ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

FACTORS AFFECTING THE PERFORMANCE OF CONSTRUCTION PROJECTS IN THE CASE OF DEFENSE CONSTRUCTION

BY

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FACTORS AFFECTING THE PERFORMANCE OF CONSTRUCTION PROJECTS IN THE CASE OF DEFENSE CONSTRUCTION ENTERPRISE

BY YORDANOS YOSEPH

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A THESIS SUBMITTED TO ST. MARY UNIVERSITY,SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PROJECT MANAGEMENT

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DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of **TirunehLegesse (Asst.Proff).**All source of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in pat or in full to any other higher learning institution for the purpose of earning any degree.

_____ _____

Name Signature

St. Mary's University, Addis Ababa **June, 2019**

ENDORSEMENT

This thesis has been submitted to St. Mary's University College, School of Graduate Studies for examination with my approval as a university advisor.

_____ _____

Advisor **Signature**

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Acronyms

ACWP Actual Cost for Work Performed

ANOVA Analysis of Variances

ARPU Average Revenue per Users

BCWS Budgeted Cost for Work Scheduled

PERT Program Evaluation and Review Technique

CPM Critical Path Method

PMBOK Project Management Body of Knowledge

PMI Project Management Institute

SPI Schedule Performance Index

EVM Earned Value Management

SV Schedule Variance

SPSS Statistical Package for Social Sciences

Abstract

Project management practice has been improved on the past decades due to the publication of different literatures in the area of the study. Companies all over the world persuade project management practices to reduce cost, increase customer satisfaction and to better utilized the organization resources. The general objective of the study was to investigate the factors that influence the performance of construction projects in Defense Construction Enterprise. The study adopted quantitative method and the descriptive as well as co relational research design. For the proper accomplishment of the study, the primary data were collected using Likert scale type questionnaire by distributing to and collecting from the construction project implementers in the enterprise. The collected questionnaires were cleansed and analyzed using SPSS Version 20 and Microsoft excel. The analysis includes descriptive, correlation, regression and ANOVA. The major finding of the study indicated that project practice i.e., top management support, user involvement and project monitoring has significantly affect the performance of construction projects in Defense construction. However, user involvement on requirement specification and testing are poorly practiced on the company. Hence, to proactively avoid the challenges of poorly practiced project management variables, the researcher recommends to follow project life cycle, use project management tools and techniques, provide a good communication channel and support, involve user throughout the project implementation and use a good project follow up and monitoring methods.

Key Words: Project management, Construction, Project Performance, Defense construction Enterprise

CHAPTER ONE
INTRODUCTION

1.1 Backgroundof the Study

According to Melba, Dhanya and Ganapathy(2015) Construction industry plays foremost role in improvement and accomplishment of the target of society. Construction industry is complex in its nature as it involves large number of parties such as clients, contractors, consultants, stakeholders, shareholders and regulators. Performance is associated with several factors such as time, cost, quality, client satisfaction, productivity and safety. There are other genuine reasons like closures, modification of drawings and changes of the design. Other grounds affecting Construction projects performance are poor management and guidance; inapt participants; poor relations and coordination; lack of motivation, insufficient infrastructure, political problems, cultural problems and economic conditions. Also factors like inadequate leadership, poor site management, lack of manpower skills, lack and breakdown of equipment plays a very important part in Construction delay. Organizations failing to adapt and respond to the complexity of the new environment tend to experience survival problems (Lee et al. 2001). Therefore, in order to survive the market complexity organizations must operate change rapidly.

A number of studies have been conducted to examine factors impacting on project performance in developing countries. Hansonet al. (2003) examined causes of client dissatisfaction in the South African building industry and found that conflict, poor workmanship and incompetence of contractors to be among the factors which would negatively impact on project performance. Mbachu and Nkando (2007) established that quality and attitude to service is one of the key factors constraining successful project delivery in South Africa. The performance of contractors in Zambia is apparently below expectation; it is not uncommon to learn of local projects that have not been completed or significantly delayed. This poor performance of many local contractors has huge implications in terms of their competitiveness (Zulu and Ehileshe 2008).

Ethiopia is the fastest-growing, non-oil driven economy among African countries. The country has showed a remarkable growth over the past ten years with average annual growth GDP of

10.9% (UNDP, 2014). Recently, the contribution of the industry sector (which is 21.2%) and particularly that of the Construction sector to the national economy is given high prominence and is mainly driven by the energetic performance of the Construction sub-sector (ECIDP, 2014; UNDP, 2014). Despite the Construction sector high importance, several defects are being noted in the sector that requires immediate action (ECIDP, 2014).

Project performance can be measured and evaluated using a large number of performance indicators that could be related to various dimensions (groups) such as time, cost, quality, client satisfaction, client changes, business performance, health and safety (Cheung et al. 2004; DETR 2000). Time, cost and quality are, however, the 3 predominant performance evaluation dimensions. Another interesting way of evaluating project performance is through 2 common sets of indicators (Pheng and Chuan 2006). The first set is related to the owner, users, stakeholders, and the general public; the groups of people, who will look at project performance from the macro viewpoint. The second set comprises the developer and the contractor; the groups of people who will look at project performance from the micro viewpoint.

Although, Construction industry is highly dynamic sector and plays very important role in the development of country, the Construction industry in Ethiopia is facing chronic problems including poor performance of project management practice, top management support, stakeholder involvement, project monitoring, time, cost, managing Construction wastes, poor productivity, contractor's performance, lack of skilled man power, and over dependent of foreign workers. Different tools, processes, and techniques have been developed in attempts to improve performance.

Recently the project management discipline has matured through the publication of several standards best practices research articles and significant growth in its community of professional (Pollack and England, 2007).

In this study, factors affecting the performance of Construction projects in the case of defense Construction enterprise will be analyzed. Performance indicators will be used to measure performance in Construction projects. Then these indicators will be used for bench marking purposes, and will be a key element in achieving best practice so as to conquer the performance problem. However, this study aims at identifying the factors which are affecting the

performance of Construction projects and the analysis of the factors using the SPSS software and finding the means and ranking them accordingly.

1.2 Statement of the Problem

(Inna and Ivan, 2008) Briefly, evolution of thought in area of success levers in projects starts in 1960s when main attention of studies lies in planning and control area. Also top management support as well as change management are considered. Later when planning school of thought (Mintzberg, 1998) dominates in management, the role of planning, scheduling, feedback system and control also become stronger in project management area. Moreover, management support, resource allocation and PM's competence are indicated as significant. Next decade brought communication, organizational aspects, realistic and clear objectives; client's and project team's characteristics were added to body of knowledge. In 1990s studies concluded that project related factors have a great impact on project success. Project scope, type and size contributed to existing findings. In spite of numerous of reiterations of factor this decade also broad human factor including user, contractor and project champion role; procurement and environmental factors. During 2000s authors has been concentrated mostly on categorization of factors rather than on production of new factors themselves.

The management of Construction projects requires knowledge of modern management as well as understanding of the design and the Construction process. Construction projects have a specific set of objectives and constraints such as a required time frame for completion. Also they are a costly undertaking so many people, in an effort to reduce the cost, become penny wise and pound-foolish. Change is inherent in Construction work. The majority of the projects fail to meet deadlines, cost and quality targets. This is not too surprising considering that there are not known perfect engineers, any more than there are perfect designs or that the forces of nature behave in a perfectly prediction able way. Change cannot be eliminated, but by applying the principles of risk management, engineers are able to improve the effective management of this change.

Successful Construction industry plays an important role of a country's economic development. For the past few years, the Construction industries have developed in size, complexity and high demand by client, causing construction project more difficult for the project objective of time,

and cost to be achieved. Many Construction projects are being performed throughout the world this time Mega structure projects have been constructed and some of them are finished but they have their own complexity during their design period and in the construction phase.

As per the previous studies the main performance problems can be also divided in to two groups, the first one being the unrealistic target setting which is setting unachievable target. The goal of the project should be achievable, realistic and clear; and the other group dealing with the causes originating from the actual Construction. During the actual Construction deviation from the design, losing satisfaction of the client by the Construction could occur.

Many previous research studies show that the reasons for the poor performance of the industry as the badly chosen procurement system, financial stability, work progress, quality standards, health and safety, relation with clients, consultants, relationships with subcontractors, resources, project monitoring and evaluation.Faridi and El-Sayegh (2006) reported that shortage of skills of manpower, poor supervision and poor site management, unsuitable leadership, shortage and breakdown of equipment among others contribute to Construction delays in the United Arab Emirates. Hanson et al. (2003) examined causes of client dissatisfaction in the South African building industry and found that conflict, poor workmanship and incompetence of contractors to be among the factors which would negatively impact on project performance. Mbachu and Nkando (2007) established that quality and attitude to service is one of the key factors constraining successful project delivery in South Africa. The performance of contractors in Zambiais apparently below expectation; it is not uncommon to learn of local projects that have not been completed or significantly delayed. This poor performance of many local contractors has huge implications in terms of their competitiveness (Zulu and Chileshe, 2008).Construction time is also important as it can serve as benchmark for assessment of the performance.

The Construction project performance in Defense Construction enterprise also have problems for performing the project within the specific time, cost and within the given specification. According to Ashenafi's (2015) assessment on the enterprise there are many problems in planning, monitoring and evaluation of the construction projects; including poor planning practice, absent of well-organized project monitoring and evaluation system and cost and time overrun due to poor planning, monitoring and evaluation.

Therefore, this study assess the main factors that affect the performance of the company; including top management support, involvement of stakeholders, poor project management practice and project monitoring were assessed.

1.3 Research Questions

The study answers the following basic research questions;

i.What are the effects of project management practice towards the performance of Construction project at defense Construction?

ii. How does the management support affect the performance of Construction project at defense Construction?

iii. How stakeholder involvement does affect the performance of Construction project at defense Construction?

iv. How does project monitoring affects the performance of Construction project at defense Construction?

1.4 Objective of the Study

1.4.1 General Objective

The general objective of the study is to assess factors affecting Construction project performance in defense Construction enterprise.

1.4.2 Specific Objective

Specifically, the study has the following objectives:

i. To describe how project management practices affect performance of construction projects
ii. To examine how management support affects performance of Construction projects
iii. To find out how stakeholder involvement affects performance of Construction projects

iv. To determine how project monitoring affects performance of Construction projects

1.5 Significance of the Study

Findings of this study will benefit different stakeholders, such as, defense Construction enterprise, the government, other organizations and further researchers. Therefore, the study's outcomes will benefit defense Construction to improve and to evaluate its project management performance and for decision making process; the concerned government body will know how the project performance is in line with the targeted mission and objectives of the government on the sector.

An assessment of the study would enable Clients, Contractors and Consultants give an economic approach to Construction work such that they would be able to identify the dominating factors leading to poor performance.

Future more, researchers can use this research's outcome as a base to investigate more about the company's project management.

1.6 Scope of the Study

The research focuses onConstructionproject performance in the defense Construction and its assessment. The key elements addressed are project management practice, top management support, stakeholder involvement and project performance in defense Construction. With regard to the clients, the research focuses only on public clients (government). The study limit itself on assessing only factor affecting Construction project performance in general in the case of Defense Construction but; Defense Construction is affected by different project performance like building, dam projects the possible limitations of the study are inability to incorporate all projects implemented in defense Construction .

1.7 Limitation of the Study

The study focus on Construction projects only due to time constraint and other resource limitations. Therefore, it is difficult to generalize the findings and results to the whole implemented project in defense Construction.

1.8 Organization of the Report

Structurally, the paper will be composed of four chapters. The first chapter will present introductory materials, which includes background of the study, problem statement, research objective, research questions, and methodologies, significance of the study and the scope and limitations of the study. The second chapter presents the related literature reviewed during the desk research phase of the study. The third chapter contains research methodology and design used in this study. In chapter four the data collected during the data collection process will be presented that is it contains an analysis of the empirical data. Finally chapter five will present the summary of findings, conclusion and recommendations, and limitation and implications for further research.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1 Theoretical Literature Review

2.1.1 What is Project?

Different institutions and different authors provide different definitions for the concept of a project. Lewis(2005, P.5) define a project as a one-time job that has a definite starting point, definite ending point, clearly defined scope of work, a budget, and is multitask in nature. Wysocki(2003, p.3) define a project as a sequence of unique, complex, and connected activities having one goal or purpose and that must be completed by a specific time, within budget, and according to specification.

A project is a one-time, multitask job with a definite starting point, definite ending point, a clearly defined scope of work, a budget, and usually a temporary team. A project is define as 'a unique set of coordinated activities, with definite starting and finishing points, undertaken by an individual or organization to meet specific objectives within defined schedule, cost and performance parameters.' it is "a temporary endeavor undertaken to create a unique product or service" (PMBOK; project management institute, 2004, p. 5).

The PMBOK definition of project management is "Application of knowledge, skills, tools and techniques to project activities to achieve project requirements. Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing" (PMBOK 2004, p. 8).

According to Lewis (2005) projects often involve many different disciplines. For instant in Construction projects architects, civil engineers, Construction engineers, electrical engineers, mechanical engineers, accountants, purchasers, carpenters, plumbers, electricians, painters, suppliers and unskilled laborers are involved. Projects also have various phases the nature of the project changes with its life cycle.

Dissanayaka and kumaraswamy (1999) found that project time and cost performances get influenced by project characteristics, procurement system, project team performance, client representation's characteristics, contractor characteristics, design team characteristics, and external conditions. Similarly, Iyer and Jha (2005) identified many factors as having influence on project cost performance, these include: project manager's competence, top management support, project manager's coordinating and leadership skills, monitoring and feedback by the participants, decision-making, coordination among project participants, owners' competence, social condition, economic condition, and climatic condition. Coordination among project participants, however, was identified as the most significant of all the factors, having maximum influence on cost performance. Interestingly, Love et al. (2005) examined project time-cost performance relationship, and their results indicate that cost is a poor predictor of time performance. Elyamany et al. (2007) introduced a performance evaluation model for construction companies in order to provide a proper tool for the company's owners, shareholders and funding agencies to evaluate the performance of Construction companies in Egypt.

2.1.2 Characteristics of a Project

Projects differ from programs and routine works. Projects have their own characters which distinguish them from other. Nicholas and Herman (2008) states the following seven project characteristics;

1. A project involves a single, definable purpose, end-item, or result, usually specified in terms of cost, schedule, and performance requirements.

2. Every project is unique in that it requires doing something different than was done previously.

3. Projects are temporary activities. The organization of personnel, materials, and facilities is assembled to accomplish a goal, usually within a specific, scheduled time frame; once the goal is achieved, the organization is disbanded or reconfigured to begin work on a new goal.

4. Projects cut across organizational lines because they need the skills and talents from multiple professions and organizations. Project complexity often arises from the complexity of advanced technology, which creates task interdependencies that may introduce new and unique problems.

5. Given that a project differs from what was previously done, it also involves unfamiliarity. It may encompass new technology and, for the organization undertaking the project, possess significant elements of uncertainty and risk.

6. The organization usually has something at stake when doing a project. The activity may call for special scrutiny or effort because failure would jeopardize the organization or its goals.

7. Finally, a project is the process of working to achieve a goal; during the process, projects pass through several distinct phases, called the project life cycle. The tasks, people, organizations, and other resources change as the project moves from one phase to the next. The organization structure and resource expenditures slowly build with each succeeding phase; peak; and then decline as the project nears completion.

2.1.3 Project Parameters

Project parameters are constraints that are so important to the success or failure of the project. According to Wysocki (2003) there are five constraints operate on every project, these are;

Scope; Scope is a statement that defines the boundaries of the project. It tells not only what will be done but also what will not be done.

Quality; two types of quality are part of every project that is product quality and process quality.

Cost; Cost is a major consideration throughout the project management life cycle. The first consideration occurs at an early and informal stage in the life of a project.

Time; the customer specifies a timeframe or deadline date within which the project must be completed. To a certain extent, cost and time are inversely related to one another. The time a project takes to be completed can be reduced, but cost increases as a result.

Resources; Resources are assets, such as people, equipment, physical facilities, or inventory, that have limited availabilities, can be scheduled, or can be leased from an outside party. Some are fixed; others are variable only in the long term. In any case, they are central to the scheduling of project activities and the orderly completion of the project.

2.1.4 Types of Project

According to Lock (2007) projects are classified as four different general types;

Type 1 project: civil engineering, Construction, petrochemical, mining quarrying.

Projects in this category are those which spring to mind most readily whenever industrial projects are mentioned. Once common feature is that the fulfillment phase must be conducted on a site that is exposed to the elements, and usually remote from the contractor's main office.

These projects incur special risks and problems of organization. They often require massive capital investment, and they deserve (but do not always get) rigorous management of progress, finance, and quality.

For very large industrial projects the funding and resources needed are often too great for one contractor to risk or even find. The organization and communications are therefore likely to be complicated by the participation of many different specialists and contractors, with the main players possibly acting together as a consortium or joint venture company.

Type 2 projects: Manufacturing

Manufacturing projects aim to produce a piece of equipment or machinery, ship, aircraft, land vehicle or some other item of specially designed hardware. The finished product might be purpose-built for a single customer, or the project could be generated and funded from within a company for the design and development of a new product intended for subsequent manufacture and sale in quantity.

Manufacturing projects are usually conducted in a factory or other home-based environment, where the company should be able to exercise on-the-spot management and provide an optimum environment.

Type 3 projects: IT projects and projects associated with management change

This class of projects proves the point that every company, whatever its size, can expect to need project management expertise at least once in its lifetime. These are the projects that arise when companies relocate their headquarters, develop and introduce a new computer system, launch a

marketing campaign, prepare for a trade exhibition, produce feasibility or other study report, restructure the organization, mount a stage show, or generally engage in any operation that involves the management and co-ordination of activities to produce an end result that is not identifiable principally as an item of hardware or Construction.

Although management projects might not result in a visible, tangible creation, much often depends on their successful outcome. There are well-known cases, for instance, where failure to implement a new computer system correctly has caused serious operational breakdown and has exposed the managers responsible to public discredit. Effective project management is at least as important for these projects as it is for the largest Construction or manufacturing project.

Type 4 projects: projects for pure scientific research

Scientific research project: is a special type of project. These projects is trying to extent the current human knowledge on a matter and by that it has the potential to very profitable but at the same time it may just consume a lot of money over a lot of years without any useable outcome. It is the uncertainty of the outcome that makes this type of projects unique since you cannot totally predict the result of the project. The result of the scientific research project can have the potential to give birth to projects from the three other types or on some way improve other projects, all depending on what the scientific research is about and what the result is.

Besides of the above mentioned four types to categories projects there are numerous ways to further sort the projects.

2.1.5 Classification of a Project

Projects can also further classify by their character according to Wysocki (2003) organizations have chosen to classify projects based on the following project characteristics as these:

Risk—Establish levels of risk (high, medium, low)

Business value—Establish levels (high, medium, low)

Length—Establish several categories (i.e., 3 months, 3 to 6 months, 6 to12 months, etc.) Complexity—Establish categories (high, medium, low)

Technology used—Establish several categories (well-established, used somewhat, basic familiarity, unknown, etc.)

Number of departments affected—Establish some categories (one, few, several, all) Cost Using the above seven project characteristics projects can be classified further in to four types:

i. Type A projects

Projects of Type A are the high-business-value, high complexity projects. They are the most challenging projects the organization undertakes. Type A projects use the latest technology, which, when coupled with high complexity, causes risk to be high also. To maximize the probability of success, the organization requires that these projects utilize all the methods and tools available in their project management methodology. An example of a Type A project is the introduction of a new technology into an existing product that has been very profitable for the company.

ii. Type B projects

Projects of Type B are shorter in length, yet they still are significant projects for the organization. All of the methods and tools in the project management process are probably required. The projects generally have good business value and are technologically challenging. Many product development projects fall in this category.

iii. Type C projects

Projects of Type C are the projects occurring most frequently in an organization. They are short by comparison and use established technology. Many are projects that deal with the infrastructure of the organization. A typical project team consists of five people, the project lasts six months, and the project is based on a less-than-adequate scope statement. Many of the methods and tools are not required for these projects. The project manager uses those tools, which are optional, if he or she sees value in their use.

iv. Type D projects

Projects of Type D just meet the definition of a project and may require only a scope statement

and a few scheduling pieces of information. A typical Type D project involves making a minor change in an existing process or procedure or revising a course in the training curriculum.

Table2.1: Project Classification

CLASS	DURATION	RISK	COMPLEXITY	TECHNOLOGY	LIKELIHOOD OF PROBLEM
Type A	> 18 months	High	High	Breakthrough	Certain
Type B	9–18 months	Medium	Medium	Current	Likely
Type C	3–9 months	Low	Low	Best of breed	Some
Type D	< 3 months	Very Low	Very Low	Practical	None

Source: Wysocki (2003)

2.1.6 Construction Projects

Researches show that Construction projects have their characters which differentiate them from other types of projects. Hidaya (2011) in his research states that Construction projects require skilled management, as they are complicated and face many challenges and constraints, such as cost, time regulations, materials and environmental rules or customs. In Construction projects several activities happen and take place at the same time, but still are connected and integrated. Therefore, we need thorough and effective communications and cooperation to manage and control these activities. Construction projects are characterized as very complex projects, where uncertainty comes from various sources such as technical, legal, natural, social, economic, financial, commercial and political; these may differ according to the specialty of each project.

A Construction project is commonly acknowledged as successful, when it is completed on schedule and within the agreed budget, with the highest quality and in the safest manner, in accordance with the specifications and to stakeholders' satisfaction. Functionality, profitability to contractors, absence of claims and court proceeding and "fitness for purpose" for occupiers have also been used as measures of project success Takim and Akintoye (2002). When a Construction project is completed within the specific time and budget and achieves the required

specification of product or service, the project is successful.

According to Aburizk (2010) Construction projects differ from other projects in that Construction projects have the following features.

- Construction is typically undertaken at a fixed location or site, requiring a closer look at the logistical complexities involved. The building materials and resources required will have to be procured and taken to the site. Where the works are significant in scope, working space, traffic management, security, public health and safety, and the environmental impact of the operations will all have to be given consideration.
- Weather creates uncertainty for any project. In Ethiopia most of the road projects closed on summer due to rain fall. In other parts of the world, temperature, snow, water, and sand can have a negative impact on the progression of works.
- In modern Construction, the introduction of new materials and technologies, methods, and requirements for sustainable or green development, can all contribute toward increasing levels of risk and complexity. Thorough project planning, design, research, and procurement can aid in their reduction and management.
- The uniqueness of Construction projects also mean that the external influences and constraints would be different, yet subject to change throughout the project timeline. These can include rates of technological change, sources of financing, market forces, climate change, politics, and changing client requirements.
- The timelines of Construction projects are typically measured in years. Accordingly, clients would typically be required to have prepared and formalized at a very early stage, a design and budget. With some projects, the finer details and points are not fully worked out until after the works have commenced, thereby negatively impacting cost, quality, and timelines for the completion of activities.

Finally, different members of the project organization have to balance conflicting commercial business interests and against achieving the aims and objectives of the project. For example, contractors may focus more on profit maximization and less on the other parameters which define project success. Clients on the other will seek to have the asset delivered in the shortest time possible, at the lowest cost, with the highest quality. Consultants, based on their contractual arrangements, may seek to also maximize their incomes, by limiting their time on

the project. This offers a very complex landscape which has to be navigated, and often doesn't work to the best advantage of the project itself.

For any public or private Construction firms, upgrading the project performance can be taken as one of their main objectives. This can be achieved by reducing cost, finishing projects on schedule and increasing quality. Public Construction projects in Ethiopia are parts of the country's development initiative. It shares considerable amount of the country's scarce financial resources.

In Ethiopia, the Construction industry is the highest recipient of government budget in terms of government development program. Consequently, public Construction projects consume an average annual rate of nearly 60% of the government's capital budget (MOWUD, 2006).

Currently, Ethiopia is in a struggle to undertake mega projects that demands huge finance and political decisions. At the moment, this idealistic view is becoming reality guaranteed by the nation's dedication and ability to fund major projects from domestic sources. This has resulted in astonishing growth trajectory whereby the average GDP growth of 11 percent over the past 8 years has been achieved (MOFED, 2013). The Construction sector in Ethiopia is booming and still continuing to have a leading part in the industry. The fast growth of the Construction industry resulted in increased in the number of contractors joining the industry. During the period 2000 up to 2008, the number of contractors increased by 1.9121. Consequently, there are a total of 7259 building contractors (BC), road contractors (RC) and general contractors (GC) registered during the 2014/15 budget year as implied by the ministry of urban development, housing and Construction of Construction industry development and regulatory bureau. The numbers of larger contractors up to level three are: 263 BC1/RC1/GC1; 73 BC2/RC2/GC2; 163 BC3/RC3/GC3.

2.1.7 Project Parties in Construction

There are many parties involved in Construction projects but according to Rohaniyati (2009) the primary Construction project parties include the following.

1. **Employer/Owner**; -define project requirements, function and services. Also, owners are responsible for providing financing support to a project.

2. **Contractors**; - The Contractor shall carry out the works properly and in accordance with the contract. The contractor shall provide all supervision, labor, plant and contractor‘s Equipment which may be required. All materials and plant on site shall be deemed to be the property of the employer.

3. **Designer (architect /engineer); -**the third party of a project who is responsible to interpret the idea and need of the owner in to a tangible blue print. And also watch and supervise the Works and to test and examine any materials to be used or workmanship employed in connection with the Works.

Table2.2: Contract Parties and Roles

CONTRACT PARTY	MAJOR ROLE
EMPLOYER	Creates the necessity to build the facility Provides financial support to develop the project Determines the scope of the work Most important player of the process
ENGINEER	Responsible for the project design Idealizes the final result of the project Develops drawings and specifications and prepares other contract documents administers the contract and supervises the works
CONTRUCTOR	Creates the facility based on the design Brings the project into reality Manages different resources to build the facility

Source Rohaniyati (2009)

2.1.8 Construction Project Life Cycle

Every project, not just those in the Construction industry, goes through a series of identifiable phases, from its initiation to its closeout time. Lawrence (2003) states six phases of the Construction project life cycle.

Pre-project phase

A Construction project begins with an idea or the wish for more efficient provision of some public service. Whether the idea will be converted into a completed project will be decided during the planning and design phase. The owner must decide the type of project, select design professional and consultant.

Planning and design phase

The project is fully defined and made ready for contractor selection and deployment during the Planning and design phase. The consultant defines the project‘s objectives, consider alternative ways to attain those objectives and ascertain whether the project is financially feasible. In this process of planning and feasibility study, a project brief will be developed, more details will be set forth in a program statement, various sites may be investigated, public input may be sought, a preliminary cost estimate will be prepared and a final decision on whether to proceed with the project will be rendered. The design professional will use the results of the planning efforts to develop schematic diagrams showing the relationships among the various project components followed by detailed design of the structural, electrical and other systems. The output from this design development effort is used in the final stage, wherein contract documents are prepared for use in contractor selection and installation work at the Construction site.

Contractor selection phase

In anticipation of selecting a contractor, the owner must decide the method either an open selected contractor will be invited to submit offers. The consultants open the submittal, and evaluate the tenders, the selection of the successful contractor and the finalization of the Construction contract.

Project mobilization phase

After the contractor is selected, a number of activities must be completed before installation work can begin at the project site. The contractors take over the Construction site, all the drawings and specification. The contractor prepares detailed program for the Construction activities and submit it to the consultant for approval and budget. The worksite must be organized, with provisions for temporary buildings and services, access and delivery, storage

areas and site security. The process of obtaining materials and equipment to be incorporated into the project must be initiated and arrangements for labor, the other essential resource, must be organized. With the completion of this phase, it is finally time to begin the actual field Construction.

Project operations phase

In presenting the contractor‘s activities on the Construction site, we will suggest, perhaps too simply, that the responsibilities involve three basic areas: monitoring and control, resource management and documentation and communication.

Project closeout and termination phase

Finally, as the project nears completion, a number of special activities must take place before the contractor‘s responsibilities can be considered complete. There are the various testing and startup tasks, the final cleanup, various inspections and remedial work that may result from them and the process of closing the Construction office and terminating the staff‘s employment.

Generally, good planning, monitoring and evaluation enhance the contribution of contractors by establishing clear links between past, present and future initiatives and development results. Monitoring and evaluation can help organization extract relevant information from past and ongoing activities that can be used as the basis for programmatic fine-tuning reorientation and future planning. Without effective planning, monitoring and evaluation, it would be impossible to judge if work is going in the right direction, whether progress and success can be claimed, and how future efforts might be improved.

According to Merithal.et (2013p.123) ‖ managing a project involves continually planning what to do, checking on progress, comparing progress to plan, taking corrective action to bring progress into agreement with the plan if it is not, and re-planning when needed.

2.1.9 Human Capital Theory

Human capital theorists insist on the importance of investment in education and the imparting of value to the future worker (Livingstone, 1999). Skills and knowledge gained through education is importance to employees when they are performing their tasks as it improves their

performance. There is a large and growing body of evidence that demonstrates a positive linkage between the development of human capital and organizational performance.

Human capital is 'generally understood to consist of the individual's capabilities, knowledge, skills and experience of the company's employees and managers, as they are relevant to the task at hand, as well as the capacity to add to this reservoir of knowledge, skills, and experience through individual learning (Dess&Picken, 2000).

Management teams require technical skills to run the projects successfully. These skills could be gained from technical institutions, formal education or on job training. This theory has been put in application in several occasions. According to Ngugi (2013) human capital theory emphasizes the value addition that people contribute to an organization. Ngugi also added that the theory regards people as assets and stresses that investments in people generate worthwhile returns for gaining competitive advantage key among them improvements in performance, productivity, flexibility and the capacity to innovate. The theory shows the need for the management team to have skills and experience in project management cycle and use of project management tools and techniques when running the projects.

2.1.10 Project management model and practice

Project Management is the application of a collection of tools and techniques like CPM or network analysis, PERT and soon, to direct the use of diverse resources toward the accomplishment of a unique, complex, one-time task within time, cost and quality constraints. Each task requires a particular mix of these tools and techniques structured to the task environment and life cycle (from conception to completion) of the task (Turner and Muller, 2005). Projects are successful if they are completed on time, within budget, and to performance requirements. In order to bring the many components of a large project into control there is a large toolkit of techniques, methodologies, and tools. These techniques provide the tools for managing different components involved in a project: planning and scheduling, developing a product, managing financial and capital resources, and monitoring progress. Project management processes and techniques are used to coordinate resources to achieve predictable results. All projects may need some level of project management.

2.1.11 Complexity Theory and Project Management

Current management practices require adherence to rigid, global responses unsuitable for addressing the changing needs of most projects. Complexity Theory and Project Management shifts this paradigm to create opportunities for expanding the decision-making process in ways that promote flexibility—and increase effectiveness. It informs readers on the managerial challenges of juggling project requirements, and offers them a clear roadmap on how to revise perspectives and reassess priorities to excel despite having an unpredictable workflow (Wanda et al, 2010)

Complexity theory helps understand the social behaviors of teams and the networks of people involved in and around a project. The ideas apply equally to small in-house projects as to large complicated programs. In this regard, 'complexity' is not a synonym for 'complicated' or 'large'. Whilst the ideas of 'complexity theory' are applicable to all projects, size does have an impact. From a complexity theory perspective, every project is complex, the project team are working together to deliver their project and in the process have to deal with issues and tensions within the project and issues and tensions (if not outright conflict) with stakeholders external to the project. The actions and influences of these external stakeholders trigger the need for the project team to adapt to its environment and engage proactively with the external stakeholders for the project as a whole to survive and deliver a successful outcome. And importantly the behavior of the team cannot be predicted from the behavior of any one person.

2.1.12 Change and Project Monitoring

Theory of Change (ToC) is a specific type of methodology for planning, participation, and evaluation that is used in the philanthropy, not-for-profit and government sectors to promote social change. Theory of Change defines long-term goals and then maps backward to identify necessary preconditions. Theory of Change explains the process of change by outlining causal linkages in an initiative, i.e., its shorter-term, intermediate, and longer-term outcomes.

Theory of change is both a process and a product. It should be seen as an on-going process of discussion-based analysis and learning that produces powerful insights to support program design, strategy, implementation, evaluation and impact assessment, communicated through diagrams and narratives which are updated at regular intervals.

The quality of a theory of change process rests on ‘making assumptions explicit’ and making strategic thinking realistic and transparent. Practical experience highlights that this is not straightforward to do, as these tap into deeper beliefs, values, worldviews, operational ‘rules of thumb’ and analytical lenses that all individuals in development bring to their work. It takes time and dialogue to be able to challenge assumptions. Power relations, both in the program’s context and within organizations, limit the ability to challenge established ways of working.

2.1.13 Project Cost performance

Project Management Body of Knowledge guide (PMBOK) defines cost estimates as a developed approximation of the monetary resources needed to complete project activities. The accuracy of cost estimates starting from the planning phase of a project through to the tender estimate can affect the success or failure of a Construction project. The process of determining the project budget involves aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline (PMI, 2008).

The project budget that results from the planning cycle must be reasonable, attainable, and based on contractually negotiated costs and the statement of work. The basis for the budget is historical cost, best estimates, or industrial engineering standards. The budget must identify planned manpower requirements, contract-allocated funds, and management reserve Performance results standards are quantitative measurements and include such items as quality of work, quantity of work, cost of work, and time-to-complete (Kerzner, 2009).

Earned value is a management technique that relates resource planning to schedules and technical performance requirements. Earned value management (EVM) is a systematic process that uses earned value as the primary tool for integrating cost, schedule, technical performance management, and risk management.

The cost variance compares deviations only from the budget and does not provide a measure of comparison between work scheduled and work accomplished. In order to calculate variances, we must define the three basic variances for budgeting and actual costs for work scheduled and performed (Archibald, 1976).

2.1.14 Project Time performance

The project time schedule includes a planned start date and a planned finish date for each activity. A project schedule may be presented in a summary form referred to as a master schedule or milestone schedule or may be presented in detail. Often, the project schedule is presented graphically using milestone charts, bar charts, and project schedule network diagrams. The schedule baseline is developed from the schedule network analysis and is accepted and approved by the project management team as the baseline with baseline start dates and baseline finish dates. The baseline is a key element in schedule control and time management.

Project time performance is established by measuring, comparing and analyzing schedule performance such as actual start and finish dates, percent complete, and, remaining duration of work in progress. The performance is assessed by the use of techniques such as earned value management (EVM), schedule variance (SV), schedule performance index (SPI). These techniques help to assess the magnitude of schedule variances. The critical chain method compares the amount of buffer remaining to the amount of buffer needed to protect the delivery date and thus can help determine the schedule status (PMI, 2008).

The total float variance is an essential planning component to evaluate project performance. Project management software for scheduling such as MS Project and Task provides the ability to track planned date versus actual dates and to forecast the effects of changes to the project schedule.

2.2 Empirical Review

2.2.1 Top Management Support

In Top management support, selecting a project manager with the required technical expertise management experience and interpersonal skills to successfully manage the project, provide adequate resources for the project and provide incentives to the team members. The findings of the study pointed out that Top management support strongly affects the success of construction projects, Top Management is required to conduct regular review meetings to ensure and monitor the progress of the project, follow up with customers to determine general customer satisfaction and finally to recognize and reward the project team members upon the successful completion

of the project(Imtiaz et al, 2013).

Top management support ensures the availability of resources and employee commitment towards the project. Based on the study it is determined that top management support is essential for the success of construction Project.

2.2.2 Project Management Practice

Timely and with budget completion of a Construction project is frequently seen as a major criterion of project success by clients, contractors, consultants and related stakeholders (Luka and Muhammad, 2014; Ibrahim and Nabil, 2013; Abadir, 2011; Chabota et al., 2008). The primary challenge of a project is the handling of constraints to meet the desired goal where one aims to honor the primary constraints of time and budget to produce quality result (ECIDP, 2014; Warszawski, 1996).

2.2.3 Communication

Gharashe (2009) concluded in his study on analysis of factors influencing projects in Kenya that the quality of project management, operating environment, worker motivation, communication, inadequate resources and organization of the project team as factors affecting project implementation. Mwadali (2006) found that inexperienced project managers, poor communication, poor monitoring and control systems negatively affect project management efficiency. Effective communication in project implementation creates a common perception, changing behaviors and acquiring information (Brown 2011). A failure in communication can negatively impact the project (Ruuska, 2007). Project communication is an informative tool, which communicates to all relative groups what is happening in the project. The importance of communication in the success of a project is immense. Careful communication planning and setting the right expectations with all the project stakeholders is therefore extremely important.

2.2.4 Project Monitoring

According to Chua et al (2009), project success is not determined exclusively by the project manager, monitoring and control efforts. Similarly, Chen et al (2007) studied critical success factors for projects in Taiwan and concluded that project owners, team members, vendors and other related stakeholders who are directly or indirectly involved in the work all significantly

influence the success of the projects. Chan et al (2004) examined 3 case studies of key performance indicators for measuring project implementation success in Hong Kong. He concluded that cost, time and quality were still three most important indicators of success in projects. Other measures such as safety, functionality and satisfaction are attracting increasing attention.

Pheng et al (2007) on the other hand carried out a study on how environmental factors affect the performance of the project manager. He identified 13 factors which would affect performance: job related factors were salary, job satisfaction, job security, availability of information; project related factors were, project environment, project size, time availability, complexity of project, team relationship, materials and supplies and duration of project, while organization-related factors were, level of authority and type of client.

Karani (2007) carried a study focusing on factors impacting delivery reliability of projects. He identified the critical factors as cash flow problems, delayed payment to vendors, under estimation of project duration, unqualified staff on the project team, inadequate supervision of work and increase in scope of works. He concluded that these inputs and transformational process factors are attributable to the core stakeholders in any project.

2.2.5 Project Management performance

Nowadays, more and more organizations change their organizational culture towards project orientation. There is a big challenge for each organization to continually improve its project management processes to increase quality of outputs and satisfaction of customers. Measuring project management implementation maturity can assist in this effort by providing a valuable framework for performance improvement.

Over the past few years, many organizations have adopted a project-oriented approach both for external delivery processes and internal control processes. This decision has positive impacts on the organization, as it systemizes the work being delivered. Continuously, more and more activities are classified as projects to deliver project outputs. In this sense, a project can be defined as a temporary organization, containing sources (people, budget, tools, etc.), existing over a specific time period with the objective to deliver project outputs. There are many potential advantages for both organization and its customers, if work is being organized this

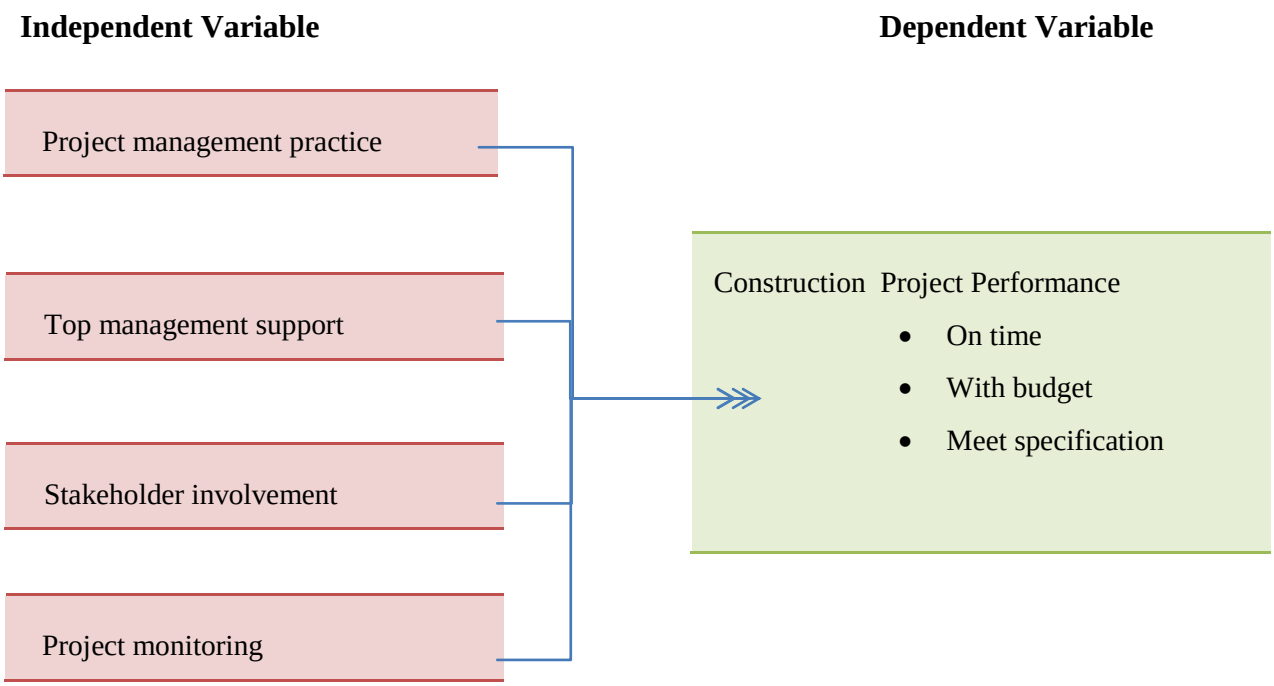
way. However, there are many potential risks and problems that can occur if projects are not systematically managed with the use of a project management framework. The aim of the study is to introduce possible measures for improving project management performance of companies in the Construction sector. This will be achieved by determining the level of maturity of project management processes within these organizations and by identifying determinants affecting the performance.

2.3 Conceptual Frame Work

Conceptual framework is a hypothesized model identifying the concepts under the study and their relationships. Mugenda (2008) defines conceptual framework as a concise description of phenomenon under study accompanied by a graphical or visual depiction of the major variables of the study. According to Young (2009), conceptual framework is a diagrammatical representation that shows the relationship between dependent variable and independent variables.

In this context the dependent variable is construction project management performance, while project management practices, top management support user involvement and project monitoring are independent variables. (See figure below)

Figure1: Conceptual Framework



Source: Stephen Omwaka, (2016) p.857

CHAPTER THREE
RESEARCH METHODOLOGY

This chapter is a review of the various approaches to data collection and analysis adopted in conducting this research; it explains the type of research strategy adopted the mode of data collection and the methodology used in carrying out this research. It includes the research design, sample size and sampling technique, data source and collection method, procedure of data collection, method of data analysis and questionnaire reliability test was presented.

3.1 Research Design

A research design is a conceptual structure that shows how all the major parts of the research project come together. According to Kothari (2004) it constitutes the blueprint for the collection, measurement and analysis of data. In this study, both descriptive and explanatory analyses were conducted. Descriptive research design is preferred for describing the existing descriptive characteristics of the variables. Descriptive statistics like mean, percentage, etc. was used to describe the data. Explanatory analysis using linear regression model is employed to analyze the major factors affecting Construction project performance in Defense Construction Enterprise. Correlation design regression analysis have been applied to empirically investigate the association of variables and assess the cause and effect relationship between the independent variables; project management practice, top management support, stakeholder involvement, project monitoring, information communication technology and dependent variable; project management performance.

3.2 Source of Data

The study used both primary and secondary data. The primary data was collected from Defense Construction Enterprise employees through questionnaires to investigating the effect of project management practice, top management support, user involvement and project monitoring on Construction project implementation performance from project owner point of view. The secondary data was collected from books, research journals and articles conducted on project management and other related titles, unpublished materials of Defense Construction Enterprise

3.3 Target Population of the Study

The populations for this study involve Project Manager, Site and Office Engineers, Construction Engineers, Equipment Administration Team and Resource Supply Team form 11 major road Construction projects which Defense Construction Enterprise currently operating. In addition, top middle management members, human resource department members; case team leaders, monitoring and evaluation department members from head office will also be targeted.

3.4 Sample Design

Out of the total 11 major road Construction projects, 4 projects have beenselected as a sample for this assessment. According to the information received from Defense Construction Enterprise, each project has more than 100 professionals working in them. Therefore the total number of target population for the study is 400 professionals working at the 4 major road Construction projects in Defense Construction Enterprise.

This study apply simplified formula provided by Yamane, (1967) to determine the required sample size at 95% confidence level, degree of variability = 0.5.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n = Desired sample size

N =Total target population size (400)

e = Accepted error limit (0.1) on the basis of 90 percent degrees of confidences put into decimal form

$$n = \frac{400}{1 + 400(0.1)^2}$$

n= 80

Therefore, based on the formula stated above, the sample size of the study was 80 professionals. The sampling technique that the research employs for identifying personals which participate in the survey was purposive sampling. Kent (2007) defines Purposive sampling is a sampling technique that allows the researcher pick informants based on the purpose of the study. Of the different types of non-probability sampling techniques, purposive sampling is taken as the most appropriate for the study. This is because of the context of the target enterprise. It is clear that DCE is basically part of a military institute controlled and directed by Ministry of National Defense (MoND). Therefore, naturally, its projects are widely dispersed across the border of the country. This makes it very difficult to reach all the projects and complete the research project within a given period of time. Therefore, it is preferable to reach projects and offices of the enterprise based on purposive sampling in terms of transportation and other facilities.

The focus of study was on employees and management members of Defense construction who are responsible for project implementation. The total sample size was 80. The total numbers of 80 professionals who are responsible for project implementation in Defense construction were researcher's sample.

From the total distributed 80 questionnaires 66 of them (82% response rate) were filled in and returned back by the respondents. Mugenda and Mugenda (2008) reveal that 60% response rate is good for such a study. Therefore, it can be inferred that such response rate was adequate. Design, construction and project Management department are selected for this study because these teams are the one who has the overall responsibility for the successful initiation, planning, design, execution, monitoring, controlling and closure ofconstructionproject of the Defense Construction.

The study targets these employees because they are very relevant for the research. The employees are further classified into the following sector which includes top managers, middle managers and general staff.

3.5 Method of Data Collection

A questionnaire survey instrument was employed. The structured questionnaire was employed

the typical form of fixed-response alternative questions that require the respondent to select from a predetermined set of answers to every question.

The study used a five point Likert Scale from (1) strongly disagree to (5) strongly agree. It is a widely used rating scale which requires the respondents to indicate a degree of agreement or disagreement with each of a series of statements or questions (Albaum, 1997 as cited in Samuel, 2006). This rating scale is easy to construct and administer and respondents readily understand how to use the scale (Malhotra and Birks, 2003, as cited in Samuel, 2006).

To collect the data the following procedures are used. First the briefing on the questionnaires was given for the Construction project implementers. Then the questionnaires were distributed to Construction project implementers who are respondents of this study to be filled by them. The questions were collected from the respondents after a week in order to give them sufficient time. A reminder was made for the non- responding project implementers. The remaining questionnaires were collected, coded and analyzed for usability.

3.6 Pilot Study

In survey based research it is important to validate the scales used for reliability and validity. Even if the measurement variables and scale questionnaires are adopted from highly validated instruments, checking it whether they can be applied in Ethiopian context is important. Gleam & Rosemary (2003) explained that oftentimes information gathered in the social sciences, marketing, medicine, and business, relative to attitudes, emotions, opinions, personalities, and descriptions of people's environment involves the use of Likert-type scales p.82. As individuals attempt to quantify constructs which are not directly measurable they oftentimes use multiple-item scales and summated ratings to quantify the construct(s) of interest. The present study validated the measurements using Internal Consistency and Predictive Validity.

Pilot study of the questionnaire is achieved by a scouting sample, which consisted of 10 questionnaires. These questionnaires were distributed to team leaders, projects managers, office engineers, construction engineers, site engineers and expert engineers at head office and projects around Addis Ababa first to give their comment on the questions and then to fill the questionnaire.

3.6.1 Reliability

Cronbach's alpha is a coefficient (a number between 0 and 1) that is used to rate the internal consistency (homogeneity) or the correlation of the items in a test. A good test is one that assesses different aspects of the trait being studied. Cronbach's alpha will generally increase as the inter correlations among test items increase, and is thus known as an internal consistency estimate of reliability of test scores. Because inter correlations among test items are maximized when all items measure the same construct, Cronbach's alpha is widely believed to indirectly indicate the degree to which a set of items measures a single construct (Gleam & Rosemary , 2003). George and Mallery (2003) provide the following rules of thumb: — > .9 Excellent, > .8 – Good, > .7 Acceptable, > .6 Questionable, _ > .5 Poor, and < .5 Unacceptable p.231 (as cited in Gleam & Rosemary, 2003). If correlations between items are too low, it is likely that they are measuring different traits and therefore should not all be included in a test that is supposed to measure one trait.

Table 3.1 Cronbach's Alpha

Measurements	No of Items	Cronbach's alpha
Project Management Practice	7	0.924
Top Management Support	8	0.944
User Involvement	10	0.951
Project Monitoring	8	0.901
Project Performance	7	0.758

Source: Survey data, 2019

Cronbach's alpha for each value was established by the SPSS application and gauged against each other at a cut off value of 0.7 which is acceptable according to Cooper and Schindler (2008). All the values were above 0.7 which concludes that the data collection instrument is reliable.

3.7 Methods of Data Analysis

Before analyzing the quantitative data, the questionnaires were cross checked for completeness and consistency. And then it was analyzed with the help of SPSS version 20.

The information was displayed by use of bar charts, graphs and pie charts. Correlation analysis will be used to establish the relationship between the independent and dependent variables. The purpose of doing correlation was to allow the study to make a prediction on how a variable deviate from the normal.

In order to assess the influence of independent variables on dependent variable multiple linear regressions will be applied. The model which will be applied to show this influence is presented as follows;

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$

Where:

Y = Dependent Variable (Project Performance)

$\beta 0$ = Intercept (value of Y when X= 0)

$\beta 1$ = Slope

X1= Project management Practices

X2= Top Management support

X3= User Involvement

X4= Project monitoring

ε = the error

.

3.8 Ethical Consideration

Due consideration was given to obtain consent from each participant about their participation in the study. It was strictly conducted on voluntary basis. The researcher tried to respect participants' right and privacy. The findings of the research were presented without any deviation from the outcome of the research. In addition, the researcher gave full acknowledgements to all the reference materials used in the study.

CHAPTER FOUR
RESULT AND DISCUSSION

4.1 Descriptive Analysis

4.1.1 Background characteristics

Since the general characteristics of the respondents are vital to get insights to the overall study we shall start by seeing the demographic nature of the respondents. It is believed in many extant Literatures that demographic variables like educational level, Job position and experience do have an impact on project performance.

It is important to note that the majority of project implementers are concentrated in one group in terms of Educational qualification and employee Level. Education is paramount in enabling the respondents to conceptualize issues related to resource utilization. It was established from the study that 71.2% of the respondents have bachelor and the remaining 28.8% have post graduate degree.

Apparently from the table 4.1 finding it shows that majority of respondents working in Defense Construction have bachelor degree qualifications. This implies that they are capable of conceptualizing and respond authoritatively on issues and practices.

Thus, the profile of project implementer' working in Defense Construction Enterprise are summarized by the following table.

Table4.1: Project Implementers Profile

Variables	Category	Frequency	Percentage
Educational Qualification	Certificate/ Diploma	0	0%
	Bachelor Degree	47	71.2%
	Post graduate degree	19	28.8%
	Doctorate Degree	0	0%
Job Position	Staff	47	71.2%
	Manager	15	22.7%
	Site engineer	3	4.5%
	Forman	1	1.5%
Service Year	0-3 Years	5	7.6%
	4-6 Years	19	28.8%
	7-10 Years	24	36.4%
	Above 10 Years	18	27.3%
Department	Project management	11	34.8%
	Construction design	23	35.4%
	Site	31	47.0%

Source: Survey Data, 2019

This finding was in line with Katz (1992) finding that those with higher education are more successful as they have more knowledge and have modern managerial skills making them more conscious of the reality of the business work. And the majority of the respondents (95%) have more than 3 years' experience.

4.1.2. Descriptive statistics of the Variables

To come up with the scores of the variable, items under each dimension are aggregated to one. As indicated in the table 4.2, all independent variables mean score is less than the midpoint of the scale which is 3. Of the four independent variables top management support is the highest (2.27), while user involvement is the lowest (2.12). But the mean value of the dependent variable (project management performance) is above 3. From the variables the highest range is project management performance and the lowest is of top management support 2.29 and 0.87 respectively.

Table4.2: Statistics of Variables

Variable	Mean	Std. Deviation
Project Management Practice	2.24	0.52
Top Management Support	2.27	0.33
User Involvement	2.12	0.5
Project Monitoring	2.22	0.39
ProjectManagement Performance	3.01	0.48

Source: Survey data, 2019

The mean values for all variables are below the average which implies that the independent variables are poorly conducted in the Enterprise.

4.1.2.1 Project Management Practices

The study sought to find whether project management practices significantly improved the performance of construction projects in the firm. From the findings the study revealed that majority (42%) of the respondents neither agreed nor disagreed, 30% of the respondents agreed and 5% of the respondents strongly agreed that project management practices significantly improved the performance of construction projects in the firm while 19% of the respondents

were not for the opinion that project management practices significantly improved the performance of construction projects in the firm. The study also sought to find out project life cycle is used implementation. From the findings 51.5% of the respondents disagreed that project cycle used in Defense Construction during project execution while 7.6% of the respondents agreed and the remaining 41% of the respondents neither agreed nor disagreed.

The study sought to find out the project management tools that the respondents were being used in Defense Construction. The majority (76%) of the respondents strongly disagreed that project charter is easily available in Defense Construction and 7.6% of the respondents agreed while the remaining 16.7% of the respondents neither agreed nor disagreed. For work breakdown structure the majority (83.3%) responded as project works are not decomposed in to manageable deliverables while 16.7 of the respondents neither agreed nor disagreed, the majority (79%) of the respondents disagreed and strongly disagreed that there is a clear project evaluation and review techniques are practiced in Defense Construction while the remaining responded as neither agreed nor disagreed.

During project execution Gantt charts techniques are not used effectively to follow projects in Defense Construction as per 92.4% of the respondents while the remaining 7.6% of the respondents neither agreed nor disagreed, 92% of the respondents responded as SWOT analysis is not used to evaluate the project in Defense Construction while 7.6% responded as neither agreed nor disagreed.

Table4.3: Frequency Table for Project Management Practice Statements

Project management practice	SDA (1)	D(2)	N (3)	A (4)	SA (5)
Project management practices significantly improve performance of Construction project in defense Construction.	0%	19.7%	42.4%	30.3%	7.6%
Project management life cycle (Initiation, planning, execution, monitoring and closure) is used during Construction project implementation	0%	51%	40.9%	7.6%	0%
Project charter is easily available/ accessible in defense Construction.	0%	75.8%	16.7%	7.6%	0%
Project works are broken down to manageable deliverables in your organization	10.6%	72.4%	16.7%	0%	0%
Clear Project evaluation and review 1techniques are practiced in defense Construction.	10.6%	68.2%	21.2%	0%	0%
A Gantt chart is effectively used to follow up projects in defense Construction.	42.4%	50%	7.6%	0%	0%
SWOT analysis is used to evaluate the projects in defense Construction.	33.3%	59.1%	7.6%	0%	0%

Source: Survey data, 2019

4.1.2.2 Top Management Support

The study sought to investigate the influence of top management support on the performance of construction projects in Defense Construction. Specifically, the study focused on allocation of financial capital resources, allocation of human capital resources, allocation of physical capital resources, the competence development, Incentives, Recognition and reward.

Table4.4: Financial Capital Resource

		Frequency	Percent
Valid	Dis-agree	14	21.2
	Neither agree nor disagree	46	69.7
	Agree	6	9.1
	Total	66	100.0

Source: Survey data, 2019

The study sought to find out whether financial capital resources are fully allocated in construction projects of Defense Construction. From figure 4.3, 21.2 % of the respondents disagreed that financial capital resources are fully allocated in construction projects of Defense Construction, 69.7 of the respondents neither agreed nor disagreed that financial capital resources are fully allocated in construction projects of Defense Construction. While 9.1% of the respondents agreed that financial capital resources are fully allocated in construction projects of Defense Construction. Therefore, it can be inferred that financial capital resources is not fully allocated to construction projects of Defense Construction. The finding vary with the studies such as Wiklund and Shephere, (2005) and Zhou and Chen, (2008) identify that there is need for financial capabilities to obtain physical resources in order to take advantage of business opportunities. The study sought to know the availability adequate human capital resources in construction projects of Defense Construction.

Table 4.4 shows that 9.1% of the respondents indicated that there is adequate human capital resources in construction projects of Defense Construction as strongly disagreed, the majority (54.5%) of the respondents indicated that there is adequate human capital resources in construction projects of Defense Construction as dis agreed while (36.4%) of the respondents indicated that there is adequate human capital resources in construction projects of Defense Construction as neither agreed nor disagreed.

The findings contrast with those of Viedma (2001) who observed that human capital is considered as the potential source of innovation and generation of ideas for the firm, thus providing added value of unquestionable importance. Human capital is recognized as the organization‘s most important intangible resource (Johanson, 2005) by playing a fundamental

role in firms in this knowledge-based economy (Sveiby, 2000).

Table4.5: Human Capital Resource

		Frequency	Percent
Valid	Strongly Disagree	6	9.1
	Dis-agree	36	54.5
	Neither agree nor disagree	24	36.4
	Total	66	100.0

Source: Survey data, 2019

The study sought to evaluate if there is a Competence development in construction projects of Defense Construction. Table 4.6 shows that the majority (81.8%) of the respondents indicated that there is Competence development in construction projects of Defense Construction as dis agreed and the rest (18.2%) of the respondents indicated that there is Competence development in construction projects of Defense Construction as neither agreed nor disagreed. This finding contrast with findings of study by Samson and Lema (2005) who found that competence development enhances quality and productivity performance of Construction projects.

The study concludes that there is no competence development in construction projects in Defense Construction as depicted by the statistics above even though the researchers stated Competency development enables vertical alignment by aligning organizational, team and individual goals (Cardy&Selvarajan, 2006; Fleury&Fleury, 2005). The competency framework implicates the development of a mutual language throughout the organization, making it possible to translate an organization's strategy into individual goals and competencies for every employee (Audenaert et al, 2009; Fleury&Fleury, 2005).

Table4.6: Competence Development

		Frequency	Percent
Valid	Dis-agree	54	81.8
	Neither agree nor disagree	12	18.2
	Total	66	100.0

Source: Survey data, 2019

4.1.2.3 User Involvement

The study sought to find out if the users are involved during construction projects in different stage of the projects at Defense Construction. It is not enough to finish the project on time and in budget, our end goal is to have the project accepted by the users who the project is being developed for. In order to make sure our product will be accepted by end users, we must include them in the development and testing phase.

According to the findings in Requirement stage, the majority (52%) indicated that users are involved during user requirements specification stage of construction projects as dis agreed, For design stage, the majority (72.7%) indicated that users are involved during design stage of construction projects as strongly dis agreed and dis agreed, For development stage 95.5% indicated that users are involved during development stage of construction projects as strongly dis agreed and dis agreed, and For testing stage majority 60.6% reported as disagreed that users are involved at the testing stage of construction projects for respective questions.

Table4.7:User Involvement

User Involvement	N	Mean	Std.Deviation
There is an end users Involvement during Construction project.	66	2.62	0.67
There is an end users Involvement during requirement specifications stage of Construction projects.	66	2.58	0.66
There is an end users Involvement during Design stage of Construction projects.	66	2.09	0.67
There is an end users Involvement during development stage of Construction projects.	66	1.67	0.56
There is an end users Involvement during testing stage of Construction projects.	66	2.48	0.66
Users are communicated about the project	66	2.3	0.46

status in all project stages.			
The project managers always update the users and he/she manages their expectations throughout the project.	66	1.94	0.63
There is adequate exchange of information among stakeholders.	66	1.92	0.79
There are timely feedbacks to/from project team and to/from users.	66	1.76	0.72
The project managers are concretely plan the communications that allow the project team to share information, actively work to identify issues, conflicts, and interact creatively to resolve these issues	66	1.82	0.63
Grand Mean		2.19	

Source: Survey data, 2019

Findings in Table 4.8 show that Users are communicated about the project status in all project stages in construction projects of Defense Construction to a moderately disagree with mean of 2.30. The standard deviation is 0.46 implying that majority of the respondents were in dis agreement. There is adequate exchange of information among stakeholders in construction projects of Defense Construction with a mean of 1.94. The findings are differs with those of Brown (2011) who reported that the goals of effective communication include creating a common perception, changing behaviors and acquiring information. There is timely feedback to/from project team to/from users with a mean of 3.36 was strongly dis agreed upon.

The project managers are concretely plan the communications that allow the project team to share information, actively work to identify issues, conflicts, and interact creatively to resolve these issues is with mean of 1.82. The findings imply that a failure in communication can negatively impact on the project. Therefore, establishing team communication norms is very

important. The project manager must concretely plan the communications that allow the project team to share information, actively work to identify issues, conflicts, and interact creatively to resolve these issues.

4.1.2.4 Project Monitoring

Table4.8:Monitoring

Project Monitoring	N	Mean	Std. Deviation
Top Managements conducts regular review meetings to ensure and monitor the progress of the project.	66	2.94	0.63
The Top managements follow all projects with the customer, in order to determine general customer satisfactions.	66	2.7	0.83
The project sponsor evaluation is considered as one of the important component of monitoring during Construction projects.	66	1.82	0.55
User assessments conduct to evaluate the outcome/product during Construction projects.	66	1.71	0.46
Corrective actions are always identified to address the issues in Construction projects.	66	2.03	0.39
The project managers involve in monitoring the project variables in Construction projects.	66	1.73	0.60
Project managers/ management teams involve in measuring the ongoing project activities in Construction projects.	66	1.73	0.60
The Construction projects always meet project objectives and user descriptions.	66	3.06	0.65
Grand Mean		2.22	

Source: Survey data, 2019

Due to corrective actions are always identified to address the issues in construction projects not achieved project performance is affected at Defense Construction as shown by a mean of 1.71, The standard deviation is .46 implying that majority of the respondents were in dis agreement.

The project sponsor evaluation is considered as one of the important component of monitoring during construction projects and Project managers/ management teams are involved in measuring the ongoing project activities in construction projects are very closely linked with project performance affecting factors at Defense Construction as shown by a mean of 1.7.

User assessments are conducted to evaluate the outcome/product during construction projects with mean of 1.82. The project managers are involved in monitoring the project variables in construction projects with mean of 2.03, The standard deviation is .39 implying that majority of the respondents were in dis agreement.

4.2 Regression Analysis

In addition, the researcher conducted a linear multiple regression analysis so as to test the relationship among independent variables and dependent variable. The researcher applied the statistical package for social sciences (SPSS) to code, enter and compute the measurements of the multiple regressions for the study.

Table 4.9: Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.903[a]	0.815	.803	0.2072

Source: Survey data, 2019

The adjusted R^2 is the coefficient of determination. This value explains how project performance practices varied with project management practices, top management support, user involvement and project monitoring. The four independent variables that were studied, explain 81.5% of the factor affecting Construction projects performance as represented by the R^2. Therefore, a further research should be conducted to investigate the other factor (18.5%) that affects Construction projects performance in Defense Construction.

Table4.10: ANOVA

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	566.258	4	141.565	67.274	.000[b]
	Residual	128.363	61	2.104		
	Total	694.621	65			

Source: Survey data, 2019

According to Mugenda&Mugenda, 2003, ANOVA is a data analysis procedure that is used to determine whether there are significant differences between two or more groups or samples at a selected probability level. An independent variable is said to be a significant predictor of the dependent variable if the absolute t-value of the regression coefficient associated with that independent variable is greater than the absolute critical t-value. In this study, the significance value is .000 which is less than 0.05 thus the model is statistically significant in predicting Project Management Practices, Top Management Support, User Involvement and Project Monitoring.

Table4.11: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.426	.200		2.134	.037
	PmPractice	.150	.072	.168	2.095	.040
	TopMgt	.289	.107	.202	2.713	.009
	UserInvolve	.228	.105	.243	2.159	.035
	Pmonitoring	.501	.140	.417	3.567	.001

Source: Survey data, 2019

The researcher conducted a multiple regression analysis so as to determine the relationship between Construction Project Management Performance and the four variables. As per the SPSS generated table above, the equation ($Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \varepsilon$)

becomes:

As per the SPSS generated the established regression equation is:

$Y = 0.426 + 0.150 X1 + 0.289 X2 + 0.228 X3 + 0.501 X4 + \varepsilon$ where:

Y = Dependent Variable

$\beta 0$ = Intercept (value of Y when X= 0)

$\beta 1$ = Slope

X1= Project management Practices

X2= Top Management support

X3= User Involvement

X4= Project monitoring

ε = the error

According to the regression equation established, taking all factors into account (Project Management Practices, Top Management Support, User Involvement and Project Monitoring) constant at zero, Construction Project Management Performance will be 0.426. The findings analyzed also show that taking all other independent variables at zero, a unit increase in Project management Practices will lead to a 0.150 increase in Construction Project Management Performance; a unit increase in Top Management support will lead to a 0.289 increase in Construction Project Management Performance, a unit increase in User Involvement will lead to a 0.228 increase in Construction Project Management Performance and a unit increase in Project monitoring will lead to a 0.501 increase in Construction Project Management Performance.

This infers that project monitoring affects the Construction Project Management Performance more followed by the Top Management support.

At 5% level of significance and 95% level of confidence, Project management Practices had a

0.040 level of significance; Top Management support showed a 0.009 level of significant, User Involvement showed a 0.035 level of significant, Project monitoring had a 0.001 level of significant, and hence the most significant factor is Project monitoring.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of the findings

The main objective of this study was to assess the factors that affect performance of construction projects in Defense Construction Enterprise. The results arrived at show that the following factors affected the successful implementation of Construction Projects in Defense Construction in order of ranking: Project Monitoring, Top Management Support, User Involvement, and Project Management Practice affect the performance of the project in DCE in ascending order.

The findings of the show that project monitoring is the first leading variable in influencing the performance of the construction project in DCE. Top management support will take second place by analyzing the human capital resource, financial capital resource and competence development the study find out that more than 50% of the responders disagree about the management support in DCE. The third variable which affects the performance of the project will goes to User Involvement the study tries to find out the level of user involvement in the design, development and testing stage and according to the finding more than 70% of the responders disagree for the questions prepared on the questionnaires. Finally the last variable project management practice affect the performance of construction projects in DCE.

The findings of the study showed a high impact of all the four variables to performance of construction projects in Defense Construction. The study found out that there was 81.5% of corresponding change in determining performance of construction projects in Defense Construction for every change in all the four predictor variables jointly. Test of overall significance of all the four variables jointly, Project management Practices, Top Management support, User Involvement and Project monitoring using ANOVA, at .05 level of significance found the model to be significant (Mugenda&Mugenda, 2003).

5.2 Conclusion

From the analysis of the data collected, it can be concluded that:

There is no significant relation between the descriptive variables; different educational qualification, experience level groups, Service Level groups, and Departments in terms of their performance. Being Staff or Manager or stayed short or long in construction sector by itself have no statistically significant evidence to affect the performance level of the construction project in Defense Construction.

And also there is no sufficient statistical evidence to support significant and positive relationship between departments and education level of the project implementers with the project performance.

Project monitoring and project performance are significantly and positively related. Furthermore Project monitoring is the highest predictor of factors affecting project performance compared to other factors. So Project monitoring is the main predictor of construction project performance in Defense Construction.

Top Management support is the second highest predictor of project performance. Thus the data analysis reveals that the project implementers receive very low top management support that should have been received in the form of allocation of financial capital resources, allocation of human capital resources, and allocation of physical capital resources, the competence development, Incentives, Recognition and reward.

The finding indicates that one of the factors that affect performance in construction project of Defense Construction is User Involvement. Except limited end user involvement during requirement specification and testing stages there is no end user involvement in all stages of project implementation. And it is shown that there is a problem of channels in communication and exchange of information between the project implementer and the end user/stakeholders.

The finding also indicates that there is positive and statistically significant relationship between Project management Practices and performance. This result shows that Project

management Practices is one of the factors affecting project performance in construction project of Defense Construction.

5.3 Recommendation

The following recommendations can be drawn from the analysis and conclusions made. It is presented in the reference to factors affecting Construction project of Defense Construction.

Project management practice:

Defense Construction Enterprise should work to improve the project management practice during the project implementation. Project implementer's should follow the project life cycle for the application of appropriate knowledge, processes, skills, tools, and techniques which can have a significant impact on project success of construction projects.

Defense Construction Enterprise Project managers should adopt project management practices in their work. They need to get acquainted with project management tools and techniques, know which phase their projects are, plan, monitor and evaluate their projects regularly. This will ensure their projects perform better and when they don't, they can make changes that will yield positive results to the projects.

Defense Construction Enterprise should have sufficient special technical and project management knowledge and openness to new and effective methods when initiating construction projects. Staff should be equipped with the specific skills and competencies needed.

Top Management support:

The finding indicate that projects which have failed were poorly supported and understood by top management, the progress was halted mid-way due to poor interim results. To ensure long-term business vision Defense Construction Enterprise, Top management should support the projects. Beside to this there should be high level interaction among users and design and construction departments so that to facilitate successful implementation.

Defense Construction Enterprise top managers should consider project funding, quality of project management, working environment, competency, adequate resources allocation and organization of the project team to enhance the project implementation.

Training and Development should be conducted for managers, staff and end-users for the success of the construction project.

User Involvement:

User involvement in different stage is necessary and the lack of it can result in project failure. Many projects fail due to their inability to meet user expectations.

Effective communication helps stakeholders to understand the objectives and makes them more responsible towards their work. Defense Construction Enterprise should consider that the successful project has a solid communication system between the project sponsors and the project managers and also between project managers and their teams.

Furthermore, the researcher study recommends that there should be a clear and adequate plan for communication. This will help shorten the time taken to resolve issues or conflicts during project implementation.

Project Monitoring:

Defense Construction Enterprise should have effective and adequate monitoring mechanism for the quality of the project. Effective control can help in reducing the planned time and ambiguity. Project monitoring should be done on all stages of the project for construction projects by considering the dynamism of technology. And it should be proactive, i.e. must be used to prevent incidents and provide regular feedback.

In monitoring projects, sponsor evaluation of the investment should be handled in tandem with outcomes and assessment of the project product.

In addition, speed in deployment of project resources, adequacy of project scheduling and project stakeholders understanding of project timelines must be seriously considered.

Policy and practice for project performance should be carefully evaluated and the results of

that evaluation feed back into improved approaches. It is important that the evaluation considers the full range of costs and benefits.

Moreover, project product delivery, budget delivery and time delivery should be placed in line with the project goals and objectives.

The study recommends that Defense Construction Enterprise construction projects should address project scope, budgeting and project scheduling to reduce delays in project implementation.

Project performance initiatives appear to be instrumental for improving organizational performance, by harmonizing purchases, launching co-ordination initiatives, setting standards and building skills. As such, the management of the Defense Construction Enterprise should adopt project performance initiatives.

5.4 Limitation and Implication for further research

While these results are valuable, the limitation of this study must also be considered. A potential limitation of this research is the possibility that the results are not generalizable due to the particular industry it studied. Since the questionnaire survey instrument was employed through Likert rating scale some of the dependent variable i.e. project performance statements responded according to the respondent's perception. The population considered of construction project implementers only, but it is feasible the relations among these variables are quite different for project implementers in other environments.

Therefore, the results have to be interpreted taking this limitation into account. Future studies can examine the proposed relationships by bringing some contextual variables and additional dimensions into the model in order to fill the observed gap.

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APPENDIX 1

APPENDIX: QUESTIONNAIRE

St. Mary's University

School of Graduates

Factors Affecting Performance of Construction Projects:

QUESTIONNAIRE

Dear respondents, the purpose of this questionnaire is to gather data on **factor affecting Construction Project management performance in the case of Defense Construction Enterprise.** The study is purely for academic purpose and thus not affects you in any case. So, your genuine, frank and timely response is vital for successfulness of the study. Therefore, I kindly request you to respond to each items of the question very carefully.

In order to investigate the performance of projects in Defense Construction Enterprise, the researcher prepared the following questions with regard to Construction projects, please tick (√) on the appropriate question number to indicate the extent to which you agree or disagree with each statement.

The item has five-point Likert type scales; the scales have the following meaning

1 = Strongly Disagree, 3= Neutral, 5 = Strongly Agree,

2 = Disagree, 4 =Agree,

General Instructions

- There is no need of writing your name
- Where answer options are available please tick (√) in the appropriate box.

Contact Address

If you have any query, please do not hesitate to contact me and I am available as per your convenience at (Mobile: 0921-12-22-47 or e-mail: send4yordi@gmail.com)

Thank you in advance for scarifying your precious time!

PART I: Demographic Information

1. Educational Qualification:

- ☐ Certificate/diplomas
- ☐ Bachelor's degree
- ☐ Post Graduate degree
- ☐ Doctorate degree

2. Employee Level

- ☐ S
- ☐ Manager
- ☐ Site engineer
- ☐ Forman

3. Years stayed at the Construction projects

- ☐ 0 ears
- ☐ 4-6 Years
- ☐ 7-10 Years
- ☐ 1 rs

4. Your department:

- ☐ oject management
- ☐ nstruction Design
- ☐ Site

Part II: Question related to project management

Instruction: Please put tick mark in the box that fits the level of your agreement with the statement. Key: SA = Strongly Agree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

1.project management practices		SDA (1)	D(2)	N (3)	A (4)	SA (5)
1.1	Project management practices significantly improve performance of Construction project in defense Construction.					

1.2	Project management life cycle (Initiation, planning, execution, monitoring and closure) is used during Construction project implementation					
1.3	Project charter is easily available/ accessible in defense Construction.					
1.4	Project works are broken down to manageable deliverables in your organization					
1.5	Clear Project evaluation and review 1techniques are practiced in defense Construction.					
1.6	A Gantt chart is effectively used to follow up projects in defense Construction.					
1.7	SWOT analysis is used to evaluate the projects in defense Construction.					
2 .Top management support		SDA (1)	D(2)	N (3)	A (4)	SA (5)
2.1	The financial and capital resources are fully allocated in Construction projects of defense construction					
2.2	There are adequate human capital resources available in Construction projects of defense construction.					
2.3	There is an adequate physical capital resource available in construction projects of defense construction.					
2.4	There is Competence development construction projects of defense construction.					
2.5	The selection of project manager is based on required technical expertise, management experience and interpersonal skills to successfully manage the Construction projects of defense construction.					

2.6	The Top management provides incentives to the team members.					
2.7	The Top management of defense Construction always supported the Construction projects by ensuring the availability of resources to increase the employee commitment towards the project.					
2.8	Adequate recognition and reward is given to the project team members upon the successful completion of the project					
3.User Involvement		SDA (1)	D(2)	N (3)	A (4)	SA (5)
3.1	There is an end users Involvement during construction project.					
3.2	There is an end users Involvement during requirement specifications stage of construction projects.					
3.3	There is an end users Involvement during Design stage of construction projects.					
3.4	There is an end users Involvement during development stage of construction projects.					
3.5	There is an end users Involvement during testing stage of construction projects.					
3.6	Users are communicated about the project status in all project stages.					
3.7	The project managers always update the users and he/she manages their expectations throughout the project.					
3.8	There is adequate exchange of information among stakeholders.					
3.9	There are timely feedbacks to/from project team and to/from users.					

3.10	The project managers are concretely plan the communications that allow the project team to share information, actively work to identify issues, conflicts, and interact creatively to resolve these issues					
4.Project Monitoring		SDA (1)	D(2)	N (3)	A (4)	SA (5)
4.1	Top Managements conducts regular review meetings to ensure and monitor the progress of the project.					
4.2	The Top managements follow all projects with the customer, in order to determine general customer satisfactions.					
4.3	The project sponsor evaluation is considered as one of the important component of monitoring during construction projects.					
4.4	User assessments conduct to evaluate the outcome/product during construction projects.					
4.5	Corrective actions are always identified to address the issues in construction projects.					
4.6	The project managers involve in monitoring the project variables in construction projects.					
4.7	Project managers/ management teams involve in measuring the ongoing project activities in construction projects.					
4.8	The Construction projects always meet project objectives and user descriptions.					

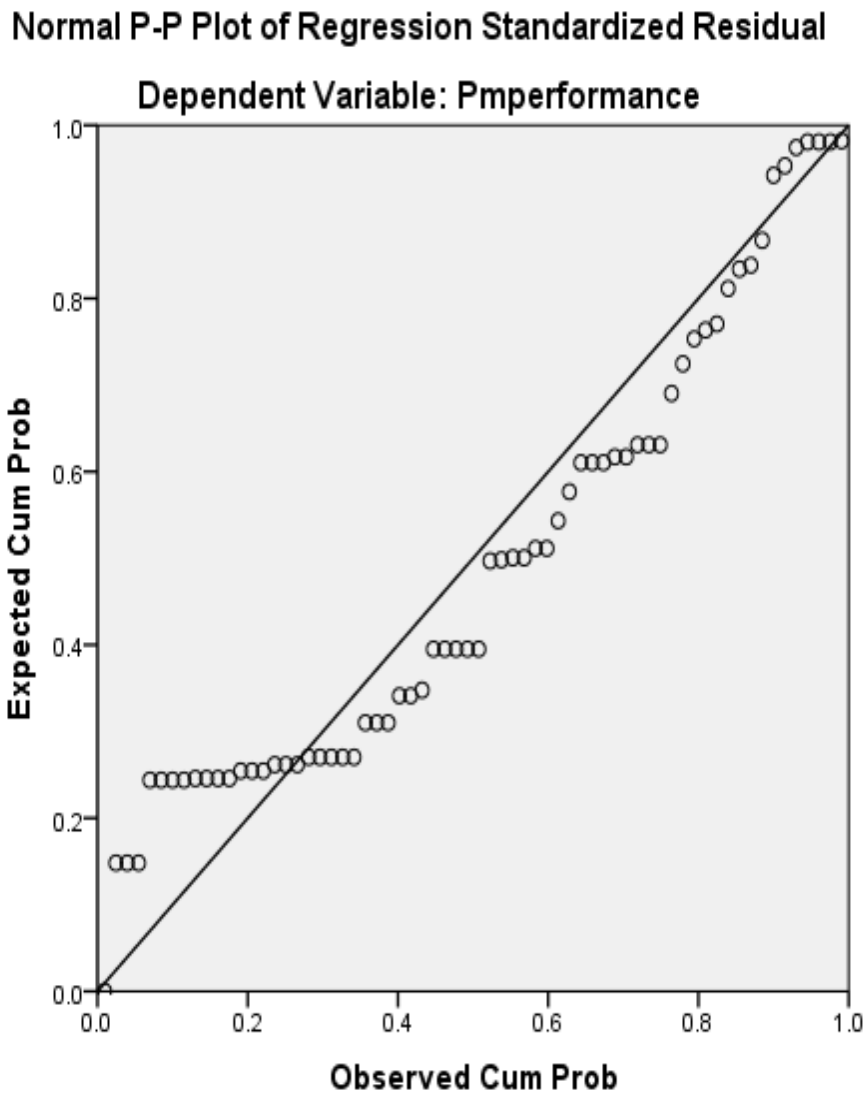
Part III. Construction Project Management Performance

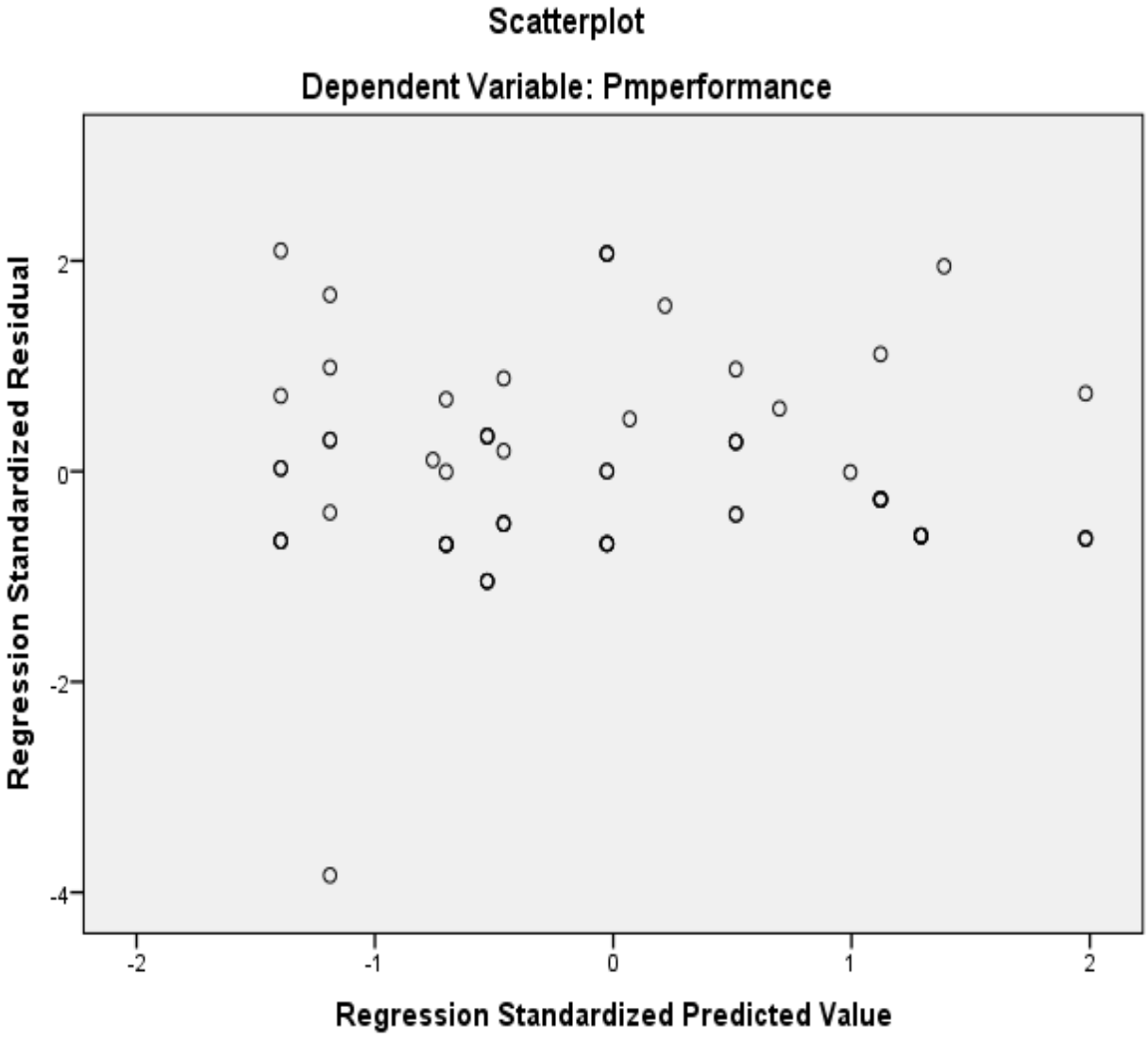
Instruction: Please put tick mark in the box that fits the level of your agreement with the statement. Key: SA = Strongly Agree; D = Disagree; N = Neutral; A = Agree; SA = Strongly Agree

5. Construction project Management performance		SDA (1)	D(2)	N (3)	A (4)	SA (5)
5.1	In Defense Construction, Construction Projects meet the expected objectives of the project.					
5.2	In Defense Construction, Construction projects are delivered on time.					
5.3	In Defense Construction, Construction projects are delivered within budget.					
5.4	In Defense Construction, Construction projects meet the required specification.					
5.5	In Defense Construction, Construction projects are delivered based on the requirement and based on expected standard.					
5.6	In Defense Construction, Construction projects are delivered based on the prepared Scope of work.					
5.7	In Defense Construction, End users of Construction projects are always satisfied by the delivery of projects.					

APPENDIX 2

NORMALITY AND HETEROSCEDASTICITY TEST




Scatterplot
Dependent Variable: Pmperformance
Regression Standardized Residual
Regression Standardized Predicted Value
2
0
-2
-4
-2
-1
0
1
2