



COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE
DEPARTMENT OF BUSINESS ADMINISTRATION AND INFORMATION SYSTEMS
MASTERS PROGRAM IN PROJECT MANAGEMENT

A STUDY ON
THE EFFECT OF MONITORING AND EVALUATION PRACTICE ON
PROJECT PERFORMANCE:
THE CASE OF ELMI OLINDO CONTRACTOR PLC.

A RESEARCH PROJECT WORK SUBMITTED TO ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS SCHOOL OF COMMERCE: IN PARTIAL
FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ARTS IN
PROJECT MANAGEMENT

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ENDORSEMENT

This Research Project with the title of ‘The Effect of Monitoring and Evaluation Practice on Project Performance: The Case of Elmi Olindo Contractors Plc’ has been submitted to Addis Ababa University, College of Business and Economics, Department of Business Administration and Information Systems, Masters Program of Project Management with my guidance and approval as a University advisor.

Wasihun Mohammed (PhD)

DECLARATION

I, Tsega Alemayehu, declare that this research project with the title of ‘The Effect of Monitoring and Evaluation Practice on Project Performance: The Case of Elmi Olindo Contractors Plc’ is an original work of mine. Furthermore, I would like to confirm that this thesis and its contents have not been submitted for a degree or any other academic award in this, or any other university or institution of higher learning.

Declared by

Date

Signature

Tsega Alemayehu

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ABSTRACT

Monitoring and Evaluation is believed to play a crucial role in project management. However, in developing countries like Ethiopia, the practice of Monitoring and Evaluation in construction projects still requires effort to develop and improve its use. This study, therefore, intends to analyze the effect of Monitoring and Evaluation practices on the performance of projects carried out by Elmi Olindo Contractors Plc. Project performance was measured based on the organizational structure of Monitoring and Evaluation, its planning aspects, the participation of stakeholders, and the use of results. With this in mind, several literatures were evaluated for the relationship between these variables and project performance. A research design that determines the cause-and-effect relationship between the two variables was used which allowed a quantitative analysis in order to meet the research objectives. A probability sampling technique was used in order to identify 190 samples from the total population of 361 employees of Elmi Olindo Contractors Plc who are part of the management team and who has routine responsibilities of decision-making. The research findings show a positive relationship between Monitoring and evaluation organization, planning, and use of results with project performance. Whereas, the relationship between stakeholder participation and project performance had an inverse relationship. The research suggested that Elmi Olindo Contractors Plc has to develop its organizational structure and internal capacity towards Monitoring and evaluation process. It also identified the major improvements that need to be done with regard to planning, budgeting of Monitoring and Evaluation, and use of Monitoring and Evaluation results to improve progress, informed decision making and effective corrective measures. The research gave an insight into further studies that can be carried out in order to fill the gap that is not covered under this research.

Keywords: Monitoring, Evaluation, Effect, and Performance

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CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

In order to achieve a better and modernized living standard for their citizens, most developing countries concentrate their resources on improving their economic, social, and technological statuses. Over the recent past, the fight against low-income rates, illiteracy, high number of infant mortality, short life expectancy, and other signs of low socioeconomic development has taken on a new urgency. Several approaches and integrations have been made to eradicate, or at least to minimize, these unfavorable conditions. In view of achieving these goals, the construction industry plays a great role. According to Fred & Janet (1975), the construction industry contributes to economic development by satisfying some of the basic objectives of development including output generation, employment creation, income generation and re-distribution, and satisfying basic physical and social needs. It opens the door to improved education, health systems, transportation, agriculture, trade and so on. It is a way to facilitate and help advance the several aspects of development.

Hillebrandt (2000) pointed out that the construction industry throughout the world, by its nature and as it involves several stakeholders, has many special problems and requirements. On top of that, this sector faces several issues and challenges, especially in developing countries. These factors influence the industry negatively, and rarely in a positive way. Ofori (2000) stated that a number of nations with varying levels of socioeconomic development have recently acknowledged the significance of taking action to improve the performance of the construction industry. With this recognition, countries have been forming an agency that administers the continuous improvement of the industry. The establishment of an agency does not, however, ensure the success of the development of the construction industry due to the nature of the needs and difficulties of the sector and the resource limitations in many developing nations. Therefore, those involved in the construction industry need to develop a consistent process through which they should be able to monitor their performance and the outcome to identify the areas where sustainable upgrading is required and where improvement is needed.

According to James and Dr. Naomi (2021), it is when the Independent Evaluation Group (IEG) of the World Bank approved M&E usage in 1973 that the need for M&E procedures was established. Mackay (2007) reaffirmed that since that time, the World Bank has begun to help government initiatives in developing nations by enhancing their M&E processes.

In light of the above, monitoring and evaluation are very important in examining and tracking the development of a particular organization's aims and objectives. Data is gathered as part of the M&E process to track how well a project or program is doing at attaining the predetermined goals and objectives. The process of M&E helps organization in making an informed decision on how to improve a project or program through enhancing the positive practices and demoting ones that are not.

Monitoring is the routine, methodical gathering and evaluation of data to determine how well a program is being implemented in relation to established goals and targets. Clarifying program objectives, tying activities and resources to objectives, turning objectives into performance indicators and setting targets, routinely gathering data on these indicators, contrasting actual results with targets, communicating progress to managers, and adjusting them in response to issues are all important aspects of monitoring.

A project, program, or policy's aim, as well as its design, implementation, and outcomes, are all assessed in a process called evaluation. The purpose of evaluation is to examine why intended results were or were not achieved, to assess the specific casual contributions of activities to results, to examine the implementation process, to investigate unintended results, to provide lessons, to highlight significant accomplishments or program potential, and to make recommendations for improvement.

Upon conducting M&E, there are five key steps to be strictly followed. First, a starting point needs to be agreed upon. These specifics should be stated, including if the M&E system is a pilot or a rollout, operating at the national or subnational level, and whether it is a short, medium, or long term intervention. Then it will be determined who the main implementers are, who the main beneficiaries are, who finances the project, who supplies the M&E resources, and who is qualified and available to carry out the M&E activity.

The second step is to identify the approach and secure the budget. To put together a formal approach and the required budget, it is necessary to choose the appropriate indicators, tools and instruments for data collection and analysis, clear time frames with milestones, identify people and other resources for undertaking the M&E, and agree on the overall M&E approach and methodology.

The third step is to implement the M&E plan. Here, one has to identify the key tasks for implementing the M&E plan. Then a clear way forward has to be set on how the data is to be recorded. Afterwards, mechanisms for reporting the findings shall be determined for use of the results.

Fourth step is to analyze the M&E findings. To fulfill the inform and learn functions of M&E, data gathered from the M&E operations must be continually examined. Tools used for analysis depend on the adopted research methodology, instruments used for collecting data and volume and appearance of data.

The last step is communicating M&E findings. A crucial aspect of M&E's primary function, which is to support informed decision-making and corrective action, is regular dissemination of its findings. This helps in developing institutional thinking and improved policy making.

1.2. Background of the Company

Elmi Olindo & Co. P.L.C, as it was used to be called in the early stages of its life, started operating in Eritrea back in 1937. During this time, its principal activity was the production and supply of construction materials resulting from quarrying activities. After enrolling in these activities for a certain period, it then expanded its services and started involving into roads and building construction. In the mid-1960s, it extended its activities to all over Ethiopia. Prior to relaunching the business in 1983 by Luigi Elmi, most of its assets were nationalized by the well-known socialist government of Ethiopia at the time called 'Dergue' in 1980.

Elmi Olindo P.L.C was re-established anew back in 1945 GC, when a crushing plant was planted in Asmara. It started supplying construction materials such as aggregates and other for several road and building construction projects. It contributed significantly to the

construction and renovation of Asmara's road system in the 1950s. It soon began working on church construction projects, as well as other civil works projects.

With more than 70 years of industry experience, Elmi Olindo & Co. is currently Ethiopia's top construction firm. Its potential to take on significant projects with assurance and expert execution has increased.

The company is registered as grade BC-1 by Ministry of Infrastructure and has a capital of 150,000,000 birr. The company now has employees exceeding 3,800. The company currently participates in local and international projects.

1.3. Statement of the Problem

Proper implementation of M&E is intended to achieve learning from past experience, proper allocation and use of resources and deliver products and services to a level of satisfaction of all involved stakeholders. In the case of Ethiopia, M&E is only at its infant stage in most of the sectors especially in the construction sector as far as this research is concerned with. The efficiency and effectiveness of a construction project in Ethiopia is mostly dependent on the strengths and weaknesses of the involved parties; the Client, the Engineer, the contractor and other stakeholders. The more organized and modern the parties involved are, the more efficient the sector will be. However, the fact is that most of the responsibilities upon determining the successful completion of a construction project fall on the contractor. Yet, the contractor's performance is highly dominated and is under the full control of the stakeholders. For the reasons mentioned above, project performance in Ethiopia is rarely to the anticipated level. According to the publication of Federal Democratic of Ethiopia, Ministry of Urban Development, Housing and Construction (2014) on project performance status evaluation, 8 out of 14 public building projects failed to meet the planned percentage.

Aschalew (2017) revealed in his study that in public projects of Addis Ababa, cost underperformance affected 74.3% of public building projects, while 25.7% of them went above their allotted budgets. Whereas in terms of time, all 71 projects that were active in the year 2016 were not completed on time. Nuredin (2010) deducted from his study that 82.5% of small enterprise projects in Jimma were behind schedule and 40% of them

experienced cost under performance. These two studies indicate that project performance within Ethiopia is very poor. It goes without saying that such poor performances in cost and time will side by side influence other performance indicators such as quality, customer satisfaction and so on. These studies somehow indicate that project performance is highly affected by factors that can be easily tracked through M&E practice. Therefore, this study intends to bridge the gap between M&E practice and project performance in the construction industry.

As usually practiced in Ethiopia, the company under investigation fulfills the necessary precautionary and nationally used trends, at the start of most projects that it acquires, just for the sake of requirements of the bidding process. After winning a project, implementation of M&E which is influential to the performance of the contractor is mostly thrown down the pit. This calls for the contractor to make mistakes, take time to learn from them and improve its process as it learns. This process seems to repeat itself every now and then. For instance, for a successful completion of a construction project, monitoring the status and output of machineries is a great factor, as pointed out by most of the management team of the company. Failure to follow up the operation of machineries will result in frequent failure of the machines and subsequent delay in the project. The absence of such M&E practices forces the projects to consume more resources than anticipated, result in distressed projects and sometimes end up in terminations and subsequent undesired conditions.

Upon communicating the members of the management team who participated in several projects of the company, most of them prevailed that they themselves or the company has no organized M&E practice and rather run projects based on years of experience. They mentioned that since projects are left to run their own courses with no organized M&E practice, the project, the managers and the staff mostly get distressed usually at the final stages of the projects. Periodic reporting systems are created throughout the projects only for the aim of monitoring the project's progress. Further investigations on mitigation systems and future corrective plans are not practiced.

It is evident that such absence of M&E systems in the company has a high impact on the performance of projects. Being a construction company, efficiency and performance of

projects is dependent on the way resources are monitored and controlled. In this particular case, the major resources that play a huge role are budget, manpower and materials or equipment. The project management team explained that poor management on these resources influences the performance of projects with regards to time, cost and quality. Major problems that were pointed out by the project management team were absence of efficient and monitored purchasing strategy, delays in delivery of materials and malfunctioning of the logistics, absence of proper evaluation of performance of the available manpower, and absence of evaluation and performance assessment of completed projects and experience sharing.

However, if proper implementation of M&E on every factor of the project is practiced, it reduces or, in fact, eliminates such risks and achieves the desired results. Therefore, this research is undertaken in order to assess the current practice of M&E and its impacts, identify the observed gaps in the current practice, if any, of M&E and provide a basis upon which improved performance can be achieved through M&E.

While researching on the above mentioned points, this study investigates on the M&E trends and resulting impacts on a Grade 1 contractor in Ethiopia which barely has an experience of implementing M&E systems at an organizational level.

1.4. Research Questions

1. What is the effect of the current M&E organization of Elmi Olindo Contractors Plc on project performance?
2. What is the effect of M&E planning on performance of projects undertaken by Elmi Olindo Contractors Plc?
3. What is the effect of external stakeholder participation on performance of projects undertaken by Elmi Olindo Contractors Plc?
4. What is the effect of the use of M&E results on performance of projects undertaken by Elmi Olindo Contractors Plc?

1.5. Research Objectives

1.5.1. General Objective

The overall objective of this research is to investigate how Elmi Olindo Contractors Plc's projects performed in relation to M&E.

1.5.2. Specific Objectives

The specific objectives of this research are:

1. To assess the influence of the current M&E organization of Elmi Olindo Contractors Plc on project performance,
2. To determine the influence of M&E planning on project performance,
3. To identify the influence of stakeholder participation on project performance,
4. To analyze the influence of use of M&E results on project performance.

1.6. Significance of the Study

Most studies, that have been carried out locally, do not revolve around or provide solution for the problems faced by the Ethiopian construction sector. Some of these studies attempted to evaluate the impact of M&E procedures on project success. They do not, however, examine the precise relationship between M&E and project performance or the degree to which M&E affects performance. This study is intended to close the gap between the effect of the current M&E practice and project performance.

In the big picture, this study helps the organization in delivering projects to the required level of performance criteria and the desired satisfaction of the Client. The study's ultimate goal is to provide higher and medium level management of Elmi Olindo Contractors with the knowledge they need to minimize the numerous difficulties they frequently encounter in projects by identifying the gaps in the M&E process in use. It also helps to guide the staff of the company and other project participants in developing a culture of learning from their past and improving their performance in their future endeavors. It also helps managers to make decisions based on realistic findings rather than their experience and intuitive judgments.

This study will also serve as an input for the several stakeholders involved in the projects. Furthermore, as the construction industry tends to face similar problems throughout the country, companies with similar nature benefit from this study.

1.7. Scope of the Study

This study is conducted on the practice of monitoring and evaluation of projects that are being carried out by Elmi Olindo Contractors Plc currently. The projects under consideration for this research are located in three different regions of Ethiopia, i.e. Addis Ababa, Oromia and SNPPR. Project management team who are part of these projects will be requested to share their experience of projects they have been part of to address the history of the M&E practice in the company and compare with the current practice of M&E as well as the performance of the projects. Then the research will evaluate the current practice of M&E and how it influences the performance of projects majorly in terms of the three basic performance criteria i.e. time, cost and quality.

1.8. Limitation of the Study

This study reflects the trends and real condition of the company under study and does not imply that the findings and results do not necessarily hold true to other construction companies in Ethiopia.

On the other hand, due to company policies, information regarding overall company performance, specifically in terms of cost, could not be accessed. Therefore, for the sake of consistency, this study evaluates the performance of projects individually.

Furthermore, this study was challenged due to scarcity of time. As the research is conducted on projects with relatively large resources and tight schedule, respondents were a bit busy.

1.9. Organization of the Research Report

Chapter one of the research is Introduction that focuses on background of the study, statement of the problem, objectives, and scope of the study. Chapter two includes review of literatures comprising theoretical and empirical reviews. Chapter three is about research design and methodology used. This chapter revolves around the data collection and methods used to collect, organize, and analyze the data. Chapter four discusses the data presentation, analysis, and interpretation of findings. Finally, the last chapter, Chapter five presents the summary of the research, conclusion of findings and recommendations.

1.10. Definition of Key Terms

Evaluation: It is the process of examining a program/project with the involvement of collecting and analyzing information about a program's/project's activities, characteristics, and outcomes in order to make judgments, improve its effectiveness, and inform decision making.

Monitoring: It is a continuous and ongoing process of observing progress, track changes in performance against the set plan and check compliance to established standards.

Monitoring and Evaluation process: FAO (2010) defines M&E is the process of continuously acquiring information, analyzing it, and highlighting any unexpected (positive or bad) outcomes from a project and its operations to see if progress is being made towards pre-specified goals and objectives. It is an essential component of both sound management practices and the project cycle.

Project: PMBOK (2004) defines project as a brief activity with a start and finish that must be employed to produce a distinctive good, service, or outcome.

Project Performance: It is a general assessment of whether a project has reached its goals and prerequisites, most notably those related to scope, cost, and schedule.

Stakeholder: It is a n individual or group of people who have an interest in the outcome of a program/project.

CHAPTER TWO

2. Literature Review

2.1. Introduction

M&E is a method for gathering, analyzing, and methodically and impartially evaluating the development and results of current or completed projects. The goal of M&E is to manage outputs, results, and impacts more effectively in the present and the future. M&E will result in an effective outcome when it attempts to target the outcome and impacts of the project. Such approach is well known and recently practiced as Results Based M&E. According to IOM, RbM&E is a methodical way to tracking results and performance that is based on a logical and results framework approach that is transparent and reflective. It also uses evaluation to quantify impact. The main objectives of RbM&E are;

1. Promoting real accountability to governments, beneficiaries, funders, other partners, and stakeholders,
2. Swift corrective measures,
3. Ensure decision making are well-informed,
4. Encourage risk management,
5. Strengthen organizational and individual learning.

Monitoring is concerned with inputs, activities, and output. It offers warning signals and makes it possible for quick corrections. It offers a complete picture of the project's development following the completion of normal data collecting. It offers a space for self-evaluation as well.

IFRC PMER pocket guide (2012) describes common types of monitoring as;

1. Results monitoring keeps tabs on impacts and repercussions. In that it determines if the project or program is on track to provide the planned outcomes and whether any unintended consequences may have happened, results monitoring is comparable to evaluation in this regard.

2. Process monitoring maintains an eye on how inputs are used, how activities are developing, and how outputs are being generated. It often occurs at the same time as compliance monitoring and affects the evaluation.
3. Compliance monitoring assures adherence to rules and expectations of donors, requirements of grants and contracts, rules and laws of the local government, and ethical standards.
4. Situation monitoring tracks the environment in which the project or program operates, especially in relation to the risks and assumptions that have been created as well as any unforeseen elements that may arise.
5. Beneficiary monitoring keeps track of their opinions of a project or program. It includes the perceptions of the project or program held by the beneficiaries as well as their involvement, treatment, use of resources, and overall experience of change.
6. Costs are tracked by input and activity within predetermined categories of expenditures in financial monitoring. It frequently takes place concurrently with compliance and process monitoring.
7. Organizational monitoring keeps tabs on capacity development, institutional growth, and sustainability inside the project/program and with its partners. It frequently occurs in conjunction with the monitoring processes used by the larger, implementing organization.

Evaluation deals with the outcome and resulting impact. World Bank Group (2008) describe that evaluation is the process of determining the worth, value, or influence of an intervention. It is often conducted on an ongoing basis, such as once a year or at the conclusion of a project or program's phase. It is a thorough evaluation of the project. It is usually conducted by an external party which is not part of the execution. This helps to emphasize on true findings and make the information credible. It can be used to develop strategies and policies.

There are different types of evaluations depending on the timing when it is conducted, who it is conducted by, and the technicality and methodology of the evaluation.

According to the timing

1. Formative evaluations are undertaken during implementation of a project/program in order to improve performance and assess compliance.
2. Summative evaluations are undertaken at the end of project/program implementation to assess results and impact.
3. Midterm assessments, which take place halfway through implementation, are formative in nature.
4. Final evaluations are summative in nature and are carried out after a project or program has been fully implemented to determine how effectively it met its original goals.
5. Ex-post evaluation—conducted sometime after implementation to evaluate sustainability and long-term impact.

According to who conducts the evaluation;

1. Internal evaluations are carried out by those in charge of carrying out a project or program.
2. External assessments are carried out by Evaluators who are not part of the implementation team do external assessments, giving them some objectivity and frequently technical expertise.
3. Beneficiaries and other important stakeholders participate in participatory evaluations, which can be empowering and help them develop their ability, sense of ownership, and support.
4. Multiple implementing partners work together to undertake joint evaluations, which can foster cooperation, credibility, and support at many levels.

According to evaluation technicality and methodology

1. Evaluations are conducted in real time while a project or program is being implemented to give quick input for changes that will enhance ongoing implementation.
2. To evaluate the evaluation process itself, meta evaluations are used.

3. Thematic evaluations, which typically cover a number of projects, initiatives, or the entire organization, focus on a certain subject, such as gender or the environment.
4. Cluster evaluations, generally spanning sites and implemented by various organizations, concentrate on a group of similar activities, projects, or programs.
5. Rather than concentrating on a project's management and delivery, impact evaluations concentrate on the impact of a program.

A result-based project life cycle stages planning, monitoring and evaluation. Although it does not necessarily mean that the stages occur sequentially but rather also simultaneously. IFRC PMER pocket guide (2012) determine the major PMER activities that often occur in a project life cycle as;

1. Initial assessment – carried out to ascertain whether a project or program is necessary and, if so, to assist in preparing it.
2. Log frame – includes the project's or program's operational design, including its goals, indicators, methods of validation, and assumptions.
3. M&E planning – practical planning to track and evaluate the goals and indicators in the log frame.
4. Baseline study – the assessment of the initial conditions made before a project or program starts.
5. Midterm evaluation and/or reviews – to assess and direct ongoing implementation.
6. Final evaluation – this is done at the end of the project or program to see how well the objectives were achieved.
7. Dissemination and use of lessons – aid in the ongoing tinkering and improvement of programming.

Logical framework approach is a document that helps to clarify the objectives and improve the quality of M&E design and methodology. LFA includes situation analysis, problem analysis, objective analysis, alternative analysis, risk & assumption analysis and development of project logic model (PLM). In order to capture the information gathered

well, indicators are used. Indicators are quantitative or qualitative standard of measurement of the gathered information. Indicators have to be simple, measurable, precise, consistent, sensitive and action focused.

Selecting indicators is the next stage in finishing the monitoring and evaluation framework once the logical framework has been established. Hales (2010) defined indicators as tools used to assess whether a program or intervention is progressing toward reaching its objectives and goal. Hales stated that an indicator is a quantifiable statistic that gives information to monitor performance, assess achievement, and establish accountability in the context of monitoring and evaluation. An effective indication must be true, trustworthy, accurate, measurable, timely, and programmatically significant.

Upon undertaking M&E, the five key steps followed are;

1. Agree on the starting point: This involves making important early decisions that properly articulate the context for developing M&E and Impact assessment. Defining whether the intervention is a pilot or a roll-out, national, or sub-national or short, medium or long term. The other one is identifying the key implementers, the primary beneficiaries, who funds the intervention and who has the skills to undertake the M&E work.
2. Identify the approach and securing the budget: In order to allocate the budget questions and appropriate approach should be identified, appropriate indicators should be selected, data collection, planning of time frames and resources should be identified.
3. Implement the M&E plan
4. Analyze the findings: The analysis of the data might require outside expertise. This aids in directing the use of appropriate instruments and, in connection with them, the recording and storage of data.
5. Communicate the learning: A sound distribution strategy should be in place since M&E is used to fulfill both learning and improvement functions, and because its findings have an impact on development thinking, policy, and practice.

2.2. Structure and organizational alignment of M&E system

Organizational structure plays a great role for an M&E system to work to the required level. Organizational hierarchy, reporting lines, and organized work arrangements are all related to organizational structure. An organizational chart that shows how the many components of an organization relate to one another illustrates this. Depending on their requirements or based on geographical regions, goods, or hierarchy, organizations may have a classic, divisional, team, matrix, or hybrid structure. The staff will be motivated to carry out their M&E responsibilities and exercise them freely when an organization has a clear and appropriate organizational structure and culture. They will also have a clear understanding of the organization's overall goals and the strategies it has chosen to achieve those goals. Simister (2009) argued that there needs to be a balance struck between imposing common M&E policies, practices, and procedures and giving local decision-makers the freedom to create their own in response to local needs, taking into account that the balance will be struck differently across each M&E area and at each level of an organization's work.

2.3. Human capacity vs. M&E system

The M&E system works best when qualified individuals who efficiently carry out the M&E activities for which they are accountable are appointed. For this reason, it is important to understand the required skills, undertake human capacity assessment and address the breaches in capacity. This will aid in ensuring that human resources are suitably qualified and capable of successfully completing all tasks outlined in the work plan.

2.4. M&E plans

M&E plan is a systematic plan for the collection and analysis of all data needed for proper M&E. According to Ed Mallorie (2011), The M&E strategy identifies the data to be collected, the data collection techniques, the major data collectors, the frequency of data collection, and the data analysts. An M&E plan provides a common vision of what a successful M&E system will look like, used as a benchmark against which to measure progress in implementing the M&E system, standardizes and validates the mandates, authorities, and obligations of M&E stakeholders, allocates specific responsibilities to specific organizations, used as basis for deciding which M&E activities to implement, and offers a standard implementation recipe.

The strategy should be updated on a regular basis to take into account issues such as data demands, standardized indicators, data gathering technologies and procedures, roles and responsibilities.

2.5. M&E budgeting

A work plan for an organization will give all stakeholders a single shared vision and a single operational framework within which different organizations can customize their strategy. To accurately ascertain financial requirements, mobilize resources, and assign suitable levels of money, a budget should be created for the work plan. Gorgens, et al. (2009) argues that the following advantages are discovered by firms that have established their M&E system based on an M&E work plan for all M&E activities.;

1. Helps to clarify and facilitate execution of M&E system mandates
2. Provides a useful management tool
3. Enables partnership to be performed
4. Enables the assessment of the types of M&E support required
5. Helps to mobilize and rationalize resources for M&E system
6. Helps track progress in implementing M&E system

2.6. Involvement of partners/stakeholders

Involving as much partners or stakeholders and maintaining the established partnership helps to achieve a strong M&E system when people from diversified backgrounds and sector work around the same set of objectives. Upon doing this, inventory should be made to involve all stakeholders, coordinate and communicate. This will strengthen the M&E system. It will help to mobilize required technical and financial support for implementing the M&E system. Sulemana, et al. (2018) found that effective stakeholder involvement in M&E of projects and programs can increase transparency, accountability, sustainability of projects and programs, and promote supportive stakeholder attitudes at the community level. By expanding the level of participation of important stakeholders beyond information sharing and consultation, this can be accomplished. The coordination and communication of stakeholders in time will save the unnecessary waste of time and budget required to bring all the stakeholders to a common understanding afterwards. This will enhance a way to achieve the set goals in a harmonized manner.

However, on the contrary, of the above mentioned measures are not considered, stakeholder participation can lead to deteriorating the desired target. In the developing countries, like Ethiopia, stakeholder participation is not properly accounted for since the start of a project. Stakeholders are not engaged in every step of a project cycle. Hence, during the time when stakeholders who were not part of the initiation or planning of a project are brought into the picture, then the issue arises. As the interest of all stakeholders are not predetermined ahead of time, ambiguities and conflict of interest will be a point of worry. Chikati (2009) mentioned that only if there was good communication during planning and the people were involved in the planning can the necessary commitment to uphold decisions made by people be attained. In a project where all stakeholders were not part of from the start, involving them in the M&E process would not bring any change or improvement to the performance of a project.

2.7. Evaluation and Research

A systematic investigation, including the development, testing, and evaluation of the research itself, is called a research project. There are numerous types of research, depending on the main objective, the type of data and research methods, the level of comprehension needed, the type of research question, and the planned use of the study's findings.

OECD-DAC Working Party on Aid Evaluation (2021) defines evaluation is the methodical, unbiased examination of a project, program, or policy's conception, execution, and outcomes, whether it is ongoing or finished.

Research and evaluation produce data that helps us understand key program components and provide answers to queries about program performance. They aid in the creation of new plans, initiatives, and objectives. They help a program or project to stay on track. By doing so, they help the capacity of an organization and its staff and increase efficiency with accountability.

2.8. M&E and lessons learning

To support the use of data for policy, planning, and programming, M&E is essential for analyzing the data created by the system and disseminating information to important

decision makers. This the ultimate use of an M&E system. Depending on the available information;

1. An organization or sector can address the issue at hand
2. Problems can be understood jointly and widely, which fosters unity of effort.
3. Relevant policies and remedies can be identified
4. An organization or sector can improve its program and utilize resources more effectively
5. A program or service offered by a company or industry might develop public support.

2.9. Empirical Review

Kissi, et al. (2019) conducted a research on the impact of monitoring and evaluation practices on construction project success criteria. The study was conducted on construction projects in Ghana with a quantitative research approach. The authors used purposive sampling and used questionnaires to collect data from selected 120 professionals who had worked over 20 years in the public and private sector. The research developed a clear relationship between the two concepts, project success criteria and the impact of M&E practices which had a positive relationship.

Winiko, et al. (2018) used a mixed method approach to conduct a study on the use of monitoring, evaluation, and performance of digital education technology (DET) projects in Malawi. This study set out to ascertain the degree to which M&E results were applied in the DET project, and it was discovered that the degree of utilization was minimal. Further research into the impact of using M&E results on the performance of the DET project was conducted, and it was found that doing so had a statistically significant positive impact on the project's performance. In this line, the study found that the use of M&E results might account for a change of 23.9% in the performance of the DET project. Therefore, encouraging the use of M&E data will help the DET project perform better.

Claude and Didace (2020) conducted a study on Project monitoring and evaluation and project success in local government in Rwanda. In their study, they have indicated that in Africa, 62% of road construction projects wouldn't end as per the initial scope of work, of which 32% are not completed due to lack of financial resources, 15% would face additional

unexpected tasks during project implementation and 53% due to lack of monitoring and evaluation. Specifically, in Rwanda, in the year 2017, of 109 audited projects, projects worth 206 billion were delayed, projects worth 123 billion were abandoned and projects worth 45 billion were not finalized which totally account for more than 50% of the country's government projects. 63% of these mentioned projects were road construction projects. The researchers used explanatory research design to determine the level of significance of project monitoring and evaluation on project efficiency in local government projects. Qualitative data was collected from a sample size of 90 respondents which were selected using probability sampling technique. The findings of the research show that 53.3% agreed that monitoring and evaluation is being implemented while the rest disagreed. The findings show that there is no significant relationship between technical skills of staff on monitoring and evaluation and budget allocation for monitoring and evaluation, and project success. Whereas, results indicated that level of stakeholder's participation in monitoring and evaluation has high significance in project success. Therefore, the researchers suggested that project funders and management should separate the M&E funds from the entire project, increase the level of stakeholder's involvement in M&E and more technical trainings on M&E are required to empower the staff.

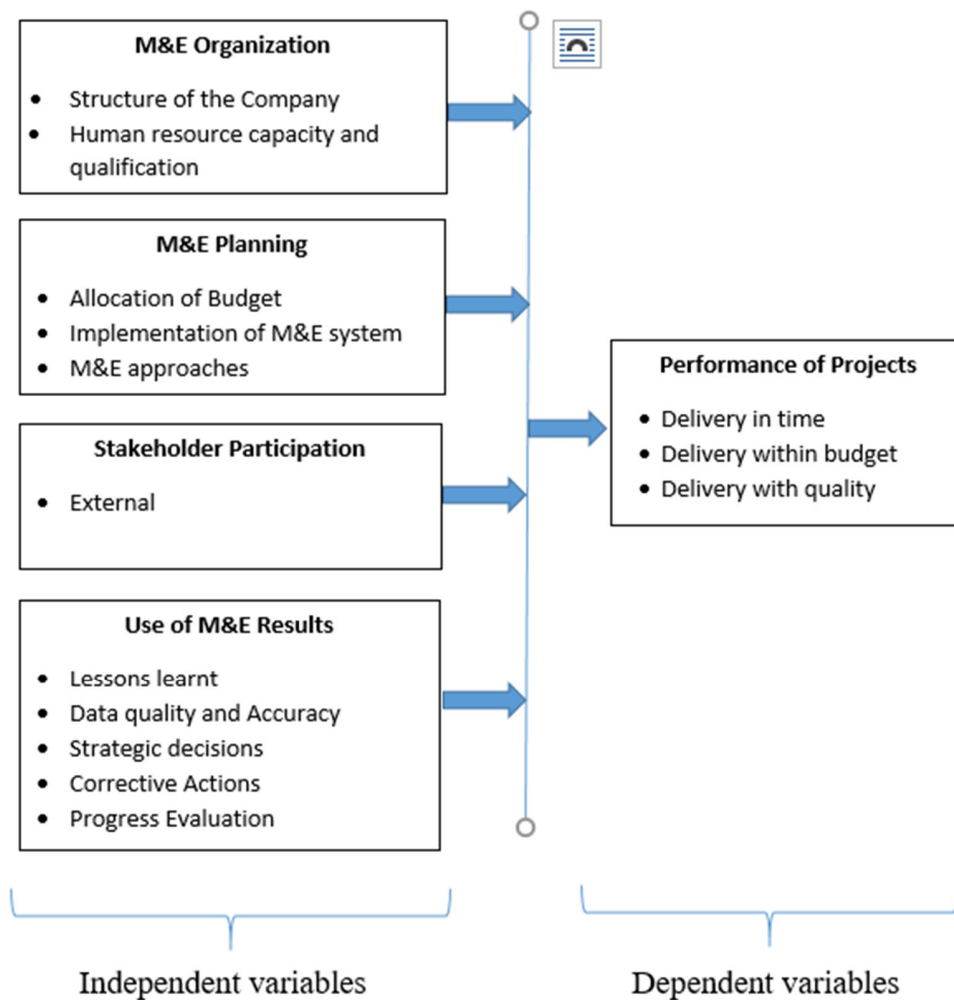
According to Callistus and Clinton (2018), when M&E is implemented effectively, projects are completed to quality, cost, schedule, health and safety regulations, and the satisfaction of stakeholders, despite the numerous challenges M&E faces, such as the limited financial resources for M&E, weak institutional capacity of M&E departments or team, and the weak linkage between project planning and M&E.

Mesfin (2020) conducted a study on the effects of M&E practice on project success in projects funded by an NGO named Compassion International Ethiopia. The purpose of the study is to assess the M&E methods, examine their effect on project success and identify gaps of M&E. The research used explanatory and descriptive design to enable the researcher to describe M&E practice in Compassion International Ethiopia project successes. The researcher used Non-probability sampling to identify 65 employees that were directly involved in the head office and projects out of the total employees of 142. The researcher revealed in his study that even though all projects don't have an M&E expert,

M&E systems are implemented and highly contribute to the success of projects. Due to this reason the researchers believes that the presence of sound M&E system helps in project success but its absence does not necessarily result in project failure. Still, the researcher suggested that sufficient budget shall be allocated for M&E, Project planning and decision making should align with the M&E system and Project managers should use M&E tools as one of project management tool.

2.10. Conceptual framework

The conceptual framework in this research shows the practices of monitoring and evaluation that are to be implemented for the successful completion of projects.



Source: Adopted from Omunga, L., & Gitau, R.

Figure 1: Conceptual Framework of the Study

CHAPTER THREE

3. Research Design and Methodology

3.1. Research Design and Approach

While conducting the research, an explanatory approach of research design is used. Establishing the cause-and-effect link between variables is the goal of explanatory study. It is feasible to study a potential cause-and-effect link by monitoring an existing condition or state of things and looking back in time for conceivable accidental circumstances using the ex post facto research method. Accordingly, the performance of projects carried out by Elmi Olindo Contractors Plc is measured based on the current M&E system practiced throughout the companies' projects.

To represent the collected data, a quantitative design approach is used to describe the prevalence or frequency of certain behaviors or characteristics within the studied population. This will help to grasp a wider understanding of the study.

3.2. Target Population

The company currently has 10 building and related projects under progress in Addis Ababa as well as in different regions of Ethiopia. Under these projects, more than 3800 employees are hired. Among the entire employees working in these projects, this research targets certain employees in managerial and technical positions to help address the issue in particular. These targeted employees are highly involved and are responsible in the day-to-day managerial decisions of the projects. The project managers and project management teams involved in these projects are tabulated below.

The below table summarizes the current active projects and target population.

Table 1. Active projects' location and population size

No	Project Locations	No of Projects	Population Size
1	Addis Ababa	6	192
2	Oromia	3	44
3	SNNPR	1	28
4	Technical Support Staff from HO	All	97
	Total	10	361

3.3. Sampling and Sample Selection Technique

According to Onwuegbuzie and Collins (2007), sampling—the process of choosing "a portion, piece, or segment that is representative of a whole"—is a crucial step in the research process because it influences the validity of the inferences the researcher draws from the underlying findings.

The above table summarizes that the total population size grouped under 4 strata is 361. For the purpose of this study, a proportionate stratified sampling is used in order to represent each stratum proportional to its size. In order to identify the target population, Slovin's formula is used.

$$n = \frac{N}{1 + Ne^2}$$

Where n = Sample size,

N = Total population size

e = acceptable margin of error, 0.05 mostly used

$$\text{Therefore, } n = \frac{361}{1+(361 \times 0.05^2)} = 189.75 \approx 190$$

Applying proportionate sampling and distributing the sample size to each stratum, the target population from each strata is calculated as shown below and presented in the table accordingly.

For instance, the target population from Strata 1 = $(192/361) \times 190 = 101$ respondents.

Table 2. Selection of target population

No	Project Locations	No of Projects	Population Size	Target Population
1	Addis Ababa	6	192	101
2	Oromia	3	44	23
3	SNNPR	1	28	15
4	Technical Support Staff from HO	All	97	51
	Total	10	361	190

Out of the total population size, 190 respondents were considered for the purpose of this study. These respondents, who are comprised of project managers, site engineers, superintendents, department heads, and foremen, have a better knowledge and insight about the subject matter and are able to deliver clear and constructive responses towards the study's intentions.

3.4. Sources of Data

Both primary and secondary sources of data were employed to acquire all the information that was required for the investigation.

In order to achieve a fast collection of data, questionnaires were sent through email to respondents from the selected sample of the management team of Elmi Olindo Contractors Plc who are involved in the projects considered at the time of the study. Secondary data was collected through gathering the necessary data of projects in which research participants were or are part of. Progress reports and evaluations collected from the projects

were used to have a full insight of the actual conditions of the projects. Documents were also retrieved from the company's server.

3.5. Data Collection Instrument and Design

As a research instrument for quantitative data, self-administered questionnaires with a 5-point Likert scale were collected from respondents. The questionnaire was adapted from a study conducted by Omunga and Gitau (2019) and was restructured in order to address the questions raised in this study. The questionnaire was developed to align with the research objectives and research questions mentioned earlier in this study. Afterwards, the questionnaire was discussed with the advisor in order to keep questions within the boundary and avoid vague and misleading questions.

Several books, publications, project data, reports and working formats from currently undergoing and previously completed projects were used as secondary sources to collect qualitative data.

3.6. Data Analysis

Prior to analyzing the collected data, questionnaires were first cleaned for missing or inaccurate data. In order to clearly present the collected data, statistical tools were used and presented in tabular and graphic forms. The data retrieved from the questionnaires were analyzed by using the Statistical Package for the Social Science version 27. The Multiple regression model used for the study is presented below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon,$$

Where:

Y = Performance of projects

X₁ = Organizational structure and Human capacity of Monitoring and Evaluation

X₂ = Monitoring and Evaluation Plan

X_3 = Stakeholder Participation

X_4 = Use of Monitoring and Evaluation Results

β_0 = constant

$\beta_{1,2,3,4}$ = regression coefficients

3.7. Validity and Reliability

3.7.1. Instrument Validity

Validity suggests truthfulness and refers to how well an idea about reality fits with actual reality. Care should be taken not to mismatch the actual real scenario with the conceptualization of the research idea. The content of the questionnaire was carefully constructed to measure the research questions. The advisor review and approval helped in attaining content validity through an expert's opinion. In order to reduce errors during measuring, a pilot test on the instrument, in our case, a questionnaire, will be done on several respondents to assure that the information on the instrument is easy to understand and respond to.

On the other hand, the construct validity of the variables is also checked through Pearson correlation. The validity of each variable is presented in the below table extracted from SPSS. As can be seen in the table, all the variables are statistically significant (P value < 0.05). Furthermore, for a degree of freedom N-2, which is $172 - 2 = 170$ and a margin of error of 0.05, the critical value extracted from the statistical table by Bart, et al. (2012) is 0.1593. It can be deducted from the table below that all Pearson's correlation values are above the critical value. Therefore, we can say that the questions representing each variable are valid.

Table 3. Correlation coefficients

		M&E Organization	M& E Plan	Stakeholder Participation	Use of M&E Results	Project Performance	Sum
M&E Organizatio n	Pearson Correlation	1	.503**	.670**	.910**	.555**	.892**
	Sig. (2- tailed)		.000	.000	.000	.000	.000
	N	172	172	172	172	172	172
M&E Plan	Pearson Correlation	.503**	1	.482**	.486**	.265**	.809**
	Sig. (2- tailed)	.000		.000	.000	.000	.000
	N	172	172	172	172	172	172
Stakeholder Participation	Pearson Correlation	.670**	.482**	1	.680**	-.044	.708**
	Sig. (2- tailed)	.000	.000		.000	.567	.000
	N	172	172	172	172	172	172
Use of M&E Results	Pearson Correlation	.910**	.486**	.680**	1	.566**	.861**
	Sig. (2- tailed)	.000	.000	.000		.000	.000
	N	172	172	172	172	172	172
Project Performanc e	Pearson Correlation	.555**	.265**	-.044	.566**	1	.540**
	Sig. (2- tailed)	.000	.000	.567	.000		.000
	N	172	172	172	172	172	172
Sum	Pearson Correlation	.892**	.809**	.708**	.861**	.540**	1
	Sig. (2- tailed)	.000	.000	.000	.000	.000	
	N	172	172	172	172	172	172

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Surveyed data (2023)

3.7.2. Instrument Reliability

Reliability is the consistency, repeatability, or dependability of the measures used. If the measures produce a consistent result, then the measures are said to be reliable. However, it should be kept in mind that reliability cannot be exact but estimated. In order to measure the reliability of the data collection instrument, i.e the questionnaire, Cronbach's alpha coefficient is used. According to Gliem (2003), the threshold for acceptance of the reliability of a questionnaire is set at 0.7. A reliability of 0.7 means that about 70% of the variance of the observed score is attributable to truth and 30% is attributable to error. On the other hand, Konting et al. (2009), who studied the quality assurance of existing surveys in higher education institutions in Malaysia, stated that a value of above 0.91 is excellent, 0.81 – 0.90 is good, 0.71 – 0.80 is good and acceptable, 0.61 – 0.70 is acceptable and any value less than 0.60 is not acceptable. It can be observed from these two studies that there is not a clear cut-off line for the value of Cronbach alpha. A general rule that can be deducted is that, the higher the Cronbach alpha value, the better the reliability of the instrument.

The reliability test of the four variables used measured with a 5-point Likert scale is calculated and presented in the below table.

Table 4. Reliability test

Variables	Cronbach's Alpha	Measures as per Konting et al. (2009)
M&E Organization	0.694	Acceptable
M&E Planning	0.754	Good and acceptable
Stakeholder participation	0.710	Good and acceptable
Use of M&E Results	0.682	Acceptable
Project Performance	0.700	Acceptable

Source: Surveyed data (2023) and Konting, et al. (2009)

3.8. Ethical Considerations

Norms that should be respected were given priority in conducting the research. This provides a basis to respect the well-being of anyone who is involved in the research. Care is taken upon collecting data, interpreting the data and presenting the results. With this

regard, participants of this study were advised to respond voluntarily. Their anonymity was assured and data was kept confidential.

The outcome of the study was prepared carefully in a way that it does not compromise the integrity of the company. Furthermore, sources and citations used for the purpose of this study have been properly recognized.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

4.1. Introduction

In order to clearly understand the results of this study, this chapter is presented in five sections. The first section discusses about the response rate and profile of respondents. The gender, educational level, experience and job title of respondents is presented in this section. The second section discusses the responses to the questionnaire on the M&E organizational setup of Elmi Olindo. The third section presents the M&E planning process carried out by Elmi Olindo. The fourth section of the results and discussion contains the findings of the questionnaire on the involvement of stakeholders during the process of M&E at Elmi Olindo. The fifth section covers the results obtained from the questionnaire with regard to the use of M&E results among the projects carried out by Elmi Olindo. The last section of the results and discussion revolves around the performance of projects carried out by Elmi Olindo.

4.2. Response Rate and Profile of Respondents

4.2.1. Response Rate

The number of usable responses received is divided by the total number of eligible respondents in the sample used to compute response rates.

The questionnaire was sent out to a total of 190 respondents. Out of these respondents, 172 questionnaires were filled out and returned. This results in a 90.5% return rate. Although there is no clear demarcation or cut-off line for an acceptable response rate prescribed in any literature referred, the attained percentage can be anonymously agreed upon that it is well beyond acceptable. All the filled-out questionnaires were used for the purpose of the study.

4.2.2. Respondent's General Profile

The following figure summarizes the gender profile of respondents. As can be deduced from the figure, most participants in the construction industry are males for several reasons that need detail investigation.

The Gender composition of the respondents is presented with a pie chart as below.

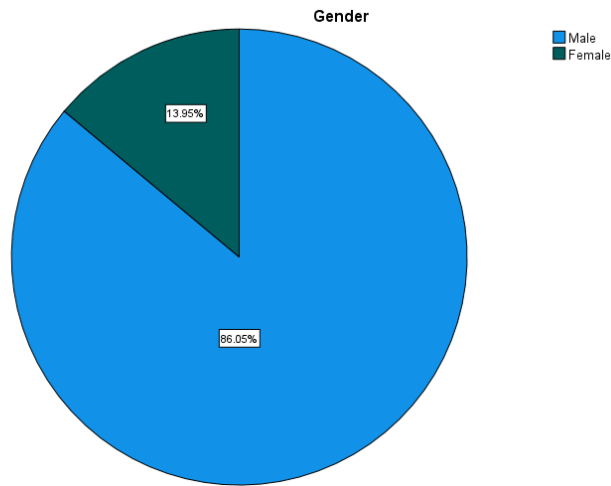


Figure 2. Respondents Gender Composition

Source: Surveyed data (2023)

While analyzing the age of the respondents, 63.37% which accounts a large amount of the respondents fall in the range of 31-40 years as can be seen in the below figure.

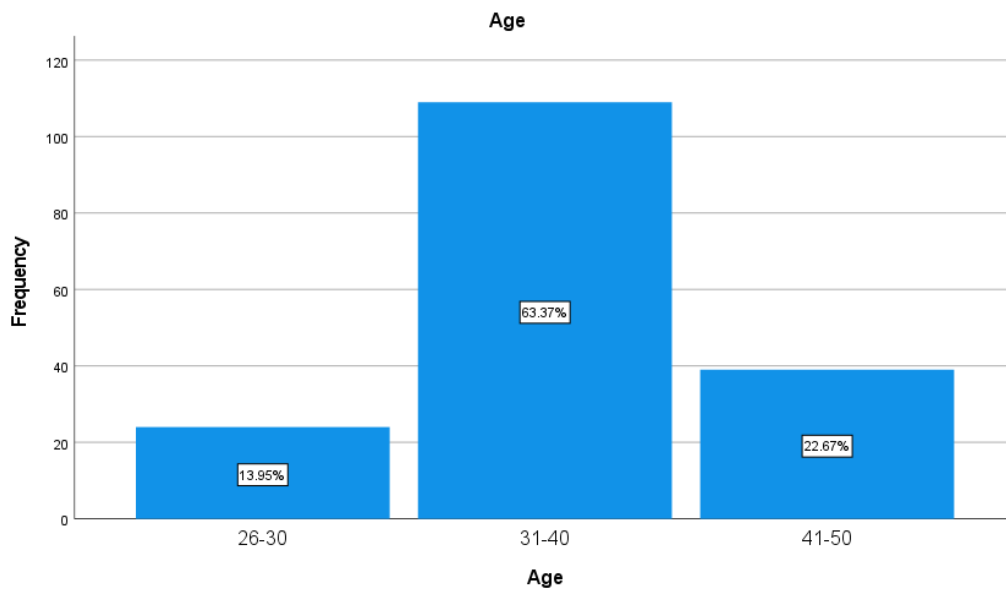


Figure 3. Age range of Respondents

Source: Surveyed data (2023)

Considering the highest education level achieved by respondents, 23.26% of the respondents have Masters degree while 68.60% have Bachelors degree. The remaining respondents have Diploma or Advanced Diploma.

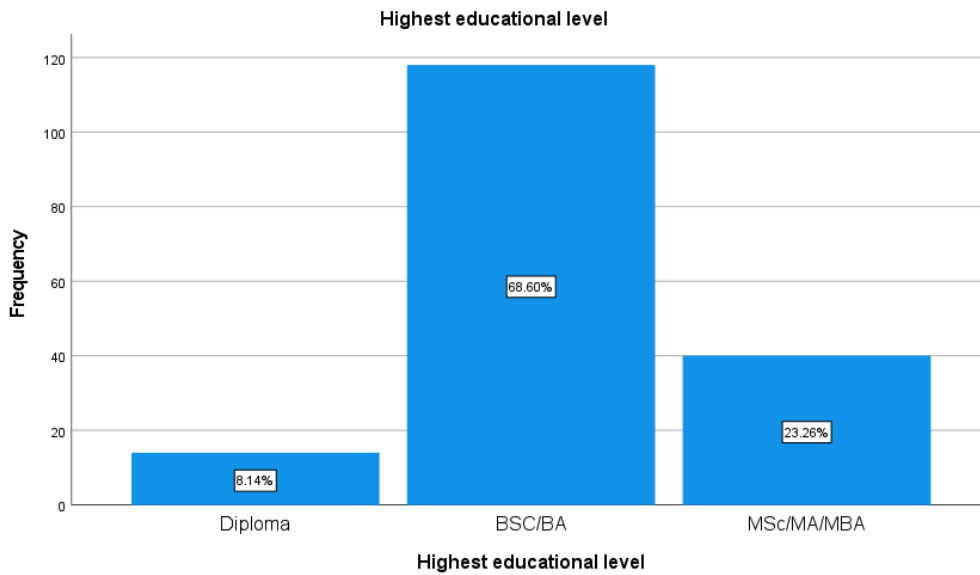


Figure 4. Educational level of respondents

Source: Surveyed data (2023)

With regards to the job position of respondents, 12.79% of the respondents are senior project managers, 11.63% are Project managers at assistant level, 40.70% are office or site engineers, 11.63% are foremen and 23.26% are support staff from workshop and headquarters. The below figure presents the same.

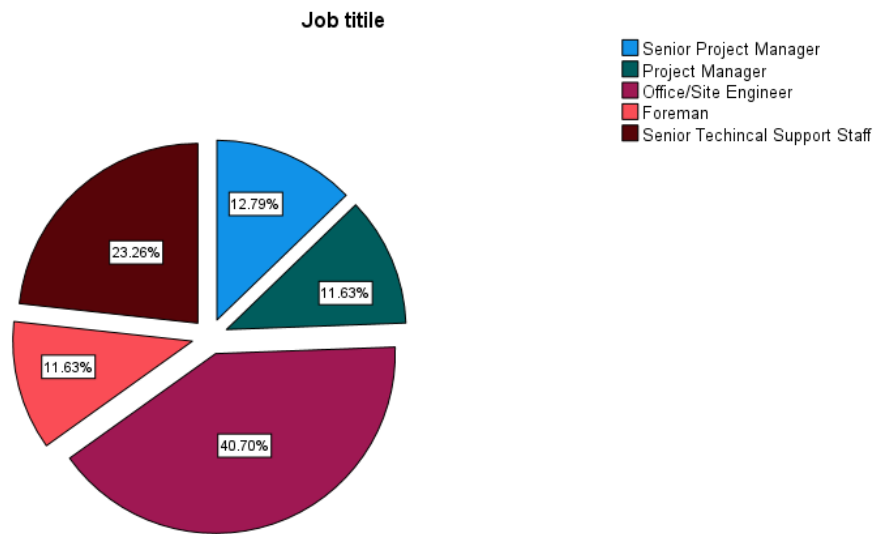


Figure 5. Job title of respondents

Source: Surveyed data (2023)

The below tables summarizes the experience of 172 respondents in the construction industry as a whole and within Elmi Olindo.

Table 5. General Experience of Respondents in construction industry.

Experience in construction industry					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	26	13.7	15.1	15.1
	6-10 years	54	28.4	31.4	46.5
	More than 10 years	92	48.4	53.5	100.0
	Total	172	90.5	100.0	
Missing	System	18	9.5		
Total		190	100.0		

Source: Surveyed data (2023)

Table 6. Experience of Respondents in Elmi Olindo Contractors Plc.

Experience in Elmi Olindo					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 years	38	20.0	22.1	22.1
	6-10 years	57	30.0	33.1	55.2
	More than 10 years	77	40.5	44.8	100.0
	Total	172	90.5	100.0	
Missing	System	18	9.5		
Total		190	100.0		

Source: Surveyed data (2023)

4.3. Descriptive Statistics

4.3.1. Descriptive Results of M&E Organization

The study established the effect of M&E organization on project performance in projects carried out by Elmi Olindo Contractors Plc. The respondents rated statements on M&E organization and the results are presented in table 7 below. The respondents had in common that they themselves had basic knowledge of M&E (M = 4.18; SD = 0.77), monitoring should be implemented regularly during the course of a project to a high degree (M = 4.60; SD = 0.626), evaluation should be implemented at certain stages of a project to a high degree (M = 4.18; SD = 1.163), M&E has a positive impact in improving project performance to a high degree (M = 4.95; SD = 0.223), Elmi trains its employees on M&E to a moderate extent (M = 3.22; SD = 1.133), management of Elmi believes that M&E brings change on project performance to somehow higher extent (M = 3.62; SD = 1.161), Elmi practices M&E system at an organizational level to moderate extent (M = 2.92; SD = 1.309), M&E is implemented during the whole stages of project cycle to a moderate extent (M = 2.96; SD = 1.045), employees have a clear understanding of his/her responsibilities with regards to M&E to a moderate extent (M = 3.29; SD = 1.255), employees have the required skills in M&E to somehow higher extent (M = 3.62; SD = 1.115), employees involved in M&E are independent in their operations to a moderate extent (M = 3.38; SD = 1.151) and the number of employees working on M&E is enough to a moderate extent (M = 3.27; SD = 1.130). Overall, the respondents had a common understanding and belief on all questions with a small variation among themselves; SD = 1.006.

The results implied that there is a relatively very well understanding of M&E and its implementation among the employees, Elmi’s attitude towards M&E is below satisfactory and employees’ capacity is to a moderate level.

Table 7. Descriptive results of M&E organization

Questions	Mean	Std. Deviation
I have a basic knowledge of M&E	4.18	0.770
Monitoring should be implemented regularly during the course of a project	4.60	0.626
Evaluation should be implemented at certain stages of a project	4.18	1.163
I believe M&E has a positive impact in improving project performance	4.95	0.223
Your company trains its employees on M&E	3.22	1.133
The management of your company believes that M&E brings change on project performance	3.62	1.161
Your company practices M&E system at an organizational level	2.92	1.309
M&E is implemented during the whole stages of project cycle	2.96	1.045
Employees have a clear understanding of his/her responsibilities with regards to M&E	3.29	1.255
Employees have the required skills in M&E	3.62	1.115
Employees involved in M&E are independent in their operations	3.38	1.151
The number of employees working on M&E is enough	3.27	1.130
Average	3.68	1.006

Source: Surveyed data (2023)

4.3.2. Descriptive Results of M&E Planning

Similarly, the study determined the effect of M&E planning on project performance in projects carried out by Elmi Olindo Contractors Plc. The respondents rated statements on M&E organization and the results are presented in table 8 below. The respondents agreed that separate budget is allocated for M&E during planning stage of the project to a moderate extent ($M = 3.29$; $SD = 1.047$), baseline survey is identified at the planning stage of the project to somehow higher extent ($M = 3.55$; $SD = 1.166$), M&E approaches are predetermined at the planning stage of a project to a moderate extent ($M = 2.92$; $SD = 1.309$), M&E approaches are pre-integrated with the existing management system to a moderate extent ($M = 2.96$; $SD = 1.045$) and key M&E milestones are set at the planning stage of the project to a moderate extent ($M = 2.96$; $SD = 1.045$). A standard deviation of 1.122 indicated that the responses did not differ much from the average.

The results implied that M&E budget allocation for M&E, planning of M&E prior and during project execution are not satisfactory in projects carried out by Elmi Olindo Contractor Plc.

Table 8. Descriptive results of M&E planning

Questions	Mean	Std. Deviation
Separate budget is allocated for M&E during the planning stage of the project	3.29	1.047
Starting point (Baseline survey) is identified at the planning stage of the project	3.55	1.166
M&E approaches are predetermined at the planning stage of the project	2.92	1.309
M&E approaches are pre-integrated with the existing management system	2.96	1.045
Key M&E milestones are set at the planning stage of the project	2.96	1.045
Average	3.13	1.122

Source: Surveyed data (2023)

4.3.3. Descriptive Results of Stakeholder Participation

The study established the effect of stakeholder participation in M&E on project performance in projects carried out by Elmi Olindo Contractors Plc. The respondents rated statements on M&E organization and the results are presented in table 9 below. The results indicate that internal stakeholders participating in M&E have high impact on project performance to somehow higher extent (M = 3.62; SD = 1.161), external stakeholders are involved during the implementation of M&E to a moderate extent (M = 2.99; SD = 0.997), external stakeholders should participate frequently during M&E process to a moderate extent (M = 3.30; SD = 1.174), external stakeholders shall participate during the M&E process for the sole purpose of information only to a moderate extent (M = 3.29; SD = 1.255) and external stakeholders participating in M&E have high impact on project performance to somehow higher extent (M = 3.62; SD = 1.115). The overall standard deviation reveals that the respondents had a very small variation in their responses with a value of 1.140.

The results indicate that external stakeholders are involved in the M&E process and their impact on project performance is relatively high.

Table 9. Descriptive results of Stakeholder participation

Questions	Mean	Std. Deviation
Internal stakeholders participating in M&E have high impact on project performance	3.62	1.161
External stakeholders are involved during the implementation of M&E	2.99	0.997
External stakeholders should participate frequently during the M&E process	3.30	1.174
External stakeholders shall participate during the M&E process for the sole purpose of information only	3.29	1.255
External stakeholders participating in M&E have high impact on project performance	3.62	1.115
Average	3.36	1.140

Source: Surveyed data (2023)

4.3.4. Descriptive Results of Use of M&E Results

The study determined the effect of use of M&E results on project performance in projects carried out by Elmi Olindo Contractors Plc. The respondents rated statements on M&E organization and the results are presented in table 10 below. The results imply that M&E results are communicated among different projects in Elmi to a moderate extent ($M = 3.29$; $SD = 1.255$), M&E results help the management team to gain an accurate information on the progress of the project to somehow high degree ($M = 3.62$; $SD = 1.115$), M&E results helps the management team to assess the project progress against the project initial plan to a moderate extent ($M = 3.38$; $SD = 1.151$), M&E results allows the management team to make a strategic decision regarding corrective actions to be taken in order to bring the project back to track again to a moderate extent ($M = 3.27$; $SD = 1.130$) and corrective actions taken based on M&E results are usually effective when implemented to a moderate extent ($M = 3.29$; $SD = 1.047$). a standard deviation of 1.139 implies that the responses did not differ much from the average.

The findings show that M&E results are not thoroughly communicated among projects, decision and making and corrective actions deviate from M&E results, even if the management team has the required information about the progress from M&E results.

Table 10. Descriptive results of use of M&E results

Questions	Mean	Std. Deviation
M&E results are communicated among different projects in your company	3.29	1.255
M&E results help the management team to gain an accurate information on the progress of the project	3.62	1.115
M&E results helps the management team to assess the project progress against the project initial plan	3.38	1.151
M&E results allows the management team to make a strategic decision regarding corrective actions to be taken in order to bring the project back to track again	3.27	1.130
Corrective actions taken based on M&E results are usually effective when implemented	3.29	1.047
Average	3.37	1.139

Source: Surveyed data (2023)

4.3.5. Descriptive Results of Project Performance

The study recognized the performance of projects carried out by Elmi Olindo Contractors Plc in terms of time, cost and quality. The respondents rated statements on M&E organization and the results are presented in table 11 below. The findings show that project are delivered on schedule to a moderate extent ($M = 3.38$; $SD = 1.151$), and delivered within budget to a moderate extent ($M = 3.27$; $SD = 1.130$). However, it was identified that projects are delivered to the standard of Elmi and the Client to a high degree ($M = 4.58$; $SD = 0.631$ and $M = 4.48$; $SD = 0.729$ respectively). The findings showed less variation from the average by a value of 0.910.

The results imply that projects are delivered to the required standard of the company and the Client but deviate from the original cost and delivery time.

Table 11. Descriptive results of project performance

Questions	Mean	Std. Deviation
Projects are delivered on schedule.	3.38	1.151
Projects area delivered within budget	3.27	1.130
Projects are implemented within the quality standard of the organization	4.58	0.631
Projects are delivered to the satisfaction of the Client	4.48	0.729
Average	3.92	0.910

Source: Surveyed data (2023)

4.4. Inferential Statistics

4.4.1. Correlation Analysis

The below table summarizes the correlation coefficient intervals of the dependent and independent variables.

Table 12. Correlation between variables

Correlations		M&E Organization	M&E Plan	Stakeholder Participation	Use of M&E Results	Project Performance
M&E Organization	Pearson Correlation	--				
M&E Plan	Pearson Correlation	.503**	--			
	Sig. (2-tailed)	.000				
Stakeholder Participation	Pearson Correlation	.670**	.482**	--		
	Sig. (2-tailed)	.000	.000			
Use of M&E Results	Pearson Correlation	.910**	.486**	.680**	--	
	Sig. (2-tailed)	.000	.000	.000		
Project Performance	Pearson Correlation	.555**	.265**	-.044	.566**	--
	Sig. (2-tailed)	.000	.000	.567	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Surveyed data (2023)

The table indicates that M&E organization has a positive and significant relationship with project performance in projects carried by Elmi Olindo Contractors Plc ($r = 0.555$; p value < 0.01). The results show that a standardized structure and human capacity in M&E increases the performance of projects.

It was also established from the table that planning of M&E has a positive and significant relationship with project performance in projects carried out by Elmi Olindo Contractors Plc ($r = 0.265$; p value < 0.01). Implementing proper procedures of M&E in projects has a crucial effect in attain better performance of projects.

However, the table implies that Stakeholder participation has a very minimal relationship with project performance ($r = -0.044$; p value > 0.01). In fact, it has an inverse relationship

with project performance. When the involvement of stakeholders increases, the results show that project performance will decrease.

Finally, the table also established the use of M&E results in projects has a positive and significant relationship with project performance in projects carried out by Elmi Olindo Contractors Plc ($r = 0.566$; $p \text{ value} < 0.01$).

4.4.2. Regression Analysis

As mentioned in chapter three, this study uses multiple regression analysis to determine the existence of relationship between the correlated independent variables and the dependent variable.

Multiple regression analysis makes several key assumptions in order to ensure that the regression model is appropriate. This study has checked for independence of errors, outliers, normality, linearity, homoscedasticity and multicollinearity as basic assumptions of multiple regression.

Independence of errors determines that there is no relationship between the independent variables and the residual variable. The Durbin Watson statistic test is extracted from SPSS to determine the relationship between the two is shown in the table below. In general, if the Durbin Watson test is less than 1.5 or greater than 2.5, then there is possible serious autocorrelation problem. On the other hand, if the value is between 1.5 and 2.5, then the autocorrelation is likely not to cause a serious concern. The table below shows the Durbin Watson value as 2.228 which is in between the acceptable range. Therefore, we can conclude that there is no serious relationship between the independent variables and the residual variable.

Table 13. Durbin Watson test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.845 ^a	.713	.706	.36411	2.228
a. Predictors: (Constant), Use of M&E Results, M&E Plan, Stakeholder Participation, M&E Organization					
b. Dependent Variable: Project Performance					

Source: Surveyed data (2023)

While checking for outliers, each variable has been checked separately and no significant outliers have been found in the data. Correspondingly, the below figure shows the error bars very close to the mean of the variables. This implies that the data set is clean from any significant outliers.

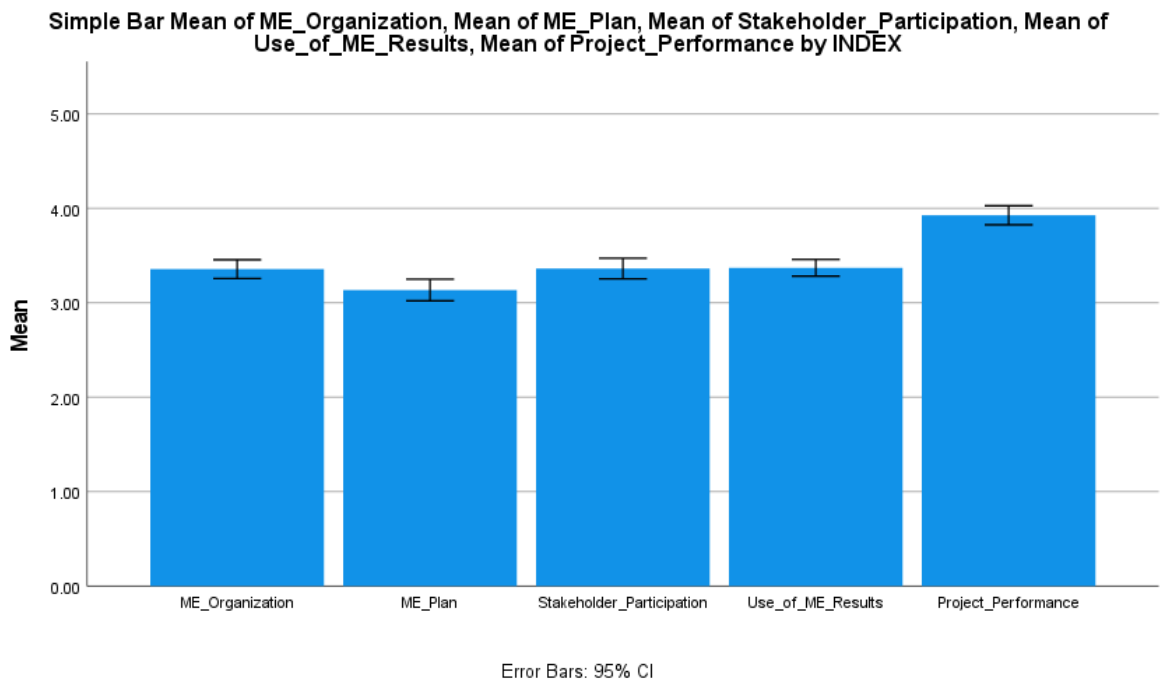


Figure 6. Checking for outliers

Source: Surveyed data (2023)

On the other hand, the data has been checked for normality. Normality is defined as the normal distribution of the collected data. Normality can be measured through skewness and kurtosis. Skewness is a measure of symmetry or asymmetry of a data distribution. As per George & Mallery (2010), acceptable value of skewness falls between +2 and -2. Kurtosis measures whether the data is light-tailed or heavy-tailed in a normal distribution. Collier (2020) stated that an acceptable value of kurtosis falls within the range of +10 and -10. The SPSS output for the normality distribution test of the collected data is presented in the below table. As can be shown in the below table skewness and kurtosis of all variables is within the acceptable range. So we can deduct that the data is normally distributed.

Table 14. Normality Distribution

Descriptive Statistics									
	N	Min	Max	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
M&E Organization	172	1.60	4.80	3.3570	.66227	-.268	.185	.513	.368
M&E Plan	172	1.00	4.80	3.1360	.75879	-.209	.185	-.112	.368
Stakeholder Participation	172	1.00	4.80	3.3628	.72516	-1.095	.185	2.155	.368
Use of ME Results	172	1.60	5.00	3.3709	.58587	-.099	.185	1.153	.368
Project Performance	172	2.50	5.00	3.9273	.67198	-.150	.185	-.800	.368
Valid N (listwise)	172								

Source: Surveyed data (2023)

The same assumptions of normality which is found to be acceptable is presented here below with a histogram.

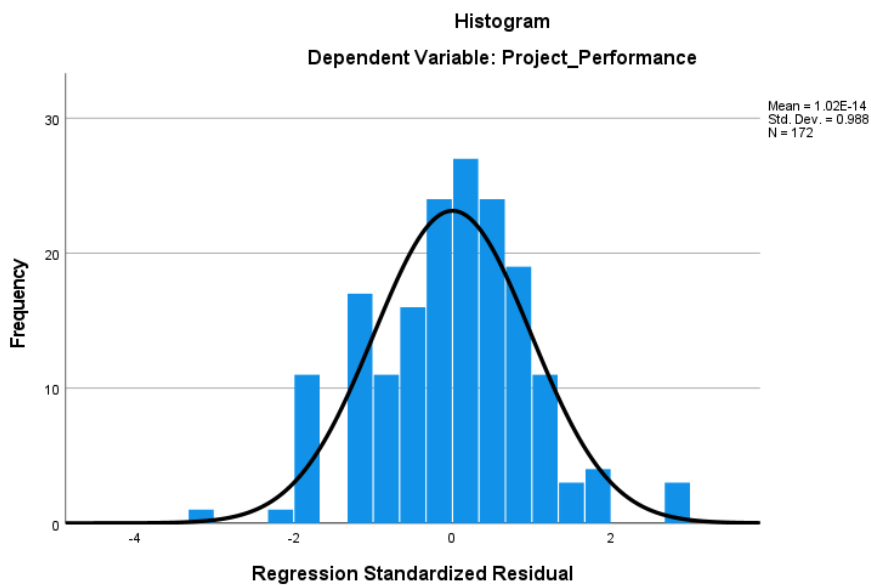


Figure 7. Normality Distribution

Source: Surveyed data (2023)

In a similar manner, the assumption of linearity of the model is presented in the below probability plot developed by SPSS.

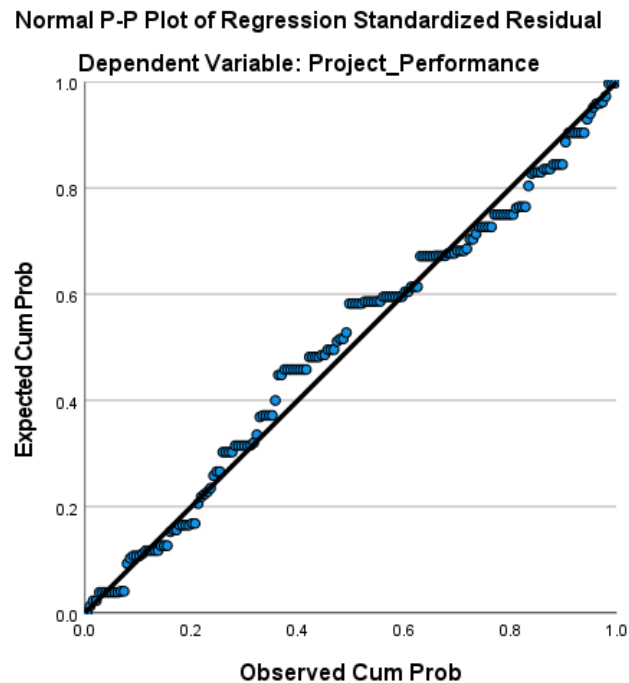


Figure 8. Probability Plot

Source: Surveyed data (2023)

The other basic assumption in the regression model, is the homoscedasticity. Homoscedasticity is the error terms or residual are equally distributed. The below figure shows that the residual spot are scattered in a way that do not form a specific clear pattern. We can therefore, conclude that the regression model does not suffer from heteroscedasticity problem.

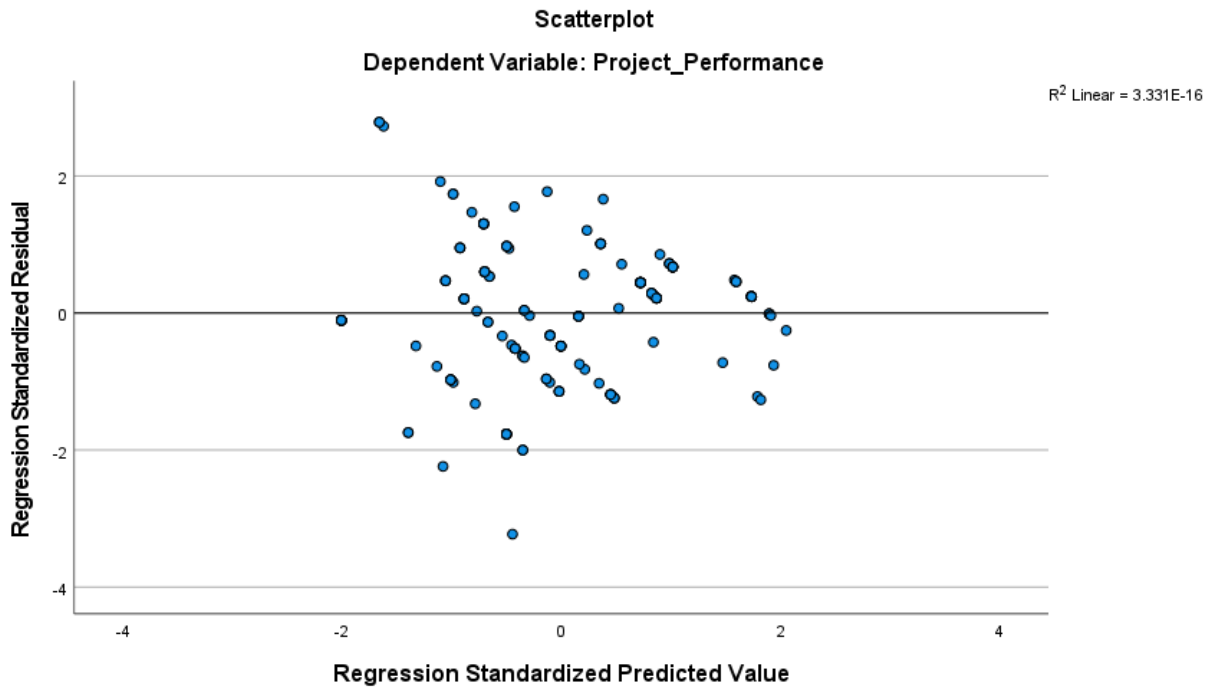


Figure 9. Homoscedasticity

Source: Surveyed data (2023)

As one of the assumptions of regression model, we have to check for the absence of multicollinearity of the model. In a multivariate regression model, multicollinearity is the presence of significant correlations between two or more independent variables. Multicollinearity can be inducted from the Variance of Inflation Factor (VIF). A rule of thumb to detect multicollinearity is that when the VIF value is greater than 10, then there is a problem of multicollinearity. The below table shows the VIF values of each variable. All VIF values are below 10, so we can deduct that multicollinearity does not exist between the independent variables.

Table 15. Multicollinearity diagnosis

Variance of Inflation Factor								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	2.105	.170		12.356	.000		
	M&E Organization	.461	.104	.454	4.450	.000	.165	6.067
	M&E Plan	.110	.044	.125	2.530	.012	.708	1.413
	Stakeholder Participation	-.812	.054	-.877	-14.931	.000	.498	2.008
	Use of M&E Results	.790	.117	.688	6.721	.000	.164	6.112
	a. Dependent Variable: Project Performance							

Source: Surveyed data (2023)

Since all the above basic assumptions are met in full, all variables are considered in the multiple regression analysis.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon,$$

Where:

Y = Performance of projects

X₁ = Monitoring and Evaluation organization

X₂ = Monitoring and Evaluation Planning

X₃ = Stakeholder Participation

X₄ = Use of Monitoring and Evaluation Results

β₀ = constant

β_{1,2,3,4} = regression coefficients

The model summary below showed that M&E account for 71.3% ($R^2 = 0.713$) of the variation in performance of projects carried by Elmi Olindo Contractors Plc. This means that the remaining 28.7% of the variation in project performance is due to factors than M&E.

Table 16. Model Summary

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.845 ^a	.713	.706	.36411
a. Predictors: (Constant), Use of M&E Results, M&E Plan, Stakeholder Participation, M&E Organization				
b. Dependent Variable: Project Performance				

Source: Surveyed data (2023)

In order to determine if the regression model was fit or not, ANOVA findings were extracted from SPSS and checked. The below table shows that the F statistic was significant as the p value is lower than 0.05 (Sig. = 0.000 < 0.05). This indicates that the regression model is fit. The multiple regression model that we established can be used to determine the link between the M&E and project performance.

Table 17. Analysis of Variance

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.076	4	13.769	103.858	.000 ^b
	Residual	22.140	167	.133		
	Total	77.217	171			
a. Dependent Variable: Project Performance						
b. Predictors: (Constant), Use of M&E Results, M&E Plan, Stakeholder Participation, M&E Organization						

Source: Surveyed data (2023)

The specific objectives set in this study are achieved through the model coefficients presented in the below table. The results in table 18 below indicate that M&E organization has a positive and significant effect on project performance. M&E organization has a value of $B = 0.461$ with p value < 0.01. This implies that for one unit increase of the M&E structure and human resource capacity, there is an increase on project performance by

0.461 units. The other output that can be extracted from the table is that M&E planning has a positive and significant effect on project performance. M&E planning has a value of $B = 0.11$ with $p \text{ value} < 0.01$. This implies that for one unit increase in proper M&E planning, there is an increase in project performance by 0.11 units. The other interesting variable in this regression model is the stakeholder participation. As can be derived from the table below, stakeholder participation has a negative effect on project performance. Stakeholder participation has a value of $B = -0.812$ with $p \text{ value} < 0.01$. The result implies that external stakeholder participation has a negative and significant effect on project performance. Based on the coefficients indicated below, for one unit increase in external stakeholder participation, there is a decrease in project performance by 0.812 units. Last of all, the table establishes that use of M&E results has a positive and significant effect on project performance. The use of M&E results has a value of $B = 0.79$ with $p \text{ value} < 0.01$. This implies that for one unit increase in use of M&E results, there is an increase in project performance by 0.79 units.

Table 18. Model coefficients

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.105	.170		12.356	.000
	M&E Organization	.461	.104	.454	4.450	.000
	M&E Plan	.110	.044	.125	2.530	.012
	Stakeholder Participation	-.812	.054	-.877	-14.931	.000
	Use of M&E Results	.790	.117	.688	6.721	.000

a. Dependent Variable: Project Performance

Source: Surveyed data (2023)

Accordingly, the regression model can be presented as;

$$\text{Project Performance} = 2.105 + 0.461 X_1 + 0.11 X_2 + (0.812) X_3 + 0.79 X_4$$

Where:

Y = Performance of projects

X_1 = Monitoring and Evaluation organization

X₂ = Monitoring and Evaluation Planning

X₃ = Stakeholder Participation

X₄ = Use of Monitoring and Evaluation Results

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

5.1. Introduction

The study focused on examining the influence of M&E on performance of projects carried out by Elmi Olindo with specific objectives as stated earlier. While trying to achieve the objectives set, several literatures with related topics to this study have been referred and examined. The projects undergoing during the time of this study and those recently completed have been analyzed. Perception of the project management team at project level and at organizational level towards M&E practiced by Elmi Olindo has been considered. Survey was conducted by the researcher in order to analyze the practice of M&E at the company and its related effect on the performance of projects. Primary data was collected through questionnaires distributed to relevant respondents and data was analyzed and presented in the Results and Discussion chapter. This chapter presents the conclusions drawn from the previous chapter and tries to outline recommendations for the future.

5.2. Conclusion

In view of addressing the specific objectives set in the start, the below points conclude the findings of this study.

The study has witnessed that project performance within the experience of Elmi Olindo is on a moderate scale. Projects, with the criterion used for evaluation performance, are delivered to the standard and quality of the company and Client but rarely within time and budget. However, this level of project performance was not only due to M&E practice implemented in projects and in the company as a whole but also other factors.

M&E organization, structure and human capacity has been confirmed to have a positive and moderate impact on project performance. The managers and management team of Elmi Olindo have a strong belief towards M&E practice and uses the results, somehow, routinely. It is found out that the company does not have a well-organized M&E department but still, delivery and performance of projects is kept to a moderate standard. This implies that absence of M&E practice does not necessarily imply poor performance of projects.

However, better results can be accomplished upon properly organizing the structure of M&E and building human capacity.

M&E planning also was found to have a certain positive impact on project performance. M&E planning shall be part of the project planning phase in order to maximize the project performance. M&E planning is characterized by Budgetary allocation, baseline line surveys, M&E approaches and setting of key milestones.

Stakeholder participation has been established to have a negative effect on project performance. External stakeholders, mostly identified as end user, government, community and other stakeholders are, in the case of Elmi Olindo, are set to result in a decreased project performance. This mostly arises due to the conflict of interest among the different stakeholders.

Lastly, project performance can be highly enhanced through the use of M&E results. The exchange of M&E results among projects, assessing progress of projects with initial plan, communicating findings, taking corrective actions and ensuring a better decision making can characterize the effect of using M&E results on project performance.

5.3. Recommendation

Based on the findings and the conclusion of the study, the researcher offers the below recommendations.

The company, Elmi Olindo should strive towards developing the in-house structure and organization of M&E. in-house human capacity building shall be facilitated in order to closely monitor the progress of projects and evaluate and share critical findings of each project.

The study deducts that the involvement of external stakeholders has an inverse relationship with performance of projects. The more external stakeholders are involved in a project, the less the outcome is. Therefore, extreme care shall be taken on the extent of the participation of external stakeholders in order not to negatively impact the project performance.

On the other hand, it can be deducted from the study that M&E practice in the construction industry less popular. Consequently, several researches can be conducted in order to

indicate the use of M&E practice and integrate the process with the structuring, planning and implementation of projects.

As per the findings of this study M&E practices contribute to project performance only 71.3% of the time. This means that there are other factors that account for the remaining 28.7% which are not covered under this study. The researcher suggests other researches to identify and analyze the variables, other than M&E, that has an effect on project performance.

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APPENDIX

Questionnaire for M&E and Project Management Team

Questionnaire on ‘The Effect of Monitoring and Evaluation Practice on Project Performance’

Dear Sir/Madam

My name is Tsega Alemayehu and I am currently studying Master of Arts in Project Management at Addis Ababa University, School of Commerce. I have completed my courses and currently working on my thesis entitled: THE EFFECT OF MONITORING AND EVALUATION PRACTICE ON PROJECT PERFORMANCE - The Case of Elmi Olindo Contractors Plc.

My research is aimed purely for academic purposes only. Your invaluable contribution will be of great assistance in achieving this objective. Your participation in this research is absolutely voluntary.

Therefore, with great respect, I ask you to fill this questionnaire with upmost *HONESTY & SINCERITY*. I guarantee that your identity will be kept confidential and the information you provide will be used for academic purposes only.

I would like to thank you in advance for taking your precious time from your day to fill this questionnaire. Please try to answer all the questions openly, as your answers will have an influence on the outcome of the research.

If you are interested, I will be happy to share the findings of this research when it's completed.

If you have any questions or comments, please don't hesitate to reach me by;

❖ Mobile: +251935-987223

❖ E-mail: tsegalex@yahoo.com

Regards,

Tsega Alemayehu

Addis Ababa University
School of Commerce
MA in Project Management

Questionnaire

This study entitled “*Effect of Monitoring and Evaluation Practice on Project Performance – The Case of Elmi Olindo Contractors Plc*” is designed to identify the current Monitoring and Evaluation (M&E) practice used in the company, its challenges and effect on performance of construction projects carried out by Elmi Olindo Contractors Plc.

1. SECTION ONE: GENERAL PROFILE OF THE RESPONDENT

1.1. Gender: _____

1 = Male 2 = Female

1.2. Age: _____

1 = 20-25 3 = 31-40

2 = 26-30 4 = 41-50

1.3. Highest educational level: _____

1 = Diploma

2 = BSc/BA

3 = MSc/MA/MBA

4 = Others: _____

1.4. Job title: _____

1 = Senior Project Manager

2 = Project Manager

3 = Office/Site Engineer

4 = Foreman

5 = Senior Technical Support Staff (HO, Logistics, Mechanic, Purchaser, Department Head)

6 = Others: _____

1.5. Years of experience:

a) In the construction industry: _____

1 = < 1 year 2 = 1-5 years

3 = 6-10 years 4 = >10 years

3. SECTION THREE: M&E PLANNING

Please indicate your opinion by ticking on the appropriate box for the five-point scale questions:

STRONGLY AGREE **AGREE** **NEUTRAL** **DISAGREE** **STRONGLY DISAGREE**
5 **4** **3** **2** **1**

No.	Description	5	4	3	2	1
3.1 How is M&E planning undertaken in your organization?						
3.1.1	Separate budget is allocated for M&E during the planning stage of the project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2	Starting point (Baseline survey) is identified at the planning stage of the project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.3	M&E approaches are predetermined at the planning stage of the project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.4	M&E approaches are pre-integrated with the existing management system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.5	Key M&E milestones are set at the planning stage of the project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. SECTION FOUR: STAKEHOLDER PARTICIPATION

Please indicate your opinion by ticking on the appropriate box for the five-point scale questions:

STRONGLY AGREE **AGREE** **NEUTRAL** **DISAGREE** **STRONGLY DISAGREE**
5 **4** **3** **2** **1**

No.	Description	5	4	3	2	1
4.1 How are external stakeholders involved in M&E process?						
4.1.1	Internal stakeholders participating in M&E have high impact on project performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.1.2	External stakeholders are involved during the implementation of M&E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.1.3	External stakeholders should participate frequently during the M&E process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.1.4	External stakeholders shall participate during the M&E process for the sole purpose of information only	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.1.5	External stakeholders participating in M&E have high impact on project performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. SECTION FIVE: USE OF M&E RESULTS

Please indicate your opinion by ticking on the appropriate box for the five-point scale questions:

STRONGLY AGREE **AGREE** **NEUTRAL** **DISAGREE** **STRONGLY DISAGREE**
5 **4** **3** **2** **1**

No.	Description	5	4	3	2	1
5.1. How are M&E results used in the course of project management?						
5.1.1	M&E results are communicated among different projects in your company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1.2	M&E results help the management team to gain an accurate information on the progress of the project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1.3	M&E results helps the management team to assess the project’s progress against the project’s initial plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1.4	M&E results allow the management team to make a strategic decision regarding corrective actions to be taken in order to bring the project back to track again	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1.5	Corrective actions taken based on M&E results are usually effective when implemented	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. SECTION SIX: PERFORMANCE OF PROJECTS

Please indicate your opinion by ticking the appropriate box for the five-point scale questions:

STRONGLY AGREE **AGREE** **NEUTRAL** **DISAGREE** **STRONGLY DISAGREE**
5 **4** **3** **2** **1**

No.	Description	5	4	3	2	1
6.1. What’s the position of your project in terms of performance?						
6.1.1	Projects are delivered on schedule.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.1.2	Projects are delivered within budget	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.1.3	Projects are implemented within the quality standard of the organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.1.4	Projects are delivered to the satisfaction of the Client	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. What is your opinion on the impact of M&E practice on the performance of projects you are/were involved in?

Thank you for your time.

Critical Values for Pearson's Correlation Coefficient

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STATISTICAL TABLES

TABLE B.7. Critical Values for Pearson's Correlation Coefficient

Level of Significance of a One-Tailed or Directional Test						
$H_0: \rho \leq 0$ or $H_0: \rho \geq 0$						
$\alpha = 0.1$	$\alpha = 0.05$	$\alpha = 0.025$	$\alpha = 0.01$	$\alpha = 0.005$	$\alpha = 0.0005$	
Level of Significance of a Two-Tailed or Nondirectional Test						
$H_0: \rho = 0$						
df	$\alpha = 0.2$	$\alpha = 0.1$	$\alpha = 0.05$	$\alpha = 0.02$	$\alpha = 0.01$	$\alpha = 0.001$
1	0.9511	0.9877	0.9969	0.9995	0.9999	0.9999
2	0.8000	0.9000	0.9500	0.9800	0.9900	0.9990
3	0.6870	0.8054	0.8783	0.9343	0.9587	0.9911
4	0.6084	0.7293	0.8114	0.8822	0.9172	0.9741
5	0.5509	0.6694	0.7545	0.8329	0.8745	0.9509
6	0.5067	0.6215	0.7067	0.7887	0.8343	0.9249
7	0.4716	0.5822	0.6664	0.7498	0.7977	0.8983
8	0.4428	0.5494	0.6319	0.7155	0.7646	0.8721
9	0.4187	0.5214	0.6021	0.6851	0.7348	0.8470
10	0.3981	0.4973	0.5760	0.6581	0.7079	0.8233
11	0.3802	0.4762	0.5529	0.6339	0.6835	0.8010
12	0.3646	0.4575	0.5324	0.6120	0.6614	0.7800
13	0.3507	0.4409	0.5140	0.5923	0.6411	0.7604
14	0.3383	0.4259	0.4973	0.5742	0.6226	0.7419
15	0.3271	0.4124	0.4821	0.5577	0.6055	0.7247
16	0.3170	0.4000	0.4683	0.5425	0.5897	0.7084
17	0.3077	0.3887	0.4555	0.5285	0.5751	0.6932
18	0.2992	0.3783	0.4438	0.5155	0.5614	0.6788
19	0.2914	0.3687	0.4329	0.5034	0.5487	0.6652
20	0.2841	0.3598	0.4227	0.4921	0.5368	0.6524
21	0.2774	0.3515	0.4132	0.4815	0.5256	0.6402
22	0.2711	0.3438	0.4044	0.4716	0.5151	0.6287
23	0.2653	0.3365	0.3961	0.4622	0.5052	0.6178
24	0.2598	0.3297	0.3882	0.4534	0.4958	0.6074
25	0.2546	0.3233	0.3809	0.4451	0.4869	0.5974
30	0.2327	0.2960	0.3494	0.4093	0.4487	0.5541
35	0.2156	0.2746	0.3246	0.3810	0.4182	0.5189
40	0.2018	0.2573	0.3044	0.3578	0.3932	0.4896
50	0.1806	0.2306	0.2732	0.3218	0.3542	0.4432
60	0.1650	0.2108	0.2500	0.2948	0.3248	0.4079
70	0.1528	0.1954	0.2319	0.2737	0.3017	0.3798
80	0.1430	0.1829	0.2172	0.2565	0.2830	0.3568
90	0.1348	0.1726	0.2050	0.2422	0.2673	0.3375
100	0.1279	0.1638	0.1946	0.2301	0.2540	0.3211
150	0.1045	0.1339	0.1593	0.1886	0.2084	0.2643
300	0.0740	0.0948	0.1129	0.1338	0.1480	0.1884
500	0.0573	0.0735	0.0875	0.1038	0.1149	0.1464
1000	0.0405	0.0520	0.0619	0.0735	0.0813	0.1038