



ADDIS ABEBA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

MASTER OF ARTS IN PROJECT MANAGEMENT

**THE EFFECT OF PROJECT MANAGEMENT MATURITY LEVEL
ON PROJECT SUCCESS: THE CASE OF ETHIO TELECOM**

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THE EFFECT OF PROJECT MANAGEMENT MATURITY LEVEL ON PROJECT SUCCESS: THE CASE OF ETHIO TELECOM

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**ADDIS ABABA UNIVERSITY, COLLEGE OF BUSINESS AND
ECONOMICS SCHOOL OF COMMERCE, DEPARTMENT OF
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ENDORSEMENT

This is to certify that the project work entitled "The Effect of Project Management Maturity Level on Project Success: The Case of Ethio Telecom" prepared by Solen Ephrem and submitted in partial fulfillment of the requirements for the degree of Masters of Arts in Project Management complies with the University's accepted standards of originality and quality.

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STATEMENT OF DECLARATION

I, Solen Ephrem, hereby declare that this study entitled "The Effect of Project Management Maturity Level on Project Success: The Case of Ethio Telecom" is the result of my own work and research. All project materials have been properly credited, and this research has not been submitted for a degree or diploma program at this or any other institution.

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CERTIFICATION

This is to certify that Solen Ephrem has completed his thesis entitled "The Effect of Project Management Maturity Level on Project Success: The Case of Ethio Telecom". All materials used for the thesis have been duly acknowledged, and his thesis is appropriate to be submitted as a partial fulfilment for the requirement of Master of Arts Degree in Project Management (MAPM).

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Acronyms and Abbreviations

APMML – Average Project Management Maturity Level

CEO - Chief Executive Officer

CMM - Capability Maturity Model

DNS - Domain Name Server

ETC - Ethiopian Telecommunication Corporation

HPMML - High Project Management Maturity Level

LPMML - Low Project Management Maturity Level

OPM3 - Organizational Project Management Maturity Model

PCM - Project Cost Management

PCMM - Project Communications Management

PIM - Project Integration Management

PM - Project Management

PMBOK – Project Management Body of Knowledge

PMM - Project Management Maturity

PMML - Project Management Maturity Level

PMMM - Project Management Maturity Model

PMI – Project Management Institute

PPM - Project Procurement Management

PQM - Project Quality Management

PRM - Project Resource Management

PRKM - Project Risk Management

PS – Project Success

PSR – Project Success Rate

PSCM - Project Scope Management

PSTM – Project Stakeholder Management

PTM - Project Schedule Management

PTO - Public Telecommunications Operator

VHPMML - Average Project Management Maturity Level

VLPMML - Very High Project Management Maturity Level

WBS – Work Breakdown Structure

Abstract

This study aimed to assess project management maturity level of Ethio telecom in terms of the implementation of the PMBOK's ten knowledge areas. Furthermore, the study aimed to find out the effect project management maturity level has on project success within the company. To achieve its aim, the research selected the PM solutions model as the most suitable among the different project management maturity models available. The research designed survey questionnaires based on the literature that was reviewed and collected primary data by distributing them to the project management offices in Ethio telecom. The research then applied a descriptive research methodology and an inferential analysis to analyze the data and draw conclusions. According to the findings, Ethio telecom's project management maturity is currently at level 3. That implies "Organizational Standards and an Institutionalized Process." According to the study's findings, project risk management, project communications management, and project cost management are all at a low level of maturity (approximated level 2 PMM). Project schedule management, project quality management, project scope management, project stakeholder management, project resource management, project integration management, and project procurement management, on the other hand, are at a higher level of project management maturity (approximated level 3 PMM). Furthermore, it was determined that Ethio Telecom's overall project success rate was 3.37 (rated out of 5). The results also showed a significant linear relationship between project management maturity level and project success rate in Ethio telecom. And a unit increase in project management maturity level will increase project success by 2.02. This suggests Ethio telecom should thrive to achieve high project management maturity in order to be successful with its projects.

Key words: Project Management Maturity Level, Project Success, Project Management Body of Knowledge, Project Management Maturity Model

Chapter One

1. Introduction

1.1. Background of the Study

The Guide to the Project Management Body of Knowledge (2017) defines project as “a temporary endeavor undertaken to create a unique product, service, or result”. A project needs management because it is an endeavor that uses resources, which necessitates the effective use of a resource that already exists in order to achieve its goal within the constraints of time, money, and quality. Project management is the planning and coordination of a company's resources to advance the completion of a particular task, event, or duty (Julius, 2022). Hence, project management is essential for companies to survive in a rapidly changing technological and market environment.

Project Management Maturity (PMM) is a concept used to describe the level of project management capability within an organization. Derived from the root word 'mature', it is an indicator of the organization's capability to achieve its goals and objectives (Gebrewahd, 2018). And because project maturity is meant to be a sign of an organization's capacity to effectively manage its projects, a company with a high level of project maturity would be thought to have better chances of project success than companies with a lower level of project maturity. Therefore, organizations need to be interested to find out how mature their project management levels are.

Ethio telecom is a 125-year-old state-owned enterprise that provides internet, telephone, and financial (through Telebirr) services in Ethiopia; it is also Africa's oldest Public Telecommunications Operator (PTO). The current name and structure of the company were adopted in 2010 G.C.; previously, the company was known as Ethiopian Telecommunication Corporation (ETC). Ethio telecom was Ethiopia's sole telecom service provider until Safaricom Ethiopia entered the market in July 2021. Ethio telecom now in a competitive market provides Fixed Solutions, Mobility Solutions, Hosting and DNS, Devices and Terminals, and other services. Ethio telecom has over 70 million total subscribers as of January 2023, including 67.7 million Mobile Voice subscribers, 31.3 million Internet and Data users, 862.2 thousand Fixed

Voice subscribers, and 566.2 thousand Fixed Broadband subscribers (Ethio telecom Profile, 2023).

According to Kerzner (2001), the successful completion of projects is critical to the success of any organization and this has something to say to Ethio telecom which performs a lot of expansion and non-expansion projects. Ethio telecom is currently confronted with the challenges of fiercely competitive and changing environments brought about by regulatory changes and organizational restructuring. Furthermore, forces such as new telecom service providers, economic inconsistency, technological change, and political, legal, demographic, and cultural complexities create both challenges and opportunities for the organization.

Ethio telecom can use project management as part of its competitive advantage strategy to stay ahead of its competitors. And, given the strategic importance of projects in business, Ethio telecom must implement effective project management processes that capitalize on innovation, measure progress, value, and risks, and ensure the right projects can be delivered in accordance with organizational strategy.

The odd thing with projects is that various interest groups, including stockholders, managers, customers, employees, and so forth, may evaluate the success of a project. Because of this, project success criteria must take into account various perspectives (Stuckenbruck, 1986). Therefore, it is important that this research uses the 10 PM Knowledge areas to assess how Ethio telecom is performing. According to the Project Management Body of Knowledge (PMBOK®, 6th edition), the PMI framework of project management consists of 49 processes that are classified into ten knowledge areas. The ten PM knowledge areas are; integration, scope, schedule, cost, quality, resources, communications, risk, procurement, and stakeholders. A knowledge area is a "category" of project management and the knowledge areas collaborate to complete a project.

Today, there are numerous management maturity models in use. Some are specific to the industry, while others are more general. In this study case, the Project Management Maturity Model (PMMMSM) adopted by Gebrewahd (2018) is used to assess where Ethio telecom stands in terms of the 10 PM knowledge areas. The PMMMSM has five levels and it is a tool designed by PM Solutions for determining an organization's level of project management maturity. The

five levels included in PM Solutions Project Management Maturity Model are; Initial Process, Structured Process and Standards, Organizational Standards and Institutionalized Process, Managed Process, and Optimizing Process.

1.2. Statement of the Problem

Projects are undertaken with the expectation of success; however, the vast majority of projects fail. One reason for this is that companies' project management maturity is low. According to the Project Management Institute's (PMI) 2018 Pulse of the Profession, mature project management allows for rapid adaptation to changing market conditions which is the major challenge for projects these days. Most organizations react when the need for project management becomes critical. And this lack of foresight frequently results in a situation in which project management systems and infrastructure are not in place to support the project's needs (Yilma, 2018).

Knowing one's project management maturity level can assist an organization in determining where it stands and how mature its processes are. This, in turn, will help in applying knowledge to further develop and improve the company's processes for managing projects (Sarah, 2022). Many studies conducted in developed countries concluded that there is a positive relationship between project management maturity levels and project success (Price, 2004). Research done by Gebrewahd (2018) showed that Ethio telecom is at level 2.46 in terms of overall project management maturity on a relative scale of 1 (lowest maturity level) to 5 (highest maturity level). And out of the 10 PMBOK; the project time management and project cost management knowledge areas were found to be the least mature knowledge areas in the company (averaged 2 in their PMML) whereas the most mature knowledge areas were found to be; project procurement management, project risk management, and human resource knowledge areas (averaged about 3 in their PMML). Accordingly, this research will help the company figure out if it has advanced to a better maturity level after 2018; and it will demonstrate the effect of project management maturity level on project success in the company, which was not covered by Gabrewahd's (2018) research.

Ethio telecom is currently in a competitive market, which means that in order to be successful and make a profit, it must be as effective and efficient as it can be with its projects. This is different from the good old days when getting a profit was relatively simpler. Accordingly, for Ethio telecom to be successful it needs great maturity in managing its projects and the researcher

believes Ethio telecom can increase its project management maturity level and project success rate by being aware of its current maturity level.

Various studies have been conducted to assess the level of project management maturity in various organizations worldwide. However, it is challenging to find data or research aimed at examining Ethio telecom's current level of maturity (With the exception of one done by Gebrewahd 2018) and its effect on the company's project success rate. As a result, the goal of this research is to determine the current level of Ethio telecoms project management maturity and its effect on the company's project success.

1.3. Research Questions

This study aims to answer the following research questions:

- What is the level of project management maturity in Ethio telecom with respect to each of the project management knowledge areas?
- What are the most and least matured project management knowledge areas in Ethio telecom?
- What is the level of project success in Ethio telecom?
- How does the level of project management maturity in Ethio telecom affect project success?

1.4. Hypothesis

Null hypothesis - There is no relationship between project management maturity and project success rate in Ethio telecom.

Alternative hypothesis - Project Management Maturity has a positive and significant effect on project success rate in Ethio telecom.

1.5. Objective of the Study

1.5.1. General Objective

The general objective of this study is to assess project management maturity level in Ethio telecom and its effect on project success.

1.5.2. Specific Objectives

- To assess the maturity level of Ethio telecom in relation to each of the project management knowledge areas.
- To identify the company's most and least matured project management knowledge areas in Ethio telecom.
- To assess the level of project success in Ethio telecom.

1.6. Significance of the Study

The first significance of this research is that assessing project management maturity level and its relationship with the company's success rate will assist Ethio telecom in designing improvement action as it embarks on a number of new projects and enters a new competition. Second, an assessment of most and least matured project management knowledge areas could be used to identify project management knowledge areas in need of improvement. Third, it adds significantly to the existing project management literature. Because there hasn't been much research on assessing Project Management Maturity Level (PMML) and Project Success Rate (PSR) regarding Ethio telecom, this paper serves as a resource for research done on the same or related subject.

1.7. Scope of the Study

The study is limited to the ten PMBOK knowledge areas. The ten PMBOK knowledge areas are: Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management, and Project Stakeholder Management. In addition, the data is collected from project management offices of Ethio telecom located in Addis Ababa. And the projects studied, and questions asked in the questionnaire will only include projects completed after 2018.

This study is based on two sets of variables: the dependent variable (Project Success) and the independent variable (Project Management Maturity Level). And an inferential analysis (a correlation and regression analysis) for each PMBOK knowledge areas is not included.

1.8. Limitation of the Study

It's possible that employees in the organization do not fully comprehend the company's project management system. Additionally, the organization has not fully adopted the 10 knowledge areas recommended by the PMBOK. Another limitation was the difficulty in obtaining secondary data from the organization's side and the numerous procedures Ethio telecom requires to obtain any data from the company. In addition, despite the fact that the questions' content was condensed to make them less time-consuming and tedious for respondents to complete, there were some dishonest and careless answers that were discovered to be incongruous on their own. And the limited time frame (3 months) to complete the work played a significant role in all of this.

1.9. Organization of the Study

The paper is organized into five chapters.

Chapter one is the introduction part and it covers background of the study, statement of the problem, objectives of the study, scope of the study, limitation of the study, significance of the study and organization of the paper including definition of key terms. Chapter two presents review of related theoretical and empirical literatures. Chapter three discusses method of the study (research methodology), model specification, and reliability test, chapter four encompasses the presentation and analysis results obtained from the study. And finally, chapter five presents conclusions and recommendations of the study.

1.10. Operational Definition of Key Terms

Project: A temporary endeavor undertaken to create a unique product, service, or result (PMBOK®, 2017).

Project Management: The application of knowledge, skills, tools, and techniques to project endeavors in order to fulfill the requirements of the project. (PMI, 2013).

Project Management Maturity: The incremental creation of an enterprise-wide project management methodology, strategy, and decision-making process (pmsolutions, 2012).

Project Success: It describes the completion of a project "on time, within budget, and to specification," (Bannerman, 2008). For the purposes of this research, the study participants defined "project success" according to their particular environments and contexts.

Chapter Two

2. Review of Related Literature

This chapter discusses the various theories advanced by different authors and organizations, including the national and international literature on project management maturity and its relationship with project success.

2.1. Theoretical Literature Review

2.1.1. Definitions of a Project

Project has been defined in different ways by different authors and organizations. According to PMBOK Guide (2017), a project is defined as a temporary endeavor undertaken to create a unique product, service, or result. On the other hand, instead of providing a clear definition, Kerzner (2009) chose to break down a project into a series of activities and tasks that projects must have. He stated that projects: first, must have a specific goal that must be completed within certain parameters; second, they must have defined beginning and completion dates; third, they must have funding limits; fourth, they must utilize resources that are both human and nonhuman; and fifth, they must be multifunctional.

Here are some other definitions of a project;

Projects start as a result of unmet needs, claims Wysocki (2014); and he continues to define a project as a series of unique, complex, yet interrelated tasks with a single goal or purpose that must be completed on time, within budget, and within certain specifications. A project, according to the Cambridge Dictionary (2023), is a piece of planned work or an activity that is completed over a period of time and is intended to achieve a specific goal. Addis Ababa University's project management context module states that a project is a one-time endeavor with a single definable end result or product.

All of the project definitions we have seen so far have a lot in common. These similarities reveal a project's character. First, a project is unique, which means that no two projects are the same; second, a project is a complex endeavor, which means it necessitates different skills and

resources; third, a project is temporary, indicating that it has a beginning and an end; and finally, a project has a purpose, an end goal, or an objective that it seeks to achieve.

2.1.2. Project Management

Project management is the application of knowledge, skills, and tools required to complete a unique, complicated, and one-time task within time, cost, and quality constraints (Mandson, 2015). Project management, in other words, enhances the use of tools and strategies to effectively direct resource utilization, task completion, the use of tools and procedures, and leading a team to successfully and productively complete a project goal. And according to Antonio and Daniel (2004), the most successful organizations use project management as a strategic instrument to drive change and achieve their business goals.

The Project Management Institute (2013), states that there are five process groups that characterize project management: initiating, planning, executing, monitoring and controlling, and closing. Each of these process groups is made up of a series of interconnected processes that work together to achieve a specific goal. And among the areas to take into account throughout the 5 processes are the 10 Project Management Knowledge Areas (which will be explained later in detail).

Initiating Process Group: The project initiation phase, according to the PMBOK Guide sixth edition, involves formally acknowledging the existence of a new project or the need to move an existing project forward into the following phase. Projects are only pursued if they are deemed valuable and feasible. In this phase, the project's benefits and costs are estimated as well. An evaluation of the project's viability for the organization and its stakeholders is also included.

Planning Process Group: Once the project initiation is complete and permission to proceed has been granted, the project planning phase can begin. Stakeholders and the project team learn how to achieve the project's final deliverable during the project planning phase. It includes developing a project plan for managing time, cost, quality, changes, risk, and other project-related issues (Dickerson, 2022).

Executing Process Group: The majority of project work is completed within the executing process group.

Monitoring and Controlling Process Group: The monitoring and control process group makes certain the project stays on track and that any deviations from the plan are effectively managed.

Closing Process Group: Finally, the closing process group ensures that each of the elements of the project have been completed and all deliverables have been approved by stakeholders.

2.1.3. Project Management Maturity

According to Merriam-Webster's Dictionary, the adjective "mature," from which the noun "maturity" is derived, has a variety of different meanings in everyday speech. It can, for instance, mean (1) having attained a final or desired state; (2) having attained a very advanced or developed form or state; or (3) based on slow, careful consideration. From this, we can infer that Project Management Maturity is reaching an advanced/desired level in project management.

Project Management Maturity is the incremental creation of an enterprise-wide project management methodology, strategy, and decision-making process (pmsolutions, 2012). According to Antonio and Daniel (2004), four essential factors are required for an organization to be mature in managing its projects. These elements include processes, organizational structure, people, systems and tools.

Project management maturity is an important indicator of a company's ability to lead successful projects. Companies with low maturity may fail to complete projects on time, on budget, or to specification, and organizations frequently base their decision to partner with a company on its project management maturity level. When a company assesses its project management capabilities and commits to continuous improvement, it achieves project management maturity (Kate, 2022).

According to Thomas and Mullaly (2009), organizational success can be attributed to higher Project Management (PM) maturity. A company's ability to deliver projects consistently, effectively, and efficiently is determined by its level of project management maturity (PMM). PMM also reflects the capacity to align project goals with the strategic vision, optimize processes and resources, and respond to shifting external conditions and internal client demands in an organization. Achieving a high level of project management maturity can provide a competitive advantage in this digital transformation era, where innovation, agility, and customer satisfaction are critical success drivers (EPM, 2023).

2.1.4. The Challenge: Measuring Project Management Maturity

There is no generally recognized definition of what a "mature project-based organization" looks like (Cooke, 2004). Maturity is a term that has many different connotations, even in the context of project management. 'Ibid' asserts that there are also differences in how projects are managed across various industries (IT, construction, defense, Research & Development, pharmaceutical and etc.), therefore changing what project management maturity is; in their specific context.

Despite the fact that the PMI's PMBOK Guide lists practices of project management that are applicable to a majority of projects most of the time. This does not imply that the knowledge and practices described should be applied thoroughly to all projects (PMI, 2000, P. 3). Therefore, it is always the responsibility of the project management team to determine what is appropriate for any given project.

Projects, from the perspective of business organizations (as in Ethio telecom), are a means to an end, not an end in themselves. Businesses do not exist to undertake projects; they undertake projects to achieve one or more business goals in the pursuit of their chosen strategic goal. Therefore, it's crucial to find a PMM model that works for that particular company (Cooke, 2004).

2.1.5. Project Management Maturity Model

Project Management Maturity Models (PMMMs) measure how well a company manages its projects. These models also offer standards for evaluating a company's project management capability. Additionally, PMMMs offer a structure for later process improvement implementation. By understanding how they differ and are similar, project managers can select the project management maturity model that is best for their company. According to Kate (2022), there are seven PMMMs (though there are up to 29) that are some of the most popular and can accommodate the needs of the majority of business types.

Capability Maturity Model (CMM): To determine a company's maturity level, the Capability Maturity Model assesses its standardized processes. Managers use this model to rank businesses based on their maturity at each of the model's five levels: initial, managed, defined, quantitatively managed, and optimizing. Prior to that, this method includes two approaches to assessment and improvement: staged, which tracks a specific set of processes in an organization,

and continuous, which tracks process capabilities in accordance with an organization's priorities. The Capability Maturity Model (CMM) is a methodology for developing and improving an organization's software development process, but it can also be applied to other processes (Desmond, 2023).

Organizational Project Management Maturity Model (OPM3): The PMI Organizational Project Management Maturity Model can assist managers in assessing maturity levels in projects, programs, and portfolios (Kate, 2022). To drive assessments, this model employs the Project Management Body of Knowledge (PMBOK®) guide's ten knowledge areas, which are project integration, time, scope, cost, quality, resource, risk, communications, stakeholders, and procurement. One of four maturity stages—standardize, measure, control, and continuously improve—is assigned after the assessment is complete. And according to Fahrenkrog (2003), OPM3 is also a tool that can assist businesses in driving organizational improvement.

Project Management Maturity Model (PMMMSM): To assess the project management maturity of an organization, PM Solutions (PM company founded in 1996 by J. Kent Crawford, the former president, and chair of the Project Management Institute) created the Project Management Maturity Model (PMMMSM). By identifying and naming various maturity levels, this model offers a framework for implementing process improvements within an organization. Using this model, project managers assign each knowledge area into one of five maturity levels. These levels are the initial process, the structured process and standards, organization standards and institutionalized process, the managed process, and the optimizing process.

Berkeley Project Management Process Maturity Model: The Berkeley project management process maturity model employs an iterative process to increase a company's maturity level. This model enables project managers to rank organizational features and key project management processes on a five-stage maturity scale that includes the ad-hoc, defined, managed, integrated, and sustained stages. The advantage of using this model is that it can be applied across industries (Kwak & Ibbs, 2000).

Gartner Score Diagnostic Family: The Gartner Score Diagnostic Family, founded in 2014, is a collection of online maturity assessments. It offers a series of dynamic maturity assessments to assist in measuring, prioritizing, and improving the performance of an organization in managing

its projects. Based on the strategic goals of their organization, the model's high degree of adaptability and customization helps a company in identifying priority growth areas (Kate, 2022).

Kerzner's Project Management Maturity Model (KPM3): The Kerzner Project Management Maturity Model is a five-level project management maturity model. These five levels are common language, common processes, singular methodology, benchmarking, and continuous improvement, with the theory being that the higher the level of maturity, the better the overall management performance of the project. The Kerzner Project Management Maturity Model has one limitation: while it is very useful in basic strategic policy planning, it is ineffective in directive and overall organizational policy planning (Francis, 2021).

Portfolio, Programme, and Project Management Maturity Model (P3M3®): The Portfolio, Program, and Project Management Maturity Model (P3M3®) is a tool for assessing and measuring an organization's current performance and assisting in the development of improvement plans. Furthermore, according to Zoe Talent Solutions (2021), it is a maturity model that evaluates an organization's capability not only in terms of projects, but also in terms of portfolio, program, and project management practices. This model assesses maturity based on seven essential processes: organizational governance, management control, benefits management, risk management, financial management, resource management, and stakeholder management, and ranks maturity on a five-stage scale: awareness, repeatable, defined, managed, and optimized.

2.1.6. Selecting Project Management Maturity Model

There is no universal PMMM for any industry or sector, claims Kate (2022). The model of project management maturity selected will depend on a variety of elements, including the company's culture. Khoshgoftar and Osman (2009) also stated that PMMMs differ in terms of their components and characteristics, and that there is no standard associated with these models; as a result, they argue that it is critical for organizations to be able to assess their situation using a comprehensive and useful model.

According to Khoshgoftar and Osman (2009) (as cited in Gebrewahd, 2018) and PM Solutions (2014), PM Solution's model and the OPM3 model, from all the other models include the

necessary steps for advancement of a business organization. The only difference that lies between the PM Solution's model and the OPM3 models are in their areas of focus or coverage when determining the maturity level. In other words, the OPM3 model emphasizes program and portfolio management in addition to projects (Farrokh & Mansur, 2013), whereas the model for PM solutions concentrates all of the emphasis on project management while disregarding other organizational elements like program or portfolio management. Accordingly, the PM Solutions Project Management Maturity Model is employed in this project work to stay within the scope of the study.

Shako (2019) (as cited in Solomon, 2020), also outlined five benefits of using PMMM by PM solutions; First, PMMM by PM Solutions is surrounded by the PMI's ten well-defined knowledge areas and processes. Second, it has distinct levels of maturity. Third, it incorporates different project management maturity models. Fourth, it depicts a series of steps to assist an organization in improving its overall PM effectiveness, and fifth, it can include up-to-date knowledge areas and processes.

2.1.7. Project Management Maturity Levels

Project Management Academy (2023) asserts that every organization has a level of PM maturity. Some organizations lack maturity, which results in poorly planned, carried out, or finished projects. While other organizations have a high level of maturity, which means they have a clear process for managing projects, view the project as one of the most important ways to achieve strategic goals, and have well-planned, well-executed, and well-closed projects. The majority of organizations that do projects will fall within these two extremes.

All of the previous project management maturity models discussed provide a framework for implementing improvements to a company's processes by identifying and naming various levels of maturity. Low-maturity project management entails poorly planned and executed projects, whereas high-maturity projects are planned, budgeted, and completed on time.

Although the names and specifics of maturity levels vary depending on the model, the following are descriptions of five common maturity levels by Crawford (2002). All project management maturity levels are evaluated in terms of the processes, documentation, project management techniques, and metrics employed.

Level 1: Initial Process: Also known as the ad hoc or initial level, an organization on this level lacks any established practices or standards. Project management is disorganized and there is little to no consistency between projects. Project success at this early stage depends on individual initiative and capability.

Level 2: Structured Process and Standards: Project documentation and fundamental metrics are present here, but no organizational standards have been established. At this level, an organization is considered to have reached a basic level of maturity (Kate, 2022).

Level 3: Organizational Standards and Institutionalized Process: Here, formal organizational standards are used in all projects. Additionally, a company records its processes and incorporates them across the entire organization, and employees can dependably carry out processes because they are aware of them. In an organization at this level, the majority of projects are completed on time and within budget.

Level 4: Managed Process: The management is aware of its role in the project management process, and project management processes, standards, and supporting systems are integrated with other corporate processes and systems at this level. Processes and standards are also documented to support using metrics to make project decisions. For various projects, there are various project management requirements as well as metrics for efficiency and effectiveness. Based on metrics from cost estimates, baseline estimates, and earned value calculations, all issues and changes in a project are assessed.

Level 5: Process Optimization: At this level, processes are automated, and lessons learned are regularly reviewed to improve project management processes. The majority of organizations never reach this level of maturity and those that do serve as inspirational examples for other organizations.

2.1.8. Project Management Body of Knowledge (PMBOK)

The Project Management Institute (PMI) published the Project Management Body of Knowledge (PMBOK) Guide, which provides a glossary of standard terminology and guidelines for project management. Here are the 10 knowledge areas in the PMBOK Guide (PMI, 2017);

Project Integration Management: Project Integration Management is the process of identifying, defining, combining, unifying, and coordinating the various processes and project management activities within the Project Management Process Groups.

Project Scope Management: The primary goal of project scope management is to define and control what is and is not included in the project. Project scope management encompasses the processes required to ensure that the project includes all of the necessary work and that the project is completed successfully.

Project Schedule Management: Project Schedule management encompasses the processes required to ensure the project is completed on time.

Project Cost Management: Project cost management encompasses the processes involved in planning, budgeting, financing, funding, managing, and controlling costs which enables the project to be finished within the allotted budget.

Project Quality Management: Project quality management is responsible for ensuring that project requirements are met and validated. Project quality management encompasses the process and activities of the performing organization that establishes quality policies, objectives, and responsibilities to ensure that the project meets the needs for which it was undertaken.

Project Resource Management: Project Resource Management encompasses the processes for identifying, acquiring, and managing the resources required for the project's successful completion.

Project Communications Management: Project Communications Management encompasses the processes required to ensure that the project's and its stakeholders' information needs are met through the creation of documents and the implementation of activities designed to bring about effective information exchange.

Project Risk Management: Project Risk Management encompasses the processes of risk management planning, identification, analysis, response planning, response implementation, and risk monitoring on a project. The goals of project risk management are to increase the probability and/or impact of positive risks while decreasing the probability and/or impact of negative risks in an effort to maximize the chances of project success.

Project Procurement Management: Project procurement management encompasses the processes necessary to buy or acquire products, services, or results needed from outside the project team.

Project Stakeholder Management: Project Stakeholder Management encompasses the processes required to identify the individuals, groups, or organizations who may have an impact or be impacted by the project.

- A matured project management is organized using both project management process groups and project management knowledge areas. Process groups describe the tasks and procedures that must be followed in order to finish a project successfully. On the other hand, project management knowledge areas are comprehensive and do not directly relate to the work that is done. They cover everything a project manager needs to know (Indeed, 2023).

Table 1: The 10 PMBOK knowledge areas and Project Management Process Groups

The 10 PMBOK Knowledge Areas	Project Management Process Groups					
		Initiating	Planning	Executing	Monitoring & Controlling	Closing
	Project Integration Management	• Develop Project Charter	• Develop Project Management Plan	• Direct and Manage Project Work • Manage Project Knowledge	*Monitor and Control Project Work *Perform Integrated Change Control	* Close Project or Phase
	Project Scope Management		*Plan scope management *Collect Requirements * Define Scope		* Validate Scope * Control Scope	

			* Create WBS			
Project Schedule Management			Plan Schedule Management * Define Activities * Sequence Activities * Estimate Activity Duration * Develop Schedule		Control Schedule	
Project Cost Management			Plan Cost Management * Estimate Costs * Determine Budget		Control Costs	
Project Quality Management			Plan Quality Management	Manage Quality	Control Quality	
Project Resource Management			- Plan Resource Management - Estimate Activity Resources	* Acquire Resources * Develop Team * Manage Team	* Control Resources	
Project Communications Management			Plan Communications Management	* Manage Communications	* Monitor Communications	
Project Risk Management			* Plan Risk Management * Identify Risks * Perform Qualitative Risk Analysis * Perform	* Implement Risk Responses	* Monitor Risks	

			Quantitative Risk Analysis * Plan Risk Responses			
Project Procurement Management			• Plan Procurement Management	* Conduct Procurements	*Control Procurements	
Project Stakeholder Management	* Identify Stakeholders	* Plan Stakeholder Engagement		* Manage Stakeholder Engagement	* Monitor Stakeholder Engagement	

Source: Project Management Institute. A Guide to the Project Management Body of Knowledge (PMBOK® Guide)-Sixth Edition. Table 1-1

2.1.9. Project Success

There has been considerable debate about the nature and definition of project success, but no consensus has been reached. Bannerman (2008), believes a project is typically a means to an end rather than an end in itself. Depending on the stakeholder's interests, the success of a project can be determined from the standpoint of the means (the project itself) or the end (what it was intended to accomplish). In addition, regardless of means or ends, stakeholders most of the time have different expectations for what the project was supposed to accomplish and opinions on whether it succeeded in doing so. Due to this, determining a project's success is highly dependent on the expectations and perceptions of various stakeholders, as well as the evaluation's timing.

Project success has historically been characterized by the "iron triangle" of cost, time, and quality. Oftentimes, the measures in this are both inadequate and misleading (Kloppenborg, 2012). Many researchers have expanded on the formerly widely accepted idea of project success, even though meeting performance objectives within time and budget constraints is still crucial.

Majid (as cited in Tigist, 2017) claims that a construction project is typically regarded as successful when it is finished on schedule, within budget, and in accordance with specifications. But in the case of business projects, Heiskanen (2022) noted that, in addition to being delivered within budget and finished on time, the most crucial factors are that the project ensures a return

on investment, satisfies company requirements and provides customer satisfaction. In addition, according to Anantatmula & Rad's (2018) research findings, customer satisfaction is regarded as the key to a project's success.

2.1.10. Project Management Maturity and Project Success

In his book Project Management Maturity Model (2021), J. Kent Crawford, the CEO of PM Solutions, discusses the basis of project management maturity as well as the advantages of maturity assessment. Crawford (2021) asserts that PMM enhances organizational performance and project success. It also acts as a comprehensive tool for bettering project management parts, such as the project management office, management oversight, and professional development. A company with a high level of project maturity is thought to have a higher chance of project success than a company with a low level of project maturity. As a result, businesses should be curious about their project maturity level (Anderson, 2007).

According to Sarah (2022), some of the practical advantages of a high project management maturity level include increased productivity, a lower rate of errors, less waste, higher customer satisfaction, higher employee morale, higher return on investment (ROI), reduced miscommunication, and improved business performance. When it comes to project management, organizations with high PMML have nearly twice as much total success as organizations with low PMML. And, high PMML organizations, have a failure rate that is nearly four times lower than low PMML organizations (MPCM, 2021).

2.1.11. Project Management in Telecom Companies

Due to their complex internal and external interfaces, international orientation, multidisciplinary activities, and numerous customer requirements, projects in the telecom sector demand extensive planning and management. Trivedi (2023) defines telecommunications projects as "projects to add capabilities to an already existing public network, establishing a network of businesses specialized in a certain field, and projects for the establishment and dissolution of a temporary network."

Managing projects in the telecommunications industry necessitates the ability and knowledge of project management. This is due to the fact that project management necessitates managing and

supervising job execution while constantly rolling projects, analyzing new constraints and specifications, and compressing time and costs. (Ludovico, 2010).

2.2. Empirical Literature Review

The relationship between project success and project management maturity level has been studied across several industries. In order to determine whether there is any relationship between organizational performance and project management performance, Hartono et al. (2019) conducted research and used the Spearman correlation analysis. With a correlation coefficient of 0.478 ($p = 0.001$, $n = 71$), the analysis showed a significant, positive correlation between the two measures. The outcome offers crucial insight into how project management performance translates into relative business performance.

In order to investigate the connection between project success rate and group sample maturity level in the Ethiopian construction industry, Hailemeskel (2020) employed Pearson correlation. As a result, all measures of project success and project management maturity score of Level-1 and Level-2 were found to be statistically significant ($p.001$) and to have a strong positive correlation (Pearson's ranging from .502 to .677). The study provides compelling evidence that the degree of project management maturity in the construction industry is related to and predictive of project success.

According to Yoseph's 2017 Masters Thesis, "Assessment of the Relationship between Project Management Maturity and Project Management Success: The Case of Initiative Africa," at 5% significance level there is a positive relationship between project management success and the maturity levels of time, cost, and quality management.

Zerithun's (2017) "Assessing the relationship between Project Management Maturity and Competitiveness: The Case of Commercial Bank of Ethiopia" was another study. The study found that Commercial Bank of Ethiopia averages a 3.61 maturity level using OPM3 as the project management maturity model. And out of the 10 PM knowledge areas, it was discovered that Project Stakeholder Management was the most matured. In contrast, Project Cost Management was the least matured.

According to a survey conducted by PM Solutions (Project Management Services & Solutions Company) (2014) in 9 different industries across 5 continents, organizations have seen

significant benefits from raising the maturity level of their project management. Moreover, they have demonstrated a sizable improvement in projects that are in line with business goals (37%), a decline in failed projects (29%), customer satisfaction (26%), projects that are delivered on time and on budget (23%), and productivity (21%). The research study also revealed that companies with the highest levels of project management maturity (Levels 4-5) have seen the greatest benefits from raising their level of project management maturity, particularly in improvements to project alignment with business objectives (53%) and product/service marketing (45%). (PM Solutions, 2014).

Pennypacker (2002) gathered and analyzed the responses of 126 senior-level practitioners from various industries who provided an overall rating of their organization's project management maturity. According to the findings of this study, the level of project management maturity in the organizations surveyed is relatively low. Almost 67 percent of respondents rated their organizations as level 1 or level 2. And a substantial percentage of respondents (53%) rated their organizations as level 2.

The study by Nahom (2020), "An Assessment of Project Management Maturity in Construction Projects: The Case of YOTEK Construction PLC," employed a PMMM of PM solutions and looked into the maturity level of thirteen PMBOK knowledge areas. According to the researcher, 65.5% of the knowledge area components were applied below average in the company, and a maturity level of 2.64 (on a scale of 1 to 5) was recorded as a whole. This indicates that project management practices were not generally applied very effectively in the organization. The company's most mature knowledge areas were identified to be project time, financial, and scope management, whereas project risk management had the lowest maturity level at 1.8.

Yazici (2010) investigated the relationship between maturity levels (on eight PMI knowledge areas, including Project Integration, Scope, Time, Cost, Quality, Human Resource, Communications, Risk, and Procurement Management) and perceived organizational performance. This survey was conducted with project professionals and engineers from 75 different organizations in the United States, and the results revealed that project management maturity is significantly related to business performance.

Gebrewahd (2018) conducted research on "Assessing the Level of Project Management Maturity in Ethio telecom in the Case of Telecom Expansion Projects." The research was carried out by assessing the ten PMBOK project management knowledge areas, and the researcher collected data through questionnaires, interviews, and document reviews. According to the study's findings, Ethio telecom's overall project management maturity was at level 2.46. The researcher also noted that the most mature knowledge areas are project procurement management, project risk management, and human resource management which are approximately at maturity level 3, and the least matured knowledge areas according to the finding were project time management and project cost management, which are approximately at maturity level 2.

Meron (2021) conducted research on the relationship between project management maturity and project success in the case of African Union flagship projects and discovered that, at the 1% significance level, project success is positively and significantly related to time, cost, and quality management maturity level.

Antonio and Daniel (2004) conducted a survey, with the primary goal of determining whether a higher maturity level would be associated with a higher degree of project performance. Thirty countries from around the world participated in the web-based quantitative survey. And their finding indicates; 1) there is a positive correlation between project management maturity level and project performance, meaning that a higher project management maturity level will result in superior performance in terms of overall project delivery and business advantages. 2) The current overall maturity level of organizations was found to be 2.5, which indicates that project management in organizations is currently at the level of informal processes and has not yet been institutionalized. 3) More than half of the organizations (60%) are dissatisfied with their current maturity level and desire to improve. And more than 36% (71) of them want to increase their maturity by more than one level.

Table 2: Summary, 7 of the studies reviewed

Researcher	Research Area	PMMM Used	Average Maturity Level	Knowledge Area With Highest Maturity	Knowledge Area With Lowest Maturity
Gebrewahd (2018)	Telecommunication (Ethio telecom)	PM Solutions	2.46	Project Procurement Management	Project Cost and Time Management
Nahom (2020)	Construction (YOTEK Construction PLC)	PM Solutions	2.64	Project Time Management	Project Risk Management
PM Solutions (2014)	Different Industries	PM Solutions	2.5	Project Integration Management	Project Risk Management
Zerithun (2017)	Bank (Commercial Bank of Ethiopia)	OPM3	3.61	Project Stakeholder Management	Project Cost Management
Yoseph (2017)	Development Project (Initiative Africa)	OPM3	3.36	Project Quality Management	Project Time Management
Yilma (2018)	NGO's	PM Solutions	2.9	Project Stakeholder Management	Project Cost Management
Pennypacker et al, (2002)	Different Industries	PM Solutions	2	Scope Management Maturity	Human Resource Management

Source: Researcher, (based on the empirical literature review)

- The theoretical and empirical reviews show that, while there have been disagreements regarding the degree to which project management maturity plays a role in organizational project management and to what extent it contributes to project success, many are in agreement that a matured project management process and practice contribute significantly to the success of the overall project objectives and that assessing PM maturity helps in identifying current levels of performance and setting direction for future projects.

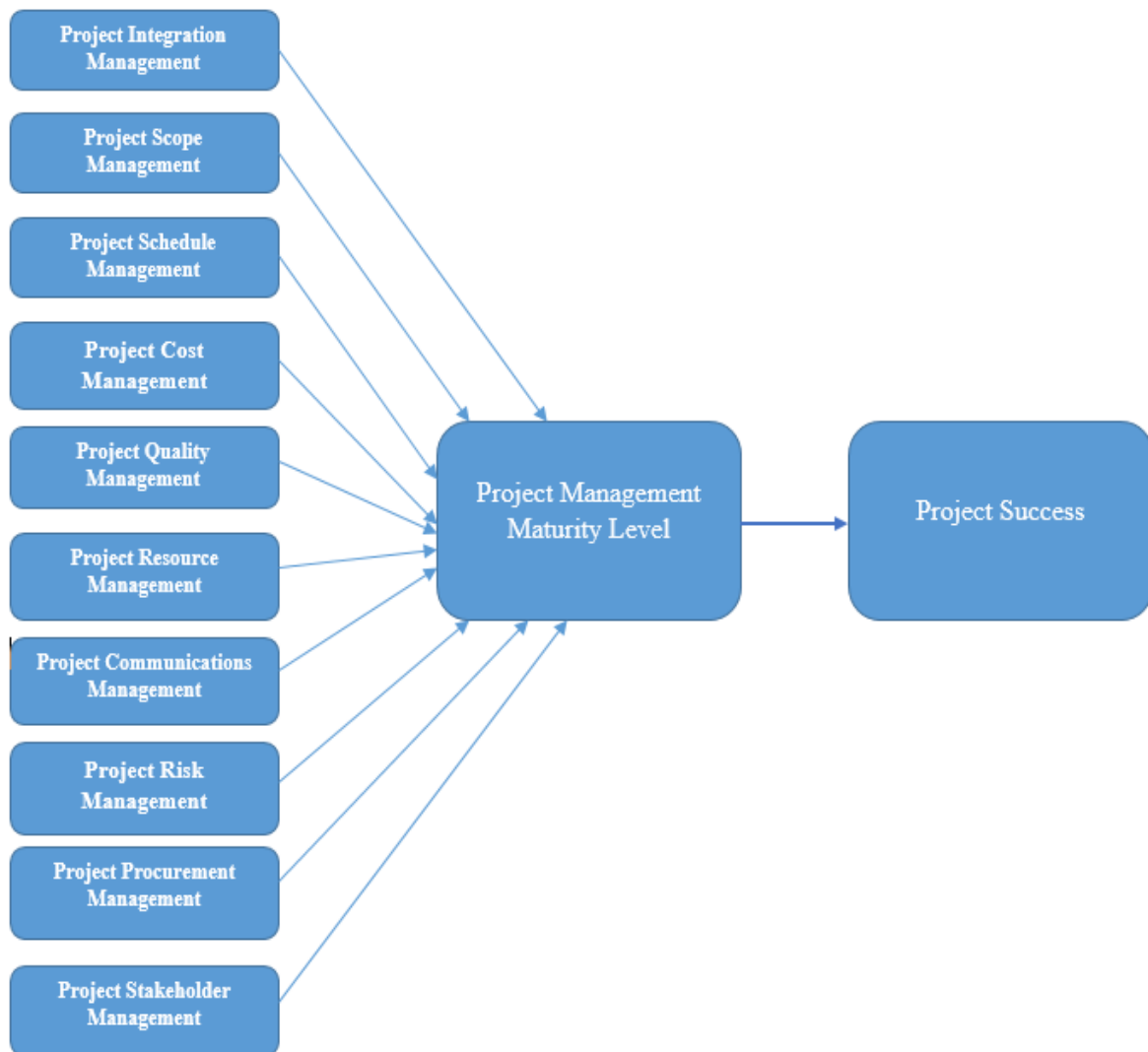
2.3. Conceptual Framework

The following framework was developed to contextualize the research on the basis of the literature review. The 10 PMBOK knowledge areas, project management process groups, PMMM, PMML, and project success are five concepts that are interrelated in this context.

- The Project Management Process Groups are logical groups of project management processes that work together to achieve specific project goals. The five process groups are: Initiating, planning, executing, monitoring and controlling, and closing.
- The Project Management Maturity Model (PMMM) is a framework that defines how well an organization can manage projects based on its processes, tools, and techniques. The PMMM chosen for this study (PMMM by PM Solutions) has five levels of maturity, these are initial process, structured process and standards, organizational standards and institutionalized process, managed process, and process optimization.
- The Project Management Body of Knowledge (PMBOK) identifies ten knowledge areas in which project managers should be well-versed. These project management knowledge areas are Integration, scope, schedule, cost, quality, resource, communications, risk, procurement, and stakeholder.
- When we come to Project Management Maturity Level (which is the independent variable for this study), organizations have different levels of PM maturity, with low-maturity projects being poorly planned and executed and high-maturity projects being planned, budgeted, and completed on time. Organizations must reach a certain level of maturity to effectively manage projects, with formal organizational standards, documented processes, and automated processes.

- Project success (which is the dependent variable) is highly dependent on the expectations and perceptions of stakeholders, as well as the evaluation's timing, and is commonly characterized by the "iron triangle" of cost, time, and quality.

Figure 1: Conceptual Framework



Source: Researcher (based on the literature review)

Chapter Three

3. Research Methodology

This chapter outlines the framework for analyzing project management maturity level and its relationship to project success. Various techniques and methods are used to assess Ethio telecom's project management maturity level. The goal of this chapter is therefore to provide (show) the approaches that the researcher took in collecting and analyzing data in order to achieve the research objectives and answer the research questions.

3.1. Research Design

This study is generally designed as follows:

To determine the level of PMM in Ethio telecom; a 5-years (i.e. from 2018 to 2023) data was gathered using questionnaires; the data was gathered from the company's project management offices.

This study is mostly descriptive, but inferential (correlation and regression) analysis was performed to determine how project management maturity affects project success in the case of Ethio telecom.

Interpreting the research findings and describing the actual project management maturity was shown via quantitative research design. Additionally, the quantitative approach enabled the computation of correlation and regression analysis as well as the tabular presentation of the data.

3.2. Data Source

The data is collected from staff members, project managers, project coordinators, project supervisors, project experts and project professionals in project management offices (Head Office) of Ethio telecom.

In an attempt to cover Ethio telecom's project management maturity level and project success rate, this study spans the years 2018 to 2023, totaling 5 years. The timeline (2018 to 2023) was chosen because many reforms occurred in Ethiopia (after Prime Minister Dr. Abiy Ahmed took office) as well as at Ethio telecom (after Frehiwot Tamru took over as CEO).

3.3. Data Collection Method

The data is gathered from selected members of the Ethio telecom project management office in person, by email, and Google form using a 1 to 5-point Likert scale questionnaire, where 1 is the lowest level of PM Maturity and 5 is the highest level. The questionnaire was adopted from Gebrewahd (2018) and Nahom (2020), which were developed using the project management maturity assessment by PM Solutions.

3.4. Method of Analysis

In order to present the primary data that has been collected in a clear and concise manner, various statistical tools such as tables and charts are employed as part of the descriptive analysis. Moreover, in order to examine the effect project management maturity has on project success, the paper employed inferential analysis, which helped conduct the correlation and regression analysis. The data analysis process was facilitated by using Statistical Package for the Social Sciences (IBM SPSS Statistics, 2022), which is a software program that specializes in statistical operations.

3.5. Model Specification

This study was developed by two sets of variables (based on the theoretical and empirical literature review); these are the dependent variable (Project Success) and the independent variable (Project Management Maturity Level).

Table 3: The regression equation

The regression equation for the model	Specifically
$Y = \beta_0 + \beta_1 X + \epsilon_i$ Where; Y= Dependent Variable X = Independent Variable β_0 = coefficient (for constant) β_1 = coefficient of the independent variable ϵ_i = error term	$PS = \beta_0 + \beta_1 PMML + \epsilon_i$ Where; PS = Project Success PMML = Project Management Maturity Level

3.6. Target Population and Sampling Technique

The target populations taken into account for this study includes project managers, project coordinators, project supervisors, project experts, project professionals, and staff people in the project management office of Ethio telecom. Accordingly, the target population in Ethio telecom's PM Office was found to be 1370.

Table 4: Target Population

PM Offices in Ethio telecom	Target Population in number
Fixed Network Division	379
Network Infrastructure Division	537
Service Operation Center Division	376
Strategic Planning and Program Management	78
Total:	1370

(Source: Ethio telecom, survey, 2023)

This study used stratified sampling as a sampling method because it helps divide the target population into smaller subgroups, or strata, based on shared characteristics of the members, and then randomly select among these groups to form the final sample. The researcher used stratified sampling to ensure that every project management office in Ethio telecom is properly represented in the sample and that the sample reflects the population's diversity.

3.7. Sample Size

Due to time and resource constraints, it is challenging to collect the data required from the entire target population. In order to calculate the sample size for this study, Yamane's (1967) formula for estimating sample sizes of finite populations is used.

Table 5: Sample Size

Formula	Computation
$nr = N / [1 + N * (e)^2]$ Where: nr = Sample Size N= Target Population e = Margin of error For this study, a 95% confidence level is assumed, and 5% margin of error.	Accordingly; $nr = 1370 / [1 + 1370 * (0.05)^2]$ $nr = 310$
Adjusted Sample Size Formula	Computation
$na = nr / \{1 + [(nr - 1) / N]\}$ Where: na = the adjusted sample size, nr = the original required sample size and N = population size	$na = nr / \{1 + [(nr - 1) / N]\}$ $na = 310 / \{1 + [(310 - 1) / 1370]\}$ $na = 310 / [1 + (309 / 1370)]$ $na = 253$

Accordingly, the questionnaire is distributed to 253 people.

- Sample size for each stratum was calculated by the following formula:

$$n(\text{stratum}) = \frac{N(\text{stratum})}{N(\text{Total})} * n(\text{Total})$$

Where, n = Sample Size & N = Target Population

Table 6: Summary of Stratum Sample Size

Stratum (PM Offices in Ethio telecom)	Target Population	Sample Size
Fixed Network Division	379	70
Network Infrastructure Division	537	99
Service Operation Center Division	376	69
Strategic Planning and Program Management	78	15
Total:	1370	253

3.8. Ethical Considerations

This study followed ethical principles throughout the data collection, analysis, and reporting stages. The participants voluntarily agreed to participate after being informed of the research aims and methods, and their data were anonymized and stored safely to respect their privacy and confidentiality. Moreover, the findings were reported honestly and objectively, without any manipulation or distortion. The study also acknowledged its limitations and implications in a fair and clear way.

Chapter Four

4. Data Analysis and Presentation

This chapter provides an in-depth analysis, interpretation, and discussion of the findings from the questionnaire survey given to the project management office of Ethio telecom. And using SPSS software, statistical procedures were used to evaluate the data obtained from the questionnaires distributed in accordance with the research purpose. In order to give respondents a clear understanding, the characteristics of each knowledge area with regard to maturity level were covered in the questionnaire.

The maturity level of Ethio telecom in each knowledge area is also assessed using a questionnaire that was created in five levels, ranging from five to one, representing very high maturity, high maturity, average maturity, low maturity, and very low maturity respectively. The results are explained using descriptive statistics like mean, frequency, and percentage and inferential statistics, which helped conduct the regression and correlational analysis.

4.1. Descriptive Analysis

In this section the questionnaire's response rate is discussed first. The second part shows the general Information of respondents. The third part discusses results of; the PMML of Ethio telecom in relation the ten project management knowledge areas, and the project success rate of the company.

4.1.1. General Information of Respondents

There were 253 questionnaires distributed to the respondents, and 195 of them were properly completed and returned, giving a return rate of 77.08%, which makes it suitable for further analysis. Despite several follow-ups, 22.92% did not respond (some failed to respond properly).

Table 7: Response Rate

Questionnaire distribution method	Number of distributed questionnaires	Number of returned questionnaires	Overall response rate (%)
Google Form	152	131	86.18
Email	63	34	53.97
Hard Copy	38	30	78.95
Total:	253	195	77.08

(Source: Researcher's Survey, 2023)

The general information provided by those who responded and were valid is summarized in the table below.

Table 8: General Information of Valid Respondents

General Information	Responses	Frequency	Percentage
Sex	Male	101	51.79
	Female	94	48.21
Job Position	Project Manager	14	7.18
	Project Specialist	61	31.28
	Project Professional	12	6.15
	Project Management Staff	91	46.67
	Project Expert	8	4.10
	Project Supervisor	9	4.62

Work Experience in the Job Position	1-2	34	17.44
	3-5	42	21.54
	6-10	93	47.69
	11-15	17	8.72
	Above 15	9	4.62
Work Experience in Ethio telecom	1-2	48	24.62
	3-5	71	36.41
	6-10	67	34.36
	11-15	7	3.59
	Above 15	2	1.03
Education level	Bachelor's Degree	105	53.85
	Master's Degree	90	46.15

(Source: Researcher's Survey, 2023)

As discussed in the previous chapter, participants in this study were staff members, project managers, project coordinators, project supervisors, project experts, and project professionals from different project management offices of Ethio telecom, who were presumptively well-versed about project management in the company.

As seen in the above table, the majority of respondents (46.67%) were staff members in project management offices of Ethio telecom, followed by project specialists (31.28%). Project managers represent 7.18 percent of the respondents, and project professionals represent 6.15 percent. The remaining respondents were project experts (4.10%) and project supervisors (4.62%).

When we come to the respondent's gender, 101 respondents are men, with the remaining 94 being women. The survey shows a bit higher percentage of male respondents (51.79%) than female respondents (48.21%), accordingly, we can say that the gender distribution of the study is proportional.

Of the 195 respondents, 17.44% had a working experience in their specific position for 1-2 years, and 21.54% of the respondents had between 3-5 years of work experience. A relatively higher percentage (47.69) had work experience of 6-10 years, on the other hand 8.72% of the respondents had 11-15 years of work experience, and 4.62 % of the respondents had a work experience of more than 15 years.

With regard to their work experience in Ethio telecom, 24.62 % had 1-2 years of work experience, In addition, 36.41% of the respondents had between 3-5 years of work experience. While 34.36% had work experience of 6-10 years in the company. Only 3.59% of respondents had 11-15 years of work experience, and 1.03% of respondents were senior workers with more than 15 years of work experience in the company.

Employees with a bachelor's degree and master's degree participated in this research, with 105 (53.85%) of the participants having a bachelor's degree, and the remaining 90 (46.15%) having a master's degree.

The above demographic profile, which outlines the participants in the questionnaire-filling process, enables us to deduce that they are competent enough to comprehend and respond to the questionnaire that the researcher administered.

4.1.2. Maturity Level of Ethio telecom in Each PMBOK Knowledge Area

Based on the quantitative data gathered from the questionnaire, the maturity levels of the 10 knowledge areas are presented and discussed in this chapter.

The questionnaire was rated on a five-point scale, with "very low" denoting the lowest maturity level and "very high" denoting the highest. The acronym VLPMML (Very Low Project Management Maturity Level) stands for maturity level 1, while LPMML (Low Project Management Maturity Level), APMML (Average Project Management Maturity Level), HPMML (High Project Management Maturity Level), and VHPMML (Very High Project Management Maturity Level) represent maturity levels 2, 3, 4, and 5, respectively.

By adding up the maturity levels of each knowledge area's constituent parts, the maturity level of Ethio telecom in each knowledge area was determined. This was accomplished by averaging the responses from respondents for each component within a given knowledge area. The maturity level was determined by giving equal weight to each component of the knowledge areas.

4.1.2.1. Project Integration Management (PIM)

The table below (Table 9) shows the six processes for measuring project integration management and the responses given. As we can see in the table below the mean of all measures of project integration management maturity is approximately similar, that is directing and managing project work which has the highest maturity is at 2.88 maturity level and monitoring and controlling project work which was rated to have the lowest maturity is at 2.70 maturity level.

As shown in Table 8, when it comes to project integration management Ethio telecom is rated (averaged) at 2.79, or approximately level 3 (APMML), which is Organizational Standards and Institutionalized Process. Level 3 project integration management maturity tells that; when coordinating all project components, such as tasks, resources, stakeholders, and deliverables, all project management processes are in place and established as organizational standards, documentation exists on all the processes, management is regularly involved in input and approval of key decisions, and metrics are formally collected and each project is evaluated and managed in light of other projects. However, there is some limitation in unifying, consolidating, articulating, and integrating projects.

Table 9: Project Integration Management Maturity Level

Maturity levels (% of 195 respondents)							
Project Integration Management Knowledge Area	1	2	3	4	5	Maturity Level	
Developing Project charter	2.1	35.9	35.9	25.6	0.5	2.87	
Project Plan Development	2.6	33.3	44.1	20.0		2.82	
Direct and Manage Project Work		36.4	39.5	24.1		2.88	
Monitor and control Project Work	9.7	32.3	36.4	21.5		2.70	
Integrated Change Control	2.1	37.9	41.0	19.0		2.77	
Closing a Project or Phase		48.2	32.3	19.5		2.71	
Project Integration Management Maturity level in Ethio telecom							2.79

(Source: Researcher's Survey Result, 2023)

4.1.2.2. Project Scope Management (PSCM)

Project scope management of Ethio telecom, as shown in Table 10, averages 2.98 maturity level. And just like project integration management, the six metrics used to measure project scope management have approximating project management maturity level. Controlling scope is rated the highest with 3.17 maturity level, and defining scope is rated at 2.89.

Approximating 2.98, we can say Ethio telecom is at Maturity Level 3 (APMML) in managing the scope of its projects, which is Organizational Standards and Institutionalized Process. This means Ethio telecom has been able to define, plan, and control the scope of its projects, as well as create a detailed description of what its project will deliver and what it will not deliver. And according to the result, the company is also good at managing changes to the project scope that may occur during the project life cycle.

Table 10: Project Scope Management Maturity Level

Maturity levels (% of 195 respondents)						
Project Scope Management Knowledge Area	1	2	3	4	5	Maturity Level
Plan Scope Management	0.5	30.3	53.3	8.7	7.2	2.92
Collect requirements		29.2	53.3	9.7	7.7	2.96
Define Scope		26.7	57.4	15.9		2.89
Create WBS		24.1	61.5	14.4		2.90
Validate Scope		29.7	48.2	8.2	13.8	3.06
Control Scope		29.2	43.1	9.2	18.5	3.17
Project Scope Management Maturity level in Ethio telecom						2.98

(Source: Researcher's Survey Result, 2023)

4.1.2.3. Project Schedule Management (PTM)

Among the 10 PMBOK knowledge areas project schedule management was rated to have the highest PMML. As shown in Table 11, project schedule management maturity level averages at 3.44. Although we approximate it to level 3 maturity (APMML), that is Organizational Standards and Institutionalized Process, some metrics used to measure project schedule management such as defining activities, and estimating activity resources approximate HPMML (maturity level 4).

Level 3 project schedule management demonstrates Ethio telecoms capacity to create, oversee, and manage a project's schedule. The result shows, Ethio telecom in order to complete the project within the specified time frame identifies the activities, dependencies, durations, and

resources needed. Additionally, the company is rated to be average in controlling any schedule adjustments that might be made throughout the course of its projects.

Table 11: Project Schedule Management Maturity Level

Maturity levels (% of 195 respondents)							
Project Schedule Management Knowledge Area	1	2	3	4	5	Maturity Level	
Plan Schedule Management		25.1	33.8	28.2	12.8	3.29	
Activity definition			36.9	49.2	13.8	3.77	
Activity Sequencing		10.8	46.7	27.2	15.4	3.47	
Estimate Activity Resources		15.9	46.2	25.1	12.8	3.35	
Activity Duration Estimating		11.3	42.1	26.7	20.0	3.55	
Schedule Development		26.7	28.2	30.8	14.4	3.33	
Schedule Control		27.7	29.7	27.7	14.9	3.30	
Project Schedule Management Maturity level in Ethio telecom							3.44

(Source: Researcher's Survey Result, 2023)

4.1.2.4. Project Cost Management (PCM)

According to Table 12, the project cost management maturity level of Ethio telecom is 2.49. We can approximate this to level 2 (LPMML) project management maturity level, which is Structured Process and Standards.

Level 2 project cost management maturity tells that; even if Ethio telecom has project cost management processes, it is not considered an organizational standard. In addition,

documentation of basic processes exists in the company, and management supports the implementation of project management. However, understanding and involvement are not consistent in all projects. And in terms of measurements, only basic metrics exist to track the cost performance of the company.

Table 12: Project Cost Management Maturity Level

Maturity levels (% of 195 respondents)						
Project Cost Management Knowledge Area	1	2	3	4	5	Maturity Level
Plan cost Management	9.2	43.1	37.9	9.7		2.48
Cost Estimating	11.3	39.5	42.6	6.7		2.45
Determine Budget	4.1	49.2	37.4	9.2		2.52
Cost Control	8.2	43.6	39.5	8.7		2.49
Project Cost Management Maturity level in Ethio telecom						2.49

(Source: Researcher's Survey Result, 2023)

4.1.2.5. Project Quality Management (PQM)

The average maturity level for project quality management, as shown in Table 13, is 3.16. From the three metrics used quality control of Ethio telecom was rated to have 3.20 maturity level, which is higher than the two other metrics. When we approximate the mean value for project quality management maturity, we get maturity level 3 (APMML) which indicates Organizational Standards and Institutionalized Process.

Level 3 project quality management demonstrates that Ethio telecom was able to define, plan, and control project quality. That means the company has done a good job of identifying the quality standards and expectations for project deliverables and processes and ensuring that they are met or exceeded. Furthermore, based on the results, the company implements quality

assurance and quality control activities to prevent and correct any defects or deviations from quality standards.

Table 13: Project Quality Management Maturity Level

Maturity levels (% of 195 respondents)						
Project Quality Management Knowledge Area	1	2	3	4	5	Maturity Level
Plan Quality Management	3.6	32.3	26.2	20.0	17.9	3.16
Perform Quality Assurance	5.6	30.8	25.6	22.6	15.4	3.11
Quality Control	3.1	29.2	27.2	25.6	14.9	3.20
Project Quality Management Maturity level in Ethio telecom						3.16

(Source: Researcher's Survey Result, 2023)

4.1.2.6. Project Resource Management (PRM)

Project Resource Management encompasses the processes that organize, manage, and lead the project team. As we can see in the table below (Table 14) project resource management maturity level of Ethio telecom stands at 2.85, approximately level 3 maturity (APMML), which is Organizational Standards and Institutionalized Process.

Level 3 project resource management indicates that Ethio telecom plans, allocates, and monitors the resources of each project in a standardized manner. This entails identifying the project's resources, such as human resources, equipment, materials, and time, and ensuring that they are available and used efficiently and effectively. The result also shows that Ethio telecom manages changes in resource requirements that may occur during the project life cycle. This means that Ethio telecoms management fully supports resource management processes and has institutionalized procedures and standards.

Table 14: Project Resource Management Maturity Level

Maturity levels (% of 195 respondents)							
Project Resource Management Knowledge Area	1	2	3	4	5	Maturity Level	
Plan Human Resource Management.	9.2	41.5	23.1	11.3	14.9	2.81	
Acquire Project team	8.2	42.1	24.1	10.3	15.4	2.83	
Develop Project team	8.7	33.3	28.2	10.3	19.5	2.98	
Manage Project team	11.8	35.4	29.7	8.7	14.4	2.78	
Project Resource Management Maturity level in Ethio telecom							2.85

(Source: Researcher's Survey Result, 2023)

4.1.2.7. Project Communications Management (PCMM)

Three metrics were used to measure project communications management, these are plan communications management, manage communications and control communications. Accordingly, the mean project communications management maturity was found to be 2.47. This is approximately 2 (LPMML), which represents Structured Process and Standards.

Level 2 project communications management demonstrates that Ethio telecom has been able to summarize project communication for higher-level management reporting. Even though project communications management entails identifying the information needs and preferences of project stakeholders and ensuring that they receive timely, relevant, and accurate information throughout the project life cycle, Ethio telecom has not been able to integrate it as an institutionalized process.

Table 15: Project Communications Management Maturity Level

Maturity levels (% of 195 respondents)						
Project Communications Management Knowledge Area	1	2	3	4	5	Maturity Level
Plan Communications Management	11.8	48.7	24.1	2.6	12.8	2.56
Manage Communications	11.3	45.6	28.7	5.1	9.2	2.55
Control Communications	7.7	57.4	30.8	4.1		2.31
Project Communications Management Maturity level in Ethio telecom						2.47

(Source: Researcher's Survey Result, 2023)

4.1.2.8. Project Risk Management (PRKM)

Of the 10 PMBOK knowledge areas project risk management was rated to have the lowest PMML. As shown in Table 16, project risk management maturity level averages at 2.17. We can approximate this to level 2 (LPMML) project management maturity level, which represents Structured Process and Standards.

Level 2 project risk management tells that Ethio telecom is able to summarize the risks of a project for higher-level management reporting. The process of managing project risks entails locating, assessing, and taking appropriate action in response to risks and opportunities that could have an impact on the project's goals, scope, schedule, budget, and other factors. However, as the results show, Ethio telecom is only at the beginning stages of planning and implementing risk management processes, which include risk identification, risk analysis, risk response planning, and risk monitoring and control.

Table 16: Project Risk Management Maturity Level

Maturity levels (% of 195 respondents)						
Project Risk Management Knowledge Area	1	2	3	4	5	Maturity Level
Plan Risk Management	24.6	31.3	44.1			2.19
Identify Risks	19.5	36.4	44.1			2.25
Perform Qualitative Risk Analysis	28.2	34.4	37.4			2.09
Perform Quantitative Risk Analysis	25.1	33.8	41.0			2.16
Risk Response Planning	24.1	33.3	42.6			2.18
Control Risks	23.1	39.5	37.4			2.14
Project Risk Management Maturity level in Ethio telecom						2.17

(Source: Researcher's Survey Result, 2023)

4.1.2.9. Project Procurement Management (PPM)

As the table below (Table 17) shows, the average of the four measures of project procurement management is 2.52. This approximately is maturity level 3 (APMML), which is Organizational Standards and Institutionalized Process.

Level 3 project procurement management indicates that Ethio telecom is planning, implementing, and controlling the procurement of a project. Project procurement management entails identifying, acquiring, and managing the goods, services, and resources required for the project from outside sources. The results of this study also show that Ethio telecom meets procurement objectives and requirements, albeit with some limitations.

Table 17: Project Procurement Management Maturity Level

Maturity levels (% of 195 respondents)						
Project Procurement Management Knowledge Area	1	2	3	4	5	Maturity Level
Plan Procurement Management	6.7	30.8	59.5	3.1		2.59
Conduct Procurements	9.2	33.3	53.3	4.1		2.52
Control Procurements	9.7	38.5	47.7	4.1		2.46
Close Procurements	7.2	40.5	47.2	5.1		2.50
Project Procurement Management Maturity level in Ethio telecom						2.52

(Source: Researcher's Survey Result, 2023)

4.1.2.10. Project Stakeholder Management (PSTM)

The average maturity level for project stakeholder management, as shown in Table 18, is 2.91. From the four metrics used stakeholder management plan of Ethio telecom was rated to have 3.20 maturity level, which is higher than the other three metrics. When we approximate the mean value for project stakeholder management maturity, we get maturity level 3 (APMML) which indicates Organizational Standards and Institutionalized Process.

The level 3 project stakeholder management demonstrates that Ethio telecom was able to recognize, evaluate, and involve the stakeholders in its projects. And as the result shows, Ethio telecom was able to identify and comprehend the wants, needs, and interests of the people who will be impacted by or will have an impact on projects. The company also employs metrics that are formally collected regarding stakeholder management, and each project is evaluated based on that.

Table 18: Project Stakeholder Management Maturity Level

Maturity levels (% of 195 respondents)						
Project Stakeholder Management Knowledge Area	1	2	3	4	5	Maturity Level
Identify Stakeholders	27.7	50.3	8.7	13.3		3.08
Plan stakeholder Management	30.3	45.1	7.7	16.9		3.11
Manage Stakeholder Engagement	43.1	42.6	5.1	9.2		2.81
Control Stakeholder Engagement	54.9	32.8	6.2	6.2		2.64
Project Stakeholder Management Maturity level in Ethio telecom						2.91

(Source: Researcher's Survey Result, 2023)

4.1.3. Overall Project Management Maturity Level of Ethio telecom

Table 19: The overall project management maturity level of Ethio telecom

The maturity level of each Project Management Knowledge Areas	PMML
Project Integration Management	2.79
Project Scope Management	2.98
Project Schedule Management	3.44
Project Cost Management	2.49
Project Quality Management	3.16
Project Resource Management	2.85
Project Communications	2.47
Project Risk Management	2.17
Project Procurement Management	2.52
Project Stakeholder Management	2.91
Overall Project management maturity level	2.78

(Source: Researcher's Survey Result, 2023)

The above table (Table 19) shows that, Ethio telecom currently (2023) stands at 2.78 Project Management Maturity Level, Approximating it to Level 3 PMM (APMML), which is Organizational Standards and Institutionalized Process.

As discussed in the literature review chapter, Level 3 project management maturity is a stage of project management development in which an organization has established and standardized project management processes and practices throughout the organization. This means that Ethio telecom has a consistent and repeatable method of managing projects, and that project outcomes are aligned with the organization's strategic goals and objectives.

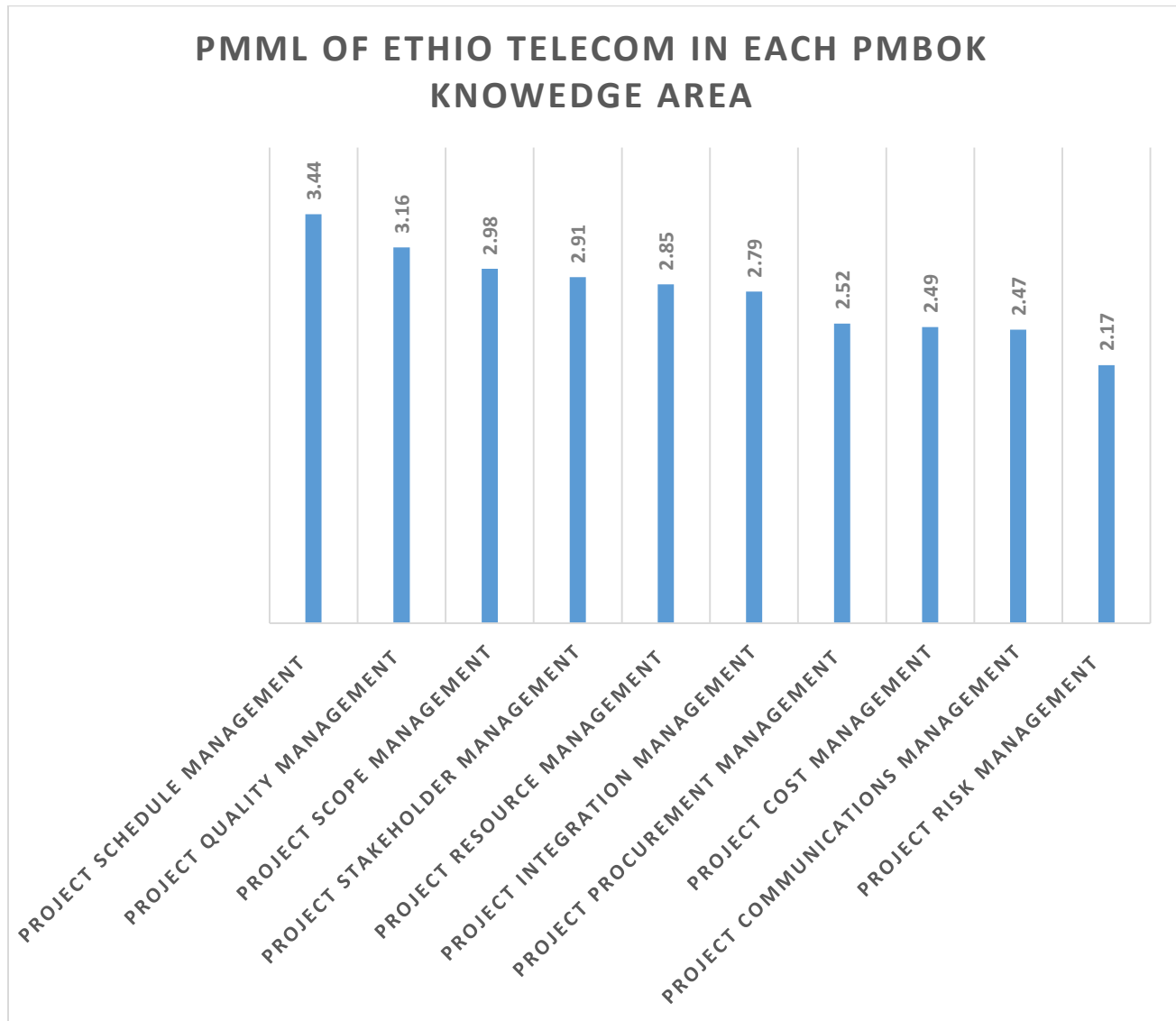
Furthermore, level 3 PMML indicates that Ethio telecom has documented its project management methodology and trained its employees on how to use it. A project management office (PMO) that provides guidance and support to project managers and teams is also available within the organization. And according to the result, the organization is also monitoring and measuring project performance and is using it to identify and implement improvements.

4.1.4. Most and Least Matured Project Management Knowledge Areas in Ethio telecom

As shown in the figure below (Figure 2), PTM is the most mature knowledge area, with 3.44 PMML. PRKM is the least matured knowledge area, with 2.17 PMML.

When we compare the PMML of all ten PMBOK Knowledge Areas, we find that PTM, PQM, PSCM, PSTM, PRM, PIM, and PPM are more mature (with approximated PMML 3) than the other project management knowledge areas, such as PCM, PCMM, and PRKM (Which are at approximated PMML 2).

Figure 2: Project Management Maturity Level of Ethio telecom in Each PMBOK Knowledge area

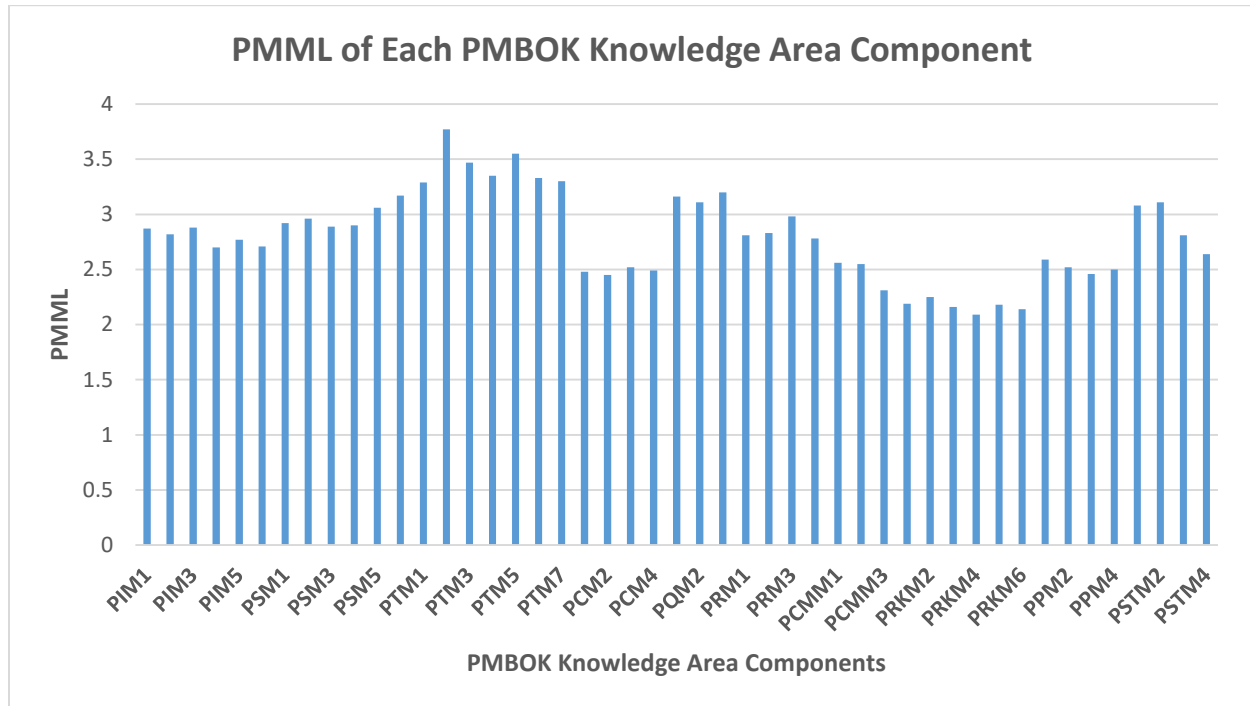


(Source: Researcher's Survey Result, 2023)

In terms of components, 11 out of 47 (23.4%) were approximately found to be practiced below average (i.e. below PMML 3). The highest matured project management knowledge area component in Ethio telecom was found to be PTM's activity definition (3.77), which is the second PTM component, i.e. identifying the specific activities that must be performed to produce various project deliverables. On the other hand, the lowest matured project management knowledge area component was found to be PRKM's quantitative risk analysis (2.09), which is

the fourth PRKM component, i.e. numerically analyzing the effect of identified risks on overall project objectives.

Figure 3: PMML of Each PMBOK Knowledge Area Component



(Source: Researcher's Survey Result, 2023)

4.1.5. Project Success Rate of Ethio telecom

As discussed in the literature review chapter, there have been considerable debates about the nature and definition of project success, however, no consensus has been reached. Accordingly, the researcher used his own metrics (based on the literature reviewed) to measure project success. The metrics were evaluated on a 1 to 5 rating, where 1 denotes a very low level of success and 5 denotes a very high level of success. The first metric used is the project success rate (PSR) of Ethio telecom in terms of cost, time, and quality. And as shown in the table below, the respondents of the questionnaire rated the company's success rate with regard to cost, time, and quality to be 2.93.

The second metric used to measure the success rate of Ethio telecom was meeting the general objective. And according to the result, Ethio telecom was rated to have 4.08 level of project

success, which is the highest of the three PSR metrics. The third and last metric used was the customer/stakeholder satisfaction rate, which was found to be 3.11.

When we take the mean of the three metrics, as shown in Table 20, Ethio telecom has a 3.37 success rate, which can be considered above average.

Table 20: Project Success Rate

Project Success Rate (% of 195 respondents)						
Success Measures	1	2	3	4	5	Success Rate
Cost, Time, and Quality	.5	32.3	41.0	25.6	.5	2.93
Meeting the General Objective		1.0	25.6	37.9	35.4	4.08
Customer/Stakeholder Satisfaction	4.6	16.4	43.6	34.4	1.0	3.11
Project Success Rate of Ethio telecom						3.37

(Source: Researcher's Survey Result, 2023)

4.2. Inferential Analysis

This section presents the inferential analysis, which includes a correlation analysis between project management maturity level and project success rate in Ethio telecom, as well as a regression analysis.

4.2.1. Correlation Analysis

Table 21: Correlation between PMML and PSR

		PMML	Success Rate
PMML	Pearson Correlation	1	.804**
	Sig. (2-tailed)		< .001
	N	195	195
Success Rate	Pearson Correlation	.804**	1
	Sig. (2-tailed)	< .001	
	N	195	195

** . Correlation is significant at the 0.01 level (2-tailed).
(Source: SPSS output, 2023)

As we can see from the above SPSS result, the Pearson Correlation Coefficient between Project Management Maturity Level and Project Success Rate is 0.8. This indicates a **strong positive relationship** between Project Management Maturity Level and Project Success Rate. This means that as Ethio telecom's Project Management Maturity Level rises, so will the company's Project Success Rate. Furthermore, a Sig. (2-tailed) value (p value) of < 0.001 shows that we can reject the null hypothesis and conclude that there is a significant linear relationship between Project Management Maturity Level and Project Success Rate.

4.2.2. Results for Assumption of Simple Linear Regression Analysis

It is necessary to test the assumptions underlying simple linear regression before conducting a regression analysis to determine the relationship between the dependent and independent variables. This maintains the reliability and validity of the research's regression findings.

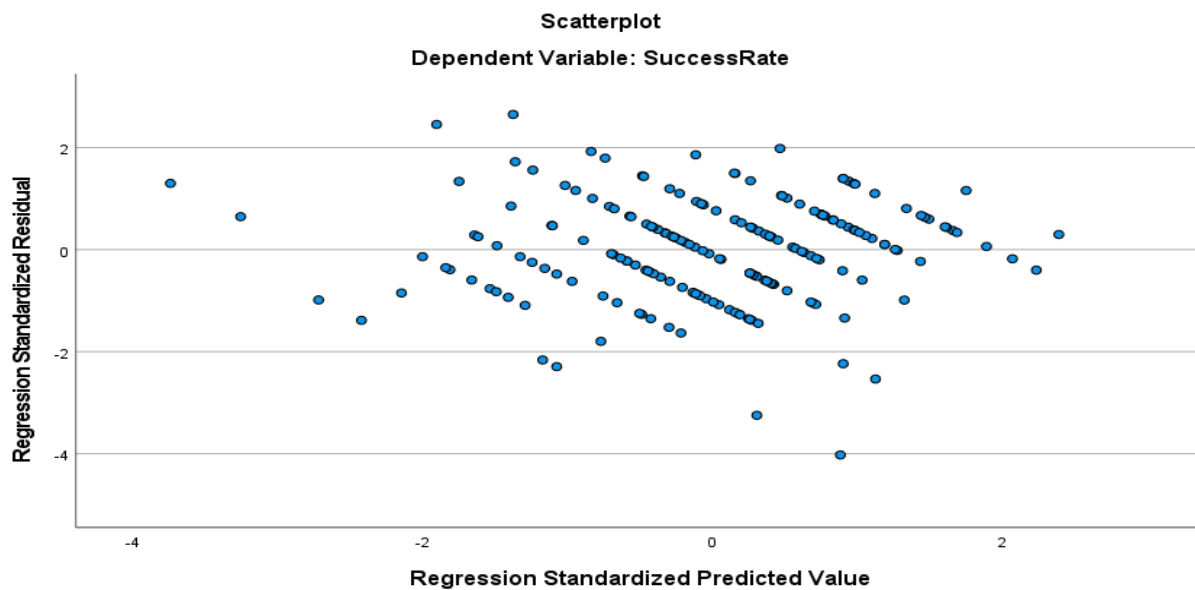
4.2.2.1. Test for Homoscedasticity

A key assumption of a classical linear regression model is that the disturbance term (ϵ_i) in the population regression function is homoscedastic. This means they all have the same variance. However, if this assumption is violated (i.e., the variance of the error term changes with the

change in values of the explanatory (independent) variable), the heteroscedasticity problem prevails, affecting the values of standard errors (Hair et al., 1998).

The figure below (Figure 4) shows that the scattered diagram's points are dispersed randomly and evenly, and there is no sign of a funnel-like shape or pattern pointing in one direction, proving that the data is not heteroscedastic. This means that the variance of the error term in the regression model remains constant across all values of the explanatory variable (Homoscedastic).

Figure 4: Test for Homoscedasticity



(Source: SPSS output, 2023)

4.2.2.2. Test for Normality

The Skewness and Kurtosis value, Normal Probability Plot (NPP), and Histogram tests were used to determine whether the data is normally distributed.

Analyzing normality can be done in two ways: graphically and numerically. According to Hair et al. (1998), the results of the standardized Skewness and the kurtosis tests must fall within the ranges of ± 1

Table 22: Skewness and Kurtosis

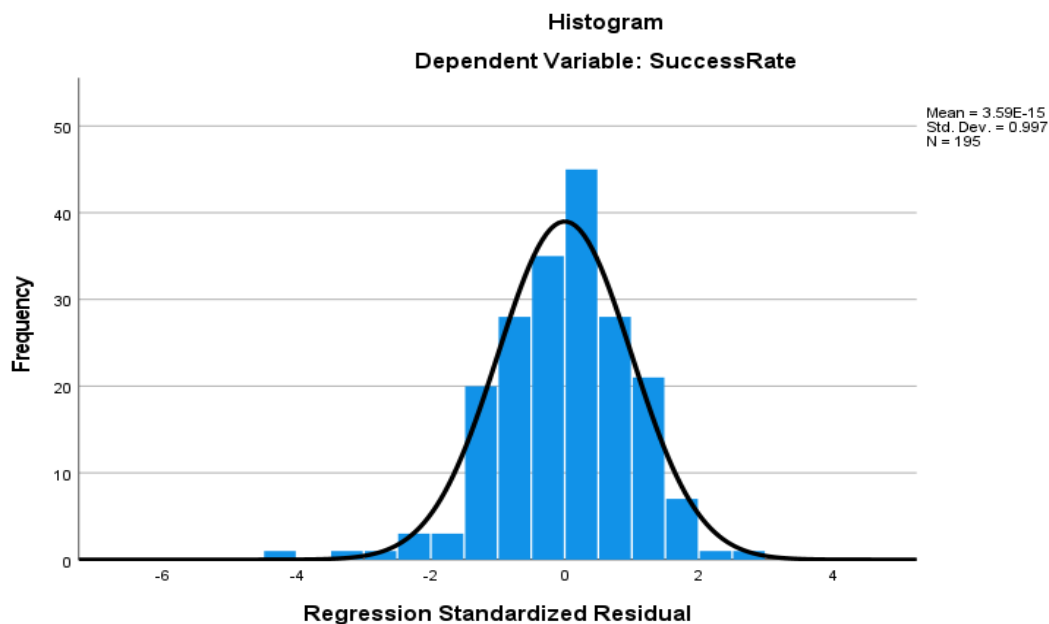
Descriptive Statistics						
	N	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SuccessRate	195	.61589	-.318	.174	-.184	.346
PMML	195	.24565	-.562	.174	.896	.346
Valid N (listwise)	195					

(Source: SPSS output, 2023)

The Standardized Skewness and Kurtosis values for this study were between +1 and -1, as shown in Table 22. As a result, we can say that the data was normally distributed and is reliable for further analysis.

The researcher used a histogram to identify the normal distribution of the data, and as shown in Figure 5, the result shows that only some standard residuals are away from the curve, many residuals are fairly close to the curve, and the histogram is bell-shaped. This means, the majority of scores are clustered around the center of the distribution, and the largest bars on the histogram are all located around the central value. This indicates that the data is normally distributed.

Figure 5: Histogram Regression of Standardized Residual

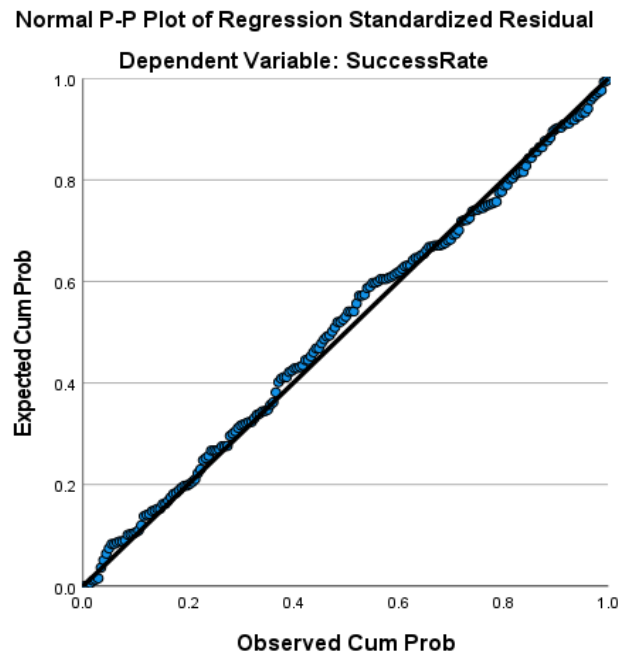


(Source: SPSS output, 2023)

4.2.2.3. Linearity of Assumption

The term "linearity" describes how closely a change in the dependent variable interacts with a change in the independent variable. And as can be seen in Figure 6 below, the residuals' p-plot shows no significant deviation in the residuals' spread, suggesting that the assumptions are reasonable given the data. The outcome thus demonstrates that a dependent variable and an independent variable have a linear relationship.

Figure 6: Normal point plot of Standardized Residual



(Source: SPSS output, 2023)

4.2.3. Regression Analysis

In order to determine the impact of the Project Management Maturity Level on the Project Success Rate of Ethio telecom, a regression analysis was carried out (at 95% confidence level). Summary of this study's overall regression model and its ANOVA is provided below.

4.2.3.1. Model Summary

According to Table 23's model summary, the adjusted R squared is 0.64, indicating that the independent variable (PMML) explained 64% of the variation in the dependent variable (Project Success) and the remaining 36% of the variance in the dependent variable may be explained by

other factors not included in the model. As a result, we can say the proposed independent variable (PMML) is a good explanatory variable for project success in Ethio telecom.

Table 23: Model Summary

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.804 ^a	.646	.644	.36733

a. Predictors: (Constant), PMML
b. Dependent Variable: SuccessRate

(Source: SPSS output, 2023)

4.2.3.2. ANOVA (Analysis of Variance)

The results of the ANOVA show that the regression model fits the data. Table 24 reveals that the regression analysis showed strong degree of prediction with a significant result of $p - 0.001$, which is less than 0.05.

Table 24: ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.546	1	47.546	352.369	<.001 ^b
	Residual	26.042	193	.135		
	Total	73.587	194			

a. Dependent Variable: SuccessRate

b. Predictors: (Constant), PMML

(Source: SPSS output, 2023)

In addition, the F-ratio in the ANOVA table tests whether the regression model is a good fit for the data. The table above (Table 24) shows that the independent variable (PMML) strongly predicts the dependent variable (PS), $F(1, 193) = 352.37$, $p.001$ indicating that the regression model is a good fit for the data.

4.2.3.3. Regression Coefficient Analysis

Regression Coefficient analysis shows the effect of the independent variable (PMML) on the dependent variable (PS). And the below table shows the result of the analysis:

Table 25: Coefficient of the Simple Linear Regression Analysis

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-2.225	.299				
	PMML	2.015	.107	.804	18.772	<.001	

a. Dependent Variable: SuccessRate

(Source: SPSS output, 2023)

As shown in the above table (Table 25), the effect of the independent variable (PMML) on the dependent variable (PS) remains constant at - 2.23, which means that if project management maturity level is zero, the dependent variable (project success) would be equal to that negative 2.23.

Thus, the regression equation takes the following form:

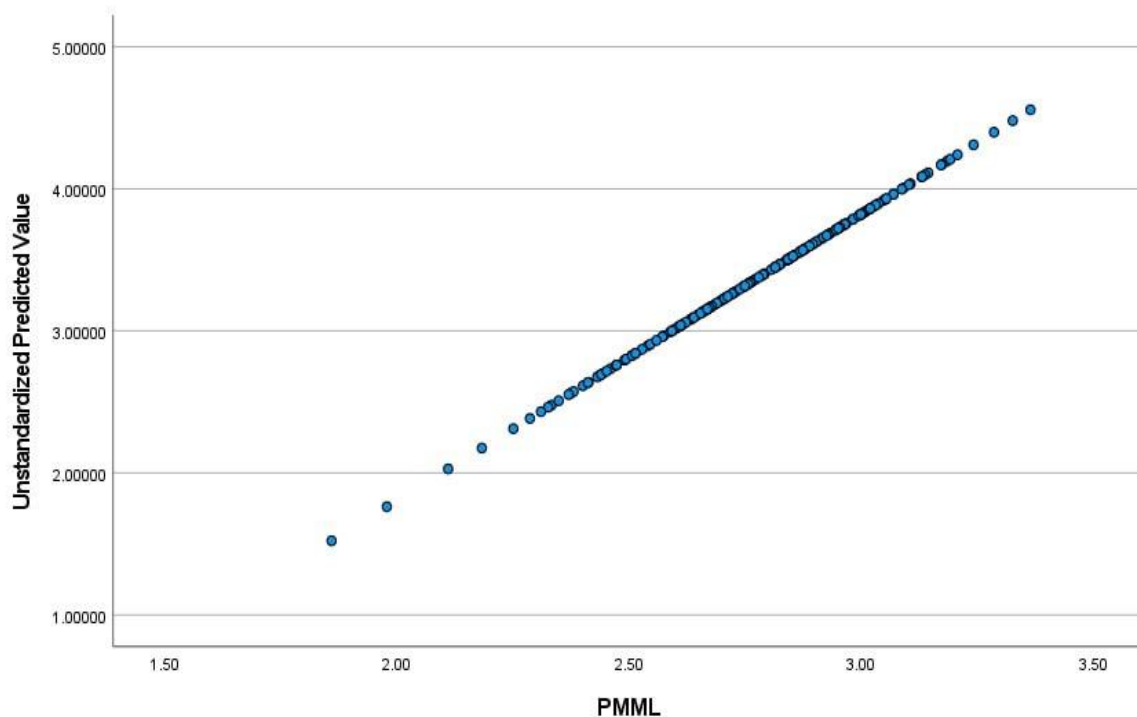
$$PS = -2.23 + 2.02 \text{ PMML}$$

This means, a unit increase in project management maturity level will increase project success by 2.02. This implies project management maturity level positively and significantly (Since $p < 0.001$) affects project success rate of Ethio telecom.

The simple regression table (Table 25) also showed that the null hypothesis, "There is no relationship between project management maturity and project success rate in Ethio telecom," is rejected, proving that project management maturity level has a positive and significant effect on project success (at 95% confidence level).

To visualize the above particular model, unstandardized predicted values for project success at each level of project management maturity level is created using a scatter plot.

Figure 7: Predicted Value of PS and PMML



(Source: SPSS output, 2023)

The regression line above (Figure 7) is a visual representation of the prediction of project success at every level of project management maturity. The scatter plot shows the more project management maturity level in Ethio telecom the more the project success rate of the company.

Chapter Five

5. Summary, Conclusion, and Recommendations

This chapter summarizes the major findings of the data analysis. The data will be used to draw conclusions about Ethio telecom's Project Management Maturity Level and its effect on project success. Recommendations for improving Project Management Maturity Level are also made in this chapter.

5.1. Summary of Major Findings

The main objective of this research was to assess the project management maturity level of Ethio telecom and to find out its effect on project success. In addition, the research aimed to identify the company's most and least matured project management knowledge areas. Accordingly, the result showed that the Project Management Maturity of Ethio telecom is currently at level 2.78. When we approximate this to Level 3 PMML, it indicates that all projects follow formal organizational standards. Furthermore, the company records its processes and incorporates them across the entire organization.

The Project Management Maturity Level for each PMBOK knowledge area was discovered as follows: Project Integration Management (2.79), Project Scope Management (2.98), Project Schedule Management (3.44), Project Cost Management (2.49), Project Quality Management (3.16), Project Resource Management (2.85), Project Communications Management (2.47), Project Risk Management (2.17), Project Procurement Management (2.52), and Project Stakeholder Management (2.91).

When we compare the approximate PMMLs of all ten PMBOK Knowledge Areas, we find that PTM, PQM, PSCM, PSTM, PRM, PIM, and PPM are more matured (with approximate PMMLs of 3) than other project management knowledge areas like PCM, PCMM, and PRKM (Which are at approximate PMMLs of 2).

In terms of components, 11 out of 47 (23.4%) were found to be practiced below average. The second PTM component, "activity definition," or "identifying the specific activities that must be performed to produce various project deliverables," was found to have the highest level of

maturity in Ethio Telecom (3.77). On the other hand, PRKM's quantitative risk analysis (2.09), the fourth component of PRKM, which involves numerically analyzing the impact of identified risks on overall project objectives, was found to be the least matured component of the project management knowledge area.

Of the three metrics used to measure Project Success Rate of Ethio telecom, the second metric used (meeting the general objective of a given project) was rated (out of 5) to have 4.08 level of success, which makes it the highest of the three PSR metrics. Following that, the third metric, customer/stakeholder satisfaction rate, was discovered to be at 3.11 PSR. Finally, the first metric used to assess PSR in terms of cost, time, and quality received a rating of 2.93. When the mean of the three metrics is calculated, Ethio telecom has a general PSR of 3.37, which is considered to be above average.

Finally, the Pearson Correlation Coefficient between Project Management Maturity Level and Project Success Rate was determined to be 0.8, indicating a strong positive relationship between PMML and PS. In addition, the regression result showed a unit increase in project management maturity level will increase project success by 2.02. This means that as Ethio telecom's Project Management Maturity Level rises, so will the company's Project Success Rate. Furthermore, because a p-value of < 0.001 was discovered, the null hypothesis was rejected. And it was concluded that there is a positive and significant linear relationship between Project Management Maturity Level and Project Success.

5.2. Conclusion

This study assessed the project management maturity level of Ethio telecom in terms of the implementation of the PMBOK ten knowledge areas. And the project success rate of Ethio telecom was also calculated using three metrics. And finally, a correlation between project management maturity and project success rate was calculated. PM Solutions' project management maturity model was also used to assess the ten knowledge areas.

After analyzing the findings, the following conclusion was drawn;

The project management maturity of Ethio telecom is currently at level 3. This implies “Organizational Standards and Institutionalized Process.” This means all project management **processes** in Ethio telecom are in place and are established as organizational standards,

documentation exists on all the processes, **management** is regularly involved in input and approval of key decisions, and **metrics** are formally collected and each project is evaluated and managed in light of other projects. These processes are institutionalized which means they are incorporated into the organization and they do not depend on individuals.

The study's findings show that project risk management, project communications management, and project cost management are all at a low level of maturity (approximated level 2 PMM). This may affect the overall performance of projects in Ethio telecom, by impairing projects from delivering what they need to deliver and reducing the satisfaction of customers/stakeholders in Ethio telecom.

On the other hand, the findings show that project schedule management, project quality management, project scope management, project stakeholder management, project resource management, project integration management, and project procurement management are relatively on a higher project management maturity level (approximated level 3 PMM), but as always there is room to improve.

The general project success rate of Ethio telecom was found to be 3.37 (rated out of 5). A project success rate of 3.37 out of 5 means, taking all projects as one, 67.4% of that project is completed successfully, while 32.6% of that project failed to meet expectations. This indicates that project management processes still need to improve.

The final conclusion drawn from the study's result is that there is a significant linear relationship between project management maturity level and project success. Where, a unit increase in project management maturity level will increase project success by 2.02. This implies project management maturity level positively and significantly (Since $p < 0.001$) affects project success rate of Ethio telecom.

This indicates that the higher the project management maturity level, the higher the project success rate. As a result, in order to complete projects more efficiently, Ethio telecom must further improve its project management maturity level. It should work harder to achieve an overall project management maturity level of 3 and higher.

5.3. Recommendations

The following points suggest possible improvement measures that Ethio telecom could take to attain a higher level of project management maturity.

- Give special attention to the least mature PMBOK knowledge areas such as project risk, communication, and cost management. As the study's result shows, the least matured PMBOK knowledge area in Ethio telecom is project risk management. When it comes to project risk management, it is widely acknowledged that projects are inherently unpredictable due to their uniqueness and complexity. As a result, well-structured risk management planning, identification, analysis, response planning, response implementation, and risk monitoring on a project are all required. These identified risks must be examined both qualitatively and quantitatively.
- All 47 processes under each PMBOK knowledge area should be considered and applied in every project, and their progress and outcomes should be monitored and controlled throughout the project life cycle.
- According to the literature reviewed it is crucial to integrate and coordinate all PMBOK knowledge areas throughout the project life cycle because they are all interconnected. Accordingly, Ethio telecom must make sure that any decisions and actions taken in one knowledge area are consistent with and complementary of those taken in the other knowledge areas. The company can deliver a project of the highest caliber that satisfies the expectations and needs of the stakeholders by integrating and coordinating the PMBOK knowledge areas.
- The researcher recommends that already established project management offices be strengthened. This office assists the organization in standardizing project management processes, tools, and best practices. It also provides project managers and teams with guidance, support, and training. Ethio telecom can improve the efficiency, quality, and success of its projects by strengthening the project management offices.
- Finally, the company ought to perform periodic assessments on an annual or semiannual basis to make sure that improvements are taking root. This is because periodic assessments serve to measure the progress and impact of improvement initiatives and identify any shortcomings or challenges that need to be addressed. Periodic assessments

also provide a consistent and comprehensive report on the company's performance and maturity level, allowing for comparison and benchmarking with prior years or industry standards. Furthermore, these periodic assessments can help foster a culture of learning and excellence by encouraging feedback, recognition, and ongoing advancement among staff members and stakeholders.

5.4. Suggestions for Future Research

As was mentioned in the first chapter, this research was a continuation of Gebrewahd's (2018) research. It was carried out to determine whether Ethio telecom had made any improvements since 2018, and the researcher discovered that this was the case. The maturity level of Ethio telecom was 2.46 when Gebrewahd conducted his research in 2018. And as this study's findings demonstrate, Ethio telecom is currently at level 2.78 of project management maturity. Therefore, the researcher would suggest another research be done after some years, to see if there is any improvement.

This study discovered that project management in Ethio telecom has visible limitations in risk, communication, and cost management knowledge areas. As a result, the researcher would recommend additional research on these specific PMBOK knowledge areas.

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APPENDIX A

QUESTIONNAIRE

QUESTIONNAIRE
ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE
DEPARTMENT OF PROJECT MANAGEMENT

Dear Respondent,

My name is Solen Ephrem, and I'm a graduate student in School of Commerce, Addis Ababa University. In partial fulfillment of the requirements for the degree of Master of Arts in Project Management, I currently am undertaking research with the topic of "The Effect of Project Management Maturity Level on Project Success: The Case of Ethio Telecom".

You were chosen among the respondents to take part in this study. So, I kindly request you to participate in this study by patiently completing the questionnaire. And, I hereby assure you that all the information will remain confidential and used only for academic research purpose.

Furthermore, I sincerely request that you respond to the questions based on the actual company's level of project management maturity and as accurately as possible. I thank you for your time and effort in advance.

If you have any questions, please contact me at:

Email: solenephrem@gmail.com

Tel: 0938094681

Sincerely,

Solen Ephrem

Addis Ababa, Ethiopia

General Information

Dear respondent, this questionnaire has three parts:

Part I - asks respondent's profile, such as position/role in projects, and years worked as a project manager or project expert/member, in projects done by Ethio telecom.

Part II - based on the provided explanation of each maturity level derived from project management solutions, Inc., this part asks respondents to rank the project management process under each of the 10 knowledge areas as Level 1, Level 2, Level 3, Level 4, and Level 5, considering projects started and completed in Ethio telecom after 2018.

Part III - this part asks questions about project performance of Ethio telecom after 2018.

Part I: General Information of respondent: (mark “√” on the space provided)

1. Position/role on the projects carried out by Ethio telecom.

- | | |
|---|---|
| ☐ Project Manager | ☐ Project Specialist |
| ☐ Project Management Staff | ☐ Project Professional |
| ☐ Other | |

2. Sex

- | | |
|---------------------------------|-------------------------------|
| ☐ Female | ☐ Male |
|---------------------------------|-------------------------------|

3. Years of working experience as project manager /project expert/ project specialist/ project professional.

- | | | |
|-------------------------------|--------------------------------|-----------------------------------|
| ☐ 1-2 | ☐ 3-5 | ☐ Above 15 |
| ☐ 6-10 | ☐ 11-15 | |

4. Years of working experience in Ethio telecom.

- | | | |
|-------------------------------|--------------------------------|-----------------------------------|
| ☐ 1-2 | ☐ 3-5 | ☐ Above 15 |
| ☐ 6-10 | ☐ 11-15 | |

5. Education level.

- | | |
|--|--|
| ☐ Diploma | ☐ Bachelor's Degree |
| ☐ Master's Degree | ☐ Doctorate Degree |
| ☐ Other | |

Part II: Main Questions on the level of project management maturity of Ethio telecom in managing its projects

Dear respondent, please read the definitions below before filling out the upcoming questions as it may help in your responses.

Maturity Level 1 - Initial Process

Level 1 maturity tells that; there are no established practices and standards regarding project management in the company, documentation of processes is loose and ad-hoc, management understands the definition of a project and is aware of the need for project management (even if it is not practiced), and project management metrics are collected informally on an ad-hoc basis.

Maturity Level 2 - Structured Process and Standards

Level 2 maturity tells that; project management processes exist, but are not considered an organizational standard, documentation of basic processes exists, management supports the implementation of project management, but understanding and involvement are not consistent in all projects, and basic metrics to track cost, schedule and technical performance exist.

Maturity Level 3 - Organizational Standards and Institutionalized Process

Level 3 maturity tells that; all project management processes are in place and established as organizational standards (these processes involve the clients as members of the project team), documentation exists on all the processes, management is regularly involved in input and approval of key decisions, and metrics are formally collected and each project is evaluated and managed in light of other projects.

Maturity Level 4 - Managed Process

Level 4 maturity tells that; project management processes, standards and supporting systems are integrated with other corporate processes and systems, processes and standards are documented to support using metrics to make project decisions, management understands its role in the project management process. There are different management styles and project management requirements for different projects, and efficiency and effectiveness metrics are used. All projects, changes and issues are evaluated based upon metrics from cost estimates, baseline estimates, and earned value calculations.

Maturity Level 5 - Optimizing Process

Level 5 maturity tells that; processes are in place and actively used to improve project management activities, lessons learned are regularly examined and used to improve project management processes, standards and documentation, management is focused not only on effectively managing projects but also on continuous improvement, and the metrics collected during project execution are used to understand the performance of a project and to assist in the making of organizational management decisions for the future.

In simple terms* Maturity Level 1 entails a very low maturity level, Maturity Level 2 entails a low maturity level, Maturity Level 3 entails an average maturity level, Maturity Level 4 entails high maturity level, and Maturity Level 5 entails a very high maturity level.

Please tick the appropriate box for each project management knowledge area. **Thank You in Advance!**

Reminder* when filling out this questionnaire only consider projects started and completed in Ethio telecom after 2018.

Project Management Body of Knowledge's (PMBOK's) ten project management Knowledge Areas	Maturity Level				
	1 (Low Maturity) up to 5 (High Maturity)				
1. Project Integration Management	1	2	3	4	5
Developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.					
Defining, preparing, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan.					
Leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objective.					
Tracking, reviewing, and reporting project progress against the performance objectives defined in the project management plan.					
Coordinating changes across the entire project					
Finalizing all activities across all of the Project Management Process Groups to formally complete the phase or project.					
2. Project Scope Management	1	2	3	4	5
Creating a scope management plan that documents how the project scope will be defined, validated, and controlled					
Determining, documenting, and managing stakeholder needs and requirements to meet project objectives.					
Developing a detailed description of the project and product.					

Subdividing project deliverables and project work into smaller, more manageable components					
Formalizing acceptance of the completed project deliverables.					
Monitoring the status of the project and product scope and managing changes to the scope baseline					
3. Project Schedule Management	1	2	3	4	5
Establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.					
Identifying the specific activities that must be performed to produce various project deliverables					
Identifying and documenting relationships among the project activities.					
Estimating the type and quantities of material, human resources, equipment, or supplies required to perform each activity.					
Estimating the number of work periods needed to complete individual activities with estimated resources.					
Analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.					
Monitoring the status of project activities to update project progress and manage changes to the schedule baseline to achieve the plan.					
4. Project Cost Management	1	2	3	4	5
Establishes the policies, procedures, and documentation for planning, managing, expending, and controlling project costs.					
Developing an approximation of the monetary resources needed to complete project activities.					
Aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.					
Monitoring the status of the project to update the project costs and managing changes to the cost baseline					
5. Project Quality Management	1	2	3	4	5

Identifying quality requirements and/or standards for the project and its deliverables and documenting how the project will demonstrate compliance with quality requirements.					
Auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used					
Monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes.					
6. Project Resource Management	1	2	3	4	5
Identifying and documenting project roles, responsibilities, required skills, reporting relationships, and creating a staffing management plan.					
Confirming human resource availability and obtaining the team necessary to complete project activities.					
Improving competencies, team member interaction, and overall team environment to enhance project performance					
Tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance.					
7. Project Communications Management	1	2	3	4	5
Developing an appropriate approach and plan for project communications based on stakeholder's information needs and requirements, and available organizational assets.					
Creating, collecting, distributing, storing, retrieving and the ultimate disposition of project information in accordance with the communications management plan					
Monitoring and controlling communications throughout the entire project life cycle to ensure the information needs of the project stakeholders are met.					
8. Project Risk Management	1	2	3	4	5
Deciding how to approach and plan the risk management activities for a project.					
Determining which risks might affect the project and documenting their characteristics.					

Prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact					
Numerically analyzing the effect of identified risks on overall project objectives					
Developing options and actions to enhance opportunities and to reduce threats to project objectives					
Implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.					
9. Project Procurement Management	1	2	3	4	5
Documenting project procurement decisions, specifying the approach, and identifying potential sellers.					
Obtaining seller responses, selecting a seller, and awarding a contract.					
Managing procurement relationships, monitoring contract performance, and making changes and corrections as appropriate.					
Completing each project procurement.					

10. Project stakeholder Management	1	2	3	4	5
Identifying the stakeholders that could impact or be impacted by a decision, activity, or outcome of the project; and analyzing and documenting relevant information.					
Developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success.					
Communicating and working with stakeholders to meet their needs/expectations, address issues as they occur, and foster appropriate stakeholder engagement in project activities throughout the project life cycle.					
Monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.					

Part III – Part III – Questions about project performance of Ethio telecom: (mark “√” on the space provided)

1. Putting in mind, cost, time, and quality Ethio telecom is successful in the projects it does (considering projects started and completed after 2018).

- | | |
|--|-----------------------------------|
| ☐ Strongly Agree | ☐ Agree |
| ☐ Neutral | ☐ Disagree |
| ☐ Strongly disagree | |

2. The projects done by Ethio telecom meet their intended objectives/goals (considering projects started and completed after 2018).

- | | |
|--|-----------------------------------|
| ☐ Strongly Agree | ☐ Agree |
| ☐ Neutral | ☐ Disagree |
| ☐ Strongly disagree | |

3. The internal and external customers/stakeholders of Ethio telecom have been satisfied with the results of the projects carried out (considering projects started and completed after 2018).

- | | |
|--|-----------------------------------|
| ☐ Strongly Agree | ☐ Agree |
| ☐ Neutral | ☐ Disagree |
| ☐ Strongly disagree | |

- **Below, you can leave any additional comments about Ethio telecom's project performance.**

Thank you for taking the time to fill out this questionnaire!

APPENDIX B

SPSS OUTPUTS

The Model

Coefficients ^a								
		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	-2.225	.299		-7.432	<.001	-2.815	-1.635
	PMML	2.015	.107	.804	18.772	<.001	1.804	2.227

a. Dependent Variable: SuccessRate

PMBOK knowledge areas

Project Integration Management

PIM1					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	2.1	2.1	2.1
	2	70	35.9	35.9	37.9
	3	70	35.9	35.9	73.8
	4	50	25.6	25.6	99.5
	5	1	.5	.5	100.0
	Total	195	100.0	100.0	

PIM2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	5	2.6	2.6	2.6
	2	65	33.3	33.3	35.9
	3	86	44.1	44.1	80.0
	4	39	20.0	20.0	100.0
	Total	195	100.0	100.0	

PIM3					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	71	36.4	36.4	36.4
	3	77	39.5	39.5	75.9
	4	47	24.1	24.1	100.0
	Total	195	100.0	100.0	

PIM4					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	19	9.7	9.7	9.7
	2	63	32.3	32.3	42.1
	3	71	36.4	36.4	78.5
	4	42	21.5	21.5	100.0
	Total	195	100.0	100.0	

PIM5					
		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	1	4	2.1	2.1	2.1
	2	74	37.9	37.9	40.0
	3	80	41.0	41.0	81.0
	4	37	19.0	19.0	100.0
	Total	195	100.0	100.0	

PIMQ6					
		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	94	48.2	48.2	48.2
	3	63	32.3	32.3	80.5
	4	38	19.5	19.5	100.0
	Total	195	100.0	100.0	

Project Scope Management

PSCM1					
		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	1	1	.5	.5	.5
	2	59	30.3	30.3	30.8
	3	104	53.3	53.3	84.1
	4	17	8.7	8.7	92.8
	5	14	7.2	7.2	100.0
	Total	195	100.0	100.0	

PSCM2					
		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	57	29.2	29.2	29.2
	3	104	53.3	53.3	82.6
	4	19	9.7	9.7	92.3
	5	15	7.7	7.7	100.0
	Total	195	100.0	100.0	

PSCM3					
		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	52	26.7	26.7	26.7
	3	112	57.4	57.4	84.1
	4	31	15.9	15.9	100.0
	Total	195	100.0	100.0	

PSCM4					
		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	47	24.1	24.1	24.1
	3	120	61.5	61.5	85.6
	4	28	14.4	14.4	100.0
	Total	195	100.0	100.0	

PSCM5

		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	58	29.7	29.7	29.7
	3	94	48.2	48.2	77.9
	4	16	8.2	8.2	86.2
	5	27	13.8	13.8	100.0
	Total	195	100.0	100.0	

PSCM6

		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	57	29.2	29.2	29.2
	3	84	43.1	43.1	72.3
	4	18	9.2	9.2	81.5
	5	36	18.5	18.5	100.0
	Total	195	100.0	100.0	

Project Schedule Management**PTM1**

		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	49	25.1	25.1	25.1
	3	66	33.8	33.8	59.0
	4	55	28.2	28.2	87.2
	5	25	12.8	12.8	100.0
	Total	195	100.0	100.0	

PTM2

		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	3	72	36.9	36.9	36.9
	4	96	49.2	49.2	86.2
	5	27	13.8	13.8	100.0
	Total	195	100.0	100.0	

PTM3

		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	21	10.8	10.8	10.8
	3	91	46.7	46.7	57.4
	4	53	27.2	27.2	84.6
	5	30	15.4	15.4	100.0
	Total	195	100.0	100.0	

PTMQ4

		Frequen cy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	31	15.9	15.9	15.9
	3	90	46.2	46.2	62.1
	4	49	25.1	25.1	87.2
	5	25	12.8	12.8	100.0
	Total	195	100.0	100.0	

PTM5					
		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	22	11.3	11.3	11.3
	3	82	42.1	42.1	53.3
	4	52	26.7	26.7	80.0
	5	39	20.0	20.0	100.0
	Total	195	100.0	100.0	

PTM6					
		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	2	52	26.7	26.7	26.7
	3	55	28.2	28.2	54.9
	4	60	30.8	30.8	85.6
	5	28	14.4	14.4	100.0
	Total	195	100.0	100.0	

PTM7					
		Freque ncy	Perc ent	Valid Percent	Cumulati ve Percent
Valid	2	54	27.7	27.7	27.7
	3	58	29.7	29.7	57.4
	4	54	27.7	27.7	85.1
	5	29	14.9	14.9	100.0
	Total	195	100.0	100.0	

Project Cost Management

PCM1					
		Freque ncy	Perce nt	Valid Percent	Cumulati ve Percent
Valid	1	18	9.2	9.2	9.2
	2	84	43.1	43.1	52.3
	3	74	37.9	37.9	90.3
	4	19	9.7	9.7	100.0
	Total	195	100.0	100.0	

PCMQ2					
		Frequen cy	Perce nt	Valid Percent	Cumulative Percent
Valid	1	22	11.3	11.3	11.3
	2	77	39.5	39.5	50.8
	3	83	42.6	42.6	93.3
	4	13	6.7	6.7	100.0
	Total	195	100.0	100.0	

PCM3				
		Frequency	Percent	Cumulative Percent
Valid	1	8	4.1	4.1
	2	96	49.2	53.3
	3	73	37.4	90.8
	4	18	9.2	100.0
	Total	195	100.0	
	al			

PCM4				
		Frequency	Percent	Cumulative Percent
Valid	1	16	8.2	8.2
	2	85	43.6	51.8
	3	77	39.5	91.3
	4	17	8.7	100.0
	Total	195	100.0	
	al			

Project Quality Management

PQM1				
		Frequency	Percent	Cumulative Percent
Valid	1	7	3.6	3.6
	2	63	32.3	35.9
	3	51	26.2	62.1
	4	39	20.0	82.1
	5	35	17.9	100.0
	Total	195	100.0	
	I			

PQM2				
		Frequency	Percent	Cumulative Percent
Valid	1	11	5.6	5.6
	2	60	30.8	36.4
	3	50	25.6	62.1
	4	44	22.6	84.6
	5	30	15.4	100.0
	Total	195	100.0	

PQM3				
		Frequency	Percent	Cumulative Percent
Valid	1	6	3.1	3.1
	2	57	29.2	32.3
	3	53	27.2	59.5
	4	50	25.6	85.1
	5	29	14.9	100.0
	Total	195	100.0	

Project Resource Management

PRM1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	18	9.2	9.2	9.2
	2	81	41.5	41.5	50.8
	3	45	23.1	23.1	73.8
	4	22	11.3	11.3	85.1
	5	29	14.9	14.9	100.0
	Total	195	100.0	100.0	

PRM2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	8.2	8.2	8.2
	2	82	42.1	42.1	50.3
	3	47	24.1	24.1	74.4
	4	20	10.3	10.3	84.6
	5	30	15.4	15.4	100.0
	Total	195	100.0	100.0	

PRM3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	17	8.7	8.7	8.7
	2	65	33.3	33.3	42.1
	3	55	28.2	28.2	70.3
	4	20	10.3	10.3	80.5
	5	38	19.5	19.5	100.0
	Total	195	100.0	100.0	

PRM4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	23	11.8	11.8	11.8
	2	69	35.4	35.4	47.2
	3	58	29.7	29.7	76.9
	4	17	8.7	8.7	85.6
	5	28	14.4	14.4	100.0
	Total	195	100.0	100.0	

Project Communications Management

PCMM1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	23	11.8	11.8	11.8
	2	95	48.7	48.7	60.5
	3	47	24.1	24.1	84.6
	4	5	2.6	2.6	87.2
	5	25	12.8	12.8	100.0
	Total	195	100.0	100.0	

PCMM2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	22	11.3	11.3	11.3
	2	89	45.6	45.6	56.9
	3	56	28.7	28.7	85.6
	4	10	5.1	5.1	90.8
	5	18	9.2	9.2	100.0
	Total	195	100.0	100.0	

PCMM3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	15	7.7	7.7	7.7
	2	112	57.4	57.4	65.1
	3	60	30.8	30.8	95.9
	4	8	4.1	4.1	100.0
	Total	195	100.0	100.0	

Project Risk Management

PRKM1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	48	24.6	24.6	24.6
	2	61	31.3	31.3	55.9
	3	86	44.1	44.1	100.0
	Total	195	100.0	100.0	
	al				

PRKM2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	38	19.5	19.5	19.5
	2	71	36.4	36.4	55.9
	3	86	44.1	44.1	100.0
	Total	195	100.0	100.0	
	al				

PRKM3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	55	28.2	28.2	28.2
	2	67	34.4	34.4	62.6
	3	73	37.4	37.4	100.0
	Total	195	100.0	100.0	
	al				

PRKM4

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	49	25.1	25.1	25.1
	2	66	33.8	33.8	59.0
	3	80	41.0	41.0	100.0
	Total	195	100.0	100.0	
	al				

PRKMQ5

		Freque ncy	Perce nt	Valid Percent	Cumulati ve Percent
Valid	1	47	24.1	24.1	24.1
	2	65	33.3	33.3	57.4
	3	83	42.6	42.6	100.0
	Total	195	100.0	100.0	

PRKMQ6

		Freque ncy	Perce nt	Valid Percent	Cumulati ve Percent
Valid	1	45	23.1	23.1	23.1
	2	77	39.5	39.5	62.6
	3	73	37.4	37.4	100.0
	Total	195	100.0	100.0	

Project Procurement Management**PPM1**

		Freque ncy	Perce nt	Valid Percent	Cumulati ve Percent
Valid	1	13	6.7	6.7	6.7
	2	60	30.8	30.8	37.4
	3	116	59.5	59.5	96.9
	4	6	3.1	3.1	100.0
	Total	195	100.0	100.0	

PPM2

		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	1	18	9.2	9.2	9.2
	2	65	33.3	33.3	42.6
	3	104	53.3	53.3	95.9
	4	8	4.1	4.1	100.0
	Total	195	100.0	100.0	

PPM3

		Freque ncy	Perce nt	Valid Percent	Cumulativ e Percent
Valid	1	19	9.7	9.7	9.7
	2	75	38.5	38.5	48.2
	3	93	47.7	47.7	95.9
	4	8	4.1	4.1	100.0
	Total	195	100.0	100.0	

PPMQ4

		Freque ncy	Perce nt	Valid Percent	Cumulati ve Percent
Valid	1	14	7.2	7.2	7.2
	2	79	40.5	40.5	47.7
	3	92	47.2	47.2	94.9
	4	10	5.1	5.1	100.0
	Total	195	100.0	100.0	

Project Stakeholder Management

PSTM1					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	54	27.7	27.7	27.7
	3	98	50.3	50.3	77.9
	4	17	8.7	8.7	86.7
	5	26	13.3	13.3	100.0
	Total	195	100.0	100.0	

PSTM2					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	59	30.3	30.3	30.3
	3	88	45.1	45.1	75.4
	4	15	7.7	7.7	83.1
	5	33	16.9	16.9	100.0
	Total	195	100.0	100.0	

PSTM3					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	84	43.1	43.1	43.1
	3	83	42.6	42.6	85.6
	4	10	5.1	5.1	90.8
	5	18	9.2	9.2	100.0
	Total	195	100.0	100.0	

PSTM4					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	107	54.9	54.9	54.9
	3	64	32.8	32.8	87.7
	4	12	6.2	6.2	93.8
	5	12	6.2	6.2	100.0
	Total	195	100.0	100.0	

Descriptive Statistics of Each PMBOK Knowledge Area Component

	N	Minimum	Maximum	Mean	Std. Deviation
PIM1	195	1	5	2.87	.839
PIM2	195	1	4	2.82	.778
PIM3	195	2	4	2.88	.770
PIM4	195	1	4	2.70	.917
PIM5	195	1	4	2.77	.775
PIM6	195	2	4	2.71	.773
PSM1	195	1	5	2.92	.833
PSM2	195	2	5	2.96	.836
PSM3	195	2	4	2.89	.645
PSM4	195	2	4	2.90	.614
PSM5	195	2	5	3.06	.967
PSM6	195	2	5	3.17	1.049
PTM1	195	2	5	3.29	.984
PTM2	195	3	5	3.77	.676
PTM3	195	2	5	3.47	.881
PTM4	195	2	5	3.35	.898
PTM5	195	2	5	3.55	.937
PTM6	195	2	5	3.33	1.023
PTM7	195	2	5	3.30	1.032
PCM1	195	1	4	2.48	.795
PCM2	195	1	4	2.45	.781
PCM3	195	1	4	2.52	.720
PCM4	195	1	4	2.49	.769
PQM1	195	1	5	3.16	1.168
PQM2	195	1	5	3.11	1.170
PQM3	195	1	5	3.20	1.110
PRM1	195	1	5	2.81	1.210
PRM2	195	1	5	2.83	1.202
PRM3	195	1	5	2.98	1.254
PRM4	195	1	5	2.78	1.203
PCMM1	195	1	5	2.56	1.144
PCMM2	195	1	5	2.55	1.065
PCMM3	195	1	4	2.31	.673
PRKM1	195	1	3	2.19	.808

PRKM2	195	1	3	2.25	.760
PRKM3	195	1	3	2.16	.800
PRKM4	195	1	3	2.09	.807
PRKM5	195	1	3	2.18	.797
PRKM6	195	1	3	2.14	.767
PPM1	195	1	4	2.59	.663
PPM2	195	1	4	2.52	.720
PPM3	195	1	4	2.46	.727
PPM4	195	1	4	2.50	.706
PSTM1	195	2	5	3.08	.947
PSTM2	195	2	5	3.11	1.024
PSTM3	195	2	5	2.81	.904
PSTM4	195	2	5	2.64	.828
Valid N (listwise)	195				

Success Rate

Descriptive Statistics Of Project Success Rate

	N	Minimum	Maximum	Mean	Std. Deviation
Cost, Time, & Quality	195	1	5	2.93	.787
Meeting Objective	195	2	5	4.08	.805
Customer/Stakeholder Satisfaction	195	1	5	3.11	.852
Valid N (listwise)	195				

(1) Success In terms of Cost, Time, and Quality

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	1	.5	.5	.5
	2	63	32.3	32.3	32.8
	3	80	41.0	41.0	73.8
	4	50	25.6	25.6	99.5
	5	1	.5	.5	100.0
	Total	195	100.0	100.0	

(2) Success in terms of Meeting Objective

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	2	1.0	1.0	1.0
	3	50	25.6	25.6	26.7
	4	74	37.9	37.9	64.6
	5	69	35.4	35.4	100.0
	Total	195	100.0	100.0	

(3) Success In terms of Customer/Stakeholder Satisfaction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	4.6	4.6	4.6
	2	32	16.4	16.4	21.0
	3	85	43.6	43.6	64.6
	4	67	34.4	34.4	99.0
	5	2	1.0	1.0	100.0
	Total	195	100.0	100.0	

Pearson Correlation Result

Correlations

		PMML	SuccessRate
PMML	Pearson Correlation	1	.804**
	Sig. (2-tailed)		< .001
	N	195	195
SuccessRate	Pearson Correlation	.804**	1
	Sig. (2-tailed)	< .001	
	N	195	195

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