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DEPARTMENT OF PROJECT MANAGEMENT

**ASSESSMENT OF PROJECT MANAGEMENT PRACTICE IN THE CASE
OF ADDIS ABABA WATER AND SEWERAGE AUTHORITY PROJECT
OFFICE**

SUBMITTED BY

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ADDIS ABABA. ETHIOPIA



ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF PROJECT MANAGEMENT

**ASSESSMENT OF PROJECT MANAGEMENT PRACTICE IN THE CASE OF ADDIS
ABABA WATER AND SEWERAGE AUTHORITY PROJECT OFFICE**

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PROJECT MANAGEMENT**

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DECLARATION

This research paper, titled - assessment of project management practice in the case of Addis Ababa water and sewerage authority project office is my original work and was completed under the supervision of **Abdurazak M. (PhD)**. All sources of information used in the thesis have been properly credited. I further confirm that the thesis has not been submitted in part or in whole to any other institution of higher learning for the intention of receiving a degree.

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Addis Ababa University

September, 2022

TITLE OF THE THESIS

**ASSESSMENT OF PROJECT MANAGEMENT PRACTICE IN THE CASE OF ADDIS
ABABA WATER AND SEWERAGE AUTHORITY PROJECT OFFICE**

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LIST OF ACRONYMS

AAWSA: Addis Ababa water and sewerage authority

PMBOK: Project management Body of Knowledge

PM: Project Management

PMI: Project management Institute

ABSTRACT

In developing economies, particularly in a nation like Ethiopia where projects of all sizes and structures are conducted, the application of project management knowledge domains is rapidly growing in importance. Project managers face a variety of problems when following the principles and regulations of project management in the context of public administration, which may have an impact on the project's success.

The study attempted to assess the Addis Ababa Water and Sewerage Authority project office's project management approach. The study used a mixed-methods approach that leans more toward qualitative research to meet these objectives. The census was used as a sample strategy since the population was manageable.

The collected data were presented and analyzed using SPSS (version 20) statistical software. In general, the study's findings showed that the five issues described above had the greatest impact on the Addis Ababa Water and Sewerage Authority project office's performance in terms of project management practice. These include concerns with project status reporting that are excessive, the delay in document approval, and team members' lack of technical expertise.

Therefore, to alleviate these prevailing challenges and to increase their project management knowledge & practice capacity, it is necessary to address the obvious need for project management training that exists in the project offices. In this context, the usage of general manuals like PMBOK may be very beneficial. The effective management of project operations as well as increased monitoring and control of quality processes can both be facilitated by the use of computers and software tools. One method of demonstrating the use of project management may also be to hire qualified project managers.

Key words: project management, project management knowledge areas, project management challenges

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

Project management is no longer just about controlling the flow of activities necessary to finish a project on schedule (Alshaer et al., 2017). It involves methodically incorporating stakeholder input, developing a disciplined approach to setting effort priorities and resolving trade-offs, and working simultaneously on all facets of the project in multi-functional teams. To plan, coordinate, and manage the intricate and varied activities of contemporary industrial, commercial, management change, and IT projects, project management has developed.

The application of project management body of knowledge domains is still in its early stages of development in less developed nations. It is a relatively new method that makes use of an integrated planning and control system to make the best use of resources in order to accomplish planned objectives within set time and cost constraints (Alshaer et al., 2017).

The project office of the Addis Ababa Water and Sewage Authority works on projects involving the development of water supply and sewerage disposal systems. The World Bank is the project's major donor. Using its prior sartorial experience, WB uses its financial management, procurement, and project design and implementation expertise to give supervision support to the project (Alias Yusof, 2014).

Therefore, the goal of this study is to fill the gap for the earlier studies that were mentioned above by evaluating the procedures, difficulties, and advantages of the project management procedures used by the project office of the Addis Ababa Water and Sewerage Authority.

1.2 Back Ground of the Organization

By decree No. 68/1971, which was issued in 1971, the Addis Ababa Water and Sewerage Authority (AAWSA) was founded as an independent entity. In 1995 and 2003, it underwent organizational changes. It is a chartered public entity with eleven project offices operating under the name of the sub city, and is led by the city administration council board of management.

With about 1100 public stand posts and about 187,000 private connections, it is Ethiopia's biggest water service provider.

Now, it has the following responsibilities: providing waste water sludge collection and disposal, protecting and conserving water resources, determining the amount of water to be supplied and waste water to be disposed of, and ensuring that water quality complies with standards. These responsibilities are all within the boundaries of Addis Ababa City. Report No. 391 19-ET of the World Bank, Project Appraisal Document. Programs and projects for providing clean water and waste management are being implemented at the national level, and each regional administration is in charge of carrying out the program in the towns in their respective regions.

AAWSA is managed by a general manager who is answerable to a board of directors, according to a Brief Profile of AAWSA (2012). Three deputy general managers oversee the water resource and sewage units and report to the general manager. In addition, the authority has established a project office called the Addis Ababa Water and Sewerage Authority Water and Sanitation Development and Rehabilitation Project Office that is responsible for creating new water and sewer facilities as well as other development projects.

The project manager is in charge of the Addis Ababa Water and Sewerage Authority's Water and Sanitation Development and Rehabilitation Project Office, which was established to carry out authority projects. The project office is fully staffed, organized into departments and procedures, and has a functional manager that reports to the project manager for each department. Support and core processes were separated out into different categories. The departments that make up the support process are procurement, human resources, finance and administration, planning and monitoring unit, etc., whereas the department that makes up the core process is the engineering or technique department, which is in charge of all the projects that the authority undertakes. The project's core processes include project initiation, project execution, project closing, and project transfer to the AAWSA headquarters (AAWSA, 2014).

1.3 Statement of the Problem

Addis Ababa Water and Sewage Authority (AAWSA) is mainly water service provider of Ethiopia's capital city Addis Ababa. The authority is organized as an autonomous public authority having its own separate judicial personality. It is fully owned by the regional

government of Addis Ababa. The 2007 census estimates that about 2, 7 million people live in Addis Ababa. More recent 2016 estimates put the total number of inhabitants at 3.4 million.

The Water Supply and Sanitation Project Office was established in May 2008 by the Addis Ababa Water and Sewerage Authority to administer the Authority's projects. The Office is in Addis Ababa, Ethiopia, with projects throughout the city. There are currently 40 projects. But most projects were suffers from poor management administration as revealed from the informal interview with the one of project office coordinator.

In Ethiopian case, some known projects have been either delayed, have had cost overruns, poor in quality, poor user satisfaction or did not meet the initial objectives (Fetene, 2008;Tekalign, 2014) as mentioned in Firehewot anmaw (2019). According to Tekalign (2018), 79.1 % of the construction project fails to meet its objectives in Ethiopia and if completed it is with an average cost overrun of more than 26.2%. We must know that, Project failures have significant effect from economic as well as political points of view. If the project takes longer time, it requires additional resources, and budgets and this increases labor, material, machinery and equipment cost. This affects the budget of other projects and in general, it affects the economy of the country and results in dissatisfaction of the society at large. This means, Projects are required to be completed within the time frame, budgeted cost and required quality so that to achieve its objective and satisfy stakeholders and users as well. (Firehewot A., 2019).

From researcher preliminary observation and as revealed by the project coordinator in Addis Ababa sewerage authority the most poorly managed projects were Legedadi water drilling project II/Deep well water development project, Armed forces Mekanisa, Behertsege and Gofa area sewerage tower construction project, Akaki chefe phase II sewage treatment plant expansion project, Sanitation services project for the poor communities and Gerbi Dam Construction Project.

According to Abera Mengistu (2018) one of the main reasons of project failure in developing countries is lack of effective or poor project management process. He also stated each project proceeds through a life cycle (almost typical) from preplanning to post evaluation. During implementation changes and differences are encountered and decisions are bound to be taken so that the project can proceed to completion. Management teams are usually grouped from various

disciplines and backgrounds reflecting different attitudes and beliefs imposing distant views and solutions that lead to severe conflicts. Effective project management practices ensure that the project would meet not only key technical objectives (budget, time and quality) but also the needs of stakeholders. It also ensures that the project fulfills the requirements for which it was initiated. On the other hand, ineffective project management practice would lead to project failure.

As far as researchers knowledge concerned though Firhewot (2019) conducts a study on AAWASA regarding project benefit realization, Project cost Schedule / Plan and human resources skills NO empirical research were conducted on the application of PMBOK in the project. So this study deemed to fill the gap by assessing the project management practice of AAWASA project office using the six project management knowledge areas defined by PMBOK. Project scope management, project time management, project cost management, project quality management, project risk management and project integration management.

1.4 Research Question

Based on the above statement of the problem, the study attempts to address the following questions.

1. How Project Integration is practiced in AAWASA?
2. What are the Project Scope practices in AAWASA?
3. How Project Time is managed in AAWASA?
4. How Project Cost is practiced in AAWASA?
5. How Project Quality is managed in AAWASA?
6. What is the Project Risk controlled practices in AAWASA?

1.5 Objective of the study

1.5.1 General Objective

The main objective of the study is assessing the factors affecting the project management practices in case of Addis Ababa Water and Sewerage Authority project office.

1.5.2 The specific objectives are

1. To examine how project integration is practiced in AAWSA
2. To measure how what is the project scopes practices in AAWSA
3. To determine how project time is managed in AAWSA
4. To examine how project cost is practiced in AAWSA
5. To determine how project quality is managed in AAWSA
6. To examine how the project risks are controlled practices in AAWSA

1.6 Significance of the Study

- For the Project Managers: This study is important because it will demonstrate how project offices are doing in terms of using effective project management and will give decision-makers advice on how to make their own practices better. This increase the likelihood that their projects will be completed on schedule, on budget, and in accordance with specifications, as well as guarantee that they will achieve their intended goals.
- For Researchers: The researcher thinks that the study's findings help other businesses understand the significance of certain project management knowledge areas. On the other hand, the study can also be used as a source of information for studies in the field
- For the institution: this study has significance to examine and of good project management practices by project managers and practitioners.

1.7 Scope of the study

- Conceptually; - this paper is restricted only six PMBOK areas. Thus are project integration, project risk, project time, project cost, and project quality and project scope. Other PMBOK areas were not assessed in this paper.
- Geographically; - this study is delimited to Legedadi water drilling project II/Deep well water development project, Armed forces Mekanisa, Behertsege and Gofa area sewerage tower construction project, Akaki chefe part 2 sewage treatment plant expansion project, Sanitation services project for the poor communities and Gerbi Dam Construction Project.

- Regarding time scope: - the data were collected Cross sectional and the current perspective of participant were become a part of a study.
- Methodology: this study used a mixed-methods approach that leans more toward qualitative research to meet the objectives. The census was used as a sample strategy since the population was manageable.

1.8 Limitation of the Study

Project management practices in a case study of Addis Ababa Water and Sewerage Authority Project Management Institute's best practice is taken as a reference for comparison due to its reputation as a de facto International standard. This could also be the limitation of the research as PMI model is predominantly developed from North American research and experience. The chosen methodology that is case study by itself will be another limitation due to the fact that case study is dependent on one side.

1.9 Organization of the Study

There are five primary chapters in the study. The first chapter covers the background of the study, the statement of the problem, the purpose of the study (general and specific objectives), the relevance of the investigation, the scope of the study, and the limitation of the study. The research's second chapter covered crucial topics like a review of pertinent literature and discussions of the definition and significance of projects and project management, project types and life cycles, the history and evolution of project management, various bodies of project management knowledge, various project management methodologies, and current project management practices.

The methodological section of this essay, which covers data sources, data collection strategies, sampling methodologies, and data analysis methods, is covered in the third chapter. The analysis and discussion of the findings based on the information gathered via the questionnaire are covered in chapter four. The fifth and final chapter focuses on the conclusions and suggestions made in light of the research's findings. The document also includes appendices and references.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1 Concept of Project Management

The Project management is the process of carrying out certain project goals in accordance with predefined parameters by using procedures, techniques, abilities, knowledge, and experience. The timing and budget for project management's final deliverables are constrained (Ahola, T. et al. 2014).

The goal of creating a thorough definition of what a project is has proven elusive over time, and the definition of a project has been the subject of great dispute among project management practitioners over the years (Cleland. 2007).

Project is a multidisciplinary term with numerous definitions provided by various writers since it has diverse meanings depending on the perspective and attitude of the speaker. The definitions of engineers, architects, managers, and other professionals were developed based on their professional experiences.

According to the Project Management Institute, PMI (2013), a project is a brief action or endeavor conducted with the intention of producing a distinctive result (product or service) within the constraints of time, money, and standards.

Project was defined by Badewi, A., and Shehab, E. (2016) as "an organization of human materials and financial resources in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, defined by quantitative and qualitative objectives so as to achieve a beneficial change. The research literature uses a variety of descriptions of the term project. Here is an illustration of that;

A project is a short-term undertaking started with the intention of developing a special good or service. Temporary projects have defined endings, and distinctive products or services are those that stand out in some way from all similar goods or services. (PMI, 2013).

A project is described as a unique, complex, connected series of activities that have one goal or purpose and that must be completed by a specific date, within a given budget, and in accordance

with specifications. Alternatively, a project is described as a complex, non-routine, one-time effort limited by time, budget, resources, and performance specifications designed to meet customer needs. J. Heagney (2016)

Since the beginning of time, people have utilized projects as a means of achieving their goals. These projects have produced significant contributions to society and culture, such as the Great Wall of China, the first steam engine, and ancient Roman roadways.

A project is a brand-new, singular, and transient collection of activities with a clear start and finish that makes strategic use of resources to accomplish predetermined goals. Projects are inherently transient, in contrast to recurring or ongoing operations.

According to T. Ahola et al. (2014), a project is a brief venture started with the intention of producing a one-of-a-kind good or service. As a result, every project has a clear beginning and conclusion by carrying out an original task. A project has been referred to be a human effort and may be rightfully viewed as such by its stakeholders when it has a distinctive scope of work that is bound by cost and time, with the purpose of achieving beneficial change as defined by quantitative and qualitative objectives.

A project is defined as an endeavor to create value based on specifications that is accomplished within a specified or predetermined time frame and subject to constraints, such as available resources and external conditions. A project is viewed as a business case that outlines the advantages and hazards of the enterprise, demonstrates a specific set of deliverables with a limited lifespan, and is carried out utilizing certain resources and undertaking specific duties (Hjelmbrekke, H., et al2014).

These definitions share the traits of being distinct in their results, having a clear beginning and finish, being of a temporary character, and being carried out to realize the strategic goals of the business. In today's modern companies, these transient structures are essential, and there is growing interest in the importance of these temporary structures in organizations. R. Joslin, R. Müller, and others (2016).

2.2 Evolution of project management

According to Kerzner, H. R. (2009), project management is important since all firms, regardless of size, eventually have to adopt new projects. These efforts may involve developing a new product or service, setting up a new production line, launching a public relations promotion campaign, or undertaking a big building project, among other things. The 1980s were about quality, the 1990s were all about globalization, but the 2000s are about velocity. Organizations must constantly develop complex products, services, and processes with very constrained time to market windows while simultaneously relying on cross-functional expertise in order to stay ahead of their competitors. In this situation, project management becomes a crucial and essential ability.

According to PMI (2013), enterprise teams are able to collaborate to define plans and manage take-to-market projects as the growth of project management capabilities in organizations coexists with the use of information management systems by coordinating team-oriented tasks, schedules, and resource allocations. This has made it possible for cross-functional teams to develop and share project information.

Project management approaches can be applied in a real-time environment with the help of information management systems, although this is insufficient. Users who are dispersed locally, nationally, or even worldwide can instantaneously view and communicate with the same updated project information, such as project schedules, threaded conversations, and other essential data, thanks to this potential project management talent. In this context, "dispersed user" has a more general meaning.

Although project management has been practiced since the Egyptian era, according to Sudhakar, G. P. (2016) corporations didn't begin utilizing formal project management tools and procedures to manage significant projects until the middle of the 1950s. Modern project management approaches originated in the United States, where they were first used to two concurrent but separate planning and control concerns. The US Navy was engaged in the first lawsuit, and at the time it was concerned about the administration of contracts for its Polaris Missile programmer. These contracts covered both the creation of original, first-time works as well as work on research and development initiatives.

This particular project was marked by significant uncertainty because neither the cost nor the length could be calculated with accuracy. As a result, probabilities were used to determine completion times. The most likely, pessimistic, and optimistic scenarios served as the foundation for the time estimations. These three time alternatives were mathematically analyzed to determine the most likely completion date. The phrase "program evaluation review technique" was the name of this procedure (PERT). Initially, the PERT approach did not take cost into consideration. However, the cost feature was later included using the same estimating process as with time. PERT was found to work best (and still does) for projects that had a lot of uniqueness and a high level of uncertainty. These three estimating possibilities are the source of this.

PERT and CPM both had a rise in popularity in the private and public sectors during the 1960s and 1970s, according to Too, E. G., & Weaver, P. (2014). NASA, various defense departments, and significant engineering and construction businesses internationally have all adopted project management theories and practices to handle large budget, schedule-driven projects. These project management technologies grew widely during this time as computers and the associated project management software packages advanced. These software applications could initially only be utilized with mainframe or microcomputers, and they were highly expensive. It became simpler to use project management techniques in the 1980s with the advent of the personal computer and accompanying inexpensive project management software.

The project timescale was shortened during this time due to the growth of technology, particularly the advent of autos and telecommunications, according to Abera Mengistu's (2018) analysis of the craft system of human connections in use before to 1958. For example, cars made it possible to move about and allocate resources efficiently, while the telecommunications network sped up communication. The task specification that eventually served as the basis for the Work Breakdown Structure (WBS) was widely used, and Henry Gantt also invented the Gantt chart. Two examples of undertakings completed during this time period that are backed by documentary evidence include the construction of the Pacific Railroad in the 1850s and the Hoover Dam, which employed about 5,200 people and is still one of the largest gravity dams in the United States.

In line with Ahola, T. et al. (2014)'s study on the use of management science from 1958 to 1979 Technology made great strides between 1958 and 1979, with Xerox introducing the first

automatic plain-paper copier in 1959. Two of the key project management tools that were introduced between 1956 and 1958 were CPM and PERT. However, one aspect of this time period that stood out was the quick development of computer technology. As the mainframe gave way to the minicomputer in the 1970s, computers became affordable for medium-sized organizations. In 1975, Bill Gates and Paul Allen founded Microsoft.

A number of project management software companies were also established as a result of the advancement of computer technology. These companies include Scitor Corporation, Oracle, and Artemis, all of which were created in 1977. (1979). The 1970s also saw the development of additional project management techniques, such as Material Requirements Planning (MRP).

According to Ahola, T., Ruuska, I., Arto, K., & Kujala, J. (2014) Production Center Human Resources, 1980–1994 the personal computer (PC) and related computer communications networking capabilities, which were introduced in the 1980s and 1990s, marked a significant advancement in the information management industry. This innovation led to the creation of low-cost multitasking PCs that were highly effective at monitoring and regulating intricate project schedules. Project management techniques were made easier to acquire during this time due to the widespread availability of cheap cost project management software for PCs.

According to Creating a New Environment, 1995-Present by Al-Hila, A. A., Alhelou, E. M. S., Al Shobaki, M. J., and Abu Naser, S. S. This period is dominated by the Internet-related breakthroughs from the middle of the 1990s that radically changed corporate operations. Thanks to the quick, interactive, and personalized new media that the Internet has to offer, people can now browse, purchase, and monitor goods and services instantly. Businesses are now more effective, productive, and customer-focused as a result. Many project management solutions available now also have Internet access.

This makes it possible for data to be automatically uploaded so that anyone with a standard browser in any location can: (a) input the most recent status of their assigned tasks; (b) learn how the project is doing overall; (c) be informed of any delays or advancements in the schedule; and (d) remain "in the know."

2.3 Project Management Process Groups

Any project must use the five project management process groupings. Before a project is finished, the process groups frequently go through numerous iterations and have internal dependencies. Project management processes are a part of a process group, and they are interconnected since the output of one process serves as the input for another (PMI, 2013).

The process groups should not be viewed as project stages that finish with the completion of a particular phase or segment. The process groups are repeated in each phase of major projects with clear phases or sub-projects, and there are ongoing interactions between the groups throughout the project. Below is a description of the five recognized process groups;

- Initiating Process
- Planning Process
- Executing Process
- Monitoring and Controlling Process
- Closing Process

2.3.1 Initiating Process

A new project is frequently started outside the project's defined scope. Basic definitions of the scope, deliverables, duration, and resource estimates serve as the foundation for the decision to begin initiation. The Initiation Process Group manages and improves this documentation to make it easier for a new project to receive formal approval. Whenever a major, multiphase project is started, procedures are followed to verify the hypotheses and choices established in the original project charter (Alias, Z, Yusof, K. Determining, 2014)

The project organization creates the project charter, but finance and approval are handled externally. The project maintains focus and the start criteria are confirmed for each phase by examining the initiation process at the beginning of each new phase or sub-project. The sub-project initiation procedures additionally carry out additional project scope assessment and development (PMI, 2017).

The main advantages of this Process Group are that projects are only approved when they are in line with the organization's strategic objectives and that the business case, benefits, and stakeholders are taken into account right from the beginning. The business case and benefits are developed and defined by the project manager in some organizations. The project sponsor, project management office (PMO), portfolio steering committee, or another stakeholder group completes the pre-project work in such organizations, whereas the project manager typically contributes to the project charter in other organizations. This standard presupposes that the sponsor or another governing authority has authorized the project after reviewing the business paperwork and giving the project their seal of approval.

2.3.2 Planning Process

The Planning Process; primary focus is on creating and overseeing the project management plan. All components of the project management plan are identified, defined, and managed as part of the planning procedures. To keep the project management plan current, these steps are regularly iterated as new information is uncovered (PMI, 2017).

An updated project management plan provides greater precision in the schedule, cost and resource requirements which increase the chances to meet the defined project scope. It is important that the project team involves stakeholders, who often have useful knowledge, in the project planning.

Stakeholder demands and requests must also be addressed as early in the planning procedures as possible. The Planning Process Group places a high value on iterations since many hazards are frequently simpler to discover after the bulk of the planning has been completed. This implies that the project team may need to reevaluate the planning with regard to the timeline, cost, or resources in light of recently discovered risks or possibilities (Alshaer, I., 2017).

2.3.3 Executing Process

The project management plan's work is carried out through the procedures that make up the Executing Process. This process is responsible for integrating activities and coordinating resources in accordance with the project management strategy. Re-planning is usually necessary in projects because of variations in activity duration, productivity, etc. These adjustments to the

planning process should be examined, and if necessary, an update request should be made in the project management plan. The Monitoring and Controlling Process analyzes these kinds of developments.

2.3.4 Monitoring and Controlling Process

Apparently, Heagney, J. (2016) The Monitoring and Controlling Process Group includes the processes used to monitor and control the project's execution in order to identify potential problems and take corrective action. When a project's performance is regularly monitored and measured, differences with the project management plan are quickly identified. An investigation into any issues or discrepancies in the project may lead to an amendment to the project management strategy. The project team gains insight into the overall project's development and is made aware of any areas that need more attention through ongoing monitoring.

2.3.5 Closing Process

In this collection of steps, the project is formally accepted as finished, the final performance and lessons learned are documented, any contracts are closed, and the resources are made available to work on other projects. It deals with the result of excellent project management abilities that were shown throughout the various connected processes that led the project. Good results at the end result in positive reviews and can boost future word-of-mouth recommendations (PMI, 2013).

Some additional characteristics of the project processes are:

- Process groups are linked by the results they produce; the result or outcome of one becomes an input to another.
- Process groups are not discrete, one-time events; they are overlapping activities which occur at varying levels throughout each phase of the project
- The process group interactions also cross phases such that closing one phase provides an input to initiating the next which means that in actual projects there will be many overlaps

2.4 Project Management Body of Knowledge Areas

The PMI (Project Management Institute) developed the PMBOK to guarantee a set of knowledge principles in project management. The goal is to assist a project manager in successfully completing their projects (PMI, 2013).

The PMBOK is a comprehensive framework of ten knowledge categories that are divided into activities for each of the five stages or process groups of the project life cycle. It is said to contain all of the information usually accepted as best practice in the field of project management. An awareness of the application area, the project environment, general management knowledge and skills, and interpersonal skills are all mentioned in the PMBOK along with these specific knowledge domains, tools, and techniques.

The PMI (2013) defines the Project Management Body of Knowledge as the total body of knowledge for the project management profession. In order to represent the interests of the project management sector, the PMI was established in 1969. It actively participates in establishing guidelines for this practice. The foundation of PMI's guiding principle is the notion that project management methodologies and tools are applicable to both software and construction projects (PMI, 2013).

The creation of what is now known as A Guide to the Project Management Body of Knowledge, which contains the standards and guidelines of practice management and is extensively used in this position, was authorized by PMI in 1981. The PMBOK was first released in 1987 and quickly rose to prominence among securities everlasting company management. The American National Standards Institute also recognized it as an American National Standard (PMI, 2013).

2.4.1 Project Integration Management

The procedures needed to identify, group, unify, and coordinate diverse tasks as well as manage interdependencies to guarantee that various project components are correctly coordinated are outlined in the PMI, 2013, guide. Develop project charter, project plan development, project plan execution, and overall change control are the main processes that fall under project integration

management. The first procedure aids in the project's formal authorization and permits the project management to use organizational resources.

The creation of a project plan helps to combine the outputs of several planning procedures into one cohesive document. By carrying out the tasks outlined in the project plan and putting into practice approved process improvement plans and adjustments, project plan execution assists in carrying out the project plan. Last but not least, comprehensive change control aids in organizing changes across the entire project.

2.4.2 Project Scope management

At the outset of the project, all stakeholders must define and agree upon the criteria (measure) for project success (time, money, and deliverables). It guarantees that all the effort necessary to successfully execute the project is included.

The key project scope management procedures, according to PMI (2013), involve initiating the project's subsequent phase. Then, create a scope management strategy to determine how the scope will be established, validated, and controlled, including how to avoid scope creep, how to handle change requests, an escalation channel for stakeholder dispute on scope items, a WBS, and how the deliverables will be approved.

Ahola claims that T. According to et al. (2014), this process is the first step in project scope management. The process' main output is a project scope management plan, and its tools and techniques include template forms, standards, as well as expert judgment. The project's size, complexity, importance, and other factors will affect how much effort is spent on scope planning. The third step would be gathering requirements, which would include documenting the needs, wants, and expectations of the stakeholders utilizing stakeholder requirements, project requirements, and quality requirements using interview, focus groups, observation, questionnaire, document analysis, etc.

The following procedure is scope definition, which aids in defining project and product scope and specifies what will and won't be included in the deliverables, as well as providing information on risks, restrictions, and assumptions. The project scope statement comprises goals,

the project's parameters, the deliverables, a cost estimate, and other details. Using a WBS to divide the primary project deliverables into smaller, more manageable components is the other important phase. If the budget and timeline are unable to fulfill management's expectations, WBS can offer options.

After creating the WBS, we must confirm the scope before formally requesting that stakeholders and customers accept the deliverables near the end of the project or phase. For regulating and evaluating changes to project scope, there needs to be a scope change control. In order to ensure that the project continues on track and avoid unneeded changes, it assesses the work product against the scope baseline.

2.4.3 Project Time Management

All procedures necessary to guarantee the project will be finished on time are included in project time management. Activity definition, activity sequencing, activity resource estimation, activity length estimation, schedule development, and schedule control are the main time management processes (PMI, 2004).

One of a project's most crucial plans is the time timeline. The previously created WBS should serve as the foundation for creating time schedules. The amount of effort put into creating, maintaining, and controlling a project's schedules is frequently directly mirrored in how it is carried out and how it turns out Heagney, J. (2016).

Activities must be correctly ordered in order to create realistic and feasible schedules. Identification of logical connections and interdependence between project activities is part of the activity sequencing process. Identifying the resources and quantity of each resource that will be used in the project is part of the activity resource estimating process. Personnel, equipment, and material are all examples of necessary resources. The timing of each resource's availability for the project is also determined throughout this procedure (PMI, 2004).

Top-down and bottom-up resource estimating techniques are the two most common. The top-down approach is frequently utilized when there is little particular knowledge about the project. It is done out by the project's upper management and is based on lessons learned from previous

initiatives of a similar nature. The bottom-up approach, also known as qualitative based estimations, incorporates each distinct labor type. Although the bottom-up approach takes more time to complete, it frequently produces results that are more accurate (Alias, Z, Yusof, K. Determining., 2014).

The project scope, the types of resources that are needed, the projected amounts of resources, and the availability of resources should all be taken into consideration when estimating how long an activity will take. Later, schedules are created using the process' output. A individual or group knowledgeable with the particular activity should conduct the estimation to ensure accuracy.

The creation of schedules is frequently done using project management software. The majority of the schedule development, if the earlier predictions were done correctly, entails compiling the data into a single document. The project's required resources can include personnel, equipment, and material. It is important to determine the types and quantities of each resource that will be employed. The timing of each resource's availability for the project is also determined throughout this procedure (PMI, 2004).

Top-down and bottom-up resource estimating techniques are the two most common. The top-down approach is frequently utilized when there is little particular knowledge about the project. It is done out by the project's upper management and is based on lessons learned from previous initiatives of a similar nature. The bottom-up approach, also known as qualitative based estimations, incorporates each distinct labor type. Although the bottom-up approach takes more time to complete, it frequently produces results that are more accurate (Heagney, J., 2016).

The activity duration estimation should be based on the project scope, required types of resources, estimated resource quantities and the availability of resources. The result of the process is later used to develop schedules. To get an accurate estimation of duration it should be carried out by a person or group who is familiar with the specific activity. The development of schedules is often carried out through the use of project management software. If the previous estimations are made correctly the schedule development mostly consists of aggregating the information into one document.

To develop an efficient schedule, it is important that the critical chain is identified and that the lags in the schedule are used to allocate the project's resources effectively (PMI, 2004). A time

schedule without control is fairly useless to the project organization. The control must be carried out regularly and relatively often in order to detect deviations early. This makes it possible for the project team to take necessary actions to avoid longer delays. The schedule control and development must be an iterative process in order for the project team to have updated schedules throughout the project.

2.4.4 Project Cost Management

Cost estimation, budgeting, and control are all parts of project cost management. Cost management's primary goal is to accomplish the project within the specified spending limit (PMI, 2004). The project budget is crucial and affects every aspect of a project's planning and execution. It's critical to maintain track of a project's overall expenditures as well as the prices associated with various work packages. A professionally created budget not only keeps project expenditures under control, but it also fosters the growth of a project's cash flow in a positive way. There is a substantial danger for a temporary halt of a project's progress, which frequently results in significant additional expenditures and delays.

The project scope, the WBS, and the project plan should serve as the foundation for the cost estimation. Each activity must be estimated based on the circumstances surrounding its execution in order to arrive at an accurate estimate. A reserve cost can be applied to activities with little to no comprehensive information or work packages with potentially significant financial risks because there are frequently many aspects that are uncertain in a project (Badewi, A., & Shehab, E., 2016).

It's crucial to implement effective cost control if you want to take control of the project's finances. The pre-calculated budget serves as the framework for the project's financial components, but it can only be used efficiently with current and accurate cost control. Cost management should compare the projected value and the actual cost of each work package while also analyzing the earned value of the project's costs. To create projections of the project's future and final costs, a properly executed analysis of the existing financial situation is required (Badewi, A., and Shehab, E., 2016)

2.4.5 Project Quality Management

To establish quality standards and ensure that the job is completed to a satisfactory standard, project quality management covers all processes and activities within the project organization. Quality control, quality assurance, and quality planning are the three main procedures in quality management (PMI, 2004).

To carry out quality control, the project team must determine which quality standards are pertinent to the project. When creating a quality strategy, the established standards should serve as the starting point. It is crucial that the quality plan include both strategies for achieving the desired quality as well as the needed levels of quality for various operations (Wei & Yang, 2010).

The goal of quality control is to make sure that the project is carried out in accordance with the quality plan and that defined criteria are met. The project team must establish techniques to track and manage particular project activities in order to perform quality control. The implementation and control of the quality plan must be done carefully; if not, the project organization won't benefit from the quality plan (PMI, 2004).

2.4.6 Project Human Resources Management

The procedures used to make sure that the project organization is set up in a way that provides the project with favorable conditions for success are known as project human resources management. Planning for human resources, assembling a project team, training that team, and managing that team are important procedures in human resources management (PMI, 2004).

It is important for project management to define how the project team should be structured and identify the responsibilities that are necessary in the early stages of a project. The project team should allocate each function specific areas of accountability, power, and necessary expertise.

It's crucial that a role with clearly defined responsibilities also has the power to make decisions within those responsibilities. Without authority, responsibility makes it very difficult for middle management to influence the work, which almost certainly has a negative impact on the project (Walker, 2007). Staff changes, particularly when important positions are involved, frequently

have a detrimental impact on the project's time, cost, and team growth. Therefore, the project management should make an effort to alter the primary duties of the project team as little as feasible.

2.4.7 Project Communications Management

The procedures used to make sure that necessary information is delivered to the appropriate person at the appropriate time are known as project communications management. Planning communications, disseminating information, tracking performance, and managing stakeholders are the key processes in communications management (PMI, 2004). Planning the handling of communication within a project is necessary to carry out efficient work and reduce hazards. To ensure that project communication, both internally and externally, is carried out successfully, a communication plan is required. The strategy should include information on the kind of information that must be disseminated, who must get it, why it must be disseminated, how frequently it must be delivered, and who is accountable for issuing it (Ahola, T. et al. 2014).

The communication strategy should also outline the meetings that are necessary for the project, together with details on their attendees, goals, and frequency (PMI, 2004). The project management team must produce periodic progress reports, primarily to update clients and other stakeholders on the project's status but also to maintain control over all project-related activities. A progress report should focus on deviations from the project plan and contain current status of the Project, executed and planned actions, uncertainties, and forecasts regarding cost and time.

The management team should suggest corrective steps to bring the project in line with the project plan when deviations from the baseline are noted in the status report. Work efficiently and with as little danger as possible. To ensure that project communication, both internally and externally, is carried out successfully, a communication plan is required. According to Alshaer, I. M. A., Al-Hila, A. A., Al Shobaki, M. J., and Abu Naser, S. S., the plan should include information on the type of information that must be distributed, who must receive it, why it must be distributed, how frequently it must be distributed, and who is responsible for issuing it (2017).

The communication strategy should also outline the meetings that are necessary for the project, together with details on their attendees, goals, and frequency. The project management team

must produce periodic progress reports, primarily to update clients and other stakeholders on the project's status but also to maintain control over all project-related activities.

When deviations from the baseline are identified in the progress report, the management team should include recommended corrective actions in order to bring the project back on track. A progress report should concentrate on deviations from the project plan and contain current Project status, executed and planned actions, uncertainties, and forecasts regarding cost and time. according to the project's schedule (Shobaki, M. J., Abu Naser, S. S., 2017)

2.4.8 Project Risk Management

Project risk management's primary goals are to raise the likelihood and impact of events that are favorable to the project and minimize the likelihood and impact of occurrences that are unfavorable to the project (Abu Naser, S. S., 2017).

One of the most important aspects of project management procedures to ensure a project is effectively finished is risk management. A project risk is a hazard that, if it materializes, could have a positive or negative impact on at least one project goal, such as timeliness, cost, or quality. Additionally, he defined risk as "a mathematical combination of an accident's event chance of occurrence and that event's consequence, should it occur." After defining risk, the next step is to determine what the Risk Management process means.

In order to reach the highest level of risk elimination, mitigation, and control, risk management is a structured procedure that may be used to identify, analyze, and respond to risks throughout the lifecycle of a project. Risk management, then, has a direct impact on how successfully a project is completed. The widely used and comprehensive literature on risk management is extensive. Three fundamental steps make up the straightforward, widespread, and systematic method to risk management proposed by:-

- ✓ **Risk Identification:** determining the types of risks, identify, and assess the potential risks in the project.
- ✓ **Risk Quantification:** the probabilistic characteristics and the degree of the Impacts for their impacts.

- ✓ **Risk Response and Development Control:** defining opportunities for managing changes in risk during the project life cycle.

Every endeavor has unknowns that could either be an opportunity or a risk. Where management lacks sufficient knowledge of the existing situation, uncertainty frequently arises. Many uncertainties can be transformed into opportunities rather than risks by effective management. When there is little information available in a number of areas early on in a project, risk analysis is frequently conducted. As more information becomes clear to the management team throughout the project, the analysis must be revised in order to manage risks and opportunities efficiently.

The goal of a risk analysis is to take control of the project's uncertainties. Therefore, it is crucial to design a strategy as soon as hazards are discovered in order to respond to them (PMI, 2004). A typical and efficient method of risk analysis is to assess the likelihood and impact of a risk. A reaction plan can be to reduce the probability or impact of a risk or to accept the risk and calculate with a potential additional cost if the risk arises. The risk response is therefore determined by the total value of all the risks, which results in a risk management where the response is dependent on the risk's size.

Risk is defined by Bedford and Cook (2001) as having two components: hazard (danger) and uncertainty (quantified by probability). Since we are unable to foretell the conditions of the future, uncertainty is a component of our daily lives. Uncertainty can create possibilities or failure hazards for a project. The same authors contend that early project phases are when uncertainty is most common and that lack of uncertainty leads to hazards. There is a chance that the outcomes of those actions won't be what was anticipated because it is very difficult to foresee all elements at the start of a project.

According to Project Management Institute's (PMI, 2004) definition of risk, risk should take into account both a project objective's positive and negative implications. This is a comprehensive definition of risk that takes into account dangers and opportunities, but it can be effective in principle but fall short in practice. Either randomness or epistemicity could be used to describe risks and uncertainty. Risk that is random still has random results and is unpredictable, despite the fact that we can estimate it using probabilities. This kind of risk is possible due to unpredictability in nature.

2.4.9 Project Procurement Management

Project procurement management is the processes to control and administrate contracts and purchase orders from sources external to the project organization. The major processes in procurement management are plan purchases and acquisitions, plan to contract, request seller responses, select sellers, contract administration and contract closure (PMI, 2004). The planning of procurement management should be carried out early in the project and focus on analysis of which products or services that need to be purchased. After the initial planning, a procurement plan should be developed that includes all major procurements that are needed in the project (PMI, 2004).

A procurement plan is an important tool for efficient procurements throughout the project. It should be developed based on the project's WBS and time schedule in order to include all procurements and to be timely integrated in the project. The procurement plan includes budgeted cost and required finish date for each procurements. Especially important is the identification of procurements with a long lead time, since they have to be initiated early. A poorly developed procurement plan, or the lack of one, is likely to cause high procurement costs and in worst case even force the production to be stopped (Alias, Z, Yusof, 2014).

In larger projects, there is often a procurement manager assigned to control and handle procurement Activities. The procurement manager is responsible to plan and execute purchases. An important part of the procurement manager's work is to evaluate quotes in order to achieve cost effective contractors. To keep control of the cost forecasts in the project the procurement manager must follow-up the actual cost in relation to budgeted cost for each purchase.

2.4.10 Project Stake Holder Management

The stakeholder theory coined by Freeman forms a ground for many other developments on stakeholders' management. Freeman's stakeholders theory evolved through his "Strategic Management: A Stakeholder Approach" which became the theoretical ground for further developments. Stakeholder theory is a theory of organizational management and ethics. It opposes the free market norm of shareholder capitalization and promotes stakeholder

maximization. For many decades economists have been defining the purpose of a business as an instrument to capitalize on shareholders, this was also referred to the legal purpose of a business.

According to Ahola, T., Ruuska, I., Artto, K., & Kujala, J. (2014) stated that this is a misinterpretation as law has not defined the purpose of a business to capitalize on shareholders; law simply says to do the lawful. This may also reflect the purpose of a project as an instrument established to deliver benefits to its stakeholders that include the project owner .The stakeholder view of strategy integrates both a resource-based view and a market-based view, and adds a socio-political level. One common version of stakeholder theory seeks to define the specific stakeholders of a company (the normative theory of stakeholder identification) and then examine the conditions under which managers treat these parties as stakeholders (the descriptive theory of stakeholder salience

Project Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution (PMI, 2013). The processes support the work of the project team to analyze stakeholder expectations, assess the degree to which they impact or are impacted by the project, and develop strategies to effectively engage stakeholders in support of project decisions and the planning and execution of the work of the project.

2.4.11 Project Management Practices

This study is based on the chaos theory. In common usage, ‘chaos’ means a state of disorder. However, chaos theory is a field of study in applied mathematics and studies the behavior of dynamic systems that are highly sensitive to initial conditions, an effect which is popularly referred to as the butterfly effect. Small differences in initial conditions, such as those due to rounding errors in numerical computation, yield widely diverging outcomes for chaotic systems, rendering long term prediction impossible in general.

This happens even though these systems are deterministic, meaning that their future behavior is fully determined by their initial conditions, with no random elements involved. In other words,

the deterministic nature of these systems does not make them predictable. This behavior is known as deterministic chaos, or simply chaos. Chaotic behavior can be observed in many natural systems, such as the weather. For a dynamic system, to be chaotic it must have the following properties: It must be sensitive to initial conditions; it must be topologically mixing; and its periodic orbits must be dense.

Project management systems are considered dynamic systems, similar to those in nature, which means they change over time and are hard to predict. This increasingly fast-paced system is ‘a breeding ground’ for a chaotic management system. This breeding ground is creating a complexity explosion, which is affecting the way project managers need to manage. Even though they are changing, there is usually an underlying predictability that can be identified. This is where chaotic behavior comes into play. Behavior in systems can be placed into two zones. One, the stable zone, where the system, if disturbed, returns to its initial state and two, the zone of instability where some small activity leads to further divergence (Ahola, T., Ruuska, I., Artto, K., & Kujala, J., 2014).

According to Kerzner (2015), the use of the best project management practices leads to added business value, greater benefit realization, and better benefits management activities, zone, where the system, if disturbed, returns to its initial state and two, the zone of instability where some small activity leads to further divergence. Project management practices are gaining increasing visibility and importance to organizations, however, project management remains a highly problematical endeavor.

According to Kerzner (2015), the use of the best project management practices leads to added business value, greater benefit realization, and better benefits management activities. Project management practices are required to ensure project success .Several studies have been conducted to demonstrate the value of project management. Several authors have shown that project management delivers several tangible and intangible benefits to organizations for example, tangible benefits, such as better financial ratio of return on investment, and intangible benefits, such as corporate culture, organization efficiency, and client satisfaction.

Project management bodies of knowledge are used by practitioners as “best practice” guides to what the project management discipline comprises. The project management body of knowledge

is the sum of knowledge within the profession of project management, which includes proven traditional practices that are widely applied, as well as innovative practices that are emerging in the profession, including published and unpublished material (Ahola, T., Ruuska, I., Artto, K., & Kujala, J., 2014).

There has been an emergence of multiple bodies of knowledge and/or standards, including A Guide to the Project Management Body of Knowledge (PMBOK Guide) Sixth Edition, from the Project Management Institute (PMI, 2017); APM Body of Knowledge (APM BOK) from the Association for Project Management (APM, 2012); Individual Competence Baseline (ICB4) from the International Project Management Association (IPMA, 2015); and A Guidebook of Project & Program Management for Enterprise Innovation (P2M) from the Project Management Association of Japan (PMAJ, 2005).

The attempts to systematize the knowledge required to manage projects through bodies of knowledge are largely based on the underlying assumption that there are identifiable patterns and generalizations, from which rules, controls, and guidelines for “best practices” can be established that are replicable, Even if not in every circumstance. The PMBOK Guide has been used as the source of this study owing to its extent of use in the context studied. Although the project management paradigm is surprisingly well defined through generic bodies of knowledge, project management is highly contingent on the organizational context, such as the structure of the business or sector, the size, and the organization environment (Artto, K., & Kujala, J., 2014).

Project management practices, when applied properly, lead to an increase in the probability of project success, however, each organization must assess the applicability of each practice because their use may not have the same effect for different organizations. Project management, therefore, can be implemented by means of tools and techniques, which should be tailored to the organization’s context. Always be applied uniformly to all projects” (Project Management Institute, 2017, p. 28); the organization and/or project management team is responsible for determining what is appropriate for any given project (Kujala, J. (2014).

Though there are different indicated project management practices defined by different scholars, this study will be benchmarking project management practices discussed in the PMBOK Guide, from the Project Management Institute (PMI, 2013). Project Management Institute is a U.S. not-

for-profit Organization founded in 1969. The PMBOK Guide defines guidelines for project management that aim to promote and expand knowledge in the field.

According to (Wideman, 1998:7), “Project Management Body of Knowledge (PMBOK) published by the Project Management Institute (PMI) represents the knowledge and practice that is generally accepted and unique or nearly unique to the field of project management”. The sixth edition of the PMBOK Guide identifies 10 Knowledge Areas: Project Integration Management, Project Scope Management, Project Schedule or Time Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management, and Project Stakeholder Management.

2.5 Challenges of Project Management Practices

According to Hence, according to PMI (2013) every project is different by its nature that is, its type, size, its geographic location, uniqueness, personnel involved in the project. Project execution is inherently risky and the lack of appropriate approach to addressing these risks has led to a lot of undesirable results.

The major challenges of project management are to accomplish all of the aims and objectives of the project while at the same time mitigating the constraints of the projects. The scope, time, cost and quality are the major project constraints. The role of senior leadership in shaping project organization is crucial. Implementation of project management practices in the project depends on the existing organizational culture, which directly influences the project organization. Project managers must focus on key challenges areas while implementing knowledge areas. Role of senior leadership, effectiveness of PMO, human resource management factors, PM training, poor adoption of PM standards, and triple constraints are some of the important challenges that can occur while implementing best practices(Alshaer, I, M, 2017).

From of all literatures that discussed about project management challenges here are the summarized most known challenges of project management? Such as government policies, insufficient funds, withdrawal by donors, shortage of foreign exchange, inappropriate contract conditions, political priorities, poverty, socio-cultural conditions, corruption, and low

institutional and human capacity are considered to be the major factors behind the poor performance of projects (Al-Hila, S.(2017).

2.5.1 Challenges with Human resources

The human resource need of project management is the biggest challenge of project management practice in the 21st century. It is the human resource that plan and execute the project and ensuring that project teams are competent enough to successfully manage the project to exceed stakeholders' expectation is crucial. Every project has different human resources needs with different skills. Most time it is difficult to get the right employees on the project and this staffing problem may therefore have several implications on the success of the project.

2.5.2 Costing and Estimating the Resources

According to Badewi, A., & Shehab, E. (2016) Project management practice depends a lot on forecasting in planning for the projects and the organization. So, what happen when things deviate from the initial planning as arranged or intended? This could pose serious threat to the success of the project and that of the organization. It therefore important that costing of the projects are as accurate as possible before the project commence. A lot of project failures known in literature are mostly due to wrong estimate or costing problem.

2.5.3 Benefits of Project Management Practices

As believed by various authors and practitioners of project management, although the absence of project management will not necessarily lead to project failure, its practice has a great deal of contribution on the successful completion of the project within its constraints and effective use of scarce resources. The importance of Project management in managing projects successfully cannot be understated (Kerzner, 2009).

Project management is helpful to have a clear definition of projects, to define and manage scope and project related risks, to prepare schedules and budgets, to gather all the possible requirements, to structure the work needed to be accomplished, to assign the necessary resources and their effective management, to monitor and control the activities, to manage stakeholders

According to Atif (2010), most of the emergent industries since world-war II are project intensive. This widespread use of projects in organizations demanded an approach that can

efficiently manage these temporary endeavors which are critical to the organizations strategic objectives. Generally, PM is used extensively in some form within many organizations. There has been no identified profession or industry where project management practices will not work (Abadir, 2011).

According to Badewi, A., & Shehab, E. (2016) Project Management has led a number of organizations to be more effective and efficient in delivery of their products and services, to have more accurate budgeting and scheduling and improved productivity. Clarify goals and identify problem areas and risk; to isolates activities and easily monitor outcomes PMI (2013).

According to Badewi (2016) PM can best be applied when: Resources are to be shared among many units, Special attention or focus is to be given to important undertakings (example to focus attention on specific customers in specific market), Integration of systems and subsystems is sought within independent units, Dealing with ad hoc, complex, unfamiliar, unique, or rare; activities, problems and opportunities. Dealing with tasks that require pooling of many resources and capacities from diverse sources (example providing emergency response during disasters), It is desired to bring a wide range of experience and viewpoints into focus (example in research and product development or solving complex problems), Dealing with an undertaking that require massive input of capital, technology, skills, and resources, When there is a need to manage change, When it is desired to have unified management of a project-based contract in order to avoid the customer work with many different functions.

Here are some benefits of project management practices that are mentioned by Michel (2014):

- ✓ Reduced product development time;
- ✓ Extended product range;
- ✓ Increased use of multi-functional teams and partnerships;
- ✓ Creation of global service centers from cross-functional teams;
- ✓ Increased importance of controlling individual activity;
- ✓ Multi-national approach to development;
- ✓ Standardization of information technology;
- ✓ Rapid restructuring of industry sectors through acquisition and joint-ventures;
- ✓ Restricted government spending;

- ✓ Management of external resources and contractors;
- ✓ Ease of access to information and knowledge;

According to Meredith and Mantel (2010), actual experience with project management indicates that the majority of the organizations using it experience better control and better customer relations. Other advantages include lower costs, higher quality and reliability, higher profit margins, a sharper orientation towards results, improved interdepartmental co-ordination and higher employee morale. Other benefits identified by Kerzner (2009) are: improved efficiency and increased profitability through better utilization of limited resources; and enhanced planning, estimating and cost control leading to a more consistent achievement of milestones and objectives.

The Project Management Institute (2013) further confirms that project management helps organizations meet their customers' needs by standardizing routine tasks and reducing the number of tasks that could potentially be forgotten. Project management thus ensures that available resources are used in the most effective and efficient manner. Project management also provides senior executives with insight into what is happening and where things are going within their organization. The application of project management principles enables senior executives to: establish measures of success, enable customer focus and alignment, quantify value commensurate with cost, optimize the use of organizational resources, incorporate quality principles, put strategic plans into practice, and ensure fast time-to-market for example new products or services). Furthermore, it is stated that project management has gained popularity because of significant changes in the workplace. Some of these changes include: downsizing (fewer people to do more tasks), Projects and services have grown larger and more complex, fierce global competition, easier access to information through vast communications networks, more sophisticated customers demanding higher quality goods and services, exponential technological growth, multinational organizations seeking to establish uniform practices for managing projects.

2.6 Empirical Literature Review

A study done by Banaitis & Banaitiene, (2017) in Lithuania, on risk management in construction project categorized risks into two: internal and external risks. According to the study, the risks

with the highest effect on construction project were Natural forces, inflation and interest rates, fiscal policy and political from external risks and construction, design and project management risks from internal risks.

A study made in China, by (Zou, et al...2016) has identified 20 major risk factors based on likelihood of occurrence and their impact on project objectives. The study classified the risks into risks related to clients, designers, contractors, subcontractors and government bodies. According to this study the major risks were: Tight project schedule, Design variations, Excessive approval procedures in administrative government departments, High performance/quality expectations, Inadequate program scheduling, Unsuitable construction program planning, Variations of construction programs, Low management competency of subcontractors, Variations by the client, Incomplete approval and other documents, Incomplete or inaccurate cost estimate, Lack of coordination between project participants, Unavailability of sufficient professionals and managers, Unavailability of sufficient amount of skilled labor, Bureaucracy of government, General safety accident occurrence, Inadequate or insufficient site information (soil test and survey report), Occurrence of dispute, Price inflation of construction materials and Serious noise pollution caused by construction. The study has finally concluded for a successful project the client, designer, government bodies, contractors and subcontractors should work together and proper management knowledge should be applying from the feasibility period of the project.

Wang, Dulaimi, and Aguria, (20017) have identified 11 major risks in construction industry, in the study entitled “Risk management framework for construction project in developing countries”. The study was done in international construction projects in Singapore and the identified major risks were: Approval and Permit, Change in Law, Justice Reinforcement, Local Partner’s Creditworthiness, Political Instability, Cost Overrun, Corruption, Inflation and Interest Rates, Government Policies, Government Influence on Disputes and Termination of Joint Venture. The research recommended to treat (mitigate) the risks at higher hierarchy level.

In the majority situations, contractors perceive risk based on their intuition, experience and judgment. Risk reduction is found to be the most popular risk response method. After risk reduction, the other favored methods are risk elimination, risk retention and risk transfer. Large

companies prefer risk transfer because they are in a better position to hire specialty contractors or purchase insurance for risky work packages (Azhar et al, 2019).

In the above studies the research methods were fairly similar, that is, the first step was identifying risks in construction industry through literature review. Then based on the identified risks, questioner survey was prepared, distributed and analyzed to identify which risks highly affect project objectives. The common major risks identified in the above researches were: inflation, interest rate, political instability, design variations and government policies.

Elise (2007) conducted an assessment on the project management practice of Oromia integrated urban land information system coordination project office. The study tried to assess the project management practice of an organization implementing large government projects in one of the regions of the country. Descriptive research design was used in the study and the assessment methodology was adopted from the study conducted to assess the project management maturity of organizations in USA and modified to be used for the study. The researcher developed a questionnaire based on the practice of five project management process groups.

The study conducted by Frezewed (2016), tries to identify the practice of project risk management in Batu and Dukem Town water supply projects. The researcher has used descriptive research method. The data collection tools were interview and questionnaires. The findings of the study revealed that there is no policy or guideline that is designed on how to manage risks in the projects. A standard risk management process also does not exist within the projects. The outcome of the research confirmed that risk management practice is implemented to some extent but there is a gap between the theory of project risk management which should be applied and the actual practice that is performed by the two water supply projects. In summary, international and local studies have been reviewed. These studies focused on assessment of project management practices in light of one or two knowledge areas. All the studies did not examine the project management practice in light of the ten knowledge areas which was the focus of this study.

Atif (2010) conducted a research entitled Investigating Project Management Practices in Public Sector Organizations of a Less Developed Country. The research identifies the different types of constraints associated with the projects in a less developed country. These constraints are

categorized by the theme of less developed country, public sector organization, culture and project management. This is done on purpose so as to distinguish between the issues which can be improved by taking an initiative at the organizational level and the issues which can only be improved by taking a major policy initiative at the political level. The researcher main findings were: Late approval of funds from the client side is an issue. This affects the project in a sense that to start the work on the project the project manager has to allocate funds to the contractor. In most of the projects the late release of funds from the client side effects the project activities. There is no process of capturing the knowledge or experienced gained from the project. There is no lessons learned report or a meeting happens in the organization once the project is finished. No electronic data management system available in the organization to take help from the previous projects. There is no proper Project Management Office (PMO) in the organization. The decision power of the project manager is limited. The delegation of power to the middle managers is not happening in the organization. He concludes the above mentioned factors will have a direct impact on project management practices.

2.7 Conceptual Framework

Based on the above literature review the following, conceptual framework is developed. In the conceptual framework, project integration, project scope, project time, project cost, project quality and project risk are independent variable and project management is dependent variables.

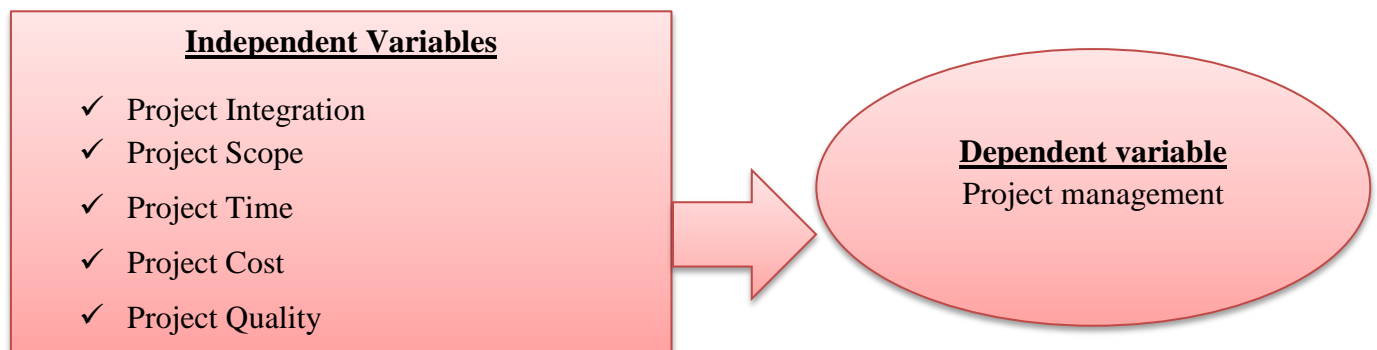


Figure 1 Conceptual Framework

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter discuss about is to present the researcher's research methodology for achieving the research objectives as stated at the outset. The research's main goal is to assess of project management practice in case of Addis Ababa water and sewerage authority project office. The study approach, sample size determination, sampling methodologies, and data collection and analysis systems are all justified and fully defined in order to achieve the objective of the study.

3.2 Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. The function of research design is to provide for the collection of relevant evidence with minimal expenditure of effort, time and money (Kothari, 2004).

Based on the research objective and basic questions explanatory research design is used to assess Project Management Practice in, Case of Addis Ababa Water and Sewerage authority Project Office.

3.3 Research Approach

The research tried to investigate the project management practice: in case of Addis Ababa water and sewerage authority project office. To address such objectives the study used employee mixed research approach more of qualitative. Mixed research approach gives the study more concise because the quantitative information will be supported by the qualitative explanation (Kothari, 2004).

3.4 Target Population

The target population of this research is permanent employees of the Addis Ababa Water and Sewerage authority Project Office and under Human Resource Development Department with the size of 130 employees.

The employees were located on the following department; -

Table 1 List of Departments

No	List of Departments	No of Staff on board
1	Division Manager's Office	2
2	Technic Deputy Manager's Office	43
3	Planning, Monitoring and Evaluation (PME) Support Process	5
4	Finance Support Process	12
5	Procurement Support Process	11
6	Human Resource, Logistics and General Service Support Process/	57
	Total	130

Source AAWSA. HR Department 2021

Regarding the sampling technique, the census was applied because the population was manageable. Therefore a total of 130 were participated in this study.

3.5 Type of Data

For accomplishing the research work and research objectives both primary and secondary data were collected. The primary data were collected from employees of Addis Ababa water and sewerage, authority project office through questionnaire and interview. In addition to the primary data secondary data were used from policy directives, journal articles and the water and sewerage authority project office report.

3.6 Data Collection Instruments

To accomplish the research objective both primary and secondary data were collected. In order to obtain reliable and sufficient information structured questionnaires were used as a data collection instrument. All the necessary data for this study was collected from the respondents through self-administered questionnaire, interview and document analysis.

3.6.1 Questionnaire

The researcher employed questionnaire which adopted and modified from researchers then modified in close and open ended form and also the 5 Likert scale (namely; agree, strongly agree, neutral, strongly disagree and disagree). Under the closed ended questionnaire, the respondents can only answer from a given alternative which limit them from further explanation of their feeling regarding to the title of the study, even if it is easier and quicker for the researcher to analyses it. This is why the researcher developed and modified the questionnaires' in open ended form which give the respondent's freedom to express their opinion or attitude towards their project office freely without any limitation.

3.6.2 Document Analysis

The researcher employed document analysis to extract relevant and supportive Secondary data from the Addis Ababa water and sewerage authority project office, policy directives and journal articles.

Interview guide:-

1. How Project Time is adjusted and managed in AAWSA
2. How Project Cost regulated in AAWSA
3. How Project quality managed in AAWSA

3.7 Data Analysis Techniques

The information collected from both primary and secondary data sources through review of different documents and in depth interviews with key informants, personal observations as well as questionnaire survey were organized and narrated.

Regarding, the descriptive data obtained from the structured interviews and open ended questions were analyzed by identifying the themes. Facts that were extracted from different documents were analyzed thematically and served to confirm study outcomes accordingly.

Indeed, descriptive analyses were presented using tables and figures where necessary. Ultimately, inferential analysis (correlation and regression) and generalizations were made and presented accordingly.

3.8 Reliability and Validity Test

Test reliability refers to the degree to which a test is consistent and stable in measuring what it is intended to measure. Most simply put, a test is reliable if it is consistent within itself and across time while Test validity refers to the degree to which the test actually measures what it claims to measure. Test validity is also the extent to which inferences, conclusions, and decisions made on the basis of test scores are **appropriate and meaningful** (Kothari, 2004)

Table 2 Reliability Test Result

Reliability Statistics

Cronbach's Alpha	N of Items
.901	36

Source: Survey Result, 2022

Cronbach's Alpha reliability result of this study is .901. Therefore, the Cronbach's alpha value of the study is strong category. So the researcher accepts the validity and reliability of the questionnaires.

3.9 Model Specification

To identify the existence and magnitude of correlation the researcher were used ordinary least square (OLS) regression. Such model captures observations at a time or the data which the researcher used were cross sectional. The resulting estimator or parameter can be expressed by a regression formula (Gujarat, 1995).

The dependent variable is project management while the independent variables are Project risk, Project Scope, Project Quality, Project Cost, Project Time, and Project Integration.

$$E_p = f(x_1, x_2, x_3, x_4, x_5, x_6)$$

$$p_g = f(\text{IVS}) \text{-----} (2)$$

$M = f(\text{Project risk, Project Scope, Project Quality, Project Cost, Project Time, Project Integration})$

$$E_p = \beta_0 + \beta_1 PR + \beta_2 PS + \beta_3 PQ + \beta_4 PC + \beta_5 PT + \beta_6 PI + e_i \text{-----} (3)$$

Where

PR=Project risk,

PS=Project Scope,

PQ=Project Quality,

PC=Project Cost,

PT=Project Time,

PI=Project Integration

3.10 Ethical Consideration

During data collection, respondents were informed as to why the data is collected. They were informed about the objectives and methods of the study. The privacy of respondent kept safe. Moreover, respondents expected to provide their response voluntarily. Finally, any work of scholar would acknowledge at bibliography part.

CHAPTER FOUR

4. DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 INTRODUCTION

As discussed in previous chapters, this study attempted to project management practice: in case of Addis Ababa water and sewerage authority project office. Therefore, the findings of the study are presented and discussed in this chapter. The questionnaire were developed in five scales ranging from five to one; where 5 represents Strongly agree, 4 agree, 3 Neutral, 2 disagree, and 1 strongly disagrees. In order to assess the project management practice: in case of Addis Ababa water and sewerage authority project office descriptive, Correlation and regression analysis were conducted. A total of 130 questionnaires were distributed and 126 were collected from AAWSA employees. The collected data were presented and analyzed using SPSS (version 20) statistical software.

Regarding inferential analysis, the study conducted diagnostic tests of the data, regression and correlation analysis, specifically Pearson correlation to measure the degree of association between different variables under consideration. Regression Analysis was also used to test the effect of independent variable on dependent variable.

4.2 Demographic Characteristics of Respondents

The demographic information of respondent gathered for the studies were gender, age, educational qualification and years stayed in Addis Ababa water and sewerage authority project office.

4.2.1 Sex Distribution

The study involved gender distribution of respondents in order to answer the questionnaires provided. The following figure 4.1 depicts male and female participants.

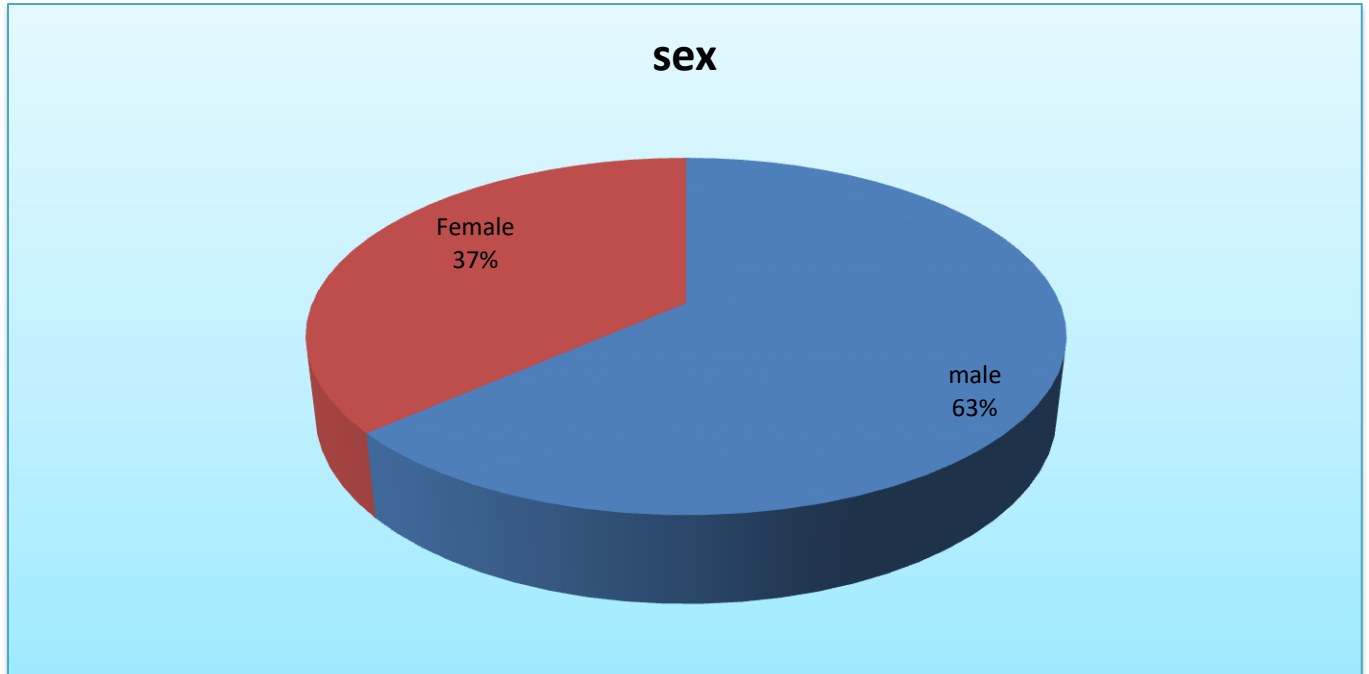


Figure 2 Genders Distribution of Respondents

Source: Survey Result, 2022

Out of 126 respondents, 63% were male while 37% were females. This indicates that employees of Addis Ababa water and sewerage, authority project office were not proportional gender-wise. This implies that the male populations of Addis Ababa water and sewerage, authority project office have the chance to be represented in every matter.

4.2.2 Age Distribution of Respondents

When we look at the age group of respondents, the larger number of employees is between the ages of 25-35 which adds to 83 respondents representing to 65.87 % of the total respondents. Second largest age groups which constitute 19.1 % of the respondents are 37-48 years of age. The rest covers of the population which accounts below 25 and above 50 years. From this result we can observe that majority of Addis Ababa water and sewerage, authority employees are at the productive age group.

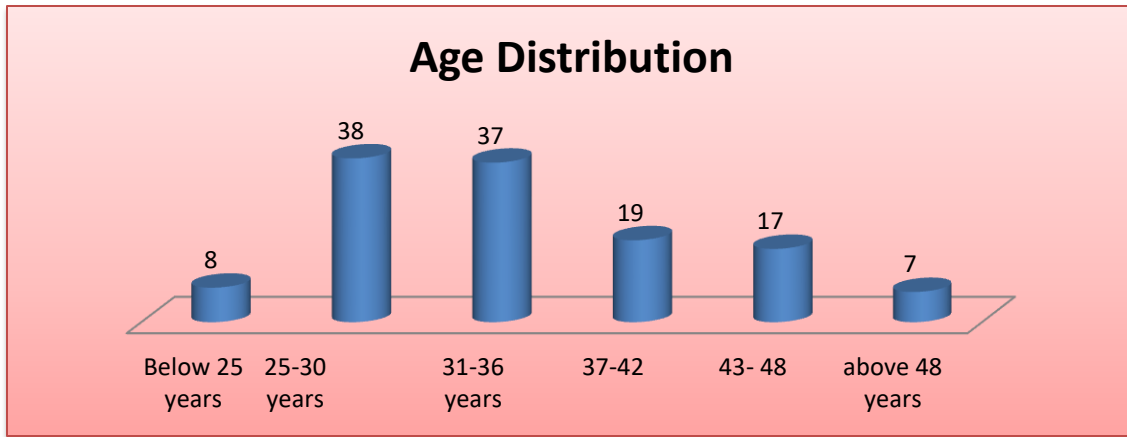


Figure 3 Age Distribution of Respondents

Source: Survey Result, 2022

4.2.3 Educational Status of Respondents

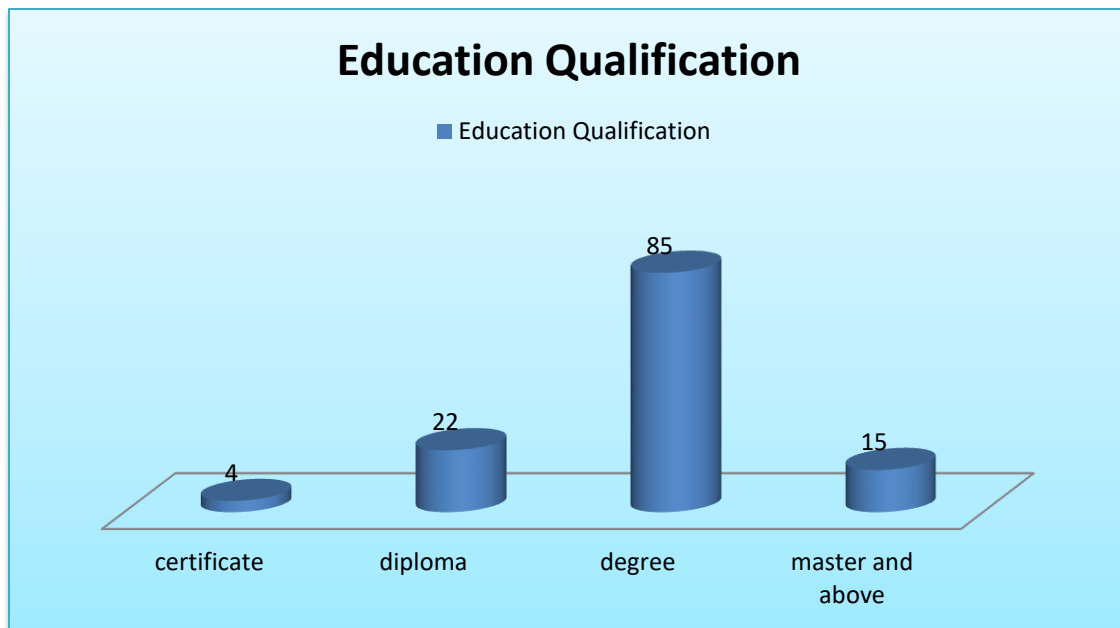


Figure 4. Educational Background of Respondents

Source: Survey Result, 2022

Regarding the educational background, 67.4% of them were BA/BSc Degree holders while 17.4% of them are diploma holders. The remaining or 11.9% of them were master's degree holders'. From this 80% of the employees are highly qualified which means that the overall project implementation practice of office can be easily understood and implemented.

4.3 Descriptive analysis

In this section, the collected data was entered and reported using SPSS. The mean value and standard deviation of each factor is analyzed and presented. For a data set, the mean is the central value of a discrete set of numbers, specifically the sum of the values divided by the number of values. Standard deviation is a number used to tell how measurements for a group are spread out from the average (mean), or expected value. A low standard deviation means that most of the numbers are close to the average. A high standard deviation means that the numbers are more spread out.

4.3.1 Project Integration

According to Badewi, A., & Shehab, E. (2016) Team collaboration is facilitated by the project management knowledge area of project integration management. To create a cohesive strategy, integration management combines multiple processes, systems, and approaches. This requires making trade-offs in order to be accomplished. When and where these trade-offs are made, project goals must serve as the benchmark, and all stakeholders must be on board with the decision. No one will receive exactly what they want, but the project will be finished on schedule and on budget in the end.

Here under is the practice of project integration in AAWSA.

Table 3 Mean Standard Deviation of Project Integration

	N		Mean	Std. Deviation
	Valid	Missing		
Projects were coordinated by Addis Ababa water and sewage authority	126	0	3.5159	1.01772
There is project road map in Addis Ababa water and sewage authority	126	0	3.3810	.67950
Stakeholders were aware about their role about the project	126	0	3.5079	.83662
All groups affected by the project know how to make	126	0	3.7460	1.15887

problems known to the project team

The projects were monitored, analyzed and reported on to identify and control any changes or problems	126	0	2.9444	1.09036
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grand mean			3.4190	0.95661
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Source: Survey Result, 2022

The mean of project integration is 3.4 and standard deviation 0.9. This high mean indicted that Projects were coordinated by Addis Ababa water and sewage authority and there is project road map. In addition to this Stakeholders were aware about their role about the project; all groups affected by the project know how to make problems known to the project team. The projects were monitored, analyzed and reported on to identify and control any changes or problems.

In the open ended participants revealed that the existence of lack of coordination among different teams, burden of responsibility, unsynchronized priorities and timelines, wastage of resources, difficulty in decision making, lack of necessary skill set, lack of motivation or interest. Furthermore they point that all project stakeholders were understand how to communicate issues to the project team. Plans were not communicated to project team members and employees in a clear and concise manner. To direct work orders and receive feedback, the project established a formal communication channel but this were not implemented through the city administration and project offices.

In the interview the interviewed revealed that the projects of AAWSA were outlining as follows Test project productivity → Feasibility study → Detail Design → Construction. In this steps project integration was the crucial step in the authority.

A study done by Firehiwot Animaw (2019) remarked that In developing economies, particularly in a nation like Ethiopia where projects of all sizes and structures are conducted, the application of project management knowledge domains is rapidly growing in importance. The study's findings showed that, with the exception of project quality management, practically all knowledge area assessments are at low levels of mean value. The organization does project quality management in a better method in light of other knowledge domains. Assessment of the difficulties in project management was the other goal. The organization experienced significant problems during the examination, including a lack of an appropriate project management

methodology and project management practices. The organization should therefore adopt a standard Project Management (PM) methodology for its initiatives, diversify its financing partners, and evaluate the needs of the recipients in order to reduce these ongoing implementation issues. Changes might be made to the project's goals, deliverables, schedule, or resource. Furthermore, it must accept these adjustments after receiving a formal request for them.

4.3.2 Project Scope

Project scope is vital for successful project execution and involves understanding all of a project's key elements. Here under are the practices of project scope in Addis Ababa water and sewerage authority

Table 4 Mean Standard Deviation of Project Scope

	N		Mean	Std. Deviation
	Valid	Missing		
The projects outcome and deliverable were clearly known	126	0	2.8333	1.23774
The project plane demarcates the time cost and output of the project	126	0	2.6905	.97541
There was a detailed plan (including time, schedules, milestones, manpower requirements, etc.) for the completion of the project	126	0	3.3254	.96191
There was a detailed budget for the project	126	0	3.6825	1.10019
The logical framework approach was adopted in identifying activities, and measureable objectives in the preparation of project plans	126	0	2.9444	1.09036
grand mean			3.0952	1.07312

Source: Survey Result, 2022

The mean score of project scope in Addis Ababa water and sewerage authority is 3.0 with standard deviation is 1.0. this modest mean indicted that the projects outcome and deliverable were relatively known, the project plane demarcates the time cost and output of the project, sometimes there was a detailed plan including time, schedules, milestones, manpower requirements, etc. for the completion of the project, there was a detailed budget for the project, the logical framework approach was adopted in identifying activities, and measureable objectives in the preparation of project plans. Generally employees perceived that project scope managed in smoothly.

In the open ended participants revealed that industrial disputes in the city administration, Ethiopian electricity and tell communication were in conflict in one project, this leads to poor sustained and expected impacts on schedules, there was unexpected loss of key staff.

In the interview the interviewed revealed that; as the name indicates the project office has two major project categories; sewerage related projects and water related projects. In Sewerage aspect, some of outstanding projects under this category; were Bole Arabsa and Cheffee Phase II- Status trail for minimum production which is half way completed. Regarding Water related projects were Workshop construction and Legedadi Phase II –planned to complete on September 2022.

A study done by Firehiwot Animaw (2019) explanation clients' exact requirements and expectations by actively engaging with them during the project planning phase helps to handle the project scope challenge. Accurate resource and talent planning is another essential step. Additionally, it's crucial to avoid accepting ad hoc change requests while a project is being completed because doing so could cause delays and extra expenditures.

4.3.3 Project Time

According to Heagney, J. (2016) Project time management is the process of managing a project that involves reviewing the work and creating a timeline to make sure you finish it on time. When controlling project time, there are six actions to take: Establish Activities: Establish each job required to create the projects final deliverable.

Here under is the practice of project scope in Addis Ababa water and sewerages authority.

Table 5 Mean Standard Deviation of Project Time

	N		Mean	Std. Deviation
	Valid	Missing		
The project is divided into tasks, which are scheduled with start dates and deadlines,	126	0	3.5159	1.01772
The project is divided into tasks and there is budgets for each task	126	0	3.3810	.67950
Things are constantly changing over the phases of any project, were revised.	126	0	2.5000	.85557
The project starting time and dead line were frequently achieved in AAWSA	126	0	3.7460	1.15887
The consecutive projects were started after the end of other projects in the office	126	0	2.9444	1.09036
The project plan schedule determines who shall perform how to perform and when to perform	126	0	3.8413	.36688
Grand Mean			3.3214	0.86148

Source: Survey Result, 2022

The mean score of project time is 3.2 with standard deviation 0.8. This indicated that the project is divided into tasks, which are scheduled with start dates and deadlines, and the projects were divided into tasks and there are budgets for each task. The project offices, things are constantly changing over the phases of any project, were revised, The project starting time and dead line were not frequently achieved in AAWSA, The consecutive projects were not started after the end

of other projects in the office, The project plan schedule determines who shall perform how to perform and when to perform though not achieved as planned.

In the open ended participants, the project offices were not utilizing technology, and frequently distracted in loss of project data, employees were faced to perform Multitasking due to this project managers and coordinators were not have enough energy. They were too busy that is why there were not effective.

In the interview the interviewed revealed that

Project time management directly impacts the quality, scope, and cost of a project, making it one of the most important project management knowledge areas. Managing time helps to secure project completion time and budget. It also clarifies how much time a project requires, what stakeholders (internal and external) to involve, and at what point to include their expertise. This process provides a framework for developing a sequence of activities, activity durations, resource estimations and how these fit into the overall project management plan. We as project offices try our best as to meet our time schedule. in addition to this the interview revealed that

Fcy Shortage, Covid-19 pandemic impact, Procurement delay due to shipping lines container shortage, low contractor capacity and failure of administration control were factors for project delay.

4.3.4 Project Cost

Cost management is the process that involves planning, controlling, and otherwise handling the budget of a business cost management helps the business predict unavoidable expenses with as much accuracy as possible

Here under is the practice of project cost management in Addis baba water sewerage authority

Table 6 Mean and Standard Deviation of Project Cost

	N		Mean	Std. Deviation
	Valid	Missing		
The AAWSA has budget estimating tools	126	0	3.5159	1.01772

Budgets were monitored regularly	126	0	3.3810	.67950
Stakeholders and sponsors were always informed about the budget	126	0	3.0238	.32160
There was a detailed plan budget for each milestones, manpower requirements, for the completion of the project	126	0	2.9444	1.09036
There was a detailed budget for the project	126	0	2.9444	1.09036
grand mean			3.1619	0.83991

Source: Survey Result, 2022

The mean of project cost management in Addis baba water sewerage authority is 3.1. This The AAWSA has budget estimating tools and Budgets were monitored regularly but stakeholders and sponsors were not always informed about the budget. There was not a detailed plan budget for each milestone, manpower requirements, for the completion of the project.

In the open ended participates revealed that there was high cost for Professionals working on the project, as well as other external contractors. In addition to this there was high and variable cost for Equipment or tools and machines that these individuals use to complete the project. Materials, on the other hand, or actual physical materials that are required to complete the project were increasing from time to time. Lastly there was also the cost of operational overhead expenses, such as office rent, utilities, insurance, general office supplies, and materials, are inflation from time to time.

In the interview the interviewed revealed that revealed that

Addis Ababa water and sewerage authority were faced the problem of quantifying cost impacts, resource constraints, Quality of available data, Large number of organizations involved DN Consistency.

A Study done by Abera Mengistu (2018) point out some challenges of project cost administration. He point out that managing project changes, managing simultaneous project

changes is perhaps the most challenging aspect of effective cost control, inaccurate reports, budget forecasting and inefficient processes and systems.

4.3.5 Project Quality

Project quality management is the process through which quality is managed and maintained throughout a project. While the context may imply that “quality” means “perfection,” in this case, is usually more about ensuring quality consistency throughout a project.

Here under is the practice of project quality in Addis Ababa water sewerage authority.

Table 7 Mean and Standard Deviation of Project Quality

	N		Mean	Std. Deviation
	Valid	Missing		
projects can come in on time and within budget in AAWSA	126	0	3.5159	1.01772
The project quality is up to the standard set in AAWSA	126	0	3.3810	.67950
Stakeholders compline about the qualities of the project	126	0	3.5079	.83662
Quality is always assessed and monitoring in each phase of the project	126	0	3.7460	1.15887
Project Quality assurances team is active in AAWSA	126	0	3.7460	1.15887
grand mean			3.5794	0.97032

Source: Survey Result, 2022

The mean of project quality is 3.5 with standard deviation 1.0. this high mean indicted that in Addis Ababa water sewerage authority projects can come in on time and within budget in AAWSA, The project quality is up to the standard set in AAWSA, Stakeholders were not

compline about the qualities of the project, Quality is always assessed and monitoring in each phase of the project and Project Quality assurances team is active in AAWSA.

In the open ended participates raveled that the existence of defining quality standards and required qualities at international standard and all project offices mangers were enforced to stick with or commit to quality, consultations and clients of each project were stick to project requirements, any contracture were legality enforced to manage quality and perform quality assurance, control the quality, focus on requirements, follow project processes are all the common practice of Addis Ababa water and swearer authority.

In the interview the project manager reveled that

We as project offices focus on quality throughout the entire project and make sure the deliverables are accurate and fault-free. In addition to this, we conduct inspections to find flaws. Start as soon as we can; locating and fixing errors as soon as they occur can save time and money. The management of requirements and the management of quality go hand in hand. Less rework and scheduling delays result from clear, well-defined requirements. Concentrate on enhancing the requirements elicitation, analysis, documentation, and validation processes.

4.3.6 Project Risk

A project risk is a hazard that could happen or not in the course of the project. Contrary to popular belief, project risks may have either a beneficial or negative impact on the progress of the project's goals.

The following table shows the project risk in Addis Ababa water and swears authority.

Table 8 Mean and Standard Deviation of Project Risk

	N		Mean	Std. Deviation
	Valid	Missing		
Risks were sufficiently identified and mitigation strategies included as part of the project plan	126	0	3.0238	.82427
Project risks were itemized, categorized and	126	0	4.4762	.50143

prioritized.

There is project risk registrar in AAWSA	126	0	3.8333	.67823
The likelihood and impact of project risk were analyzed	126	0	4.4841	.50174
The project risk management team were perform reviewing risk registrar	126	0	4.4762	.50143
grand mean			4.0587	.60142

Source: Survey Result, 2022

The mean score of project risk management in Addis Ababa water and swear authority is 4.0 and standard deviation is .6. This high mean indicted that Project team personnel understood their role on the project. Somehow, there was sufficient (both quality and quantity) human power to complete the project. The clients were given the opportunity to provide input early in the project development stage. The clients were kept informed of the project's progress. Over all there is strong and productive project management in AAWSA.

4.4 Inferential analysis

According to Kothari (2004) a subset of statistics known as inferential statistics uses a variety of analytical techniques to extrapolate conclusions about population data from sample data. Descriptive statistics are a different subset of statistics from inferential statistics. While descriptive statistics lists the characteristics of the data set, inferential statistics assists in drawing conclusions about the population. inferential analysis is type of analysis that used a random sample of data taken from a population to make inferences about the population. Inferential statistics are valuable when examination of each member of an entire population is not convenient or possible.

4.4.1 Diagnostics of Assumptions in Regression

We make a few assumptions when we use linear regression to model the relationship between a response and a predictor. These assumptions are essentially conditions that should be met before

we draw inferences regarding the model estimates or before we use a model to make a prediction, the true relationship is linear, Errors are normally distributed, Homoscedasticity of errors (or, equal variance around the line) and Independence of the observation. In order to conduct a regression analysis, the basic assumptions concerning the original data must be made. This is a mandatory prerequisite in explaining the relationships between dependent and explanatory variables. Five major assumptions have to be checked and proved to be met reasonably well. In this study these important least square assumptions were checked and explained as below.

4.4.2 Testing the Skewness and Kurtosis of the Data

A measure of symmetry, or more specifically, the absence of symmetry, is called skewness. If a distribution or data set appears the same to the left and right of the center point, it is said to be symmetrical. Kurtosis is a metric that indicates how heavy-tailed or light-tailed the data are in comparison to a normal distribution. In other words, data sets with a high kurtosis tend to have large outliers or heavy tails. Data sets with low kurtosis frequently lack outliers and have light tails. The worst-case scenario would be a uniform distribution.

Table 9 Skewness and Kurtosis

		Statistics					
		Project Integration	Project Scope	Project Time	Project Cost	Project Quality	Project risk
N	Valid	126	126	126	126	126	126
	Missin g	0	0	0	0	0	0
Skewness		-.634	-.199	-.321	.142	-.869	.911
Std. Error of Skewness		.216	.216	.216	.216	.216	.216
Kurtosis		.241	-.109	-.020	-.653	.164	.002
Std. Error of		.428	.428	.428	.428	.428	.428

Kurtosis

Source: Researcher Survey, 2022

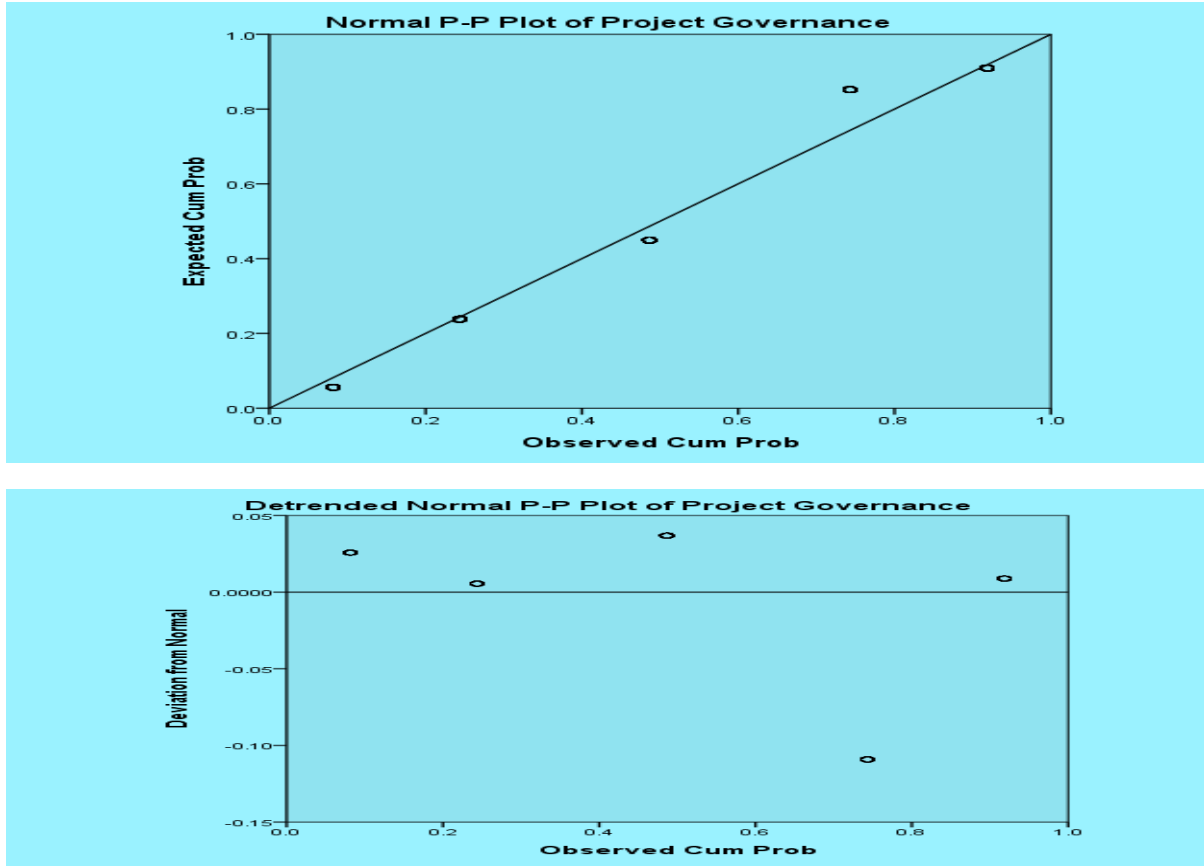
It is believed that values between +1.96 and -1.96 are acceptable. Data that deviates from these boundaries can be referred to as skewed (Hair, 2010), and according to Bryne (2010), data is considered normal if the skewness and kurtosis values are between -2 and +2 and -7 and +7, respectively. According to general principles, the researcher's data is usually distributed.

4.4.3 Normality Test

A statistical procedure known as a "normality test" is used to examine if a sample or any collection of data fits a typical normal distribution. You can run a normalcy test mathematically or visually. In order to establish if a data collection is adequately described by a normal distribution and to estimate the likelihood that a random variable underlying the data set is normally distributed, normality tests are utilized. Depending on how one understands probability, the tests, which are a type of model selection, can be interpreted in a variety of ways:

Multiple regressions assume that variables have normal distributions (Darlington, 1968). This implies that errors are normally distributed, and that a plot of the values of the residuals will approximate a normal curve (Keith, 2006). This assumption can be tested by looking at the P-P plot for the model together with above histogram of the standardized residuals. The closer the dots lie to the diagonal line, the closer to normal the residuals are distributed.

Figure 5 Normality Test



Source: Researcher Survey, 2022

In the above figure data distribution looks normal and in the P-P plots also the dots are reasonably closer to the normal line. The combination of both inspections support that the residuals are normally distributed.

4.4.4 Multi collinearity Test

Multi collinearity means a state of very high inter-correlation or inter-associations among the independent variables. It is therefore a type of disturbance in the data, and if present in the data the statistical inferences made about the data may not be reliable. Multi collinearity generally occurs when there are high correlations between two or more predictor variables. In other words, one predictor variable can be used to predict the other. This creates redundant information (Kothari, 2004) Strong relationship between explanatory variables is a problem of multi collinearity and not acceptable for ordinary list square regression analyses.

Table 10 Multi Collinearity Test

Coefficients^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	Project Integration	.007	149.837
	Project Scope	.102	9.803
	Project Time	.064	15.568
	Project Cost	.032	31.366
	Project Quality	.014	70.158
	Project risk	.904	1.106

a. Dependent Variable: Project Management

Source: Researcher Survey, 2022

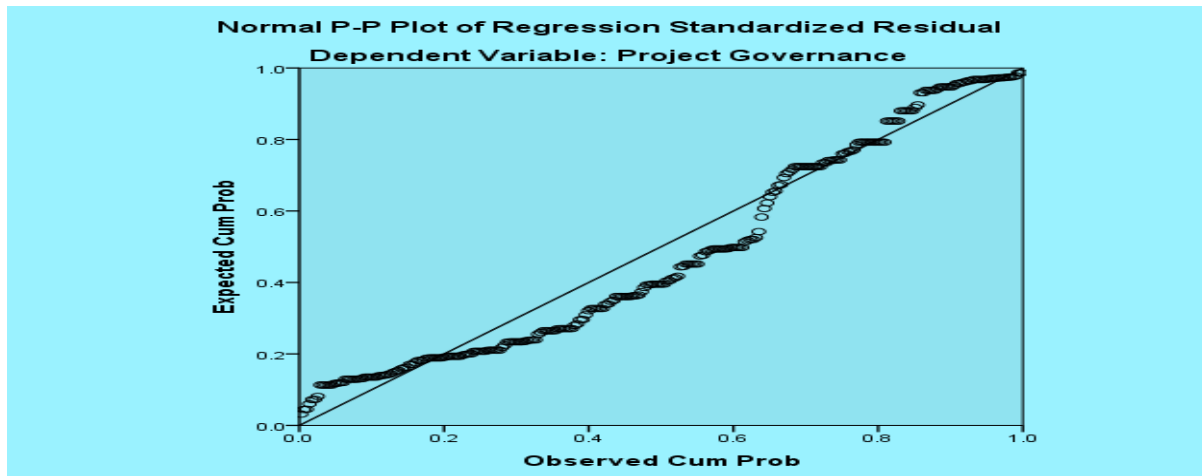
Additionally, the variance-inflation factor (VIF) was examined, and lesser values were discovered, supporting the conclusion that multicollinearity is not a concern. In this study, all VIF with fewer than 10 were accepted in accordance with. Additionally, tolerance statistics in regression analysis assist in the identification of co-linearity issues. Values closer to 1 indicate there are no problems with multicollinearity; the tolerance value ranges from 0 to 1. Since all tolerances in this study are higher than 0.8, additional factors cannot account for the variance in that construct? According to the results of the two tests, there is no multicollinearity issue. The allowable amount of VIF and the tolerance level were displayed in the above table.

4.4.5 Homoscedasticity Test

Homoscedasticity means that the variance around the regression line is the same for all values of the predictor variable (X). The plot shows a violation of this assumption. For the lower values on the X-axis, the points are all very near the regression line. For the higher values on the X-axis, there is much more variability around the regression line. This assumption requires even distribution of residual terms or homogeneity of error terms throughout the data.

Homoscedasticity can be checked by visual examination of a plot of the standardized residuals by the regression standardized predicted value (Osborn & Waters, 2002). If the error terms are distributed randomly with no certain pattern then the problem is not detrimental for analyses. The following Figures below shows that the standardized residuals in this research are distributed evenly indicating heteroscedasticity are not a serious problem for this data.

Figure 6 Data Distribution of Dependent Variable



Source: Researcher Survey, 2022

4.4.6 Autocorrelation Test

Autocorrelation is a mathematical representation of the degree of similarity between a given time series and a lagged version of itself over successive time intervals. It is the same as calculating the correlation between two different time series, except autocorrelation uses the same time series twice: once in its original form and once lagged one or more time periods (Kothari, 2004). Autocorrelation or independence of errors refers to the assumption that errors are independent of one another, implying that subjects are responding independently (Stevens, 2009). Durbin-Watson statistic can be used to test the assumption that our residuals are independent (or uncorrelated). This statistic can vary from 0 to 4. For this assumption to be met, the DW value needs to be close to 2. Values below 1 and above 3 are problematic and causes for concern.

Table 11 Autocorrelation Test

Model Summary^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.935 ^a	.874	.868	.25190	1.687

a. Predictors: (Constant), Project risk, Project Scope, Project Quality, Project Cost, Project Time, Project Integration

b. Dependent Variable: Project Management

Source: Researcher Survey, 2022

4.5 Correlation Analysis

Correlation analysis was applied to test the “interdependency” of the variables. In this section, the direction and degree of the strength of the relationship among the variables were determined. The Pearson’s product movement correlation coefficient was computed to determine the relationships between project risk, project scope, project quality, project cost, project time, project integration and project management.

Correlation analysis is useful way of exploiting relation (association) among variables. The value of the coefficient (r) ranges from -1 up to +1. The value of coefficient of correlation (r) indicates both the strength and direction of the relationship. If $r = -1$ there is perfectly negative correlation between the variable. If $r = 0$ there is no relationship between the variable and if $r = +1$ there is perfectly positive relationship between the variables. For values of r between + and 0 or between 0 and -1, different scholars have proposed different interpretation with slight difference.

For this study decision rule given by Bartz (1999) was used to describe the strength of association among the variables as follows.

Table 12 Correlation Coefficient

Measure of Association	Descriptive Adjectives
>0.00 to 0.20; <-0.00 to -0.20	Very weak or very low
>0.20 to 0.40; <-0.20 to -0.40	Weak or low
>0.40 to 0.60; <-0.40 to -0.60	Moderate
>0.60 to 0.80; <-0.60 to -0.80	Strong or High
>0.80 to 1.0; <-0.80 to -1.0	Very high or Very Strong

Source: Bartz (1999)

Table 13 Correlation Result

		Project Integration	Project Scope	Project Time	Project Cost	Project Quality	Project risk	Project Management
Project Integration	Pearson Correlation	1	.931**	.963**	.925**	.972**	-.079	.918**
	Sig. (2- tailed)		.000	.000	.000	.000	.380	.000
	N	126	126	126	126	126	126	126
Project Scope	Pearson Correlation	.931**	1	.908**	.918**	.877**	.006	.892**
	Sig. (2- tailed)	.000		.000	.000	.000	.950	.000
	N	126	126	126	126	126	126	126
Project Time	Pearson Correlation	.963**	.908**	1	.920**	.926**	-.072	.872**
	Sig. (2- tailed)	.000	.000		.000	.000	.422	.000
	N	126	126	126	126	126	126	126

Project Cost	Pearson Correlation	.925**	.918**	.920**	1	.822**	-.097	.841**
	Sig. (2-tailed)	.000	.000	.000		.000	.281	.000
	N	126	126	126	126	126	126	126
Project Quality	Pearson Correlation	.972**	.877**	.926**	.822**	1	-.075	.909**
	Sig. (2-tailed)	.000	.000	.000	.000		.403	.000
	N	126	126	126	126	126	126	126
Project risk	Pearson Correlation	-.079	.006	-.072	-.097	-.075	1	.010
	Sig. (2-tailed)	.380	.950	.422	.281	.403		.911
	N	126	126	126	126	126	126	126
Project Management	Pearson Correlation	.918**	.892**	.872**	.841**	.909**	.010	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.911	
	N	126	126	126	126	126	126	126

Source: Researcher Survey, 2022

The above table showed the correlation between dependent variable Project Management and independent variables project risk, project scope, project quality, project cost, project time, project integration. As clearly indicated, most independent variables have positive correlate with the dependent variable, project Management with significant level of 0.01. The magnitude of correlation between independent variables and the dependent variable for Project Integration($r=.918^{**}$), Project Scope($r=.892^{**}$), Project Time($r=.872^{**}$), Project Quality($r=.909^{**}$) and Project Cost($r=.841^{**}$). Though all independent variables have a positive significant relationship with project Management, project risks were not significantly correlated.

4.6 Regression Analysis Results

Regression analysis is a set of statistical processes for estimating the relationships between a dependent variable (often called the 'outcome variable') and one or more independent variables often called 'predictors', 'covariates', or 'features'. The most common form of regression analysis is linear regression, in which a researcher finds the line (or a more complex linear combination) that most closely fits the data according to a specific mathematical criterion. In this section the researcher used multiple regression analysis to absorb the relationship between the dependent variable and independent variables. Further, regression analysis helps the researcher to understand how typical value of the dependent variable changes when any one of the independent variable is varied, while other independent variables are held fixed.

Table 14 Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.935 ^a	.874	.868	.25190

a. Predictors: (Constant), Project risk, Project Scope, Project Quality, Project Cost, Project Time, Project Integration

Source: Researcher Survey, 2022

The regression model considers project Management as dependent variable and Project risk, project scope, project quality, project cost, project time, project integration as independent variables. The linear combination of those factors is significantly related to project Management ($R^2=.874$). This means that, 87.4 percent of the variance in the dependent variable; project Management can be explained by the independent variables Project risk, project scope, project

quality, project cost, project time, project integration. Although, the remaining 7.8 percent of the change is explained by other factors which are not included in this study model, both the R-squared and the Adjusted R-squared values in this study are found to be sufficient enough to infer that the fitted regression line is very close to all of the data points taken together (has more explanatory power). R-Squared greater than 20% is still large enough for reliable conclusions for such data.

Table 15 ANOVA

		ANOVA^a				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.418	6	8.736	137.680	.000 ^b
	Residual	7.551	119	.063		
	Total	59.969	125			

a. Dependent Variable: Project Management

b. Predictors: (Constant), Project risk, Project Scope, Project Quality, Project Cost, Project Time, Project Integration

Source: Researcher Survey, 2022

The ANOVA (Analysis of Variance) table provides the result of test of significance for R and R². Accordingly, it shows the F value of 36.5 is significant at 0.01 (P value that a correspondent to F statistic is significant). Thus, which states the independent variables Project risk, Project Scope, project quality, project cost, project time, project integration significantly explain the variance in employee performance in Addis Ababa water and sewerage authority region

Table 16 Regression Coefficients

		Coefficients^a			
Model		Unstandardized	Standardized	t	Sig.

		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	.117	.300		.390	.697
	Project Integration	-.279	.354	-.314	-.788	.432
	Project Scope	.300	.106	.289	2.835	.005
	Project Time	-.281	.146	-.247	-1.921	.057
	Project Cost	.363	.183	.362	1.988	.049
	Project Quality	.733	.223	.896	3.289	.001
	Project risk	.127	.064	.068	1.996	.048

a. Dependent Variable: Project Management

Source: Researcher Survey, 2022

Under Beta coefficient table, standardized Beta coefficient and unstandardized beta coefficient values are used to predict the relative importance of each independent variable and to formulate the linear regression equation respectively. Based on the standardized beta coefficient values, it can be shown that project scope, project quality found to be significant predictors of project Management in eastern Addis Ababa water sewerage authority. The linear multiple regression formula for the dependent variable, project Management and independent variables project risk, project scope, project quality, project cost, project time, project integration,

CHAPTER FIVE

5. SUMMARY OF FINDING, CONCLUSION AND RECOMMENDATION

5.1 Summery of Finding

This study attempted to project management practice: in case of Addis Ababa water and sewerage authority project office. A total of 130 questionnaires were distributed and 126 were collected from AAWSA employees. Out of 126 respondents, 63% were male while 37% were females. This indicates that employees of Addis Ababa water and sewerage, authority project office were not proportional gender-wise. When we look at the age group of respondents, the larger number of employees is between the ages of 25-35 which adds to 83 respondents representing to 65.87 % of the total respondents. Second largest age groups which constitute 19.1 % of the respondents are 37-48 years of age. The rest covers of the population which accounts below 25 and above 50 years. Regarding the educational background, 67.4% of them were BA/BSc Degree holders while 17.4% of them are diploma holders.

The mean of project integration is 3.4 and standard deviation 0.9. This high mean indicted that Projects were coordinated by Addis Ababa water and sewage authority and there is project road map. In addition to this Stakeholders were aware about their role about the project; all groups affected by the project know how to make problems known to the project team. The projects were monitored, analyzed and reported on to identify and control any changes or problems.

The mean score of project scope in Addis Ababa water and sewerage authority is 3.0 with standard deviation is 1.0. this modest mean indicted that the projects outcome and deliverable were relatively known, the project plane demarcates the time cost and output of the project, sometimes there was a detailed plan including time, schedules, milestones, manpower requirements, etc. for the completion of the project, there was a detailed budget for the project, the logical framework approach was adopted in identifying activities, and measureable objectives in the preparation of project plans. Generally employees perceived that project scope managed in smoothly.

The mean score of project time is 3.2 with standard deviation 0.8. This indicated that the project is divided into tasks, which are scheduled with start dates and deadlines, and the projects were

divided into tasks and there are budgets for each task. The project offices, things are constantly changing over the phases of any project, were revised, The project starting time and dead line were not frequently achieved in AAWSA, The consecutive projects were not started after the end of other projects in the office, The project plan schedule determines who shall perform how to perform and when to perform though not achieved as planned,

The mean of project cost management in Addis baba water sewerage authority is 3.1. This The AAWSA has budget estimating tools and Budgets were monitored regularly but stakeholders and sponsors were not always informed about the budget. There was not a detailed plan budget for each milestone, manpower requirements, for the completion of the project.

The mean of project quality is 3.5 with standard deviation 1.0. this high mean indicted that in Addis Ababa water sewerage authority projects can come in on time and within budget in AAWSA, The project quality is up to the standard set in AAWSA, Stakeholders were not compline about the qualities of the project, Quality is always assessed and monitoring in each phase of the project and Project Quality assurances team is active in AAWSA.

The mean score of project risk management in Addis Ababa water and swear authority is 4.0 and standard deviation is .6. This high mean indicted that Project team personnel understood their role on the project. Somehow, there was sufficient (both quality and quantity) human power to complete the project. The clients were given the opportunity to provide input early in the project development stage. The clients were kept informed of the project's progress. Over all there is strong and productive project Management practice in AAWSA

Insufficient skills within the team, scope creep, Poor Communication between teams, lack of using Project Management Software, delay in document approval , older Legacy systems issues, Lack of Project Management Practices, Lack of suitable project management methodology, Too much Project Status Reporting and meeting issues, Insufficient technical knowledge within team, and Unclear change management process.

Generally, the above listed points affected the project management practices of Addis Ababa Water and Sewerage Authority project office performance with regard to project management practice. But, the project was mainly affected by the five of the listed challenges. Those are the

delay in document approval, insufficient technical knowledge within team members, insufficient team skills, and too much project status reporting issues.

5.2 Conclusion

The data above allow us to draw the conclusion that a project's issues are closely tied to how an organization implements it. According to Sowoden (2013), maturity is the capacity of an organization to successfully use projects for a variety of purposes in order to achieve its business objectives.

(Jessen, 2003) grows as its skills and processes advance, businesses can benefit from PPM more. These imply that an organization will be able to benefit from project management techniques when it increases its capability on the application of project management methodologies for selection, evaluation, prioritization, management, reporting, closure, and lesson learned to be in light with the strategy of an organization. This can also be understood as a statement that as an organization's project management expertise grows, so does its capacity to manage and foresee project challenges.

To improve procedures and capabilities, it is crucial to learn from and apply best practices from how a company uses project management. Additionally, it was discovered that integration management served as the foundation for many issues. In order to handle projects that are related to one another, businesses might consider creating a PMO

According to Management Institute (2011), an organizational body or agency designated by multiple obligations tied to centralized and coordinated project management can perform tasks ranging from supporting project management to managing specific projects directly.

Effective project management increases the likelihood of successfully completing projects within schedule, cost, and quality restrictions, as was covered in length in the literature section of this study. Other project limitations, such ensuring customer happiness and demonstrating the project's business value, can also be met with the aid of project management. According to the study's findings and the "Likert scale," a five-point scale, the project management knowledge areas practiced in this study performed at a poor level. Therefore, it is crucial to evaluate project

management practices on a regular basis and to create an action plan based on the assessment results to enhance project management practices and thus increase performance.

5.3 Recommendations

The following recommendations are made in light of the study's primary goal, which was to evaluate AAWSA's project management procedures:

Project Identification should be done in accordance with pre-planned methods that serve and support the goals of general policies. Following identification, project formulation needs to be carefully examined, and feasibility studies need to be carried out. To develop sustainable initiatives, resources should be used in an economical way. It is important to think about both short- and long-term operation and maintenance policies. There should be an environmental impact assessment (EIA). To ensure the satisfaction of all relevant stakeholders, project requirements should be crystal clear and well-documented from the start. Project office setup needs to be improved during the project commencement process.

A project charter should be utilized as main practice as it explains the scope, objective, time, budget, and result of the project. The project team that has been selected needs to adopt it and adhere to it. The success of a project is greatly influenced by its scope definition and by how well it handles the inevitable change that comes with project management. Project scope, deliverables, timelines, or resources may all change. Before being put into effect, these changes must be properly sought, considered, and approved.

This change must be managed by the project manager. Project offices should place more emphasis on defining clear, standardized specifications, risk management, scope change management, and quality assurance management. Another factor in a project's success is risk management. In order to identify risks that could result in issues and to set "concrete steps" for treatment and prevention, risk management should start during project planning. Some risks can never be completely removed, and they may alter throughout the course of a project. However, to prevent unpleasant project surprises, ongoing, thoughtful risk assessment and risk mitigation techniques, together with risk contingencies in the project budget, are necessary.

Meeting quality expectations of the stakeholders can be a challenging task. Quality plan should be documented to ensure that the quality expectations are clearly defined and can reasonably be achieved.

Project scope management, project integration management, project time management, project cost management, project quality management, project procurement management, project communication management, project human resource management, project risk management, and project stakeholder management are just a few of the knowledge areas that AAWSA needs to educate its staff about.

To increase their project management knowledge & practice capacity, it is necessary to address the obvious need for project management training that exists in the project offices. In this context, the usage of general manuals like PMBOK may be very beneficial. The effective management of project operations as well as increased monitoring and control of quality processes can both be facilitated by the use of computers and software tools. One method of demonstrating the use of project management may also be to hire qualified project managers.

5.4 Future Research Implications

Given that this study primarily focused on project management knowledge areas, the researcher suggests expanding the scope of future research to cover additional project management procedures and practices. Additionally, it is advised that a larger study be undertaken in-depth by adding other project-based firms to compare their project management practices and aid in its development in Ethiopia because the practice of project management there is still in its infancy.

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Appendix

A



ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF PROJECT MANAGEMENT

Dear Respondents!

The main objective of this questionnaire is to collect data as input for the study titled “**project management practice in case of addis ababa water and sewerage authority project office**”. The sole purpose is to qualify the requirement for obtaining the Master’s Degree Project Management, from Addis Ababa University School of Commerce. Therefore, thanking in advance for your co-operation, I assure you that all information obtained from you will be used only for the research purpose and remain confidential except for the purpose pointed out here above. In case if you get any problem during the filling of the questionnaire plead don hastate to contact on the following address.

Lensa Senay

Mobil No: +251- 91 0-70 3-151

Part One: General Information of Respondents

- Note: no need of writing your name
- Circle your answer

1. Sex: A. Male

B. Female

2) Age: A. Below 25 years

B.25-30 years

C.31-36 years

D.37-42 years

E.43- 48 years

F. above 48 years

3) Educational Qualification:

A. Certificate

B. diploma

C. First Degree

D. Second Degree and above

Part II: the following statements in the table are designed to measure your level of agreement regarding each PMBOK concepts in Addis Ababa water and sewerage authority projects

Key:

SDA: Strongly disagree (1)

D-Disagree (2)

N-Neutral (3)

A-Agree (4)

SA-Strongly Agree (5)

No	Questions	SDA	D	N	A	SA
Project Integration						
1	Projects were coordinated by Addis Ababa water and sewage authority					
2	There is project road map in Addis Ababa water and sewage authority					
3	Stakeholders were aware about their role about the project					
4	All groups affected by the project know how to make problems known to the project team					
5	The projects were monitored, analyzed and reported on to identify and control any changes or problems					
Project Scope						
1	The projects outcome and deliverable were clearly known					
2	The project plane demarcates the time cost and output of the project					
3	There was a detailed plan (including time, schedules, milestones, manpower requirements, etc.) for the completion of the project					
4	There was a detailed budget for the project					
5	The logical framework approach was adopted in identifying activities, and measureable objectives in the preparation of project plans					
Project Time						
1	The project is divided into tasks, which are scheduled with start dates and deadlines,					
2	The project is divided into tasks and there is budgets for each task					
3	Things are constantly changing over the phases of any					

	project, were revised.					
4	The project starting time and dead line were frequently achieved in AAWSA					
5	The consecutive projects were started after the end of other projects in the office					
6	The project plan schedule determines who shall perform how to perform and when to perform					
	Project Cost					
1	The AAWSA has budget estimating tools					
2	Budgets were monitored regularly					
3	stakeholders and sponsors were always informed about the budget					
4	There was a detailed plan budget for each milestones, manpower requirements, for the completion of the project					
5	There was a detailed budget for the project					
	Project Quality					
1	projects can come in on time and within budget in AAWSA					
2	The project quality is up to the standard set in AAWSA					
3	Stakeholders compline about the qualities of the project					
4	Quality is always assessed and monitoring in each phase of the project					
5	Project Quality assurances team is active in AAWSA					
	Project risk					
1	Risks were sufficiently identified and mitigation strategies included as part of the project plan					
2	Project risks were itemized, categorized and					

	prioritized.					
3	There is project risk registrar in AAWSA					
4	The likelihood and impact of project risk were analyzed					
5	The project risk management team were perform reviewing risk registrar					
	Project management practice					
1	Project team personnel understood their role on the project					
2	There was sufficient (both quality and quantity) human power to complete the project					
3	The clients were given the opportunity to provide input early in the project development stage.					
4	The clients were kept informed of the project's progress.					
5	Over all there is strong and productive project Management in AAWSA					

Part III: Open Ended Questions (you can write anything regarding the projects in your offices

4. How Project Integration implemented in Addis Ababa water and sewerage authority. What are the challenges for it

5. How Project Scope managed in Addis Ababa water and sewerage authority. What are the challenges for it

6. How Project Time is adjusted and managed in Addis Ababa water and sewerage authority. What are the challenges for it?

7. How Project Cost regulated in Addis Ababa water and sewerage authority. What are the challenges for it

8. How Project quality managed in Addis Ababa water and sewerage authority. What are the challenges for it

9. How Project risk monitored in Addis Ababa water and sewerage authority. What are the challenges for it

Thank you in advances!