrapping up the project, documenting the lessons learned, and reviewing the project to identify areas for improvement.

Berg and Karlsen (2014) argue that project managers can positively impact the success of a project by influencing and motivating their team members. They base this argument on positive psychology theory, which emphasizes an optimistic view of human potential. To achieve positive outcomes, the authors recommend the use of "signature power, positive meaning, positive feelings, and positive relationships." Project managers can shape their team members' thinking, context, and self-talk, which can in turn affect their behavior and performance. By creating a culture that encourages the use of skills and resources to optimize project success, rather than individual self-interest, project managers can foster a more collaborative and productive work environment. To create this culture, project managers can encourage appealing project visions, objectives, and milestones, which can help to motivate and engage team members. By utilizing positive psychology theory, project managers can create a more positive and productive work environment, which can ultimately lead to greater project success.

Project execution theory is an interdisciplinary field that combines insights from project management, systems thinking, and organizational behavior. To ensure project success, effective leadership, communication, collaboration, and stakeholder engagement are critical components of

this theory, as emphasized by Pinto and Kharbanda (2015). By following the guidelines and principles of the theory of project execution, project managers and team members can significantly increase the chances of completing a project successfully and achieving its objectives. And also the theory provides a comprehensive framework to guide project teams in planning, organizing, executing, controlling, and closing projects in a way that maximizes the chances of meeting the project's goals and satisfying stakeholder expectations.

### **2.2.9 Concept of Project Closeout**

Project closures in the construction industry are frequently challenging, yet frequently neglected due to their unpredictable, changeable, and dynamic nature, which can result in significant consequences if not handled appropriately. As the final phase of the project lifecycle, its significance is frequently undervalued, even by big organizations, particularly when they are engaged in multiple projects simultaneously. Construction industry professionals often shift their attention to new projects, allocating limited resources of time and money, leading to a high failure rate of projects. Organizations are reluctant to take corrective action because of the time constraints, which exacerbates the issue. (Kaul, 2014)

Tyler and Johnson (2017) define the project closeout phase as the time between the completion of construction and the finalization of the contract. During this period, resources are kept in two forms: encumbered funds allocated for the project and in the contractor's financial bonding capacity. This signifies that the contractor's resources are also constrained during closeout, as they cannot access their bonding capacity for other projects. (Tyler & Johnson, 2017)

During project closeout, the period between the end of construction and the contract's finalization, resources are limited in two ways. First, funds are kept in escrow for the project, and second, contractors have a restriction on their financial capacity due to their bonding. Closeout activities, such as final payment, submitting as-built plans, and verifying quantities, must take place during this phase. Resource limitations can create challenges, as noted in a 2008 study by MSU, which identified both encumbered funds and contractor bonding capacity as constraints during project closeout (MSU, 2008).

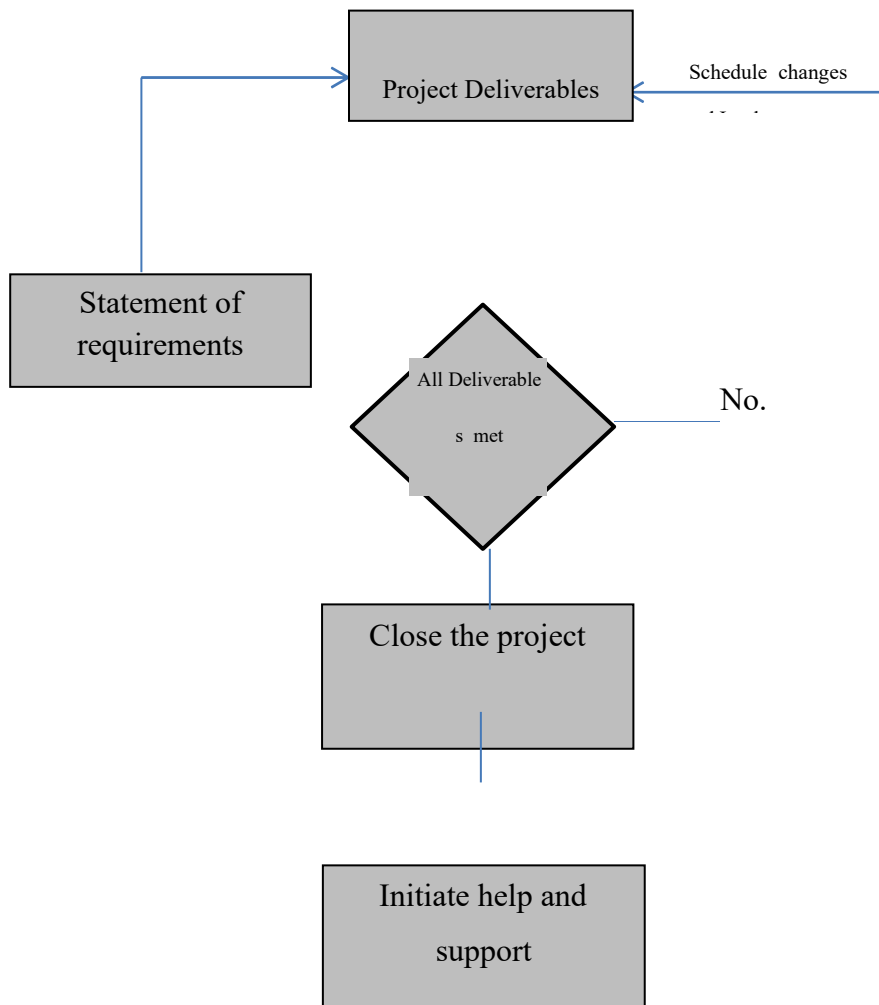
In the context of construction projects, project closure refers to the stage where the project deliverables are commissioned and all experiences are documented (Gardiner, 2005). This stage is predictable, but its execution and timing have significant implications for the project's success

(Hormozi, 2000). Specifically, for construction projects, project closure indicates that the building, bridge, or road is constructed and prepared to be transferred to the client.

In commercial construction projects, the success or failure of a project is heavily influenced by proper project scheduling, which involves setting realistic and achievable time schedules. Delays in construction schedules can cause significant financial consequences for both contractors and clients, as clients are forced to pay additional costs without being able to use or occupy their property for its intended purpose (Ochoa, 2013).

According to McManus and Wood-Happer (2003), the final stage of a construction project is project closure, which is a key aspect of project delivery. This stage involves completing all project activities, documenting the project's outcomes, and ensuring that all contractual obligations have been met. The project closure process consists of several steps, including completing project documentation, releasing project resources, settling all project invoices, closing out contracts, conducting a post-project review, and celebrating the project's success. Project documentation includes all project reports, technical drawings, specifications, and other relevant documents, which should be accurate, clear, and concise. These documents should be stored in a secure location for future reference.

Dvir (2005) outlines four different ways in which a project can be closed, namely extinction, addition, integration, and starvation. Closure by extinction occurs when a project has successfully achieved its goals. This is the most common way of closing a project, where the project team has completed all the project objectives and the project is deemed to be finished. A project can also be closed by incorporating it into the organization, which is known as closure by addition. This means that the project's outputs or deliverables are integrated into the organization's ongoing operations or business processes. Closure by integration involves distributing the resources, such as equipment, personnel, and functions, across the organization. This approach is taken when the project's objectives have been met, and the project team and resources are no longer required. The project's outcomes are integrated into the organization's existing functions or processes. Finally,



**Figure 3: Project Closeout Process**

closure by starvation is the termination of obsolete projects by cutting off resources or funds. This approach is taken when the project is no longer viable, the project team is disbanded, and the resources are reassigned to other projects or functions.

### 2.2.10 Elements of Success factors of construction projects

#### External factors

External factors are those impacting businesses that are beyond the control of their management. These factors do not depend on the company's performance, but can directly affect its success or even survival. Some external factors are triggered by society and their influence may vary

depending on public interests, market fluctuations, policy changes, etc. (Palaneeswaran, et.al. 2009). External factors are attributed to the macro-environment. This environment influences construction project performance through various factors. The Economic factors like taxes, competitiveness, credit, interest rate, inflation, etc. These factors influence the successful implementation of construction projects. Social factors are social conditions in which people live and work, influencing the effectiveness of construction projects. Technological factors are advancements in technology that can impact construction methods, materials, and efficiency. Legal factors are laws and regulations governing construction projects, including environmental regulations and building codes. Physical factors are geographic location, climate, and natural resources that can impact construction projects.

### **Institutional factors**

Institutional factors, comprising construction regulations, product and service certifications, industry standards, and construction permits, are a crucial component of the meso-environment. This system, comprising state institutions, financial bodies, public authorities, and regulatory agencies, plays a pivotal role in determining the volume and pace of construction activity, as well as the review and approval of building permits. The influence of these institutional factors on the success of construction projects is substantial, as they can either facilitate or hinder project progress (Gudienė et.al, 2013).

### **The internal factors**

Internal factors, which are under the control of an organization's management, are critical components that shape the organization's current situation and its ability to perform on a project. These factors are reflective of the organization's existing strengths, weaknesses, and capabilities, and have a direct impact on its project performance (Palaneeswaran, et.al. 2009).

### **Project-related factors.**

This category of internal factors encompasses various project characteristics, including its value, size, type, complexity, goals, and risk profile, among others. These project characteristics play a vital role in shaping the outcome of a project, and their influence can make or break the success of any project (Gudienė et.al, 2013). These factors directly affect the contractor's performance on execution of the project in different aspects.

### **Project management/team members-related factors**

The selection of team members with the right skills and expertise is crucial to the success of construction projects. Effective coordination and collaboration among all stakeholders, including project managers, team members, and clients, are essential for achieving project goals. This group of internal factors, including team members' competence, experience, decision-making abilities, motivation, technical capabilities, and personnel issues, plays a vital role in determining project outcomes (Ismail, F. et.al 2012).

### **Project manager-related factors**

The success of a project largely depends on the competence of the project manager. A project manager's performance is influenced by several factors, including their leadership skills, organizational abilities, coordination skills, experience, authority, and trust. These factors are critical in ensuring the project's planning and implementation are effective (Seiler, S. et.al, 2012 and Verburg, R. M. et.al, 2013). In other words, a project manager's ability to lead, organize, coordinate, and communicate effectively with their team, stakeholders, and clients is crucial for achieving project goals. Their experience, authority, and trust within the organization also play a significant role in their ability to manage projects successfully.

### **Contractor-related factors.**

The expertise and performance of contractors are crucial to the successful delivery of a project (Doloi et.al, 2011). Contractors take center stage during the construction or execution phase, where the actual project work is carried out (Alzahrani et.al 2013). This group of internal factors encompasses various aspects of a contractor's profile, including their company characteristics, technical and professional capabilities, experience, economic and financial stability, quality standards, health and safety protocols, and work conditions. These factors are the major for having successful performance on execution of projects. Most of the time these factors are not dealt with by the owners of the company due to a lack of monitoring and control, and also many companies don't emphasize improving such problems.

### **Client-related factors.**

The outcome of construction projects is significantly influenced by the client's characteristics, including their level of experience, type (private or public), size, and level of influence (Gudienė et.al, 2013). Additionally, the client's ability to make timely decisions, set clear and precise goals, and exhibit a certain risk attitude also plays a crucial role. Furthermore, the client's willingness and ability to participate in various stages of the project can also impact its success. In other words, a client's background, organizational characteristics, and decision-making abilities can impact the outcome of a construction project. Clients with relevant experience, a positive attitude toward risk, and the ability to make timely decisions can help ensure the project's success. These factors affect all stakeholders in one way or the other because the client is the main responsible body for successful project execution and completion since all participant is financed and administered with the investment of the client.

### **Stakeholders.**

In construction projects, stakeholders are individuals or groups with a vested interest in the project's success and the environment in which it operates. Stakeholders can include initiators, planners, designers, contractors, clients, project managers, and institutions. It's crucial for project management teams to identify stakeholders who can impact the project and manage their varying demands through effective communication in the early stages of the project (Gudienė et.al, 2013).

## **2.3 Empirical Review**

Different studies indicate the factors for the project performance on execution in related to various reasons due to different reasons on the world since there are various working conditions and approaches. These studies differ from time to time and geographically also. This is due to performance, economic, cultural, geographical, etc. which is different in every part of the world.

A project team is a group of individuals who are brought together to work on a specific project and are responsible for the success of project completion from start to end. The team is typically formed to tackle a unique task or set of tasks that require specialized skills and expertise. The team is responsible for managing the project and ensuring that it is completed successfully, within budget, and on time. Different types of projects require different competency sets for the team managing the project. For example, a project that involves a lot of technical work may require a team with a

strong background in engineering. On the other hand, a project that involves a lot of stakeholder engagement may require a team with strong communication and interpersonal skills He et al., (2019).

It is important for the appraisal to consider the competencies required by a project team to carry out a project proficiently and with an acceptable level of risk. This means that the team should have the necessary skills, knowledge, and experience to complete the project successfully. However, it is also important to avoid building up a project team that is too large to manage. A large team can be unwieldy and difficult to coordinate, which can lead to inefficiencies and mistakes. If a project team becomes too large, it may be necessary to separate the operational project delivery team (the project team) from those with stakeholder duties (Kerzner, 2018). In addition to considering the size of the team, the appraisers of a project need to be satisfied that appropriate technical expertise exists within a project team to ensure that a project is capable of proficient delivery. This may involve acquiring external expertise, such as consultants or contractors, or utilizing specialists who are already within the organization (Harris, 2014).

The construction industry has been plagued by project failures, and contractor competence is a critical factor in this regard. The shortage of skilled professionals in engineering and construction can lead to project delays, cost overruns, and poor-quality work. Furthermore, the lack of adequate risk management expertise can exacerbate these issues, as it can lead to changes in project scope, design, and timelines. This can result in significant cost overruns and delays, as seen in the case of the Kuala Lumpur airport terminal project. The competence of contractors has been identified as a key factor contributing to project failures in the construction industry. One of the primary reasons for this is the shortage of skilled professionals in engineering and construction, which can significantly impact project performance (Chihuri and Pretorius, 2010). The lack of adequate risk management expertise is a significant problem, as it can lead to project scope changes, cost overruns, and delays. For instance, the Kuala Lumpur airport terminal project has experienced substantial cost overruns and delays due to frequent design changes (Beckers et al., 2013).

Shaban's (2008) research work on the factors affecting the performance of construction projects in the Gaza Strip identified several key factors that were agreed upon by the owners, consultants, and contractors. These factors included the average delay due to closures and shortages of materials, the availability of resources as planned throughout the project duration, the leadership skills of the

project manager, the escalation of material prices, the availability of personnel with high experience and qualifications, and the quality of equipment and raw materials used in the project.

Effective stakeholder management is a crucial aspect of project management, as it involves developing and controlling relationships with individuals who are impacted by the project (Griffin, 2010). By successfully managing stakeholders, project managers can prevent scope creep, ensure project requirements are aligned, understand risk tolerance, and mitigate issues that could delay the project. Good stakeholder management is a testament to a project manager's influence within an organization and is essential for a healthy project environment.

As stated in the above statement, stakeholder management is a critical component of project management, as it involves understanding the needs and expectations of various stakeholders. In airport construction projects, there are multiple stakeholders involved, including airport authorities, airlines, passengers, and construction teams. Effective stakeholder management is essential to ensure that the project meets the requirements of all stakeholders and is delivered on time, within budget, and to the required quality.

Like for example airport construction and such projects involve multiple stakeholders who have significant input throughout the project life cycle. This is due to the large number of activities associated with aircraft and passenger flows (Flouris and Lock, 2016). However, project managers often focus on traditional aspects of project management, such as time, cost, and quality, while neglecting the allocation of human-related factors. This oversight can have a significant impact on different expectations, as no project can exist without people's input (Flouris and Lock, 2016).

In a study conducted in Vietnam, it was found that several key factors contribute to the success of construction projects, including the involvement of foreign experts, regular inspections by government officials, and close supervision during the implementation of new construction techniques (Bui and Ling, (2010). Conversely, the lack of accurate data on soil, weather, and traffic conditions can lead to poor project performance. In a separate study conducted in Nigerian construction sites, Amusan (2011) identified several factors that contribute to cost overruns in construction projects. These factors include the contractor's inexperience, inadequate planning, inflation, frequent variation orders, and changes to the project design. Other factors that can also contribute to cost overruns include project complexity, shortening of the project period, and fraudulent practices. Therefore, it is crucial to consider these factors when managing construction

projects to ensure their success and minimize the risk of cost overruns. Proper planning, the involvement of experienced professionals, and regular monitoring and evaluation can help to mitigate these risks and ensure that construction projects are completed on time and within budget.

Mega-scale infrastructure projects often face unique challenges and risks that can lead to their failure, like the Berlin Brandenburg Airport (BER) is a high-profile example of a large-scale infrastructure project that has faced significant challenges in terms of timeliness and cost. The project is reported to be more than 4 years behind schedule and at least 70% over budget. The poor track record of public-funded megaprojects in infrastructure, both in Germany and globally, should have served as a cautionary tale for decision-makers responsible for the Airport Project. However, as Fiedler and Wendler (2015) note, the broad reasons for project failure are common mistakes in planning and executing large infrastructure projects, political considerations, and ongoing innovation in the field of governing large-scale infrastructure projects.

The complexity of these projects, the numerous stakeholders involved, and the ever-evolving technological and regulatory landscape all contribute to the challenges of managing large-scale infrastructure projects. It is crucial for decision-makers to be aware of these challenges and to take a proactive and strategic approach to project planning and execution.

Based on the research studies, it is evident that project management and leadership play a crucial role in determining the success or failure of construction projects. The studies suggest that project managers and top management support, as well as appropriate project organization structures, effective management systems, and an appropriate leadership style, are essential factors in enhancing the quality performance and overall success of construction projects. Iyer and Jha (2006) found that a project manager's competence and top management support are significant contributors to enhancing the quality performance of a construction project. Similarly, Nyangilo (2012) identified the lack of appropriate project organization structures, poor management systems, and leadership as major causes of poor project performance. Gbadura and Oke (2010) examined the project management leadership styles of Nigerian quantity surveyors and found that Nigerian quantity surveyors were autocratic, while Nigerian construction professionals perceived them as more task-oriented in discharging their duties as construction project managers. And also, Iyagba, Odusami, and Omirin (2003) investigated the relationship between project leadership, team composition, and construction project performance in Nigeria. The study found a significant

relationship between the project leader's professional qualification, leadership style, team composition, and overall project performance

Yong and Mustaffa (2012) identified the critical success factors (CSFs) leading to construction project success in the Malaysian construction industry. They used a relatively important technique to identify the CSFs from 37 lists of project success factors found in previous literature. The participants in the survey were contractors, consultants, and clients in the Malaysian construction industry. The study found that the CSFs are not a standard set of measurements and may differ from country to country and over time. The identified CSFs were categorized into seven classes, including project-related factors, project stakeholder factors, client team leaders, consultants, project procurement factors, and external factors. A mean value analysis was used to rank each factor based on its level of importance. The mean score (MS) was used to identify the critical success factors based on the response degree of importance to construction project success on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The study's findings showed that the top five CSFs in the Malaysian construction industry are effective project planning, time management, quality management, effective communication, and client satisfaction. Effective project planning was identified as the most critical factor, followed by time management and quality management. Effective communication and client satisfaction were ranked fourth and fifth, respectively

Gunduz and Yahya (2015) conducted a study to identify the critical success factors (CSFs) in the construction industry in Dubai and the Middle East region. The study analyzed 25 project success factors identified in the literature review and used a statistical technique to compute the Relative Importance Index (RII) and frequency index (FE). The study found that the project management experience and project implementation knowledge of respondents were crucial in identifying the CSFs. The study used a Likert scale measurement divided into two scales, RII, and FE, to measure the relative importance of each factor. Spearman correlation was used to check the accuracy of data, a t-test was used to check the similarity between two groups, and a p-value was used to analyze the significant difference between the means between groups. The study's findings identified the top five CSFs in the construction industry in Dubai and the Middle East region as; project management experience, project implementation knowledge, time management, cost management, quality management.

Ofori-Kuragu et al. (2016) identified eight critical success factors (CSFs) for the success of Ghanaian contractors' organizations. These factors were quality and zero defects culture, organizational design, work culture, work environment, client satisfaction, strategy, leadership, measurement, analysis of information and knowledge management, and implementation of lean principles. The study used factor analysis to identify the most critical factors from a questionnaire survey conducted on contractor perception of essential factors.

Yang et. al (2010) also identified 15 factors for stakeholder management in Hong Kong construction project undertakings. These factors included managing stakeholders with social responsibility, formulating a clear mission statement, identifying stakeholders, understanding stakeholder interests, exploring stakeholder needs and constraints, assessing stakeholder behaviors, predicting the influence of stakeholders, assessing the attributes of power, urgency, and proximity of stakeholders, analyzing conflicts, compromising conflicts, keeping good relationships, formulating appropriate strategies to manage stakeholders, analyzing changes in stakeholders' influence and relationship, and communicating and engaging stakeholders frequently. The study used descriptive statistics to calculate the mean score value and identify the CSFs based on ranking. The relative importance of CSFs between groups was analyzed, and the study found weak positive and negative correlations between groups.

Das and Ngacho (2017) investigated the success factors for project performance in Kenya. They analyzed 30 project success factors based on responses from contractors, consultants, and clients, and identified six key CSFs that best explained the success of construction projects in Kenya. These CSFs included project-related, consultant-related, client-related, contractor-related, supply chain-related, and external environment-related factors. The study highlighted the significance of construction industry development projects in redistributing resources, reducing poverty, creating employment opportunities, and improving living standards through better healthcare, education, and access. The identified CSFs served as facilitating factors for project success

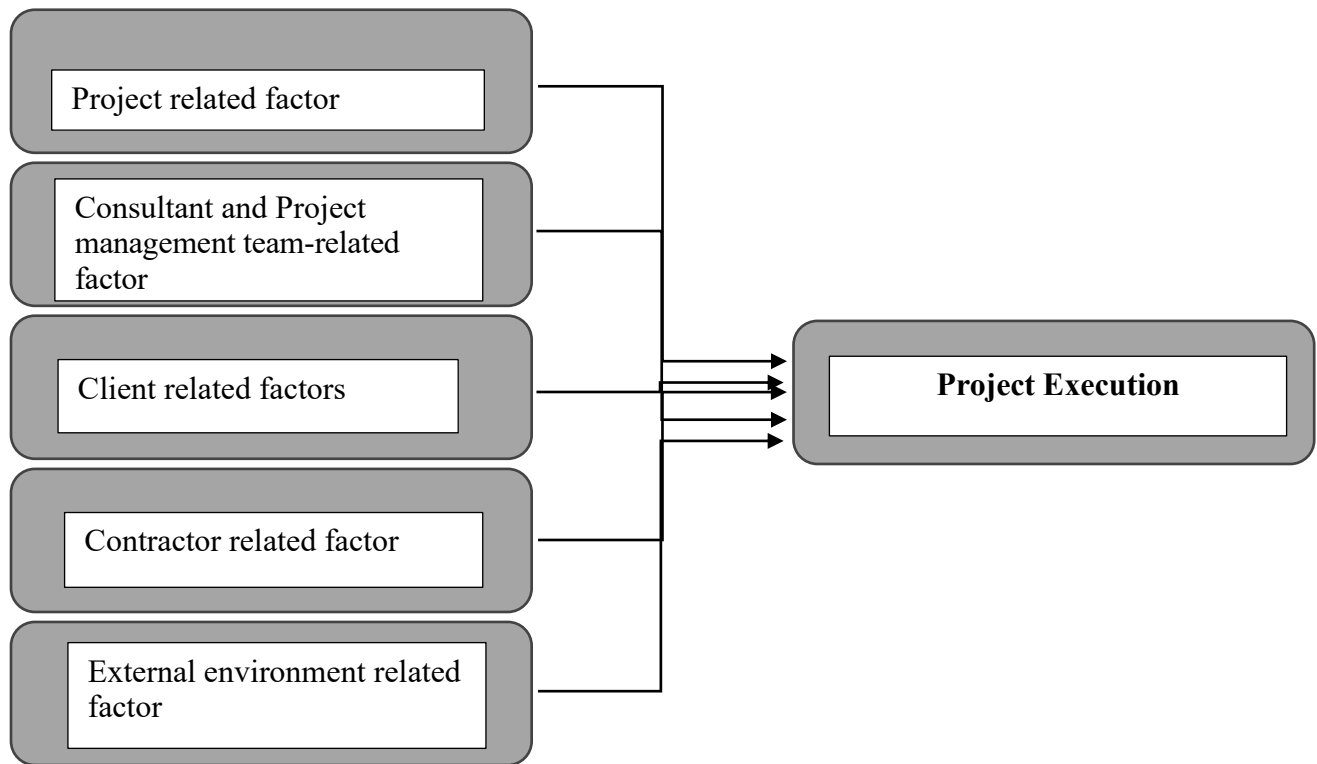
Fetene, (2008) did a study on causes and effects of cost overrun on public building construction projects in Ethiopia which cause for poor performance of project execution and closeout. From the results it was found that 67 out of 70 public building construction projects suffered cost overrun and became a problem for the project completion. The rate of cost overrun ranges from a minimum

of 0% to a maximum of 126% of the contract amount for individual projects and this is one of the factors that affect the project execution and closeout onetime.

## 2.4 Conceptual Framework

A conceptual framework has been developed based on the review of relevant literature, highlighting various elements that impact the success of project execution projects. The framework consists of collective variables such as Project-related factors, Project management-related factors, Client and consultant-related factors, and contractor-related factors, which serve as collective independent factors that can affect the successful completion of project execution (dependent variable). This framework is grounded in the findings of several studies (Gudienė et al., 2013), and provides a useful starting point for examining and insight into the relationship between these factors and the success of project execution. This paper tries to answer the research question by analyzing these factors with the raised objective. The finding will help for detailed studies in the future using the listed factor in each group as a latent variable.

**Figure 4: Conceptual framework**



Source and adapted; ( Altarawneh et al., 2017, Gudienė et al., 2013)

## **Chapter Three.**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

In this chapter, the theoretical framework of the research was explored, and the rationale for selecting the appropriate methodology and methods used in this study was justified. The research methodology consisted of various components, including the research approach, design, population and sample, data sources and types, data collection procedures, ethical considerations, and data presentation and analysis techniques. The following sections delved into each of these steps in detail, providing a comprehensive overview of the research methodology and approach. This information is crucial for understanding the research's validity and credibility and provides a clear roadmap for replicating the study or building upon the findings.

#### **3.2 Research Approach and Design**

##### **3.2.1 Research Approach**

The study utilized quantitative research methods to collect and analyze data related to various factors affecting project execution in Mafer plc. This research method helps implement statistical analysis for better generalizing the finding and also it helps to test the raised research question and to establish relationship or pattern within the variable factors. These factors included project-related factors, project management and consultant-related factors, client-related factors, and contractor-related factors. To gather this information, a standardized questionnaire was administered to a representative sample of the organization's employees who were involved in previous projects. Additionally, the study surveyed other stakeholders, such as project managers, consultants, and subcontractors, who had collaborated with Mafer plc.

The data collected through the questionnaire were quantitative and analyzed using statistical methods to identify patterns, correlations, and trends. The study focused on the prevalence and characteristics of each factor and their impact on project performance and outcomes. The results of the analysis are presented in the subsequent chapters, providing valuable insights for Mafer plc and other organizations in the industry.

The paper uses a qualitative approach to examine the relationships between the identified factors and project execution. This approach involved conducting questionnaire data gathering from key stakeholders, including project managers, consultants, and subcontractors, to gain a deeper understanding of their experiences and perspectives on the project's successes and challenges. It uses and involves statistical analysis, such as correlation, to determine which factors had a significant impact on project execution outcomes (Hossain & Gao, 2019)

The quantitative approaches allowed the study to provide a comprehensive understanding of the factors influencing project execution within Mafer plc. The findings from its approaches were triangulated to ensure the validity and reliability of the results. The study's recommendations are aimed at improving project execution culture within Mafer plc, providing a roadmap for enhancing project outcomes and success in the future.

### **3.2.2 Research Design**

The research design in this study is explanatory and descriptive analysis, aiming to determine the relationships between variables, to describe the participant population in the research, and also give a thorough and precise description of the phenomenon. These variables are usually measured through instruments, resulting in numerical data that can be analyzed using statistical techniques (Creswell, 2014). The researcher may first collect and examine qualitative data, such as through interviews or open-ended survey questions, to gain a deeper understanding of participants' experiences. The researcher then creates and administers a quantitative instrument, such as a Likert scale survey, based on the themes that emerged from the qualitative data. Researchers who use this approach typically assume a deductive testing method, implementing measures to prevent bias, considering alternative explanations, and aiming to generalize and replicate the findings. (Creswell, 2014).

The rationale for utilizing an explanatory research design in this study is to investigate the causal relationships between variables, which is fitting for the research question aimed at determining the factors that influence the success of project execution at Mafer plc. This design enables the exploration of the variables that impact the outcome of projects. This helps in identifying the causal relationships between the variables and provides insights into why and how certain phenomena occur (Trochim et.al, 2008)

The use of explanatory research design methodologies in this study is justifiable because they are the most effective for analyzing the relationships between variables and factors that affect project execution success within specific projects at Mafer plc. These methods provide insightful information about the variables and their effects on the company's performance. Explanatory research design is a rigorous and systematic approach that is appropriate for this study's goals. It allows for the exploration of the causal relationships between variables, elucidating why and how certain phenomena occur.

### **3.3 Population and sampling**

#### **3.3.1 Target population**

The population of the research comprised employees and participant bodies who have been working collaboratively with Mafer plc for a long time and who were directly involved in projects. The research mainly targeted employees who were responsible for planning, executing, controlling, and supporting overall project execution within the organization.

The target population was comprised of project managers, project coordinators, project site engineers, project members, project support staff, collaborative project managers consultants, and subcontractors with the organization. There were 8 project managers, 18 Site engineers, and Site managers, 9 Office Engineers, 12 Architects, 4 Managing body, and 11 management members, currently working with externally 5 project managers and 6 consultant's resident engineers' giving a total population of 73 based on Mafer HR department and project handover certificate data, (2023)

The population of the study incorporates 10 projects, the main office, sub-offices of the company, and different partner offices that were done between 2017 and 2023 and have reached a final stage where operation is tested.

#### **3.3.2 Sampling Technique**

The ten construction projects under Mafer PLC scope of 2017-2023 are the study's target population. In this study, a purposive sampling technique is utilized, which entails gathering data from every individual or unit in the population of interest. In this scenario, the population of interest is the ten construction projects that Mafer has implemented between 2017 and 2023.

Purposive sampling is a method of sampling in which a specific group or population is sampled. In other words, every specific member of the population is examined, and no smaller subset of the population is chosen. When the population size is small or the sample cost is low, this strategy is appropriate (Gravetter, et.al, 2020).

In the case of this project work titled "Factor Affect the Success of Project Execution: The Case of Mafer plc," the population for the study is the total number of construction projects undertaken by the company between 2017-2023.

Furthermore, since there are only 73 people involved in these 10 projects, using a purposive sampling technique would be feasible and practical. This would provide a comprehensive and accurate representation of the population being studied, and eliminate the possibility of sampling error. The use of purposive sampling in this study is appropriate as it ensures that all the construction projects within the specified time frame and all individuals involved in the implementation of these projects are included in the data collection process. This provides a comprehensive and accurate picture of the factors affecting the success of Mafer PLC.

Additionally, the use of a purposive sampling technique ensures a high level of accuracy in the data collected, which is essential in identifying the factors that affect the success of project execution in Mafer PLC.

By collecting data from this population, the research can gain a comprehensive understanding of the factors that affect the success of project execution in the context of Mafer plc. This information can be used to develop recommendations for improving construction project success on execution, and also implementation within Mafer plc and potentially other organizations with similar contexts.

### **3.4 Data collection**

A questionnaire that contains important collective variables that are selected based on a detailed literature review and contextual investigation is prepared. A preliminary questionnaire prepared is distributed to the above-mentioned stakeholders to fill in the form by including additional information that they think is worth to be included in our context. The final questionnaire is then prepared and distributed to respondents while they are at the project site and at their offices.

The developed questionnaire contains two parts. The first part is devoted to the professional employee's profile data. The second part contains questions related to the factors that affect the performance of the construction projects. The respondent's response is measured on a five Likert rating scale where: Strongly Agree (SA) = 5; Agree (A) = 4; Neutral (N) = 3, Disagree (D) = 2; and Strongly Disagree (SD) = 1. The questionnaire developed is distributed purposively to the professionals by kindly asking their willingness to fill in the questions.

### **3.5 Data Analysis**

To have the required result, this study used descriptive statistics in terms of percentages, mean scores, standard deviations, and tables to analyze and present the data collected through the questionnaire.

The data obtained from the questionnaire survey used a Likert scale ranging from 1 (Strongly disagree) to 5 (Strongly agree) and it is analyzed to determine the relative importance of various factors that contribute to the success of project execution projects within Mafer plc.

Quantitative data were gathered from primary sources and analyzed using the Statistical Package for Social Sciences (SPSS version 25.0) to identify the factors that impact the success of project execution in the study. The data were collected from the primary stakeholders in the company, including the owner, long-term employees, consultants, and project managers who are directly involved in the construction process

To analyze the quantitative analysis the study uses descriptive statistics, inferential statistics, and regression analysis. A descriptive technique can be used to synthesize information acquired from surveys and project documentation relevant to the study. Descriptive statistics may be useful in identifying patterns, relationships, and trends in data. Descriptive statistics can assist researchers in understanding and summarizing data. Variability measures, such as the standard deviation and range, represent the spread or dispersion of the data, whereas central tendency measures, such as the mean, median, and mode, describe the average value of the data. Percentiles and quartiles are two more summary measurements that give information on the data's distribution (Trochim, et.al, 2008).

Inferential statistics can help evaluate the significance of variable correlations and generalize findings to the target population. It entails drawing inferences about the population and testing

hypotheses using probability theory, hypothesis testing, and confidence intervals. Inferential statistics is frequently used in scientific research, corporate analytics, and other sectors where conclusions about a population must be drawn based on a sample of data. Inferential statistics relies on sampling, which is the process of selecting a subset of a population to serve as a representative sample. Inferential statistics also includes hypothesis testing, which is the process of testing a hypothesis about the population based on sample data. This probability is used to test the hypothesis and make demographic conclusions (Field, 2013).

Regression analysis is a statistical method for investigating the relationship between two or more variables. It is used to forecast the value of a dependent variable by modeling the connection between the dependent variable and one or more independent variables. Regression analysis can assist in identifying the characteristics that contribute to the factors affecting project execution.

### **3.6 Scale Reliability and Validity**

Instrument reliability refers to the consistency of the instruments or procedures being used. According to Creswell (2003), reliability is the extent to which the instruments yield stable and consistent results. The reliability of a standardized test is typically expressed as a correlation coefficient, which indicates the degree of association between the variables. A high correlation coefficient indicates a strong association and therefore a reliable instrument. The reliability of the instruments used in this study was assessed through a test-retest procedure and by measuring the internal consistency of the items. The results of the reliability analysis are presented in the following section

The researcher conducted a reliability test before proceeding to the main study. The importance of the reliability test was to determine probable weaknesses in the research instrument so that measures of minimizing the identified errors could be affected. To test the reliability of the scales Cronbach’s alpha was used.

<b>Indicators for Project Execution</b>	<b>Number of items</b>	<b>Cronbach’s Alpha</b>
Project related factors	10	0.742
Consultants and project management team-related factors	10	0.741

Client related factors	11	0.880
Contractor related factors	14	0.897
External related factors	11	0.853
The success of project execution	5	0.76

**Table 1, Reliability Test Cronbach’s Alpha Results, Source: Own Survey (2024)**

The concept of research validity refers to the extent to which the research process adheres to scientific research techniques in generating research findings. According to Oliver (2010), research validity is essential for various types of investigations. There are several categories of research validity, including content validity, criterion-related validity, construct validity, internal validity, external validity, concurrent validity, and face validity are the major categories of study validity defined by Cohen et al (2007).

For this study, content validity was tested, which evaluates whether the research instruments accurately measure the concept being studied. To ensure content validity, the questionnaire was evaluated by the internal advisor of this research paper and some professionals working in the construction industry. By evaluating the content validity, the researcher can ensure that the research findings accurately reflect the phenomenon being investigated.

**3.7 Ethical Considerations**

This study made clear that the respondents of the questionnaire to stay obscure and clarification is made on how the information will be gathered and how the data will be utilized. The study took all the fundamental measures to guarantee that every moral aspect of the study process is followed. In particular, the study put forth attempts to guarantee that the respondents comprehend that their interest in the study process is on a voluntary basis, and that they can withdraw whenever of they want. Moreover, the study also took all the appropriate measures to guarantee that all the respondents’ identity is kept anonymous. The study also consider the following point before proceeding the collecting and analyzing research data.

**1. Informed Consent:** Before collecting any data, the study obtained informed consent from the participants. This involved outlining the study's goals, the information that would be gathered, and its intended applications.

**2. Confidentiality and voluntary participation:** The researcher must ensure that the data collected is kept confidential and that the privacy of participants is protected. This study ensured that the respondents of the questionnaire were informed and understood how their information would be collected and used. The study took several steps to ensure that all ethical aspects of the research process were followed, including. The study made it clear that participation was entirely voluntary. Participants were informed that they had the right to choose not to participate or to withdraw from the study at any time without any repercussions. This ensures that participants are not coerced into participating and that their decision is based on their own free will This includes ensuring that any personal identifying information is kept secure and that data is only accessed by authorized individuals.

**3. Avoiding Harm:** The researcher must ensure that the research they conduct does not cause harm to participants or to the organization being studied. This includes avoiding any actions that could negatively impact the reputation or operations of the organization.

**4. Conflict of Interest:** Any potential conflicts of interest that might develop throughout the research process must be disclosed by the researcher. This includes any business or private connections with the organization under investigation.

**5. Data Integrity:** The researcher must ensure that the data collected is accurate and reliable. This includes taking steps to minimize bias and errors in data collection and analysis.

**6. Ethical Review:** The researcher should seek ethical review of their research proposal from relevant ethical review boards or committees to ensure that the research design and methodology align with ethical principles.

## Chapter Four.

### RESULT AND DISCUSSIONS

#### 4.1 Introduction

This chapter deals with presentations, discussions, and interpretation of the data collected through questionnaires. The main objective of this study is to investigate the factors that influence the success of project execution within Mafer plc. To meet the objectives of the study, the data were gathered from the primary source using a questionnaire. Furthermore, the data extracted from completed questionnaires were coded and entered into Statistical Package for Social Sciences (SPSS) IBM version 25 and was analyzed, presented, and interpreted using descriptive statistics with tables using frequency, percentage, mean, and standard deviation.

#### 4.2 Response rate

A total of 73 questionnaires were distributed, of which 69 (94.52%) were returned on time, while 4 (5.48%) of the respondents did not return them. Therefore, 69 questionnaires served as a source of data for analysis, finding presentation, and conclusion. The characteristics of the samples collected proved that responses obtained from the individuals could be extremely helpful in order to answer the research questions.

#### 4.3 Demographic data

The study examined demographic factors, which encompassed the gender, age, and educational level of the participants. In order to gather this information, the research was conducted to ascertain the gender, age, and educational level of the respondents.

Variables	Category	Outcome	
		Frequency	Percentage
Sex of respondents	Male	47	68.1
	Female	22	31.9
	<b>Total</b>	<b>69</b>	<b>100.0</b>
Age of respondents	21-30	20	29
	31-40	37	53.6
	41-50	6	8.7

	51-60	4	5.8
	>61	2	2.9
	<b>Total</b>	<b>69</b>	<b>100.0</b>
<b>Education level of respondents</b>	College diploma	9	13
	Bachelor's degree	33	47.8
	Master's Degree	27	39.1
	Doctorate degree	0	0
	<b>Total</b>	<b>69</b>	<b>100</b>
<b>Respondent Position</b>	Managing Body	4	5.8
	Management Member	10	14.5
	Project Manager	6	8.7
	Site Engineer and site manager	18	26.1
	Office Engineer	9	13
	Architect	12	17.4
	Project Manager or Consultant /external/	10	14.4
	<b>Total</b>	<b>69</b>	<b>100.0</b>
<b>Years of Work Experience</b>	1 to 5	21	30.4
	6 to 10	32	46.4
	11 to 15	9	13.1
	> 15	7	10.1
	<b>Total</b>	<b>69</b>	<b>100.0</b>

*Table 2, Respondents sex, age, educational level, position and year of experience*

*Source: own Survey Result, 2024*

According to Table 2, the demographic information for the respondents in this study, 47 people, or 68.1% of the sample, were male, making up the majority of the participants. A smaller proportion of the participants were female, with 22 individuals representing 31.9% of the sample. These demographic statistics suggest that the study sample was male-dominated which implies the company's top position is dominated by males. In relation to ages, the above table indicates 20

participants in this study, or 29% of the sample, were between the ages of 21 and 30. The age group of 31 to 40 comprised a larger percentage of participants, with 37 persons, or 53.6% of the sample, falling into this category. The age group of 41 to 50 comprised a small percentage of participants, with 6 persons, or 8.7% of the sample. The age group of 51 to 60 comprised a smaller percentage of participants, with 4 persons, or 5.8% of the sample, and only two people, or 2.9% of the sample, were above the age of 60. According to these demographic data, the majority of the study's participants were young, with a sizable number being in their mid-to-late 30s. Overall, the demographic information for age provides an important context for interpreting the study results and understanding the characteristics of the study population.

From the demographic data presented in the above table, a smaller number of respondents had college diplomas with 9 respondents or 13% of the sample. A larger portion of participants held bachelor's degrees, with 33 individuals representing 47.8% of the sample. According to the study's analysis, the participants held a Master's degree, with 27 individuals representing 39.1% of the sample. No participants in the study held a Doctorate. Looking at the data most of the respondents are educated and understand the raised matter to have genuine information for the analysis.

According to the study's responses, 4 people, or 5.8% of the sample, had the role of Managing role which is a smaller proportion of the participants. 10 people or 14.5% of the sample had the role of management members. 10 people or 8.7% of the sample had the role of Project manager in the company. 18 respondents or 26.1% which is the majority of participants had a role of Site engineer/site management position. 9 and 12 participants or 13% and 17.4% held the position of office engineer and architect respectively. From the partner's side 10 or 14.5% of participants are from external project management and consultant firms. Having such a variety of respondents regarding the work position will give good insight and acceptable information regarding the topic.

The experience of the respondents shows that the majority of the participants had 6-10 years of experience in the organization, with 32 individuals representing 46.4% of the sample. A smaller proportion of the participants had more than 15 years of experience, with 7 individuals representing 10.1% of the sample. Additionally, 21 participants had 1-5 years of experience, representing 30.4% of the sample. Finally, only 9 participants had 11-15 years of experience, which represented 7.3% of the sample. Referring to the presented data on experience, most of the respondents have mid-range experience with the company and this helps to have genuine information regarding the raised

factors that affect the success of project execution. Thus, in this way, it is possible to obtain vastly reliable survey results.

#### 4.4 Result and Analysis

Based on the problem of projects achieving their main target and goal of the plan with respect to project execution, this study classified the causes by classifying project, consultant & project team, client, contractor, and external environment-related factors for project execution. This portion of the study shows the findings of the data analysis on the factors that contributed to the project’s success of project execution.

##### 4.4.1 Results for factor affecting the success of project execution

Since project execution is a crucial phase in accomplishing one project, different factors affect for being successful. The factors that affect successful project execution are discussed in this section. The study classified 61 factors that determine the success of a project into six categories: project, consultant & project team, client, contractor, and external environment-related factors, and also measured the success of project execution with respect to different variable factors based on previous research and literature reviews. The impact of these factors is ranked and given in the tables below based on mean score and relative importance index values.

This part of the questionnaire is targeted to answer the first research question in this research work, *“To identify what are the factors that affect the success of project execution within Mafer plc?”*. Accordingly, various factors related to the project environments in Mafer plc projects have been identified and discussed in this sub-section.

#### Decision rule for Mean value and RII

**Table 3. The decision rule for respondents' Attitude**

Level	Scale	Interval Length	Lower Limit	Upper Limit
Strongly Disagree	1	0.8	1	1.8
Disagree	2	0.8	1.8	2.6
Neutral	3	0.8	2.6	3.4
Agree	4	0.8	3.4	4.2
Strongly Agree	5	0.8	4.2	5

The RII value has a range from 0 to 1 (0 not inclusive) and has been categorized into five levels of importance as shown below;

RII value	Importance level	
From 0.8 to 1	High	(H)
From 0.6 to 0.8	High-Medium	(H-M)
From 0.4 to 0.6	Medium	(M)
From 0.2 to 0.4	Medium-Low	(M-L)
From 0 to 0.2	Low	(L)

**Table 4. RII importance level range**

#### 4.4.1.1 Project-related Factor on Success of project execution

The study looked at 9 project-related factors that might affect project execution. These factors include project characteristics which are value, size, complexity, and other related issues.

Descriptive Statistics of Project-related Factor Variables list						
	N	Min	Max	Mean	Std. Dev	Rank
Complexity and lack of simplicity of the construction project scope	69	2	5	3.58	1.181	8
The size of the project from small scale (renovation) to large scale (high-raised bldg.)	69	1	5	3.70	1.180	7
Type of the construction project (residential, public, Embassy, and other)	69	1	5	3.83	1.236	5
The value of the construction project. The amount which is varied from small-value to large-value projects	69	2	5	3.74	1.146	6
A realistic schedule for the work breakdowns	69	3	5	4.35	.801	1
Material and equipment consumed in the construction project	69	2	5	4.16	.901	4

Contract and design conflict during the implementation period	69	3	5	4.28	.745	2
Change in scope and introducing new innovation to the construction project	69	1	5	4.17	.999	3
Accidents happening during the implementation of the project	69	1	5	3.29	1.139	9
PRFTE	69	2.89	4.89	3.8986	.60009	
Valid N (listwise)	69					

**Table 5. Responses regarding project-related factors.**

**Source: Researcher’s Survey SPSS result, 2024**

The survey results on project-related variables that may affect the success of project execution are described in Table 5 below using the mean score, standard deviation, and rank.

From Table 6 ‘realist schedule for the work break downs’ has the highest mean 4.35 with a standard deviation of 0.801, which indicates that the majority of respondents agree with the content of the ‘realistic schedule for the work break downs’ factor that affects the successful project execution. ‘Contract and design conflict during implementation period’ is the second most commonly factor project related factor with a mean and standard deviation of 4.28 and 0.745 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While ‘Change in scope and introducing new innovation to the construction project’ is the third most ranked project-related factor with 4.17 and 0.99 mean scores and standard deviation respectively.

The fourthly, fifthly to lastly ranked project-related factors are ‘Material and equipment consumed in the construction project’, ‘Type of the construction project (residential, public, Embassy and other)’, and ‘The value of the construction project. The amount which is varied from a small value to large values projects’, ‘The size of the project regarding small scale (renovation) to large scale (high raised bldg.)’, ‘Complexity and lack of simplicity of the construction project scope’, ‘Accidents happening during the implementation of the project’, With a mean of 4.16, 3.83, 3.74, 3.70, 3.58, 3.29 and standard deviation of 0.901, 1.236, 1.146, 1.180, 1.181, and 1.139 respectively, which also indicates that the majority of respondents agree with these factors.

#### 4.4.1.2 Consultant and Project Management team-related Factors on the Success of project execution

The study looked at 10 consultant and project management team-related factors that might affect project execution. These factors emphasized consultant and project management-related characteristics regarding experience, decision-making, technical capabilities, and related issues. The survey results on consultant and project management team-related variables that may affect the success of project execution are described in Table 7 below using the mean score, standard deviation, and rank.

From Table 6 ‘Length of time taking to for approval of proposals like; drawings details and specification material’ has the highest mean 4.46 with a standard deviation of 0.614, which indicates that the majority of respondents agree with the content of ‘Length of time taking to for

<b>Descriptive Statistics of Consultant and PM team factor variables list</b>						
	N	Min	Max	Mean	Std. Dev	Rank
Relevant past experience in construction project scope and details	69	3	5	4.35	.614	3
Controlling system and availability on construction project site	69	2	5	3.96	.946	8
Length of time taking to for approval of proposals like; drawings details and specification material	69	3	5	4.46	.584	1
Decision-making effectiveness on the raised issue of construction project	69	1	5	4.33	.869	4
Project management structures and Contract administration problems	69	2	5	4.09	.887	7
Communication with stakeholders of the project	69	2	5	3.74	.934	10
Effectiveness of risk identification and allocation for the project	69	1	5	3.94	1.083	9
Technical knowledge capability of the project	69	1	5	4.16	1.038	6

Incomplete design at the time of bid award and frequent design change during working time	69	3	5	4.42	.628	2
Lack of coordination with staff in the firm	69	2	5	4.19	.896	5
CPRFTE	69	3.20	5.00	4.1638	.47340	
Valid N (listwise)	69					

**Table 6. Responses regarding consultant and project management team-related factors**  
**Source: Researcher’s Survey SPSS result, 2024**

approval of proposals like; drawings details and specification material factors that affect the successful project execution. ‘Incomplete design at the time bid award and frequent design change during working time’ is the second most commonly factor project related factor with a mean and standard deviation of 4.42 and 0.628 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While ‘Relevant past experience on construction project scope and details’ is the third most ranked of project related factor with 4.35 and 0.614 mean scores and standard deviation respectively.

The fourthly, fifthly to lastly ranked project-related factors are ‘Decision-making effectiveness on the raised issue of construction project’, ‘Lack of coordination with staffs in the firm’, ‘Technical knowledge capability of the project’, ‘Project management structures and Contract administration problems’, ‘Controlling system and availability on construction project site’, ‘Effectiveness of risk identification and allocation for the project’ and ‘Communication with stakeholders of the project’, with a mean of 4.33, 4.19, 4.16, 4.09, 3.96, 3.94, 3.74 and standard deviation of 0.869, 0.896, 1.038, 0.887, 0.946, 1.083 and 0.934 respectively, which also indicates that the majority of respondents agree with these factors.

**4.4.1.3 Client-related factors on Success of project execution**

The study looked at 11 Client-related factors that might affect project execution. These factors emphasized client-related characteristics regarding experience, type of customer, decision-making, level of influence, and related issues The survey results on client-related variables that may affect the success of project execution are described in Table 7 below using the mean score, standard deviation, and rank.

<b>Descriptive Statistics of Client-Related Factor Variables</b>						
	N	Min	Max	Mean	Std. Dev.	Rank
Type of the client (private, Public, foreigner clients like Embassies)	69	2	5	3.52	1.208	11
Shortage of experience in the construction project	69	1	5	3.75	1.193	8
Site handover delay to start work on time	69	2	5	3.67	.995	9
Taking a long time to revise & approving relevant documents	69	1	5	4.13	1.110	2
Delay to payment and finance problem	69	2	5	3.96	1.091	4
Ability to make timely decision-making	69	1	5	4.23	1.002	1
Ability to influence and understand the project scope to manage the contract	69	2	5	3.90	.910	5
Having clear and precise goals to not change the scope of the project lately	69	2	5	4.00	.970	3
Risk management capability	69	2	5	3.84	.885	7
Ability to participate in the phases of the project and coordination	69	2	5	3.86	1.061	6
Poor communication and management with stakeholders	69	1	5	3.54	1.279	10
CLRFTE	69	2.18	4.82	3.8538	.72228	
Valid N (listwise)	69					

***Table 7. Responses regarding consultant and project management team-related factors, Source: Researcher’s Survey SPSS result, 2024***

From Table 7 ‘Ability to make timely decision making’ has the highest mean 4.23 with a standard deviation of 1.002. This indicates that the majority of respondents agree with the content of the ‘Ability to make timely decision making’ factor that affects the successful project execution. ‘Taking a long time on revising & approving of relevant documents’ is the second most common factor project related factor with a mean and standard deviation of 4.13 and 1.110

respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While ‘Having a clear and precise goal to not change the scope of the project lately’ is the third most ranked of project-related factor with 4.00 and 0.970 mean scores and standard deviation respectively.

The fourthly, fifthly to lastly ranked project-related factors are ‘Delay to payment and finance problem’, ‘Ability to influence and understand the project scope to manage the contract’, ‘Ability to participate in the phases of the project and coordination’, ‘Risk management capability’, ‘Shortage of experience on the construction project’, ‘Site handover delay to start work on time’, ‘Poor communication and management with stakeholder’ and ‘Type of the client (private, Public, foreigner client like Embassies)’, with a mean of 3.96, 3.90, 3.86, 3.84, 3.75, 3.67, 3.54, 3.52 and standard deviation of 1.091, 0.910, 1.061, 0.885, 1.193, 0.995, 1.279 and 1.208 respectively, which also indicates that the majority of respondents agree with these factors.

#### 4.4.1.4 Contractor-related Factors on Success of project execution

The study looked at 14 contractor-related factors that might affect project execution. These factors emphasized contractor-related characteristics regarding experience, technical & professional capabilities, financial stabilities, and related issues. The survey results on project-related variables that may affect the success of project execution are described in Table 8 below using the mean score, standard deviation, and rank.

<b>Descriptive Statistics of Contractor related factor variables list</b>						
	N	Min	Max	Mean	Std. Dev	Rank
Technical and professional capability on construction project	69	2	5	4.22	.802	6
Economical and financial status of the company	69	1	5	4.16	.964	8
Experience of the Company on construction projects/ability to accomplish details/	69	1	5	4.07	1.048	10
Owner /Management body/ management capability	69	2	5	4.10	.957	9

Top management support for the project site works	69	3	5	4.30	.602	3
Quality standards, types of construction methodologies followed by the company, and assigning qualified personnel for the project	69	2	5	4.57	.757	1
Rework and rectification works	69	2	5	4.03	.785	12
Management of sub-contractors and resolution methods during the rise of conflict	69	2	5	4.25	.736	4
Measurements taken regarding health and safety for workers at the project site	69	1	5	3.90	1.250	13
The advanced technology used by the company and the inability to provide appropriate equipment on the site	69	1	5	4.07	1.062	10
Office work readiness, document preparation & submission for the project works	69	2	5	4.23	.877	5
Project management (Planning, scheduling), site management & supervision	69	2	5	4.22	.968	6
Communication with the stakeholders	69	2	5	4.35	.855	2
Providing training for the workers	69	1	5	3.67	1.368	14
CORFTE	69	2.36	5.00	4.1522	.62209	
Valid N (listwise)	69					

**Table 8. Responses regarding Contractor related factors,**

**Source: Researcher's Survey SPSS result, 2024**

From Table 8 'Quality standard, types of construction methodologies followed by the company and assigning qualified personnel for the project' has the highest mean 4.57 with a standard deviation of 0.757. This indicates that the majority of respondents agree with the content of the variable factor that affects the successful project execution. 'Communication with the stakeholder'

is the second most common factor contractor-related factor with a mean and standard deviation of 4.35 and 0.85510 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While ‘Top management support for the project site works’ is the third most ranked of project related factor with 4.30 and 0.602 mean scores and standard deviation respectively.

The fourthly, fifthly to lastly ranked project related factors are ‘Management of sub-contractor and resolution methods during raise of conflict’, ‘Office work readiness, document preparation & submission for the project works’, ‘Project management (Planning, scheduling), site management & supervision’, ‘Technical and professional capability on construction project’, ‘Economical and financial status of the company’, ‘Owner /Management body/ management capability’, ‘Experience of the Company on construction project /ability to accomplished details/’, ‘Advanced technology used by the company and inability to provide appropriate equipment on the site’, ‘Rework and rectification works’, ‘ Measurement taken regarding health and safety for workers at the projects site’, ‘Providing of training for the workers’, with a mean of 4.25,4.23, 4.22,4.22, 4.16, 4.10, 4.07, 4.07, 4.03, 3.9, 3.67 and standard deviation of 0.736, 0.877, 0.968, 0.802, 0.964, 0.957, 1.062, 1.048, 0.785, 1.250 and 1.368 respectively, which also indicates that the majority of respondents agree with these factors.

**4.4.1.5 External Environment-Related Factors on the Success of Project Execution**

The study looked at 11 external environment-related factors that might affect project execution. These factors emphasized external environment-related characteristics regarding vendors, market inflation, political & social, and related issues The survey results on external environment-related variables that may affect the success of project execution are described in Table 9 below using the mean score, standard deviation, and rank.

<b>Descriptive Statistics of External Environment related factor variables</b>							
	N	Min	Max	Mean	Std. Dev	RII	Rank
Unpredicted and Inclement weather conditions	69	2	5	3.61	1.153	0.722	8
Escalation, inflation, and instant t material price increment	69	3	5	4.48	.655	0.896	2

Material & equipment availability and also shortage of consumable material	69	2	5	4.20	.778	0.841	3
Foreign currency availability problem	69	2	5	4.16	.834	0.832	4
Unfavorable and poor site condition.	69	1	5	3.64	1.137	0.728	7
Regulatory problems/Changes in government regulation & laws	69	1	5	3.96	1.091	0.791	6
Utility problems (electricity, water, telephone)	69	2	5	3.61	1.074	0.722	8
Issues raised by neighbors	69	1	5	3.58	.961	0.716	10
Time taking of testing material and sample	69	2	5	3.57	.977	0.713	11
Political instability	69	1	5	4.03	.985	0.806	5
Delay and difficulties of supplier	69	2	5	4.49	.720	0.899	1
ERFTE	69	2.82	4.91	3.9381	.60874		
Valid N (listwise)	69						

**Table 9. Responses regarding External environment-related factors.**

**Source: Researcher's Survey SPSS result, 2024**

From Table 9 'Delay and difficulties of supplier' has the highest mean 4.49 with a standard deviation of 0.720. This indicates that the majority of respondents agree with the content of the variable factor that affects the successful project execution. 'Escalation, inflation, and instant material price increment' is the second most common factor project related factor with a mean and standard deviation of 4.48 and 0.655 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While 'Material & equipment availability and also shortage of consumable material' is the third most ranked of project related factor with 4.20 and 0.778 mean scores and standard deviation respectively.

The fourthly, fifthly to lastly ranked external environment-related factors are 'Foreign currency availability problem', 'Political instability', 'Regulatory problems/Changes in government regulation & laws', 'Unfavorable and poor site condition.', 'Unpredicted and Inclement weather condition', 'Utility problems (electricity, water, telephone)', 'Issues raised from neighbors', and

‘Time taking of testing material and sample’, with a mean of 4.16, 4.03, 3.96, 3.64, 3.61, 3.61, 3.58, 3.57 and standard deviation of 0.834, 0.985, 1.091, 1.137, 1.153, 1.074, 0.961 and 0.977 respectively, which also indicates that the majority of respondents agree with these factors.

#### 4.4.1.6 Success on Project Execution by Mafer PLC

The study looked at 5 factors that can determine and measure the effect of the success on project execution by Mafer plc in different projects. The survey results on the effect of project execution in relation to Mafer plc practice that affects the performance described in Table 10 below using the mean score, standard deviation, and rank.

From Table 10 ‘Project execution experience affects Mafer on project delivery within schedule’ has the highest mean 4.59 with a standard deviation of 0.495. This indicates that the majority of respondents agree with the content of the variable factor that affects the successful project execution. ‘Project execution experience on different projects, affect Mafer’s good product/ output/ delivery regarding quality.’ is the second most commonly factor project related factor with a mean and standard deviation of 4.39 and 0.712 respectively, which also indicates that the majority of respondents agree with this content as a

<b>Descriptive Statistics of the Success on Project Execution by Mafer plc</b>								
	N	Min	Max	Mean	Std. Dev	RII	Rank	
Project execution experience affects Mafer on project delivery within schedule.	69	4	5	4.59	.495	0.919	1	
Project execution experience on different projects affects Mafer’s good product/ output/ delivery regarding quality.	69	3	5	4.39	.712	0.878	2	
Project execution experience improvement will help client satisfaction regarding Mafer’s work.	69	3	5	4.13	.684	0.826	3	
Project execution experience on different projects affects Mafer’s cost management on different projects.	69	2	5	3.30	.671	0.661	5	

Do you agree that Mafer should improve its project team satisfaction, organization, and coordination based on project execution experience on different projects?	69	2	5	3.52	.779	0.704	4
EPEMTE	69	3.00	4.80	3.9884	.48128		
Valid N (listwise)	69						

**Table 10. Responses regarding External environment-related factors.**

**Source: Researcher’s Survey SPSS result, 2024**

factor affecting. While ‘Project execution experience improvement will help client satisfaction regarding Mafer’s works’ is the third most ranked of project related factor with 4.13 and 0.684 mean scores and standard deviation respectively.

The fourth and fifth ranked effects of project execution factors are ‘project team satisfaction, organization, and coordination’ and ‘profitability’, with a mean of 3.52 and 3.30, and also standard deviation of 0.779 and 0.671 respectively, which also indicates that the majority of respondents agree with these factors.

#### **4.4.1.7 Summary of the Descriptive Statistics for the Independent and Dependent Variables**

<b>Descriptive Statistics of the independent and dependent variable</b>					
	N	Min	Max	Mean	Std. Dev
PRFTE (Project related factor)	69	2.89	4.89	3.8986	.60009
CPRFTE (Consultant and PM team-related factor)	69	3.20	5.00	4.1638	.47340
CLRFTE (Client related factor)	69	2.18	4.82	3.8538	.72228
CORFTE (Contractor related factor)	69	2.36	5.00	4.1522	.62209
ERFTE (External env. related factor)	69	2.82	4.91	3.9381	.60874
SPECMTE (Success on Project Execution by Mafer PLC)	69	3.00	4.80	3.9884	.48128

***Table 11. Descriptive Statistics for the Independent and Dependent Variables. Source: Researcher's Survey SPSS result, 2024***

Table 11 shows a summary of 69 respondents' descriptive statistics (mean scores, standard deviation, minimum and maximum scores) for five independent variables (Project, Consultant & PM team, client, Contractor, and External environment-related factors) and one dependent variable (effect of project execution on Mafer performance). Accordingly, the standard deviations for all four variables are relatively average. This suggests that the data points are clustered fairly closely around the mean.

#### **4.5 Correlation Analysis**

This section presents the correlation analysis, in which the level of association between variables is sought. The study findings were subjected to correlation analysis to determine the relationship between independent variables (Project, Consultant & PM team, client, Contractor, and External environment-related factors) and one dependent variable (effect of project execution on Mafer performance). To assess whether there is a relationship between variables, Pearson's correlation coefficient has been applied, and the results are presented in Table 13.

Correlation analysis is a statistical technique that not only determines if there is a connection between variables, it also helps to identify the direction and strength of the relationship. The direction of the relationship can be positive, negative, or zero. The correlation coefficient, ranging from -1 to +1, measures the strength of a linear relationship between two variables. According to Dancy & Reid (2007), a correlation coefficient of +1 or -1 represents a perfect relationship, whereas coefficients between  $\pm 0.9$  and  $\pm 0.7$  indicate a strong correlation. Coefficients between  $\pm 0.7$  and  $\pm 0.4$  indicate a moderate correlation, while those between  $\pm 0.4$  and  $\pm 0.1$  indicate a weak correlation. A zero coefficient indicates no correlation between the variables. Table 13 shows that the correlation coefficient value for the variables is above and almost near 0.7, indicating a positive correlation of moderate strength between all three independent (Project, Consultant & PM team, client, Contractor, and External environment-related factors) and one dependent variable (effect of project execution on Mafer performance). Furthermore, the positive correlation suggests a direct relationship between the factor affecting project execution and their impact on Mafer plc project accomplishment, with a significance level of 1%.

<b>Correlations</b>							
		PRFTE	CPRFTE	CLRFTE	CORFTE	ERFTE	SPECMTE
PRFTE (project RF)	Pearson Correlation	1	.456**	.668**	.429**	.633**	.779**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	69	69	69	69	69	69
CPRFTE (Consultant & PM RF)	Pearson Correlation	.456**	1	.454**	.655**	.420**	.694**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	69	69	69	69	69	69
CLRFTE (Client RF)	Pearson Correlation	.668**	.454**	1	.422**	.841**	.852**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	69	69	69	69	69	69
CORFTE (Contractor RF)	Pearson Correlation	.429**	.655**	.422**	1	.475**	.735**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	69	69	69	69	69	69
ERFTE (External evt. RF)	Pearson Correlation	.633**	.420**	.841**	.475**	1	.823**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	69	69	69	69	69	69
SPECMTE (Success on P. Execution by Mafer)	Pearson Correlation	.779**	.694**	.852**	.735**	.823**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	69	69	69	69	69	69
**. Correlation is significant at the 0.01 level (2-tailed).							

**Table 22. Pearson correlation result table. Source: Researcher's Survey SPSS result, 2024**

As the level of the variables increases, the negative impact on project performance will also magnify. According to the outputs of the survey, project related factor has ( $r = 0.779$ ) indicating that it has a positive, strong, and significant correlation with a marked relationship toward the success of project execution of projects. According to the outputs of the survey, the correlation between the consultant & PM team and the success of project execution is ( $r = 0.694$ ) which is a positive and moderate relationship as they are significantly correlated. According to the outputs of the survey, client related factor has ( $r = 0.852$ .) indicating that it has a positive, strong, and significant correlation with a marked relationship toward the success of project execution of projects. According to the conducted survey, the contractor-related factor has ( $r = 0.735$ ) indicating that it has a positive, strong, and significant correlation with a marked relationship toward the success of project execution of projects. According to the outputs of the survey, the correlation between the external environment and the success of project execution is ( $r = 0.823$ ) which is a positive and moderate relationship as they are significantly correlated for execution, performance, and accomplishment.

#### **4.6 Regression Analysis**

Regression analysis is a versatile tool that allows researchers to move beyond simply observing correlations between variables and delve deeper into the how and why of those relationships. Besides, regression analysis quantifies the strength and direction of the relationship between a dependent variable and one or more independent variables.

This regression aims to test the combination influence of the independent variables on the dependent variable, and the regression model that was used here is as follows

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon;$$

*where  $X_s$  are the independent variable and  $\beta$  are coefficient*

Accordingly, the research focuses on the independent variable, which encompasses factors affecting the success of project execution. This variable is further categorized into five sub-categories: Project, Consultant & PM team, client, Contractor, and External environment-related factors. On the other side, the dependent variable in this study is the effect of project execution on

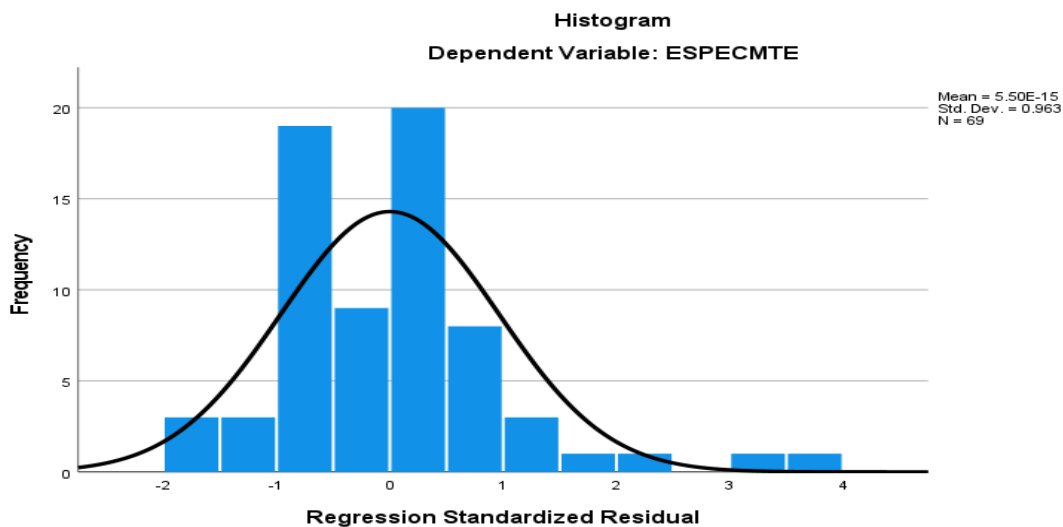
Mafer's project performance. These variables measure the impact of the listed factors effects on project outcomes, such as schedule, quality, client satisfaction, profitability, and cost project team satisfaction.

Consequently, the researcher employed multiple regression analysis to explore the strength and nature of the relationship between these variables. The analysis aims to identify the factors affecting project execution, which have the most significant negative impact on project accomplishment output.

Meanwhile, to ensure the accuracy and reliability of the regression analysis results, the researcher first verified key assumptions of the classical linear regression model, as outlined by Brooks (2014). These assumptions include normality, linearity, homoscedasticity, absence of autocorrelation, and multicollinearity.

#### 4.6.1 Assumption of Regression Analysis Normality

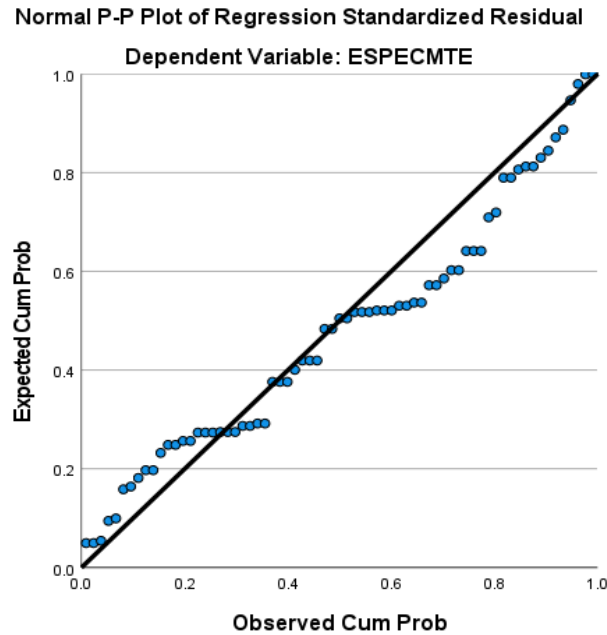
The researcher performed a normality test to comprehend the distribution of a dependent variable in relation to independent variables in the model. The purpose of this test was to determine whether the error term distribution was normal or not. Based on the histogram Figure 2, it can be concluded that the assumption of normality was not violated largely and the distribution appears roughly bell-shaped, which is suggestive of normality. The graph becomes a bit skewed and this reason due to uncontrolled survey methods to make the unbalanced data distribution.



**Figure 5. Normality Test.**  
*Source: Researcher's Survey SPSS result, 2024*

### 4.6.2 Linearity

Linearity is used to check whether all the estimates of regression including regression coefficients, standard errors, and tests of statistical significance are biased or not (Keith, 20196). This can be checked by p-p plot residuals as indicated by Figure 6 below.

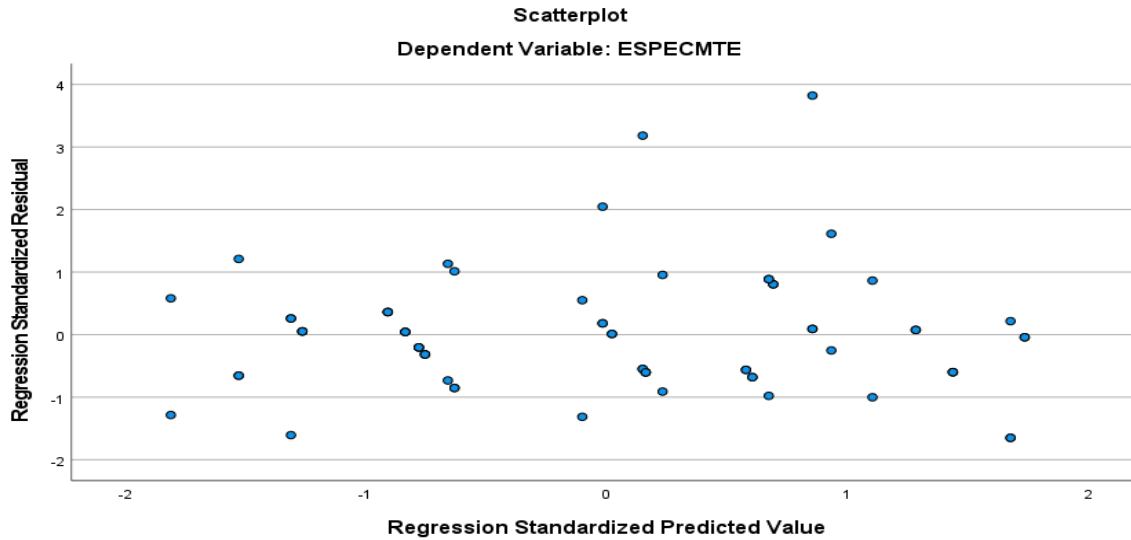


**Figure 6. Linearity Test, Source: Researcher’s Survey SPSS result, 2024**

Accordingly, in this research, the causal relation between the causes of construction claims and their effect on project performance are in a straight-line relationship.

### 4.6.3 Homoscedasticity Test

Another fundamental assumption of regression is homoscedasticity, which can be determined by creating a scatterplot that compares the residuals against the dependent variable. As shown in Figure 8, the residuals appear scattered without a discernible pattern. This suggests that the regression model likely satisfies the homoscedasticity assumption.



**Figure 7. Homoscedastic Test, Source: Researcher’s Survey SPSS result, 2024**

**4.6.4 Multicollinearity Test**

Statisticians used various methods to identify the collinearity problem. Syed-Ikhsan & Rowland (2004) used the Pearson correlation coefficient to check the pattern of relationships between independent variables. They argue that multi collinearity is not a problem if there is no correlation above 0.9 in a correlation matrix. Multi collinearity refers to the correlation among predictor variables. High multi collinearity lowers the significance levels of best coefficients.

In order to confirm that there was no issue of multi-collinearity, a diagnostic test was conducted. Tolerance is an indicator how much of the variability of independent variable is not explained by the other independent variable in the model and is calculated using the formula  $1 - R^2$  for each variable. If the value is very small (less 0.1), it shows the multiple correlation with other variable is high. The results on Table 13 revealed tolerance values ranging from 0.678 to 0.806, and none of them were below 0.2 (Belsley, Kuh, & Welsch, 1980).

Additionally, the Variance Inflation Factor (VIF) ranged from 1.240 to 1.475, well below the concerning threshold of 10 (Menard, 2002). These findings suggest that multicollinearity was not a significant concern, upholding a critical assumption of linear regression analysis.

<b>Coefficients<sup>a</sup></b>					
Model		95.0% Confidence Interval for B		Collinearity Statistics	
		Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.063	.440		
	PRFTE (project related factors)	.127	.249	.508	1.970
	CPRFTE (consultant & PM-related factors)	.084	.236	.519	1.926
	CLRFTE (client-related factors)	.169	.311	.255	3.922
	CORFTE (Contractor related factors)	.176	.292	.517	1.935
	ERFTE (External Envt. related factors)	.045	.210	.268	3.726

a. Dependent Variable: SPEMTE (Success on project execution of Mafer plc)

**Table 33. Multicollinearity Test result table.**

*Source: Researcher’s Survey SPSS result, 2024*

**4.6.5 Autocorrelation Test**

The assumption of independence of error terms, which necessitates independent observations, was evaluated using the Durbin-Watson test (Durbin & Watson, 1950). Hair et al. (2019) stated this test verifies the absence of autocorrelation in the model's residuals, a crucial assumption for regression analysis. The Durbin-Watson statistic ranges from 0 to 4. According to Kinyua et al. (2015), values between 1.5 and 2.5 suggest independence of observations. Results from Table 14 show a calculated DW statistic of 1.860, which falls in the range of 1.5 to 2.5, suggesting that residuals were not auto-correlated.

<b>Model Summary<sup>b</sup></b>	
Model	Durbin-Watson
1	1.860
a. Predictors: (Constant), ERFTE, CPRFTE, PRFTE, CORFTE, CLRFTE	
b. Dependent Variable: ESPECMTE	

**Table 44. Autocorrelation Test result table. Source: Researcher’s Survey SPSS result, 2024**

**4.6.6 Model Summary**

Two primary variables will form the basis of the proposed model. The first, designated as the independent variable, encompasses the various factors affecting the success or project execution as identified in the preceding research. This independent variable is further subdivided into five distinct categories. The first subcategory, project-related factors include frequently raised and identified factors. The second subcategory, consultant and PM team-related factor incorporates issues related to experience, decision-making, construction documents, and other frequently raised issues. The third category, client-related factors includes client satisfaction and exposure to construction. Payment issuance, decision-making, and other factors. The fourth category, Contractor -related factors which include experience, top and owner management, methodologies, financial issues & other factors, and the fifth category, external environment-related factors which include inflation, political instability, material availability, and other frequently raised factors those are beyond the control of either party involved in the construction.

The dependent variable of the study focuses on the impact of project execution construction claims on project performance. This variable will be employed to quantify the influence of the effect on project outcomes, specifically including schedule, quality, client satisfaction, profitability, and project team satisfaction.

From the model summary in Table 15, the R-value represents the correlation coefficient between independent variables (project, consultant & PM team, client, contractor and external factor) and a dependent variable namely the effect of project execution on project performance outcome. Accordingly, R = 0.901 indicates there is a strong positive correlation between the effect of Project execution on project performance outcome and independent variables.

The value of R<sup>2</sup> is a measure of how much variability in the outcome is accounted for by the independent variable. The output shows that R<sup>2</sup> = 0.901, this implies 90.1% of project success is accounted for by independent variables as a result of all five independent variables can measure/predict project success at 90.1% (0.901 x100) percent. However, the remaining 10.0% could be some other variable that had not been considered in this study.

<b>Model Summary<sup>b</sup></b>						
Model	R	R Square	Adjusted R Square	R	Std. Error of the Estimate	Durbin-Watson
1	0.915	0.901	0.895		.10723	1.860
a. Predictors: (Constant), ERFTE, CPRFTE, PRFTE, CORFTE, CLRFTE						
b. Dependent Variable: ESPECMTE						

**Table 55. Model summary result table. Source: Researcher’s Survey SPSS result, 2024**

Additionally, the adjusted R-square in the model summary indicates the goodness of fit. According to Table 15, the adjusted R-squared value is 0.895. This suggests that approximately 89.50% of the changes in Mafer plc project performance can be explained by the independent variables (project, consultant & PM team, client, contractor, and external factor). The remaining 10.5% of the variation in project performance could be attributed to other factors not included in this model.

Besides, the standard error of the estimate is a measure of the variability of multiple correlations and represents the standard deviation of the residuals. Accordingly, as shown in the model summary (Table 15) for the regression analysis, the standard error of the estimate (SEE) of this model is 0.10723. Lower values of SEE indicate a better fit of the model.

#### **4.6.7 ANOVA**

To check the statistical significance of the regression model, an ANOVA test was conducted. ANOVA helps to determine the overall significance of the regression model and whether it is useful for predicting the dependent variable. The model is effective in explaining the connection between the independent and dependent variables. Table 16 demonstrates that the significance value is below 0.05, indicating that there is a linear relationship between factors affecting success of execution (project, consultant & PM team, client, contractor, and external factor) and its effect on project output and outcome. This means the model explains a significant portion of the variance

in the dependent variable (Effects on Project accomplishment and performance). Moreover, this ANOVA table suggests that the regression model has a statistically significant effect on explaining the dependent variable (project outcomes and results).

<b>ANOVAa</b>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.026	5	3.005	261.386	.000b
	Residual	.724	63	.011		
	Total	15.751	68			
a. Dependent Variable: ESPECMTE						
b. Predictors: (Constant), ERFTE, CPRFTE, PRFTE, CORFTE, CLRFTE						

**Table 66. ANOVA result table. Source: Researcher's Survey SPSS result, 2024**

#### **4.6.8 Multiple Regression Coefficients**

Below Table 17 displays the standard error, Beta coefficient, and p-value of each independent variable. The Beta coefficient measures the strength of the relationship between each predictor or independent variable (such as project, consultant & PM team, client, contractor, and external factor) and the dependent variable (effect success on project execution of Mafer project outcome and performance) in the model.

The core of the quantitative analysis lies in the beta coefficients ( $\beta$ ) obtained from the multiple regression model. These coefficients represent the standardized change in the dependent variable (project performance) for a one-unit change in the independent variable (claims), holding all other independent variables constant. (Cohen & Aiken, 2003)

The analysis of standardized beta coefficients reveals a gradient of factors that influence on project outcome and performance. Project-related factors ( $\beta = 0.234$ ) demonstrate a moderately strong positive relationship, Consultant & PM team-related factors ( $\beta = 0.158$ ) exhibit the weakest association, with a positive value suggesting a potential link to lower performance.

<b>Coefficients<sup>a</sup></b>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.189	.126		1.499	.139
	PRFTE (project related factors)	.188	.030	.234	6.184	.000
	CPRFTE (consultant & PM-related factors)	.160	.038	.158	4.202	.000
	CLRFTE (client-related factors)	.240	.036	.360	6.730	.000
	CORFTE (Contractor related factors)	.234	.029	.303	8.053	.000
	ERFTE (external envt. related factors)	.128	.041	.161	3.096	.003

a. Dependent Variable: SPEMTE (Success on project execution of Mafer plc)

**Table 17. Multiple regression result table. Source: Researcher’s Survey SPSS result, 2024**

Client-related factors ( $\beta = 0.360$ ) and Contractor-related factors ( $\beta = 0.303$ ) have the strongest positive relationship which indicates projects experiencing these issues are most likely to suffer lower performance. External related factor ( $\beta = 0.161$ ) lowest relation implying projects encountering these challenges are more likely to experience a decline in performance.

The Beta values provide a quantitative measure of the independent variable's impact within a specific model, while descriptive analysis, qualitative analysis, and correlation play supportive roles in understanding the data and relationships between variables. The capitalized Beta values of the multiple regression analysis indicate that all five independent variables (Client, Contractor, Project, External environment, and Consultant & PM team factor, ranked by their beta value) affect project Execution performance (dependent variable). Moreover, the correlation analysis showed a strong positive correlation between the five variables, aligned with the multiple regression results.

The combined analysis of beta coefficients, descriptive statistics, and correlation results in a comprehensive picture of how these affect the success of project execution performance in the building construction at Mafer plc.

Referring to the research question, the identified factors affect positively the success of project execution within Mafer plc. This means they are directly related to the research problem. Looking at the raised factors in detail, these factors have an impact on the company in relation to time, finances, and quality. Based on the response and conducted analysis their rank will be discussed below.

#### **4.7 Discussions of Results**

The overall findings of the analysis are presented in the section above in this chapter. The researcher elaborates on each of the signs and the important relationship between the dependent variable and the explanatory variables in this section.

Based on the regression results, client related factor is positively (Beta = .360) associated with success of project execution and it is statistically significant ( $P \leq .005$ ). This result implies that an improvement and positive outcome of a one percent increase in the client-related factors of a project would increase the success of project execution by 0.360 keeping the others constant. Due to this reason, the absence of proper management of client-related factors has a direct and significant effect on the success of project execution. Referring to the regression analysis client-related factors are one of the major reasons that affect the success of project execution of building construction projects. This result is also aligned with the finding of Alharbi (2020) on the study of critical delay factors for housing construction, which is the outcome outline client-related factor is a major finding.

Based on the regression results, the contractor-related factor has a positive ( $B = .303$ ) effect on the success of project execution and was statistically significant ( $P \leq .005$ ). Since it has a positive relation with project execution, it is a determining factor and major finding. This shows contractor contractor-related factor has a significant effect on the performance of an execution construction project. This result is reliable to the findings of Negesa (2022) and Alharbi (2020) that Contractor-related factors in a project positively and significantly affect execution, closeout, and performance regarding time and causes of delay for the project.

Based on the regression results, the project-related factor has a positive ( $B = .234$ ) effect on the success of project execution and was statistically significant ( $P \leq .005$ ). This shows project project-related factor has a significant effect on the performance of an execution construction

project. This result is reliable to the findings of Musarat and Ahad (2016) found project project-related factors in a project positively and significantly affect execution and performance regarding the success of a construction project.

In addition, the regression results indicate that external and consultant & project management team-related factors have a positive (Beta =.161 and =.158) respectively, and were statistically significant ( $P < .005$ ). This shows project related factor has a significant effect on the achievement of project execution of building construction projects even if the effect of these factors is less compared to the others.

## **Chapter Five.**

# **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter provides a summary of major findings, conclusions, and recommendations of the research undertaken in the study. Accordingly, the first section describes the study's findings and presents a summary and conclusion. Lastly, the following section of this chapter reveals the recommendations for the findings and highlights the direction for further studies.

### **5.2 Summary of Major Findings**

This study aimed to investigate the factors affecting the success of project execution on building construction within Mafer PLC.

The major finding for this research paper regarding Project-related factors is that 'realistic schedule for the work breakdowns' has the highest mean of 4.35 with a standard deviation of 0.801, which indicates that the majority of respondents agree with the content of 'realist schedule for the work break downs' factor that affect the successful project execution. 'Contract and design conflict during implementation period' is the second most commonly factor project related factor with a mean and standard deviation of 4.28 and 0.745 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While 'Change in scope and introducing new innovation to the construction project' is the third most ranked project-related factor with 4.17 and 0.99 mean scores and standard deviation respectively. Overall, these factors mainly affect the project's execution performance.

The study found that from Consultant and Project management team-related factors, 'Length of time taking to for approval of proposals like; drawings details and specification material' has the highest mean 4.46 with a standard deviation of 0.614, which indicates that the majority of respondents agree with the content of 'Length of time taking to for approval of proposals like; drawings details and specification material' factor that affect the successful project execution. 'Incomplete design at the time bid award and frequent design change during working time' is the second most commonly factor project related factor with a mean and standard deviation of 4.42

and 0.628 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While 'Relevant past experience on construction project scope and details' is the third most ranked project-related factor with 4.35 and 0.614 mean scores and standard deviation respectively.

The study found that from client-related factors, 'Ability to make timely decision making' has the highest mean 4.23 with a standard deviation of 1.002. This indicates that the majority of respondents agree with the content of the 'Ability to make timely decision making' factor that affects the successful project execution. 'Taking a long time on revising & approving of relevant documents' is the second most common factor project-related factor with a mean and standard deviation of 4.13 and 1.110 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While 'Having a clear and precise goal to not change the scope of the project lately' is the third most ranked project-related factor with 4.00 and 0.970 mean scores and standard deviation respectively.

The study found that from Contractor-related factors, 'Quality standard, types of construction methodologies followed by the company and assigning qualified personnel for the project' has the highest mean 4.57 with a standard deviation of 0.757. This indicates that the majority of respondents agree with the content of the variable factor that affects the successful project execution. 'Communication with the stakeholder' is the second most common factor project-related factor with a mean and standard deviation of 4.35 and 0.85510 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While 'Top management support for the project site works' is the third most ranked of project related factor with 4.30 and 0.602 mean scores and standard deviation respectively.

Finally, the study found that from the External environment-related factor, 'Delay and difficulties of supplier' has the highest mean 4.49 with a standard deviation of 0.720. This indicates that the majority of respondents agree with the content of the variable factor that affects the successful project execution. 'Escalation, inflation, and instant material price increment' is the second most common factor project related factor with a mean and standard deviation of 4.48 and 0.655 respectively, which also indicates that the majority of respondents agree with this content as a factor affecting. While 'Material & equipment availability and also shortage of consumable

material' is the third most ranked of project-related factor with 4.20 and 0.778 mean scores and a standard deviation respectively.

Generally, the paper found the given factors have a strong relation to the project execution. The effect that is identified in the result is positive, so if the factors are more treated the company will benefit from positive feedback and improvement on the execution phase stage of work.

Concerning, descriptive analysis of factors affecting project execution which are five independent variables (Project, Consultant & PM team, client, Contractor, and External environment-related factors) and one dependent variable (effect of project execution on Mafer performance) 3.898, 4.163, 3.853, 4.152, 3.938 and 3.988 respectively.

Regression is conducted to look at the effect and relation of the independent factor to the dependent variable. The result was based on standardized beta coefficients revealing a gradient of factors that influence project outcome and performance. Project-related factors ( $\beta = 0.234$ ) demonstrate a moderately strong positive relationship, Consultant, and PM team-related factors ( $\beta = 0.158$ ) exhibit the weakest association, with a positive value suggesting a potential link to lower performance. Client-related factors ( $\beta = 0.360$ ) and Contractor-related factors ( $\beta = 0.303$ ) have the strongest positive relationship which indicates projects experiencing these issues are most likely to suffer lower performance. External related factor ( $\beta = 0.161$ ) lowest relation implying projects encountering these challenges are more likely to experience a decline in performance.

## **5.3 Conclusions and Recommendations**

### **5.3.1 Conclusion**

The purpose of this research project is to identify the factors that affect the success of project execution emphasizing building construction areas within Mafer plc., to determine the impact of the listed factors, and to analyze the rank and correlation of listed factors with dependent based on the respondent data. This can help the company to improve the performance of execution of the company referring and using them as evidence-based solutions. The importance of conducting the study stems from three key considerations: firstly, to assess the factor affecting the success of project execution recently in Mafer plc. Secondly, to analyze the impact of the mentioned factors within their group based on respondent feedback related to the achievement of execution. Finally,

to overview of the rank and correlation of these independent factors with the dependent factor helps to identify the degree of impact.

To explore this area, a quantitative methods research design was adopted, involving questionnaires with experienced and professional company workers, as well as long-time collaborated advisors and project managers. In addition, a literature review was carried out and its main objective was to share with academic researchers and construction professionals relevant findings related to factors affecting the success of project execution in different areas of projects. Selected studies were identified from the literature that had investigated the factors affecting project execution of construction within a project. this paper covers identified 61 affecting factors. Furthermore, by classifying the factors into 6 specific groups, which are 5 independent groups and 1 dependent group, the survey facilitated the identification of the most severe factors of each group.

The study identifies factors affecting the success of project execution by reviewing the project execution theories from the reviewed literature. These factors are independent variables which are project, consultant & PM team, client, contractor, and external environment-related factors on the success of project execution. The dependent variable was also identified as the effect of project execution on the success of project completion. The study identifies that the independent variables have a direct effect on the dependent variables. If the independent variables are effectively achieved and controlled, then these variables will also have a good impact on the successful project execution of the construction projects.

The research findings from the survey and analysis that client-related and contractor-related factors are the most determined factors and also have a positive relationship and strong positive impact on the success of project execution. Respondents in this study showed a high level of correlation between the Project Consultant & PM team, client, Contractor, and External environment-related factors and the effect of project execution on outcome and performance. Multiple regression analysis was also undertaken to determine the relationship between the independent and the dependent variables. From the results of the analysis, the study concludes that there is a positive relationship between the independent variables and the dependent variables. Based on the findings of this study; Client related and contractor-related factors are the most influential. In addition, project-related factors and the external environment have a significant effect and also play a crucial

role in the improvement of the project execution phase in a project. Consultant and PM team-related factors have less effect compared to others.

The study also indicates that these factors have an impact on delivery based on the schedule, on delivery of quality works, on satisfaction of clients, on cost management, and on team satisfaction of the company.

### **5.3.2 Recommendations**

The study's outcome after assessing factors affecting the success of project execution finds that project consultant & PM team, client, contractor, and external environment-related factors all have a significant impact on the success of project execution. For the purpose of fostering that supports successful project execution, effective planning, monitoring & evaluation, and also communication techniques are essential. These factors also have an impact on schedule, client satisfaction, cost management, and team satisfaction within the company. The identified factors to the dependent factor have a high correlation and the following recommendation refers to the analysis ranks.

Based on the result and feedback from the study, the company should take major measurements to have a successful project execution experience in the future, and also the study recommends the following points;

- Giving awareness and follow-up for clients about the scope of the project including details of fortunes and challenges. This helps the company to make timely decisions, to have a defined project scope, and avoid changing the project scope frequently, payment settlement will be facilitated easily and so on to have proper project execution for a project.
- Develop and update new methodologies of work, assign capable and responsible persons, train workers in advanced methods of work, specially create a strong organizational structure that follows up the work status and flow. This helps the company to have an advanced method of work, good communication with stakeholders, dedicated top management support, and good way of management of sub-contractors and so on for achievement of good project execution.
- Create proper management practices for the project and working environment to tackle the challenges related to the project. Develop a proper planning culture, have a good way of

contractual dispute resolution method, avoid the unrelated scope of change, and pre-preparation of material and equipment.

- To overcome the external effect, the company should have a dedicated and reliable supplier, make pre-orders of materials before the execution time, stocking consumable materials to overcome inflation and scarcity for effective implantation of projects.
- Self-readiness for teamwork and experience sharing to resolve the issues that affect the project from a consultant and project management side. Expecting all decisions, finished & well-compiled documents, controlling, monitoring, etc. from the consultant will be unrealistic, therefore better to cooperate and engage in this matter also.

This recommendation will be effective when the company takes measurements of assigning capable workers for the work environment, giving priority to the management and administration of project issues, regular meetings, progress reports, and open channels for feedback. Finally, applying this reference will help to overcome and have successful project execution experience in the future

#### **5.4 Recommendations for Further Studies**

Increasing the sample size and response rate: While the sample size of 73 used in this study is reasonable, a larger sample size could improve the representativeness of the findings and reduce the potential for sampling bias. Future research could consider using a larger sample size and implementing strategies to increase the response rate, such as offering incentives or following up with non-respondents. It is also better to include the response of the stakeholders like; the consultant and client with a proper sample size to look at and assess the problem in-depth.

Widening the scope of the study: The focus of the study is on Mafer plc which is a private company. It was appropriate for this study. Future research could consider including other organizations and industries to provide a more comprehensive understanding of the factors affecting the success of project execution. This could help to identify commonalities and differences in the factors that contribute to project success outcomes and performance across different contexts.

Increasing the subject scope of the study: The factors raised and analyzed to determine the success of project execution in this study, such as Project, Consultant & PM team, client, Contractor, and External environment-related factors, are important factors and collective forms. Future research

could consider including additional factors, such as organizational culture and technology factors and government policies regarding construction. The study tries to explore the factors as a collective and for the future study it is better to go into detail with single factors. This could provide a more all-inclusive understanding of the dynamics and context of the success of project execution effect on all project performance and outcome.

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## Appendixes

### Questionnaire

**ADDIS ABABA UNIVERSITY  
SCHOOL OF COMMERCE  
Department Of Project Management  
REQUEST FOR COLLECTION OF DATA**

Dear Respondent,

As a master's student in project management at the School of Commerce in Addis Ababa University, I am currently conducting a research study titled " Factor affecting the success of project execution: the case of Mafer plc". I am kindly requesting your participation in filling out a data collection questionnaire for this study. Your responses will be completely anonymous and will be combined with others to form a crucial part of my research. The confidentiality of the information you provide will be maintained and will not be used against you or your organization. The data collected will be used solely for academic purposes.

Thank you for your time and cooperation.

Sincerely,  
Amenti Chali.

Section A: Background Information

1. Please select your Sex;

Male:                       Female:

2. Please select your age range;

– 21-30 years old

– 31-40years old

– 41-50 years old

– 51-60 years old

– 61 years or older

3. What is the highest level of education you have completed?

– Collage diploma

– Bachelor's degree

– Master's degree

– Doctorate degree

4. What is your current position within the company?

Managing body

Management member

Project Manager

Site Engineer

Office Engineer

Architect

Project manager /external/

Consultant /external/

Other (please specify) -----

5. How many years have you worked in/with the Company?

1-5-year:

6-10-year:

11-15-year:

More than 15 Years:

**SECTION - TWO: Factor affecting the success of project execution: the case of Mafer plc**

Below number of factors that may be affecting the execution of projects. From your experience, please rate the importance and express your opinion on the following factors that may have impacted project execution at Mafer plc over the past five years. (Select the relevant box for each).

What is your level of agreement towards statements for “factors affecting project execution: in the case of Mafer plc ”?

Circle Using a scale of 1 to 5 where

1 = Strongly Disagree

2= Disagree

3= Neutral

4= Agree

5 = Strongly Agree

No	Factors	Scale of Agreement				
		Project execution				
		1-Strongly disagree	2-Disagree	3-Neutral	4-Agree	5-Strongly Agree
<b>I. Project related Factors</b>						
1	Complexity and lack of simplicity of the construction project scope					
2	The size of the project regarding to small scale (renovation) to large scale (high raised bld)					
3	Type of the construction project (residential, public, Embassy and other)					
4	The value of the construction project. The amount which is varied from small value to large values projects					
5	Realist schedule for the work break downs					
6	Material and equipment consumed in the construction project					
7	Contract and design conflict during implementation period					
8	Change in scope and introducing new innovation to the construction project					
9	Accidents happening during the implementation of the project					
<b>II. Consultant and project management team related Factors</b>						
1	Relevant past experience on construction project scope and details					
2	Controlling system and availability on construction project site					
3	Length of time taking to for approval of proposals like; drawings details and specification material					
4	Decision making effectiveness on the raised issue of construction project					
5	Project management structures and Contract administration problems					
6	Communication with stakeholders of the project					
7	Effectiveness of risk identification and allocation for the project					
No	Cause	Scale of Agreement				
		Project execution				

		1-Strongly disagree	2-Disagree	3-Neutral	4-Agree	5-Strongly Agree					
8	Technical knowledge capability of the project										
9	Incomplete design at the time bid award and frequent design change during working time										
10	Lack of coordination with staffs in the firm										
<b>III. Client related Factors</b>											
1	Type of the client (private, Public, foreigner client like Embassies)										
	Shortage of experience on the construction project										
2	Site handover delay to start work on time										
3	Taking long time on revising & approving of relevant documents										
4	Delay to payment and finance problem										
5	Ability to make timely decision making										
6	Ability to influence and understand the project scope in order to manage the contract										
7	Having clear and precise goal to not change scope of the project lately										
8	Risk management capability										
9	Ability to participate in the phases of the project and coordination										
10	Poor communication and management with stakeholder										
<b>IV. Contractor related Factors</b>											
1	Technical and professional capability on construction project										
2	Economical and financial status of the company										
3	Experience of the Company on construction project /ability to accomplished details/										
4	Owner /Management body/ management capability										
5	Top management support for the project site works										

No	Factors	Scale of Agreement									
		Project execution									
		1-Strongly disagree	2-Disagree	3-Neutral	4-Agree	5-Strongly Agree					
6	Quality standard, types of construction methodologies followed by the company and assigning qualified personnel for the project										
7	Rework and rectification works										
8	Management of sub-contractor and resolution methods during raise of conflict										
9	Measurement taken regarding health and safety for workers at the projects site										
10	Advanced technology used by the company and inability to provide appropriate equipment on the site										
11	Office work readiness, document preparation & submission for the project works										
12	Project management (Planning, scheduling), site management & supervision										
13	Communication with the stakeholder										
14	Providing of training for the workers										
<b>V. External factors</b>											
1	Unpredicted and Inclement weather condition										
2	Escalation, inflation and instant t material price increment										
3	Material & equipment availability and also shortage of consumable material										
	Foreign currency availability problem										
4	Unfavorable and poor site condition.										
5	Regulatory problems/Changes in government regulation & laws										
6	Utility problems (electricity, water, telephone)										
7	Issues raised from neighbors										
8	Time taking of testing material and sample										
9	Political instability										
10	Delay and difficulties of supplier										

No	Factors	Scale of Agreement									
		Project execution									
		1-Strongly disagree	2-Disagree	3-Neutral	4-Agree	5-Strongly Agree					
<b>VI. Success of project execution by Mafer plc</b>											
1	Project execution experience affect Mafer on project delivery within schedule.										
2	Project execution experience on different projects, affects Mafer's good product/ output/ delivery regarding quality.										
3	Project execution experience improvement will help client satisfaction regarding Mafer's works.										
4	Project execution experience on different projects affects Mafer's cost management on different projects.										
5	Do you agree that Mafer should improve its project team satisfaction, organization, and coordination based on project execution experience on different projects?										

**Thank you!**