



ST. MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES

**AN ASSESSMENT OF CONSTRUCTION PROJECT PLANNING,
MONITORING AND EVALUATION PRACTICE AT DEFENSE
CONSTRUCTION ENTERPRISE**

BY

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**APRIL, 2015
ADDIS ABABA, ETHIOPIA**

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DECLARATION

I, the undersigned, declare that this thesis entitled “an assessment of construction project planning, monitoring and evaluation practice in defense construction enterprise” is my original work, prepared under the guidance of the research advisor. All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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ENDORSEMENT

This is to certify that this project work, “**an assessment of construction project planning, monitoring and evaluation practice in defense construction enterprise)**” undertaken by Ashenafi Abebe for the partial fulfillment of Master’s of Business Administration [MBA] at St. Mary University, is an original work and not submitted earlier for any degree either at this University or any other University.

Research Advisor

Temesgen Belayne (PhD)

Date

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Acronyms/Abbreviations

AC-Actual Cost

ACWP-Actual Cost for the Work performed

BCWP- Budgeted Cost of Work performed

BCWS-Budgeted Cost of Work Schedule

CV-Cost Variance

DCE-Defense Construction enterprise

EEA- Ethiopian Economic Association

EV-Earned Value

EVT-Earned Value Technique

GDP- Gross Domestic Product

MOND –Ministry of National Defense

OSHA- Occupational Safety and Health Administration

PMBOK-Project Management Body of Knowledge

PV-Planned Value

SV-Schedule Variance

UNDP- United Nations Development Program

WBS-Work Break down Structure

WHS-Work Health and Safety

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Abstract

Construction project planning, monitoring and evaluation has a major role in the process of construction project management .it can be used to facilitate the generation of an accessible overview of the progress and status of a project and it may facilitate earlier problem solving, lower change in cost, meet the expected profit and help to complete the project on contract or expected completion period.

The aim of this thesis is to assess the practice of construction project planning, monitoring and evaluation in DCE.

Literature about planning, monitoring and evaluation was reviewed. Questionnaire were developed, pilot study of the questionnaire was achieved using 15 questionnaires. A total of 101 questionnaire were distributed as follows: 18(18%) to management staff and 83(82%) to professional engineers. 96 questionnaire were received (95%) as follows: 18(19%) from management staff and 78(81%) from professional engineers as respondents .A semi-structured interviews were made and feed backs was gathered.

The study revealed that there are many problems in planning, monitoring and evaluation of DCE construction projects. The most important were 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, plans should prepare in the project mobilization time by considering risks, with the appropriate team members and planning software, reports should be evaluated on time and to resolve issues on time to complete the project on time, with expected quality and profit.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Construction according to EEA(2008) is as an economic activity directed to renovation, repair or extension of fixed assets in the form of buildings, land improvements of an engineering nature, and other such engineering constructions as roads, bridges, dams, etc

As Dunna and Burela (2008) construction industry makes significant contributions to the socio-development process of a country. Its importance emanates largely from the direct and impact it has on all economic activities. It contributes to the national output stimulates the growth of other sectors through a complex system of linkages.

Similar to all other socio-economic activities, another key contribution of construction industry is revenue generation to government. The construction industry contributes to economic activity through generation of revenue for government from corporate income taxes of companies, the rental income, sales tax, capital gain tax and income tax from those employed in the construction industry, which in turn goes to the financing of public services such as schools and health institutions among others.

The construction industry has important contributions to the Ethiopian economy, as demonstrated by its share in the GDP. For instance, the share of the sector in the total GDP averaged at about 15 percent in the period 2012/13.

According to James (2004) the construction industry is large and volatile and demand huge capital outlay; as a result the industry sometimes produces also huge problems which can end up into dispute and distraction of relationships between different parties of interest. The parties involve could either be client, contractor, engineer or consultant. In most cases the negative effect that arises are as such poor quality, time loss and cost overrun. From the client point of interest they would be a loss of profit as a plan might have been drawn for business to get on. On the contractor's side delays in construction entails a contractor into additional cost from labour, material, equipments etc.

There are several factors that cause an increase in cost within projects, poor quality and time delay; some could be controllable whiles other might not.

According to UNDP –PME-HANDBOOK-(2009) to improve the chances of success, attention needs to be placed on some of the common areas of weakness in projects. Four main areas for focus are identified consistently. These are Planning, Stakeholder involvement, Communication and Monitoring and evaluation.

Good planning combined with effective monitoring and evaluation can play a major role in enhancing the effectiveness of projects. Good planning helps us focus on the results that matter, while monitoring and evaluation help us learn from past successes and challenges and inform decision making so that current and future initiatives are better able to improve people’s lives and expand their choices .

Table 1. Understanding inter-linkages and dependencies between planning, monitoring and evaluation
<ul style="list-style-type: none">• Without proper planning and clear articulation of intended results, it is not clear what should be monitored and how; hence monitoring cannot be done well.• Without effective planning (clear results frameworks), the basis for evaluation is weak; hence evaluation cannot be done well.• Without careful monitoring, the necessary data is not collected; hence evaluation cannot be done well.• Monitoring is necessary, but not sufficient, for evaluation.• Monitoring facilitates evaluation, but evaluation uses additional new data collection and different frameworks for analysis.✚ Monitoring and evaluation of a program will often lead to changes in program plans. This may mean further changing or modifying data collection for monitoring purposes.

Source: Handbook on Planning, Monitoring and Evaluating for Development UNDP(2009).

Hidaya (2011) identified a number of problems that contractors introduced in the site which includes the followings

- ✚ Poor planning and poor management and technical performance.
- ✚ No use of Work Break down Structure in most of the plans of the contractors.
- ✚ Lack of team work among all parteis working in the project.

The aim of this study is therefore to investigate deeply the practice of planning, monitoring and evaluation of construction project in Defense Construction Enterprise.

1.2. DCE’S Organizational Profile

DCE is established by the council of ministers under the supervision of Ministry of National Defense by merging two construction companies, Defense construction and Engineering enterprise and Kality construction and construction material production enterprise in 2003 E.c. The enterprise engaged in construction of roads, dams, irrigation, infrastructure, buildings and other constructions works in the country mainly to satisfy the national defense construction needs. As shown in the organization structure the enterprise has two core and two support process. It has five road, one irrigation, one dam and fifteen building construction projects which are operating at Addis Ababa, Debrezeit, Tigray, Afar, Bahirdar and Diredawa. Due to its number of projects and geographical dispersion, the data collection for the research was delimited to head office, Addis Ababa, Debrezeit and Tigray construction project. Table 1.2 and 1.3 shows the current List of defense construction enterprise building & road projects .In the project code the first number indicate the year in E.C. ,the second indicate the number of project started in that year and the alphabet represents the type of project (R=Road, DR=Dam & Road, IR=Irrigation, and B=Building).

Table 1.2 Road, Irrigation and Dam projects

Item No.	Project Name	Project code	Contract Amount before vat
1	Agula-Shaigubi-Berhale Design and Build project	10-01R	803,405,872.32
2	Berhale-Dalol Design and Build project	10-02R	1,042,835,862.65
3	Mekele -Abi-Adi Road project	11-04R	419,999,109.10
4	Addis Ababa Golf club Project	11-02R	174,946,874.97
5	Mekele city administration Road	12-06R	64,394,077.40
6	Girindaho Dam project	14-02DR	188,482,982.36
7	Tendaho Irrigation Project	12-01IR	341,878,645.34
Total contract Amount			3,035,943,424.14

Source: Road,Irrigation and Dam Engineering core process

Table1.3 Building Projects

Item No.	Project Name	Project code	Contract Amount before vat
1	Shire hospital	10-12B	79,180,073.00
2	Janmeda peace keeping	11-01B	82,014,652.46
3	Mekele 3 star hotel	11-03B	139,187,636.23
4	Bahirdar Appartmentr	11-06B	278,814,831.56
5	Dire Dawa Appartment	11-07B	94,726,911.84
6	Addis Ababa INSA project	1108B	257,380,102.75
7	Janmeda staff college	11-09B	36,222,976.24
8	MOND head quarter	11-10B	870,169,488.60
9	Calibration center	12-02B	64,863,095.88
10	lion Zoo	12-03B	79,306,394.99
11	Swimming pool	12-04B	51,109,425.91
12	children and youth center	12-05B	302,897,261.86
13	Mekele Referral Hospital	13-03B	450,603,485.43
14	Bahirdar Referral hospital	13-02B	438,363,716.46
15	Debreziet Engineering College	13-01B	144,927,505.21
Total contract Amount			3,369,767,558.42

Source: Building & Real Estate Engineering Core Process

1.3. Statement of the Problem

The study attempts to assess the practical implementation of planning, monitoring and evaluation, problems encountered during planning, monitoring and evaluation in the enterprise and tries to indicate possible solution for the problems observed.

As mentioned above project planning, monitoring and evaluation are aimed at increasing the performance of the project and meet the three main aspects of project objectives (Time, Cost and Quality).

Therefore, the overall intention of this study is to assess the practices of planning, monitoring and evaluation of construction project and its impact on performance level and evaluate the strength

and weakness of the planning, monitoring and evaluation practice of D.C.E. The following are problems related with lack of proper planning, monitoring and evaluation of construction project of D.C.E.

- ✚ Delay of resource supply which we call the 4M's (manpower, machine, materials and money).
- ✚ A decrease on expected project profitability.
- ✚ Incomplete project work planning and problem of revising the schedule on time
- ✚ Problem of Submission of progress reports on time.
- ✚ Problem of Monitoring requested material, equipment and manpower both by projects and the core process.
- ✚ Improper usage of project mobilization time for planning.
- ✚ A problem of working as a team on projects master plan preparation with all concerned body
- ✚ Delays on project completion time on most of the enterprises projects.
- ✚ Absent of project support by managements.
- ✚ Lack of managing variation of works, design modifications and changes.
- ✚ Low productivity and quality of the construction activity.
- ✚ Low technological bases to plan, monitor and evaluate project activity .
- ✚ Poor working environment including low standards of safety and occupational hazards on construction sites.
- ✚ Inefficient procurement service
- ✚ Absent of feed backs on reported problems to projects from the management.

1.4 Basic Research Questions

This study in general, aims at answering what the construction project planning, monitoring and evaluation practice in defense construction enterprise are and more specifically to find answers to the following basic research questions.

- ✚ Does the enterprise have strategy, policy and procedures in planning, monitoring and evaluation of its project?
- ✚ How effective is the project planning, monitoring and evaluation practice of the enterprise?

- ✚ What are the challenges for effective project planning, monitoring and evaluation practice at D.C.E.?
- ✚ What could be recommended to improve project planning, monitoring and evaluation practice at D.C.E.?

1.5. Objective of the study

1.5.1 General objective

The general objective of this paper is to study the practices of construction project planning, monitoring and evaluation in D.C.E.

1.5.2. Specific objective

- To assess the practice of planning, monitoring and evaluation in D.C.E.
- To evaluate the practice of planning, monitoring and evaluation of construction projects in defense construction enterprise.
- To formulate recommendations to improve the practice of planning, monitoring and evaluation of construction project in defense construction enterprise.

1.6 . Significance of the study

The result of the study will be important to defense construction in particular and other contractors in general to create awareness on the issue and its importance to achieve the project objective. Even though the research focuses on construction projects, the findings and the outcome could be relevant to practitioners in other industries with particular emphasis on the various stages involved in project planning, monitoring and evaluation.

1.7. Delimitation/ Scope of the Study

The study focused on the assessment of construction project planning, monitoring and evaluation in DCE. The enterprise has two core and two support process at head office, five road construction, one irrigation, one dam and fifteen building projects which are operating at Addis Ababa, Debrezeit, Tigray, Afar, Bahrdar and Diredawa. Due to its number of projects and geographical dispersion, the data collection for the research was delimited to head office, Addis Ababa, Debrezeit and Tigray construction project. The sample respondents comprise only managerial and professional engineers of the enterprise. It was also decided for the simplicity and reliability of data that was collected.

The result of this study was mainly based on the opinion and ideas of the respondents who were selected randomly. Though, project planning, monitoring and evaluation is contesting issues which deserve time series data collection, the data collection for this study delimited to the opinion of respondents which is collected once. The study had delimited to descriptive method by using a systematic random sampling.

1.8 Limitations of the Study

The researcher understands that constraints are expected while doing researches and would like to address them as such. The major constraints faced by the researcher whilst conducting this study were the non-availability of adequately published and documented data about construction project planning ,monitoring and evaluation by the organizations which would have been useful if found. The other main constraint was that even the data found it was not adequate

1.9Definitions

Construction: the art and science to form material or immaterial objects, systems or organizations

Project: a temporary endeavor undertaken to create a unique product, service, or result

Planning: answers the questions What is going to be done? How? Where? By whom? and When (in general terms, the project's start and end)?

Monitoring: to be aware of the state of a system and may refer to observe a situation for any changes which may occur over time.

Evaluation: is a systematic determination of a subject's merit, worth and significance, using criteria governed by a set of standards.

Engineers: An engineer is a professional practitioner of engineering, concerned with applying scientific knowledge, mathematics, and ingenuity to develop solutions for technical, societal and commercial problems.

1.10 Organization of the Paper

This research paper is organized in to five chapters. The first chapter deals with the introduction part which encompasses the background of the study, the statement of the research problem, objectives of the study, significance of the study, scope of the study and limitations of the study.

The second chapter deals with the review of related literature. Chapter three focused on the research methodology, data collection and procedures, sample and sampling techniques, where as the fourth chapter presented the result analysis and discussion of the data. Finally, conclusions and recommendations were presented under fifth chapter.

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

2.1 Definition and Concept

2.1.1. What Is a Project?

Different institutions and different authors provide different definitions for the concept of a project. (Lewis,2005,P.5) define a project as “is 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 project is 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.”(PMBOK, 2004, p.4) also define a project as “A project is a temporary endeavor undertaken to create a unique product, service, or result”

To summaries from the above definitions a project is any series of activities and tasks that:

- ✚ Have a specific objective to be completed within certain specifications
- ✚ Have defined start and end dates
- ✚ Have funding(budget) limits (if applicable)
- ✚ Consume human and nonhuman resources (i.e., money, people, equipment)
- ✚ Are multifunctional (i.e., cut across several functional lines).

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.

2.1.2 Characteristics of a project

Projects differ from programs and routine works .project s have their own character which distinguish them from other. Nicholas& 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. Even “routine” projects such as home construction, variables such as terrain, access, zoning laws, labor market, public services, and local utilities make each project different. A project is a one-time activity, never to be exactly repeated again.

3. Projects are temporary activities. An ad hoc organization of personnel, material, and facilities is assembled to accomplish a goal, usually within a 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
-  Quality
-  Cost
-  Time
-  Resources

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 projects

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

2.1.4.1 Type 1 projects: 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

2.1.4.2 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.

2.1.4.3 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.

2.1.4.4 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 can not 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 Projects

Projects can also further classified by their character according to Wycsocki (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 to 12 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:

2.1.5.1 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.

2.1.5.2 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.

2.1.5.3 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.

2.1.5.4 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.

Table 2.1 gives a hypothetical example of a classification rule. These four types of projects might use the parts of the methodology shown in.

Table 2.1 Example Project Classes and Definitions

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

Source: Wysocki (2003)

2.2 Construction projects

Researches show that construction projects have their charcters which differentiate them from other types of projects. Hidayata(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, economical, financial, commercial and political, these may differ according to the specialty of each project.

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, differing members of the project organization to have 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.

2.2.1 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. 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.

Table 2.2 The parties and their roles

CONTRACT PARTY	MAJOR ROLES
Employer	<input type="checkbox"/> Creates the necessity to build the facility <input type="checkbox"/> Provides financial support to develop the project <input type="checkbox"/> Determines the scope of the work <input type="checkbox"/> Most important player of the process
Engineer	<input type="checkbox"/> Responsible for the project design <input type="checkbox"/> Idealizes the final result of the project <input type="checkbox"/> Develops drawings and specifications and prepares other contract documents <input type="checkbox"/> administers the contract and supervises the works
Contractor	<input type="checkbox"/> Creates the facility based on the design <input type="checkbox"/> Brings the project into reality <input type="checkbox"/> Manages different resources to build the facility

Source Rohaniyati (2009)

2. 2.2 Construction Project Life cycle

Every project, not just those in the construction industry, goes through a series of identifiable phases, wherein it is ‘born’, it matures, it carries through to old age and it ‘expires’. Lawrence(2003) states six phases of the construction project life cycle.

2.2.2.1 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.

2.2.2.2 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 define 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.

2.2.2.3 Contractor selection phase

In anticipation of selecting a contractor, the owner must decide the method either an open selected contractors 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.

2.2.2.4 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 contractor hand over the construction site, all the drawings and specification. The contractor prepare 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.

2.2.2.5 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.

2.2.2.6 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.

2.3 Planning, Monitoring and evaluating a construction project

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 Merith.al.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 replanning when needed."

2.3.1 Planning a project

Every project needs proper management to meet its objective. The PMBOK (2001.p.6) defines project management as "application of knowledge, skills, tools and techniques to project activities to meet 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"

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UNDP (2009, P.7) define planning as “the process of setting goals, developing strategies, outlining the implementation arrangements and allocating resources to achieve those goals. It is important to note that planning involves looking at a number of different processes.” Planning and scheduling concern two interrelated elements of construction management: strategy and time. Completing a project on time is a big deal. However, completing a project on time does not happen by accident. It takes a great deal of effort and planning. According to UNDP (2009) planning involves a number of different processes.

Mubarak defined the planning process in his book (Mubarak,2010.p.3) as “Those processes performed to establish the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives”

2.3.1.1 Reason for planning

It is often said that „failing to plan is planning to fail“. Due to this, the benefits associated with planning make it important for organizations to plan. Aiyetan (2010) enumerate these benefits as the following:

- ✚ Planning provides direction and helps managers as well as non-managers to focus on forward thinking;
- ✚ It creates a participatory work environment;
- ✚ It reduces the impact of change. In a turbulent environment, planning enables managers to anticipate change and to develop appropriate responses;
- ✚ It reduces the overlap of activities. When means and ends are clear, the overlapping activities and wasteful activities become obvious, and
- ✚ Planning sets the standards to facilitate control. Planning sets objectives, and in so doing it complements the control function. Controlling enables performance to be compared against the established objectives. If significant deviations occur, corrective steps can be taken. Without planning, control cannot take place.

According to J. Jackson (2010)project planning have to be developed by a team of individuals from different departments and the team have to the project schedule consider details and elements of the job, the materials, labor, subcontractors, and equipment that it will take to complete the project. And also they have to consider all the factors that influence the efficient use of those resources. They’ll have a chance to ponder and discuss the circumstances that could slow

down the process and cause the project to be delayed. They'll have an opportunity to develop the strategy that will carry the project to a successful completion.

2.3.1.2 Planning steps

J. Jackson (2010) enumerates the following six steps of planning.

1. Project objectives, requirements, and scope are set. These outcome elements specify project end-items, desired results, and time, cost, and performance targets. (What, for how much, and by when?) The scope includes specific acceptance requirements that the customer uses to determine acceptability of results or end items. Everything specified in these requirements must be completed during the project to the customer's satisfaction.

2. The specific work activities, tasks, or jobs to achieve objectives are broken down, defined, and listed. (What?) Types of Activities include

- ✚ **Production activities** These activities identify tasks that are associated with the physical building of the project, such as pouring concrete foundation, erecting structural steel, or hanging acoustic ceiling.

- ✚ **Procurement activities** These activities are primarily associated with obtaining materials and equipment for the project. They can be some of the most crucial activities in the schedule and, if not properly considered, can cause major delays on the project

- ✚ **Administrative activities** These activities are mostly associated with contract administration tasks such as permitting, submittals, inspections, and testing. All of these activities can eat up a lot of time and are probably some of the most unpredictable activities on the schedule

Although a number of these types of activities should be integrated into the detailed schedule, sometimes they are assembled into a special schedule.

3. A project organization is created specifying the departments, subcontractors, and managers responsible for work activities. (Who?)

4. A schedule is prepared showing the timing of work activities, deadlines, and milestones. (When, in what order?)

5. A budget and resource plan is prepared showing the amount and timing of resources and expenditures for work activities and related items. (How much and when?)

6. A forecast is prepared of time, cost, and performance projections for the completion of the project. (How much time is needed, what will it cost, and when will the project be finished?)

2.3.1.3 Mistakes in planning

According to Talargie(2004) project planning is a fundamental and critical task of project management. Good planning is a basis for success but most of Ethiopian contractors fail in proper planning and makes mistakes.

Lewis(2003) states five common mistakes people makes in project planning.

Mistake 1: Not involving in the planning process the people who must do the work (Unilateral Planning).This mistake is made when the project manager plans a project for the group and turns it over to them to execute. The major reason this occurs is because no one individual can possibly think of everything in a project.”No project can succeed when the team members have no commitment to the plan, so the first rule of project planning is that the people who must do the work should help plan that part of the project. Not only will you gain their commitment to the plan, but you will most likely cover all of the important issues that you personally may have forgotten.” Therefore as a rule the first rule of planning is that the people who must do the work should participate in the planning.

Mistake 2: Ready-fire aim. People are convinced they don't need a plan, planning is wasting time no time to plan just start the work because planning needs time which can be used for accomplishment of the work .

Mistake 3: Planning in Too Little Detail (Broad-brush planning). Not incorporating all the plans for the project .ignoring some the project activity in planning.

Mistake 4: Planning in Too Much Detail (Micro planning). Planning in more detail which needs more effort to control the plan itself. The principle is “Never plan in more detail than you can control.”

Mistake 5: Failing to plan for risks. Not considering risks in plan, To ignore probable risks is not a “can-do” attitude but a fool hardy approach to project management.

2.3.1.4Types of planning

As discussed above before executing the work the activities listed have to be planned well and the activities have to be planned neither in too much detail nor in more detail .According to Lewis (2003.P.226) planning answers the following questions shown:

1. What must be done?
2. Who will do each task?
3. How long will each task take?

4. What materials, supplies, and equipment are required?
5. How much will each task cost?

In construction works the following plans have to be prepared from the planning teams

- + Work schedule. The work schedule includes at least planned start and expected finish dates for each detail activity.
- + **Resource planning** - Resource planning involves determining what physical resources (people, equipment, materials along with money) and what quantities of each should be used and when they would be needed to perform project activities
 - ✓ **Material Schedule:** planning construction material includes according to T.Subramani(2014)identifying type of material needed for the activity shall be determined based on company previous experience or standard breakdown documents. This is very important as it is a basis for the purchase of materials. The material should be linked with the duration of the activity to know the material requirement of the site along the course of time. The actual execution should also be checked to serve as a proof to the validation of the assumptions for future projects.
 - ✓ **Labour Schedule:** The labour schedule should clearly show the labour requirement of the activity. According to White & Fortune(2002) human resources plan is often overlooked in construction projects. It involves identifying the people needed to do the job, defining their roles, responsibilities and reporting relationships, acquiring those people and then managing them as the project is executed .it should clearly state the trade of labour as well. Skilled Labour is becoming one of the constraint in the construction industry and stringent schedule should avail for recruiting appropriate personnel in time and train and acquaint with the company. Simply recruiting a labour from the market and sending him directly to the job would not make companies profitable. A worker should be trained to be well familiar

with how activities in the site shall be done , safety rules and regulations , company rules and regulations , workers responsibilities and others.

- ✓ **Equipment Schedule:** The equipment schedule according T. Subramani et al (2014) should put the type of machinery needed for an activity and the duration.

- ✚ Procurement Planning- Procurement planning is the process of identifying which project needs can be best met by procuring products or services outside the project organization and should be accomplished during the scope definition effort. According to Yimam(2011)procurement plan involves consideration of whether to procure, how to procure, what to procure, how much to procure, and when to procure. If a contractor fails to plan for procurement the material requested either it will purchased early or purchased late. Early purchase may cause money tied up and late purchase will cause delay on construction progress as well as completion time.

- ✚ Payment Request Planning – according to J. Jackson (2010)contractors usually take measurements and prepare payment request on a monthly basis but this have to be done with schedule .The schedule contains when to submit the take off sheets and payment certificates to the consultant for approval ,when to get the approval and payments to be effected by the client. Most of the time the payments prepared by the contract instead of approved it will be returned due to lack of quality on the payment preparation.

- ✚ Risk Management Plan - Risk management is the systematic process of identifying, analyzing, and responding to project risk. Project risk is an uncertain event or condition that, if it occurs, has a positive or a negative effect on a project objective. Project risk includes both threats to the project`s objectives and opportunities to improve on those objectives. It has its origins in the uncertainty that is present in all projects. Known risks are those that have been identified and analyzed, and it may be possible to plan for them. the following major processes:

- ✓ **Risk Management Planning** — deciding how to approach and plan the risk management activities for a project.

- ✓ **Risk Identification** — determining which risks might affect the project and documenting the characteristics.
- ✓ **Qualitative Risk Analysis** — performing a qualitative analysis of risks and conditions to prioritize their effects on project objectives.
- ✓ **Quantitative Risk Analysis** — measuring the probability and consequences of risks and estimating their implications for project objectives.
- ✓ **Risk Response Planning** — developing procedures and techniques to enhance opportunities and reduce threats to the project's objectives.

Risk Monitoring and Control — monitoring residual risks, identifying new risks, executing risk reduction plans, and evaluating their effectiveness throughout the project life cycle.

Table 2 .3 Construction Risks

Construction Risks	Description
Labor availability and quality of labor pool	If the contractor can't access the proper labor needed to complete a project, significant delays may be experienced. Quality issues resulting from an inexperienced workforce can also result in rework and cost overruns
Differing site conditions	Sometimes the conditions on the building site are not communicated in the plans and specs. This discovery can lead to significant cost increases and delays.
Site access, traffic, parking issues	Projects located in highly congested areas can cause significant delays and storage issues for the contractor when trying to coordinate work.
Property damage or theft issues	The project site might be located in an area where security is an issue. The contractor has to protect the project, materials, and equipment against vandalism and theft.
Coordination with utilities, adjoining	Significant coordination efforts must be made when tying in electrical, plumbing, water, and gas lines to main supply lines.

neighbors, and so on	This often requires working with a local utility office, and their schedule and the contractor's schedule do not always coincide. Utility coordination can cause big delays.
Adverse weather	Weather is one of the most unpredictable construction risks. Contractors try to plan activities to avoid adverse weather conditions, but it isn't always possible. Having to place asphalt concrete in august in Addis Ababa can be a challenge and add cost to the job
Labor disputes, strikes	The use of union labor on public projects is often a requirement in some jurisdictions. When this is the case, delayed labor negotiations, disputes, and even strikes are always a possibility.
Availability of materials	The architect may specify materials that are difficult to get or have significant lead times.
Safety	Safety should be paramount on any project. Injuries always impact construction operations at some level and should be avoided at all cost. OSHA inspections will also have an impact on the project workflow and schedule.

Source:Jackson,B.J(2010)

- ✚ Work Health and Safety Management Plan- A WHS management plan sets out the arrangements to manage work health and safety on a construction project. One of the problem in construction management is according to Olatunji.A.A(2010)is lack of a health and safety plan. The intention of a WHS management plan is to ensure the risks associated with a complex construction project are managed, as there are usually many contractors and subcontractors involved and circumstances can change quickly from day to day. The WHS management plan must be in writing. It should be easily understood by workers (including contractors and subcontractors). It may not be necessary to communicate the entire WHS management plan to all workers; however, they must be made aware of the parts that are applicable to the work they are carrying out.

All the above plans prepared for a specific project and revised if either there is a delay or accomplishment greater than the plan is a base for monitoring and evaluation.

✚ **Quality plan:** according to J.Jackson (2010) The best way to track quality performance on a project is to prepare and implement a comprehensive quality plan. quality of work is checked against design and specification and A number of administrative and physical checks are used to track quality:

- Field observations
- Submittals
- Shop drawings
- Mock-ups
- Inspections
- Field tests

2.3.1.5 Software planning

According to Mubarak (2010) and Nicolas (2004), the development and use of software, such as Microsoft Project (MS Project) and Primavera, has helped greatly in automating many of the static calculations in complex projects, because templates for most charts, diagrams and reports are easily available through such software, after entering the data the user can easily create different types of project management planning and monitoring tools such as GANTT charts, PERT charts and CPM charts. Software can also be used to create the WBS forms, and can help the user create accurate records and reports such as schedules, budgets and time-line changes, to revise the plan, all of which are helpful in monitoring a project ;Performance measurement and reporting, use of control mechanisms for quality, cost, time and management changes.

2.4 Monitoring and Evaluation

Monitoring and evaluation are project management tools for decision making .according to Metalign (2015) while monitoring and evaluation are always referred to as the singular term “M&E” ,they are two related but very different processes.

2.4.1 Project Monitoring

Monitoring is a systematic and continuous process of collecting, analyzing, and using of information for the purpose of management and decision-making .As Metaling (2015) Monitoring is a systematic and continuous process of collecting , analyzing and use information to track efficiency (efficiency measures how productively inputs such as money

,time, equipment, personnel ,etc. were used in the creation of outputs) . It is an activity, which assesses whether project inputs are being delivered, are being used as intended to create output ,and are having the initial effects as planned. It therefore, represents an exhaustive and regular examination of the resources, outputs and results of a project.

Monitoring is an essential part of good management and is a tool to identify strength and weakness and provide the people responsible for the project with sufficient information to make the right decision at the right time to provide its quality.

According to Jody and Ray(2004) Monitoring gives information on where a project is at any given time (and over time) relative to respective targets and outcomes. It is descriptive in intent.

According to J. Jackson (2010) the three primary elements associated with managing the construction project are quality, cost, and time. These factors must be monitored throughout the duration of the job. Data for monitoring the project must be directly related to the project plans, outputs, schedules, budgets , materials purchasing invoices, worker time cards, change notices, test results and standards

Monitoring & evaluation (2001) describes Monitoring involves:

- Establishing indicators of efficiency, effectiveness and impact;
- Setting up systems to collect information relating to these indicators;
- Collecting and recording the information;
- Analyzing the information;

Using the information to inform day-to-day management

2.4.1.1 Types of Monitoring

According to Jody and Ray (2004) project monitoring includes the following major items .

- Physical project progress monitoring
- Finance progress monitoring
- Project quality Monitoring
- Assumption monitoring

Project Physical progress Monitoring

Physical project progress monitoring informs managers and owners of the project in keeping a check on whether activities in project are up to schedule . if not managers need to be able assess how significant the delay is , and whether remedial action needs to be taken .managing physical

progress can be linked to managing time .the items to be considered during physical monitoring are

- + Results of activities / project out puts
- + Project inputs
- + Progress of project according to objectives
- + The way the project is managed and style of work

Project milestones are the simplest method for monitoring physical progress monitoring. Wysocki(2003) describes mile stones as it is the main step to test if the goals are achieved, and it helps in discovering the status of the project. Milestones define certain phases of the project, and represent decisive steps during the whole phases. They are set after a certain number of work packages that belong together in certain way. Effective monitoring and control over a project physical progress requires systematic ‘performance analysis’ this calls for answer the following questions:

- + Is the project as a whole (and its individual component) on schedule, ahead of schedule, or behind schedule?
- + If there is a variation? Where did it occur, why did it occur, who is responsible for it, and what would be its implications?
- + What is the trend of the physical performance? What would be the likely final cost and completion date of for the project and its individual components?

Three approaches according to J. Jackson (2010) can be used in measuring physical progress.

- I. Quantifying output of the activity in absolute terms. it is used to determine what percentage of the work is completed on the project. It can be calculate by measuring the quantity of work executed to date relative to the total quantity of work planned.

$$\frac{\text{Work performed}}{\text{Work planned}} * 100(\%) \dots\dots\dots i$$

For example, if it is planned to perform a total of 3,000square meter of floor tiles and performed only 1,500 square meter so far, there is a 50 percent complete with the work.

- II. Valuing the output of the activity .To calculate earned value of the completed tile work and compare with total value of work planned.

$$\frac{\text{Value of work done}}{\text{Total value of Work planned}} * 100(\%) \dots\dots\dots ii$$

Total value of Work planned

III. Using time spent on the project /activity.

Time spent to date *100(%).....iii

Total time to complete

Financial progress/Expenditure/Monitoring

As the project progresses the following must be measured periodically for purposes of cost monitoring and control. Control of budgeted cost involves evaluation of cost variances by comparing actual costs with budgeted costs to determine cost over run / under run and computing schedule variances by comparing budgeted costs of work scheduled and work performed to determine deviations from the schedule. Further, it is used to estimate project cost at completion (PMBOK guidelines, 2004).

One of the budget monitoring or cost performance measurement techniques is the earned value technique (EVT). According to J.Lewis (2004), the earned value technique compares the cumulative value of the budgeted cost of work performed (earned) at the originally allocated budget amount, to both the budgeted cost of work scheduled (planned) and to the actual cost of work performed(actual).

Budgeted cost of work scheduled (BCWS) or planned value (PV): Planned value is the budgeted cost for the work scheduled to be completed on an activity or work break-down structure component up to a given point in time. It shows what is planned for execution

Budgeted cost of work performed (BCWP) or earned value (EV): Earned value is the budgeted amount for the work actually completed on the schedule activity or work break down structure component during a given time period.

Actual cost for the work performed (ACWP) or actual cost (AC): Actual cost is the total cost incurred in accomplishing work on the schedule activity or WBS component during a given time period. It is obtained by summing up the actual cost incurred to date in progressing work package.

The AC must correspond in definition and coverage to whatever was budgeted for the PV and the EV, (PMBOK guidelines, 2004).

An important part of the cost control is to determine the cause of variance, the magnitude of the variance and to decide if the variance requires corrective action. The earned value technique involves developing these key values for each schedule activity, work package or control account. The PV, EV and AC values are used in combination to provide performance

measures of whether or not work is being accomplished as planned at any given time.

According to James J.Lewis (2004), the most commonly used measures are cost variance (CV) and schedule variance (SV).

Cost variance: CV is computed by comparing actual performance with the budgeted cost of work performed. CV equals EV minus actual cost (AC).

$$CV = EV - AC \dots\dots\dots iv$$

The cost variance at the end of the project will be the difference between the budget at completion (BAC) and the actual amount spent.

Schedule variance: SV is computed by comparing budgeted cost of work performed with the budgeted cost of work scheduled.

$$SV = EV - PV \dots\dots\dots v$$

Schedule variance will ultimately equal zero when the project is completed because all of the planned values will have been earned. If schedule variance is positive, then the project is ahead of its planned cost, i.e. earned value of the work performed is higher than the planned or schedule earned value. If it is negative than the planned or schedule earned value. If it is negative then the project is behind its planned cost.

Project quality Monitoring : The first goal of the quality management plan is to get things done right the first time. Getting it right in construction doesn't always mean getting it perfect. For example, it is rare to find a concrete floor slab that is perfectly level. But it is commonly expected that a floor slab be level or flat within certain tolerances .according to technical specification a column form work are expected to be straight enough to a tolerance of 6mm. This is not perfect, but it is a common standard of quality expected in the industry. So before doing this, the project team must first know what the quality standards are and the best way to achieve them. Workers can't do the job right the first time if they don't have the proper skills, the necessary level of experience, adequate supervision, and the tools and equipment needed to perform the task. In most cases, the foreman is responsible for seeing to it that the workforce is prepared and motivated to complete the task at hand.

Quality monitoring primarily deals with issues relating to conformance to the plans and specs. All of the materials, systems, and workmanship applied to the project must conform to the requirements set forth in the contract documents. Quality control is accomplished using a number of different mechanisms: submittals, mock-ups, shop drawings, inspections, and

testing, which are all called for in the project manual.

Assumption monitoring: you need to monitor and control the project risks. The process of writing down the risks and assessing them makes everyone on the project team aware of their existence and is a good place to start. You need to put together a *risk log*. This document lists all risks that you want to manage, identifies who is supposed to manage the risk, and specifies what should be done to manage the risk event..

- ✚ The *ID Number* always remains the same, even if the risk event has occurred and been managed. If you take the risk off of the list and file it elsewhere, don't assign the old number to a new risk. Leave the number the same or there will be a great deal of confusion.
- ✚ The *Risk Description* is a short statement of the risk event.
- ✚ The *Risk Owner* is the person who has to manage the listed risk.
- ✚ The *Action to Be Taken* lists what the owner is going to do to deal with the risk event.
- ✚ The *Outcome* tells you what happened.

Other process to be monitored include procurement .payment , equipment and labour output monitoring.

2.4.1.2 Monitoring tools

There are three most widely used communication tools as mentioned by Metalign(2015)which includes progress reports, meetings ,and site observation.

Progress reports; progress reports prepared at regular intervals for reviewing of the status of the project. Progress reports enables the assessments of progress and achievements and helps focus on results of activities , enabling the improvement of subsequent work plans .reporting helps from the basis for decision-making and learning at the management level .Reporting communicates how effectively and efficiently a project is meeting its objectives.

Review meetings; regular progress review meetings help managers to inform all the members about the general progress and to identify where and when problems are likely to arise and then to act to prevent them from occurring as much as possible.

Site Visits; site visit is another important means of communication in the monitoring of project activities and output progress .site visit is an in-depth gathering of project information for monitoring purpose .

2.4.2 Project Evaluation

Evaluation is a rigorous and independent assessment of either completed or ongoing activities to determine the extent to which they are achieving stated objectives and contributing to decision making. Evaluations, like monitoring, can apply to many things, including an activity, project, program, strategy, policy, topic, theme, sector or organization. According to UNDP(2009) the key distinction between the two is that evaluations are done independently to provide managers and staff with an objective assessment of whether or not they are on track. They are also more rigorous in their procedures, design and methodology, and generally involve more extensive analysis. However, the aims of both monitoring and evaluation are very similar: to provide information that can help inform decisions, improve performance and achieve planned results.

Performance evaluation is the periodic evaluation of completed action to date to actually measure the degree of deviation completed activities and plans. Abubeker (1992) among others identified three for performance evaluation as follows:

- ✚ Computational methods which are used when deviations, whether favorable or unfavorable, are results of routine activities which are specific In nature, e.g. concreting. Such methods Include profit and loss accounting, job costing, direct comparisons, variance analysis, and ratio analysis.
- ✚ Judgmental approach; employed when deviations result from activities that are difficult to define with any reasonable degree of precision, e.g. supervision. In such cases rationality would be applied and deviations would be measured against organization policies, rules and so forth. Judgments are made concerning whether actions are in conformity with generally accepted organization guides.
- ✚ Whenever there is a clash of judgmental values. compromises should be used to determine the deviations.

Table 2.4 .shows the difference between monitoring, reporting, and evaluation.

	Monitoring	Reporting/ Communications	Evaluation
When?	Daily activity	Can be weekly, monthly, quarterly	Can be weekly, monthly, quarterly Usually at completion but also at mid-term, ex-post
What action?	To verify	To report/ communicate	To evaluate
Why?	Improve the execution and the efficiency, adjust the work stages Check progress, take remedial action	Be accountable to the board	Improve the efficiency and effectiveness of the project Learn broad lessons applicable to other projects; provides accountability
Focus?	Resources, processes, activities, and outputs	Results, outputs, benefits	Outputs, outcomes and benefits/impact
References?	Project plan, work stage plans	Reports, Lessons Learned report, End Date report	Project document, business case, organization strategy
Done by whom?	The project manager	The project manager and the team manager	External evaluators
To whom?	The executive, the quality assurance	The project board, the supplier, the users	Stakeholders, project board, the executive, the organization clients

Source: Jihane Roudias(2015)

Finally, Lewis R.Ireland(2006)states monitoring and evaluation as one of the management function called controlling and it is the process of of monitoring, evaluating, and comparing planned results with actual results to determine the progress toward the project cost, schedule,..etc.

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

The research employed descriptive method because the study intended to find out how the enterprises plan, monitored and evaluate its construction projects .Kothari (2004) defines descriptive research study as “Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group”. According to Saunders et al (2009), there are seven research strategies (experiment; survey; case study; action research; grounded theory; ethnography and archival research). In this research the researcher used survey research . Survey research is a popular and common strategy in business and management research and is most frequently used to answer who, what, where, how much and how many questions. And used for exploratory and descriptive research. Surveys research allows the collection of a large amount of data from a sizeable population in a highly economical way. Often obtained by using a questionnaire administered to a sample, these data are standardized, allowing easy comparison. In addition, the survey strategy is perceived as authoritative by people in general and is both comparatively easy to explain and to understand.

The survey strategy allows you to collect quantitative data which you can analyze quantitatively using descriptive statistics. In addition, the data collected using a survey strategy can be used to suggest possible reasons for particular relationships between variables and to produce models of these relationships.

The two common data collection techniques and analysis procedures widely used in business and management research according to Saunders et al (2009) are quantitative and qualitative methods. One way of distinguishing between the two is the focus on numeric (numbers) or non-numeric (words) data. Quantitative is predominantly used for any data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses

numerical data. In contrast, qualitative is used predominantly as a synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorizing data) that generates or uses non-numerical data.

In order to make it suit to the collection of the required information from a larger sample and make the analysis easier, the study was used a quantitative method by incorporating a qualitative item in to the questionnaire. Thus, data was gathered from sample management staff and professional engineers via self-administered closed ended questionnaire and structured interview. Saunders et al (2009) also divide research design in to longitudinal and cross-sectional, based on time horizon. Cross-sectional studies are the study of a particular phenomenon at a particular time. It includes research projects undertaken for academic courses. Cross-sectional studies often employ the survey strategy. Longitudinal research has capacity to study change and development over time the researcher is able to exercise a measure of control over variables being studied. In this study, the researcher had used a cross-sectional study because data were collected from a cross-section of management staff and professional engineers of the enterprise once.

3.2. Data Sources and Instruments of Data Collection

The study had used both primary and secondary data sources. The secondary data were collected via detailed review of related literature i.e. books, articles, journals and many other relevant written publications. The researcher used primary data that was collected via questionnaire and interview. The decision to select the two instruments was arrived at after carefully considering their advantages and disadvantages and the population size for each category. As the research was intended to investigate the practice of planning, monitoring and evaluation of construction projects in D.C.E, a set of questionnaire was distributed to management staff and professional engineers of the enterprise. In addition, four purposively selected management staff and two professional engineers were interviewed. The researcher were developed 52 likert-scales and 10 additional open-ended questionnaires.

The questionnaire statements which were developed by the researcher to answer the research question and objective were evaluated on a 1-5 Likert scale , where '1' indicates strongly disagree with the statement, '2' disagree, '3' neutral, '4' agree and '5' refers to strongly agree with the statement.

3.3 Sample and Sampling Techniques

The target groups in this study were D.C.E management staff and professional engineers at head office and project. According to human resource of the enterprise there are 58 management staff and engineers at head office, 54 at road and 106 at building construction projects. In order to determine a sufficient sample size, Phaniraj and Sreekuma (2014) showed that the sample size can be calculated as following equation for 95% confidence level.

$$n = n' / [1 + (n'/N)]$$

Where

- N = total number of population
- n = sample size from finite population
- n' = sample size from infinite population = S^2/V^2 ; where S² is the variance of the population elements and V is a standard error of sampling population.
(Usually S = 0.5 and V = 0.06)

So, for 58 head office management staff and engineers

- $n = n' / [1 + (n'/N)]$
- $n' = S^2/V^2 = (0.5)^2/(0.06)^2 = 69.44$
- N = 78
- $n = 69.44 / [1 + (69.44 / 58)] = 32$

This means that the 32 questionnaire should be distributed to head office management staff and engineers in order to achieve 94% confidence level

So, for 30 road project management staffs and engineers:

- $n = n' / [1 + (n'/N)]$
- $n' = S^2/V^2 = (0.5)^2/(0.06)^2 = 69.44$
- N = 54
- $n = 69.44 / [1 + (69.44 / 30)] = 21$

This means that 21 questionnaire should be distributed to road project management staffs and engineers in order to achieve 94% confidence level

Finally, for 152 building project management staffs and engineers:

- $n = n' / [1 + (n'/N)]$

- $n' = S^2/V^2 = (0.5)^2/(0.06)^2 = 69.44$
- $N = 54$
- $n = 69.44 / [1 + (69.44 / 152)] = 48$

This means that 48 questionnaire should be distributed to building project management staffs and engineers in order to achieve 94% confidence level.

Table 3.1: Sample frame and proportionate sampling

Strata	Head Office	Road project	Building project	Total Population	Sample size
Management Staff	28	5	10	43(18%)	18(24%)
Professional engineers	30	25	142	197(82%)	82(76%)
Total	58(24%)	30(13%)	152(63%)	240(100%)	101(100%)
Sample Size	32(32%)	21(21%)	48(47%)		101(100%)
Actual Response	28(29%)	21(22%)	47(49%)		96(95%)

(Source: DCE Human Resource Division, February, 2015)

3.4 Procedures of Data Collection

The questionnaires were distributed to the respondents at head office and projects around Addis Ababa and Tigray regional states where most of the enterprises road projects found. Interviews were made and their feedback was gathered. As the researcher himself is working at the enterprise, had the opportunity to follow up on each and every one of the questionnaires spread out. For the interview purpose, all the interviewees were contacted and time schedule was prepared. Then, the interview was conducted by the researcher himself.

3.5. Methods of Data Analysis

The methods of analysis used in this research were selected due to the type of data available for the analysis and the objectives of the research. The questions in the questionnaire were qualitative; hence the descriptive method of analysis is best suited for the analysis. Such method was applied for the presentation, interpretation and discussion parts on various dimensions of the appropriate to analyze, interpret, tabulate and present the result of the study. The data gathered through questionnaires was coded, entered into computer and analyzed and presented in the form

of charts, diagrams, and tables by using SPSS Statics version 20 soft ware. The results of the interview questions were integrated to the responses of management and employees through questionnaires and were analyzed accordingly. Finally, conclusions were made based on the results/findings of the study and recommendations were forwarded on the basis of the data analyzed.

3.6 Result of Pilot Test

Pilot study of the questionnaire is achieved by a scouting sample, which consisted of 14 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. The following items are summary of comments obtained from pilot study:

- There are few technical defects ,such as punctuations ,missing letters ,etc
- There are redundant questions, or has questions of the same concept.
- It is well prepared and organized.
- Include cell phone and email address on your cover pages.
- Some choices should be added in part three of questionnaire in order to achieve more accurate and suitable choice of respondents.

After making some amendments according to the comments 15 questionnaires were distributed to test the reliability of the questionnaire and 14 questionnaires were returned. The reliability of an instrument according to Saunders et al., (2009) is the degree of consistency which measures attribute , in particular, whether or not it will produce consistent findings at different times and under different conditions, such as with different samples. Internal consistency involves correlating the responses to each question in the questionnaire with those to other questions in the questionnaire. It therefore measures the consistency of responses across either all the questions or a sub-group of the questions from the questionnaire. There are a variety of methods for calculating internal consistency, of which one of the most frequently used is Cronbach's alpha. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability.

Cronbach's alpha can be written as a function of the number of test items and the average inter-correlation among the items. The formula for the standardized Cronbach's alpha is as shown below:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

Where N is equal to the number of items,

C-bar is the average inter-item covariance among the items and

V-bar equals the average variance.

A commonly accepted rule of thumb according to Saleh (2009) for describing internal consistency using Cronbach's alpha is as follows.

$0.9 \leq \alpha \leq 1.0$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$0.0 \leq \alpha < 0.5$	Unacceptable

Table 3.2: Reliability sample testing scale

Case Processing Summary			
		N	%
Cases	Valid	14	100.0
	Excluded ^a	0	0
	Total	14	100.0
a. List wise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.844	74

Source: Survey data

The reliability scale result is 0.844 which indicates that there is a very high consistency. Therefore, it can be said that the questionnaire is reliable and ready for distribution for the population sample.

3.7 Ethical Consideration

According to Saunders et al., (2009,p.184) “Research ethics therefore relates to questions about how we formulate and clarify our research topic, design our research and gain access, collect data, process and store our data, analyze data and write up our research findings in a moral and responsible way.”

An attempt was made to ensure all respondents to keep their identity and responses as confidential; so that all the information was given in full confidence. The questionnaire was distributed based on willingness of each respondent. In addition, the purpose of the questionnaire was clearly indicated in a cover letter along with the questionnaire

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter explains and discusses the results of findings based on the analysis done on the data collected. The result of the survey was discussed by triangulating the different source results: questionnaire results, interview and document review results .the discussion attempts to accomplish the objectives of the study and answer the research questions.

A total of 101 questionnaires which dealt with construction project planning, monitoring and evaluation practice were distributed to the respondents of the enterprise .However 96 questionnaires were collected and usable responses (95.04% response rate), interview and relevant documents have been also reviewed.

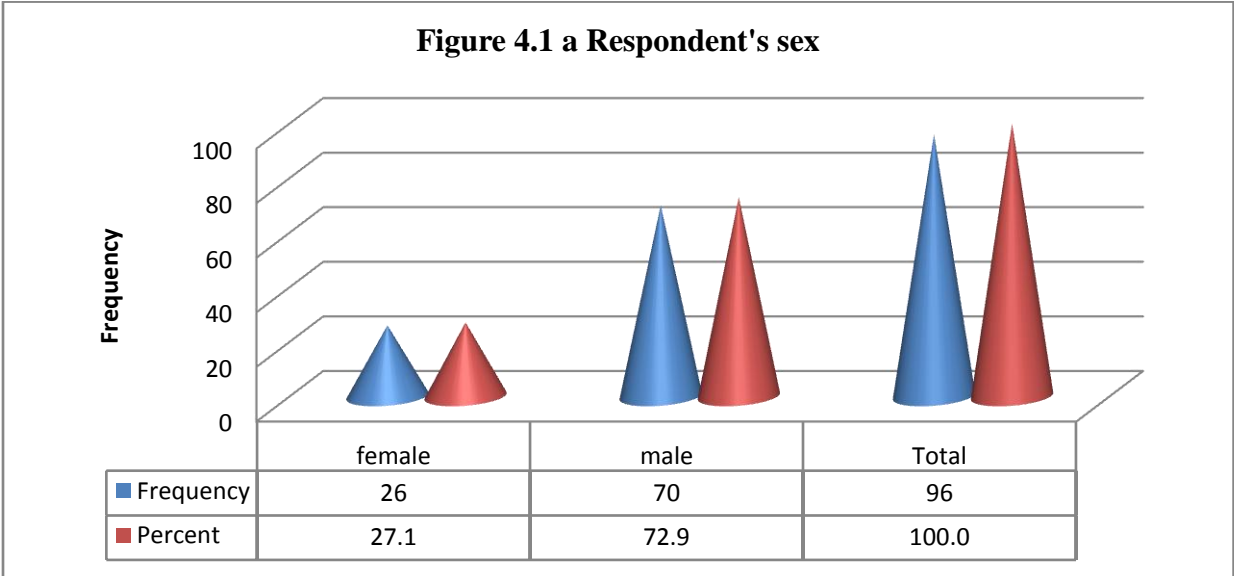
The questionnaire contains variables which include issues such as work plan, manpower plan, risk plan, procurement plan, equipment plan, safety plan, quality and payment plans and monitoring and evaluation. All items in the questionnaire are arranged in a form of likert items to capture the feelings of respondents in scale ranging from 1 to 5.All the data has been analyzed in SPSS so that the accuracy of the information is maintained.

In addition to this a self administered close ended questionnaire is included to support the researcher to discuss the results more clearly and an interview is conducted among management members. The content of the interviews were manipulated in a way that it would prove or disprove the feeling expressed by the participants who responded the questionnaire .All the interview question were structured so that it match the contents of the items enlisted in the questionnaire .

4.2 General Information about Respondents

The information generated to address the stated research objectives is solicited from respondents with diverse demographic characteristics. The first part of the questionnaire consists of the demographic information of the participants. This part of the questionnaire requested a limited amount of information related to personal and professional characteristics of respondents. Accordingly, the demographic variables about the respondents were summarized and described in different figures and tables. These variables include: sex, educational qualification , work experience and job position .

Table 4.1 shows general information about sex, educational qualification ,work experience and job position of the respondents .Most (73%) of respondents are male and 27% of the respondents are female.



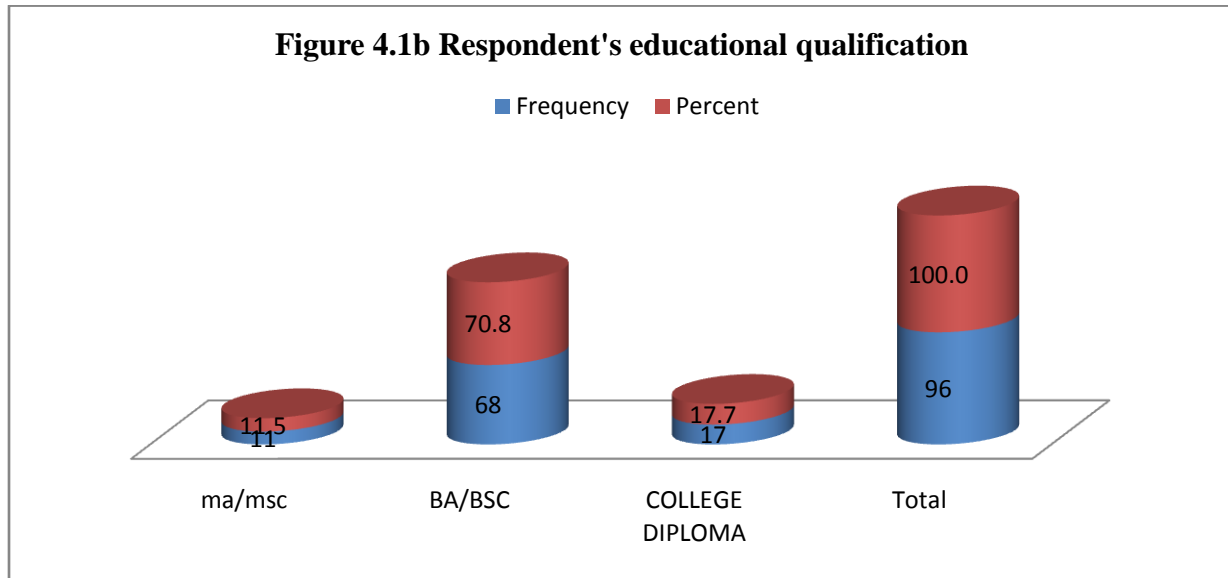
Source: Survey data

Table 4.1 General Information about Respondents

Variables	Frequency	Percent
Sex		
Female	26	27.1
Male	70	72.9
Total	96	100.0
Educational qualification		
MA/MSc	11	11.5
BA/BSc	68	70.8
College diploma	17	17.7
Total	96	100.0
Work experience		
Less than 5 years	35	36.5
5-10 years	36	37.5
10-15 years	14	14.6
Above 15 years	11	11.5
Total	96	100.0
Job position		
top management	2	2.1
middle management	9	9.4
project manager	7	7.3
other	78	81.3
Total	96	100.0

Source: Survey data

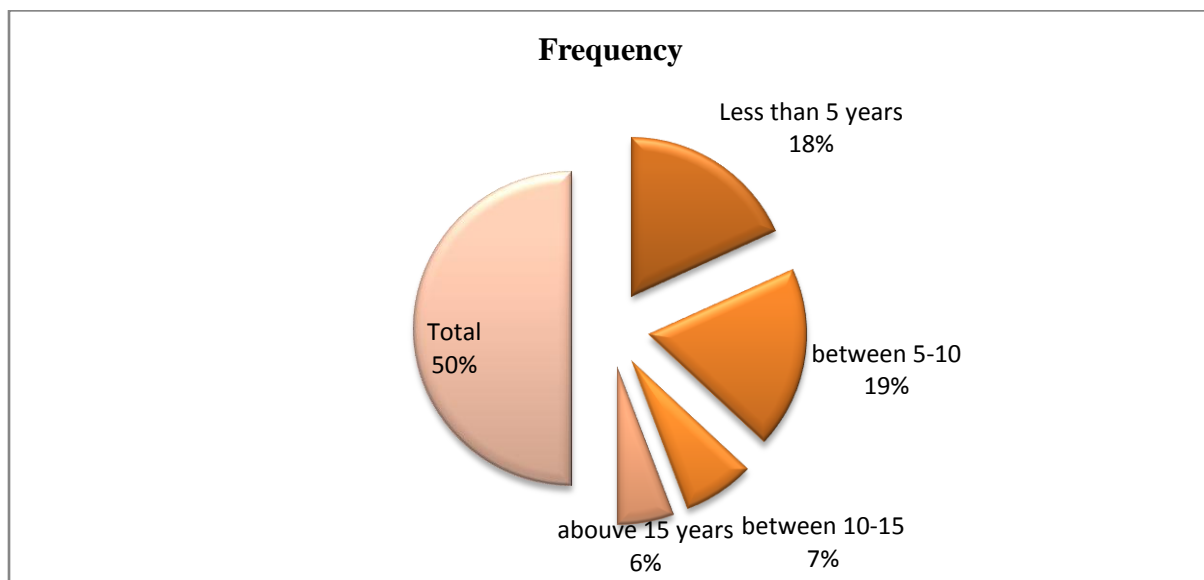
As shown below majority (70.8%) of respondents has an educational qualification of first degree and followed by 17.7 % college diploma holders and 11.5% of the respondents have second degree.



Source: Survey data

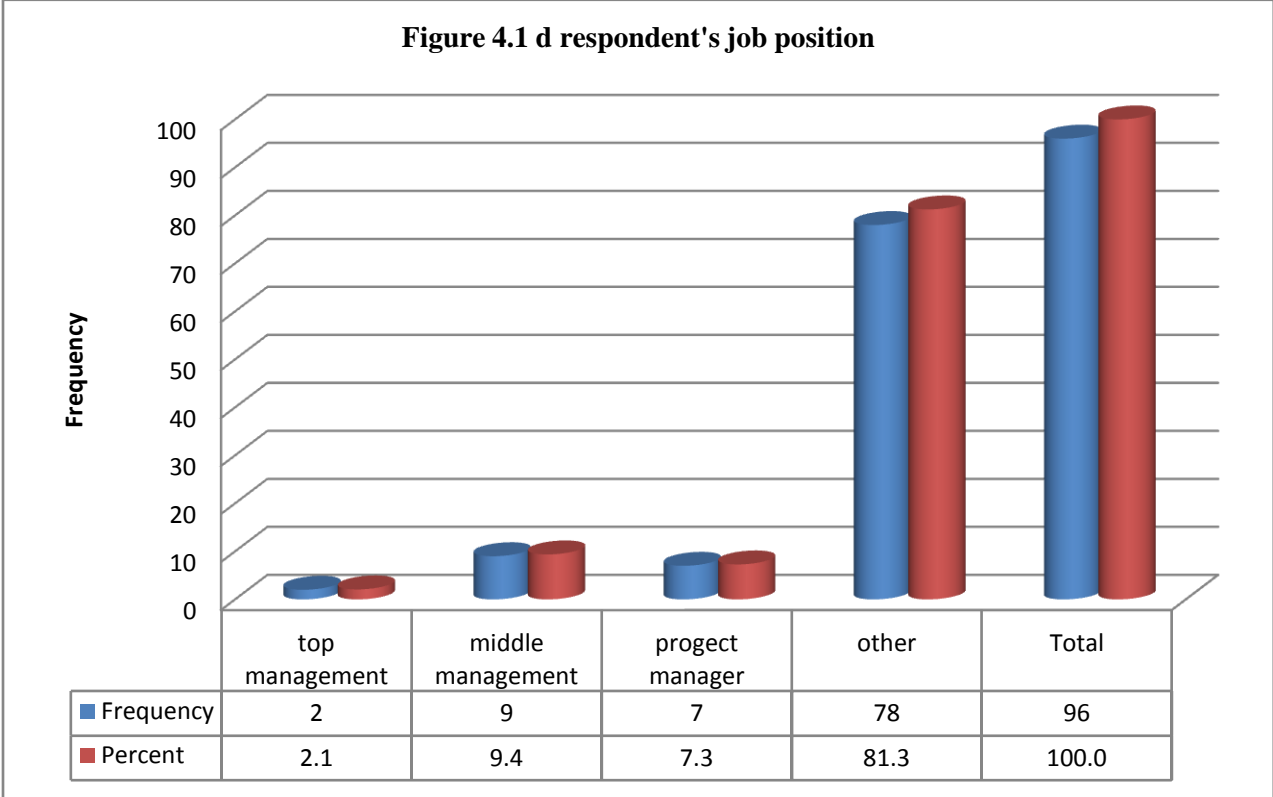
As shown in figure 4.1c below majority (38%) of the respondents have a work experience of above 5 years followed by 36% less than 5 years, 15% above 10 years and 11% above 15 years work experience.

Figure 4.1c. Respondents work experience



Source: Survey data

Finally most (81%) of respondents are professional engineers (which includes construction engineers, office engineers , site engineers , case team leaders , follow-up or civil engineers),middle management 10% ,7 %and 2% project managers and top management respectively .



Source: Survey data

4.3 Work schedule /plan

Based on the response gathered from the employees of the corporation, since the questionnaire was designed by using Likert Scale and almost all the statements were measured on a five point scale with 1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5=Strongly Agree. The information obtained from the questionnaires were summarized and discussed in the following manner.

Table 4.2: work schedule /plan

S/N	Variable	MN	MO	1	2	3	4	5
1	The enterprise prepare detailed project plan on mobilization phase of the project.	1.81	1	54 (56%)	23 (24%)	4 (4%)	13 (14%)	2 (2%)
2	All project stake holders participate in project planning of the enterprise	2.57	2	8 (8%)	58 (60%)	7 (7%)	13 (14%)	10 (10%)
3	The enterprise has written standards, guide lines and manuals & procedures for planning project works.	4	4	2 (2%)	4 (4%)	16 (17%)	44 (46%)	30 (31%)
4	WBS (work break down structure) is used when defining the schedule activities	3.85	4	1 (1%)	6 (6%)	17 (18%)	54 (56%)	18 (19%)
5	Relationships among activities are identified and the activities sequenced in planning process	3.83	4	3 (3%)	3 (3%)	21 (22%)	49 (51%)	20 (21%)
6	Estimate of resources (materials, people, equipment ...) needed is prepared	4.01	4	1 (1%)	5 (5%)	9 (10%)	58 (60%)	23 (24%)
7	The enterprise revise its plan and communicate with the client of the project	3.96	4	-	6 (6%)	14 (16%)	54 (56%)	22 (23%)
8	The enterprise uses planning software's for planning	3.25	4	9 (9%)	17 (18%)	22 (23%)	37 (38%)	11 (11%)
9	The sub-contractors or suppliers submit their detail activities plan	3.1	4	6 (6%)	25 (26%)	25 (26%)	33 (34%)	7 (7%)
10	The enterprise project schedule (finished dates are approved and fixed)	3.95	4	3 (3%)	7 (7%)	24 (25%)	48 (50%)	13 (14%)

Source: Survey data

Table 4.2 involved the assessment of work plan schedule preparation in D.C.E. where most of the respondents agreed that the enterprise has written standards, guide lines ,manuals and procedures for planning .The respondents agreed also that in planning process activities are break down ,relationship among activities are identified and sequenced ,needed resources are estimated plans are revised quarterly .the enterprise use fixed finished dates for time planning using excel sheet computer software including subcontractors and or suppliers detail activity plan .But as shown in the table 4.2 the respondents strongly disagree that the enterprise prepare detailed project plan on mobilization phase of the project and disagree that on the planning process all project stakeholders participate.

4.4 Human Resource Plan

Three questions were provided for respondents on the questionnaires in human resource planning and interview questions were asked to respondents regarding

Table 4.3 Human resource/Man power plan

S/N	Variable	MN	MO	1	2	3	4	5
11	The enterprise human resource management team member's participate in project planning	2.9	2	10 (10%)	28 (29%)	28 (29%)	22 (23%)	8 (8%)
12	The project plan incorporate man manpower plan	4.41	4	1 (1%)	4 (4%)	10 (10%)	60 (62%)	20 (21%)
13	The man power plan of the project includes detail skill requirement, Roles & Responsibilities of the position	4	4	4 (4%)	7 (7%)	12 (13%)	52 (54%)	21 (22%)

Source: Survey data

As indicated in table 4.3 most of the respondents (more than 52%) agreed that the project plan of the enterprise incorporate manpower plan which includes detail skill requirement ,roles and responsibilities of the position. But the respondents are neutral and equally disagree that the human resource team members participate in project planning.

From the interview result it is stated that the enterprise prepare the master plan and revised it with assigned follow up engineer in the head office and office engineers at project level respectively without the involvement of the human resource management team members .

4.5 Risk Plan

Considering risk in planning and planning risk response plan is uncommon in most plans but is important two question were asked and the following responds were gathered from the respondents.

Table 4.4 Risk plan

S/N	Variable	MN	MO	1	2	3	4	5
14	Risks are considered in planning the projects activities as assumptions	2.45	2	9 (9%)	56 (58%)	14 (15%)	13 (14%)	4 (4%)
15	Detailed risk response plan prepared for risks that warrant action/ attention	2.47	2	9 (9%)	55 (57%)	12 (13%)	18 (19%)	2 (2%)

Source: Survey data

Table 4.4 shows that 58% of the respondents disagree in that risks are considered in planning the enterprise projects and 57% also disagree that the enterprise prepare detailed risk response plan that warrant action . From the interview result the respondent states that the engineer in charge of planning the project activity uses only specification and bill of quantities as a source for planning and does not have the information of the site condition at planning stages unable to identify the risk and the office engineer also use the same format to revise the plan with out considering risks and detailed risk response plan.

4.6 Procurement Plan

The following four questions were included in the questionnaire to assess the practice of procurement plan in the enterprise.

Table 4.5 Procurement plan

S/N	Variable	MN	MO	1	2	3	4	5
16	The enterprise prepared detailed procurement plan of goods and service needed for a project.	2.52	2	22 (23%)	36 (38%)	11 (12%)	20 (21%)	7 (%)
17	Major and/or special supply items (such as those required in large quantity or those requiring special manufacturing or long lead time etc) identified and special attention is given for them	2.58	2	17 (18%)	38 (39%)	18 (19%)	14 (15%)	9 (9%)
18	There is awareness about the importance of project procurement plan in the enterprise.	2.23	2	25 (26%)	42 (44%)	15 (16%)	10 (10%)	4 (4%)
19	The procurement plan of the project revised with the revision of a project time plan	2.11	2	19 (20%)	57 (59%)	12 (13%)	6 (6%)	2 (2%)

Source: Survey data

From table 4.5 most of the respondents disagree in that the enterprise have the practice of preparing detailed procurement plan of goods and service needed for a project with identifying items that needs special attention and revised with the revision of the project work plan. The

respondent also claims that there is no awareness about the importance of project’s procurement plan in the enterprise.

4.7 Equipment /Machinery Plan

Resource plan include large and small equipment in construction project and it is the major resource specially in road and dam construction .the following three questions were asked to assess the practice of equipment/machinery plan practice of the enterprise.

Table 4.6 Equipment /Machinery plan

S/N	Variable	MN	MO	1	2	3	4	5
20	The enterprise project plan includes detail what, how much and when equipments are needed	3.86	4	1 (1%)	11 (12%)	11 (12%)	50 (52%)	23 (24%)
21	Equipment sharing among projects are planned and facilitated for the enterprise.	2.54	2	22 (23%)	41 (43%)	1 (1%)	23 (24%)	9 (9%)
22	The enterprise projects have an equipment maintenance plan.	2.19	2	24 (25%)	52 (54%)	4 (4%)	10 (10%)	6 (6%)

Source: Survey data

As can be seen from table 4.6 52% of the respondent’s agree that the enterprise project plan includes detail equipment plan even if the equipment administration and maintenance support process team members doesn’t participate in the planning process.

“*Equipment sharing among projects are planned and facilitated for the enterprise* “was ranked disagree by 43% of the respondents. The respondents’ perceptions showed that, the enterprise equipment plan doesn’t include equipment sharing plan among projects in order to use the equipment efficiently.

The respondent also ranked disagree (54%) to “*The enterprise projects have an equipment maintenance plan.*” meaning the enterprise project which has equipment plan doesn’t include maintenance plan.

4.8 Material Plan

Construction materials plan quantified from the working drawing and bill of quantity with detail specification must included in project plan. These question were prepared to gather information on the practice material planning in the enterprise.

Table 4.7 Material Plan

S/N	Variable	MN	MO	1	2	3	4	5
23	The enterprise has plan to acquire and use project materials	3.93	4	1 (1%)	10 (10%)	4 (4%)	61 (64%)	20 (21%)
24	Risks associated with unavailability and cost increase considered in material planning..	2.65	2	16 (17%)	47 (48%)	1 (1%)	22 (23%)	11 (12%)
25	Material requiring long-lead time and critical items given special consideration in planning.	2.88	2	5 (5%)	52 (54%)	4 (4%)	20 (21%)	15 (16%)

Source: Survey data

The research finding shows that about 64% of the respondent agreed and 20%strongl agree that “The enterprise has plan to acquire and use project materials.” but 48% of the respondent disagree in that “*risks associated with unavailability and cost increase considered in material planning.*” and also 54%of respondents also disagree that “*Material requiring long-lead time and critical items given special consideration in planning.*”.

The interview result shows that the project plan includes detailed material plans but doesn't include risks associated with unavailability of the material. if any material is unavailable in the market mostly materials will be replaced by the consultants with its equivalent. The enterprise material supply and administration manual incorporates materials lead-time but it needs some modification.

4.9 Safety Plan

Respondents were asked two questions regarding safety standards, requirement plan and availability of safety procedures, guidelines, policies and safety management.

Table 4.8 safety plan

S/N	Variable	MN	MO	1	2	3	4	5
26	The enterprise prepare safety plan (determining safety standards and requirements and devising action plan)	3.09	2	5 (5%)	28 (29%)	27 (28%)	25 (26%)	11 (11%)
27	The enterprise has organizational policies. Procedures and guidelines for safety management.	3.13	3	6 (6%)	25 (26%)	28 (29%)	25 (26%)	12 (13%)

Source: Survey data

Table 4.8 shows that 28% of the respondents disagree that the enterprise prepare safety plan 27% of the respondents are neutral and 25% are agree with the issue. The table also shows that 28% of the respondents also neither agree nor disagree in that “The enterprise has organizational policies. Procedures and guidelines for safety management” but the interview result shows that the enterprise human resource manual includes safety management which requires Safety barriers, warning sign and protective clothing and footwear. All projects have insurance for a variety of risks, ranging from theft to fire. By buying insurance, they have effectively transferred risk to the insurance company in that, if anything occurs the insurance company will compensate the company.

4.10 Quality and Payment plan

Three important factors were set to check monthly payment request practice, project quality plan and the availability of quality management policy, procedures and guidelines of the enterprise.

Table 4.9 quality and payment plan

S/N	Variable	MN	MO	1	2	3	4	5
28	The enterprise request monthly payment certificates for the accomplished work	4.19	4	1 (1%)	5 (5%)	8 (8%)	43 (45%)	39 (41%)
29	The enterprise has quality management policies procedures & guidelines	3.67	4	2 (2%)	13 (14%)	20 (21%)	41 (43%)	20 (21%)
30	The project quality plan. (Requirements & quality standards determined and strategic are devised).	2.99	2	1 (1%)	57 (59%)	2 (2%)	14 (15%)	22 (23%)

Source: Survey data

The majority (about 86%) of the respondents agreed that the enterprise projects prepare and request monthly payment for the accomplished work and about 64% of the respondents also agreed that the enterprise has quality management policies, procedures and guidelines for the construction work. However, most of the respondents (about 60%) disagree as the project quality requirements determined and strategies are devised.

4.11 Source of Monitoring and Evaluation

Monitoring and evaluation needs standards, construction project uses plans as standards for monitoring and evaluation of projects.

Table 4.10 source of monitoring and evaluation

S/N	Variable	MN	MO	1	2	3	4	5
31	Plans are the source and inputs for project monitoring & evaluation of the enterprise's project activity.	4.13	4		2 (2%)	14 (15%)	50 (52%)	30 (31%)

Source: Survey data

About 83% of the respondent agreed that the enterprise use plans as source for project monitoring and evaluation purpose .

4.12 Project Evaluation

Six factors were set to check what the enterprise evaluate, who is responsible to evaluate and how the project planning, monitoring and evaluation team evaluate the project.

Table 4.11 project evaluation

S/N	Variable	MN	MO	1	2	3	4	5
32	The enterprise use project plan to evaluate.							
	a)Performance of the work	4.26	4	2 (2%)	2 (2%)	4 (4%)	49 (51%)	39 (41%)
	b)resource utilization	3.9	4	2 (2%)	8 (8%)	13 (14%)	48 (50%)	25 (26%)
	c)equipment efficiency	3.75	4	1 (1%)	9 (9%)	23 (24%)	43 (45%)	20 (21%)
	d)procurement activity status	2.94	2	1 (1%)	57 (59%)		23 (24%)	15 (16%)
33	The enterprise has a central project planning, monitoring & Evaluation team.	4.02	4		3 (3%)	16 (17%)	53 (55%)	24 (25%)
34	The enterprise project planning, monitoring and evolutions team have formal meetings for monitoring & evaluating the project progress.	2.55	2	16 (17%)	50 (52%)		21 (22%)	9 (9%)

Source: Survey data

As shown in table 4.11 more than 66% of the respondents agreed that the enterprise evaluate its project performance of the work ,resources utilization, and equipment efficiency . but 68% of the respondent disagreed that the enterprise use project plan to evaluate procurement activity status. The table also shows that majority(80%) of the respondent agreed that the enterprise has a central project planning, monitoring and evaluation team . in the table 66% of the respondent disagreed in that the central project planning, monitoring and evaluation team have formal meetings for monitoring and evaluating the project progress.

According to the interview results most of the time project evaluation is conducted by management members which includes top management, team leaders and project managers with formal meetings.

4.13 Project Report and Evaluation

There were eight question requested to the respondents on the project progress report content, report evaluation, on report format and submission date .

Table 4.12 project report and Evaluation

s/n	Variables	Mean	Mod	1	2	3	4	5
35	The progress report produced by the enterprise's project provide sufficient information to monitor and evaluate the project activity	3.88	4	1 (1%)	8 (8%)	12 (13%)	56 (58%)	19 (20%)
36	The reports submitted to the enterprise project planning, monitoring & Evaluation team provides feedback that support the project.	2.14	1	55 (57%)	11 (11%)	6 (6%)	10 (10%)	14 (15%)
37	People involved in monitoring and evaluation has knowledge or experience or receive training about monitoring and evaluation of projects	3.45	4		12 (13%)	37 (38%)	39 (41%)	8 (8%)
38	projects are evaluated							
	a)On projects own report	4.16	4	1 (1%)	2 (2%)	10 (10%)	51 (53%)	32 (33%)
	b)on meetings	4.09	4	1 (1%)	2 (2%)	9 (9%)	59 (62%)	25 (26%)
	c)on observation report	2.63	2	4 (4%)	56 (58%)	15 (16%)	14 (15%)	7 (7%)
39	Progress reports							
	a) The enterprise have a standard report format	4.24	4		5 (5%)	4 (4%)	50 (52%)	37 (39%)

					4 (4%)	4 (4%)	51 (53%)	37 (38%)
	b) The report submission dates are fixed	4.26	4					
	c) The report format includes all the necessary information for management decision.	4.22	4	1 (1%)	1 (1%)	6 (6%)	56 (58%)	32 (33%)
	d) Reports are evaluated and issues are resolved.	2.06	2	37 (39%)	40 (42%)	2 (2%)	10 (10%)	7 (7%)
40	Financial reports are prepared regularly for the project.	4.11	4	1 (1%)	3 (3%)	10 (10%)	52 (54%)	30 (31%)
41	Project procurement progress reports are prepared and evaluated regularly with project accomplishment	2.15	1	48 (50%)	14 (15%)	12 (13%)	16 (17%)	6 (6%)
42	The enterprise have standard procurement report format	2.79	2	3 (3%)	53 (55%)	12 (13%)	17 (18%)	11 (12%)

Source: Survey data

From table 4.12, 78% of the respondent (with mean of 3.88) and 49% (with a mean of 3.45) agreed that the project report provide sufficient information to monitor and evaluate the project activity and people involved in monitoring and evaluation has knowledge or experience or receive training about monitoring and evaluation of projects respectively. But 68% of the respondent disagree with the parameter the reports submitted to the enterprise project planning, monitoring and evaluation team provides feedbacks that support the project .

On the other hand more than 86 % of the respondent agreed that the enterprise projects are evaluated on their own reports in meetings, but most disagreed on the parameter that projects are evaluated on observation report prepared by central project planning, monitoring and evaluation team members.

Surprisingly 91% of the respondents agreed that the enterprise has standard project activity progress format, the report submission dates are fixed and the report format includes all the necessary information for management decision .but 81% the respondent disagreed on that reports are evaluated and issues are resolved.

With 85% of the respondent agreed that the project report include financial report .the interview result also shows that the project prepares biweekly detail report for the core process and monthly detail manpower, budget utilization, equipment utilization and fuel consumption, material utilization and financial report for support process and core process monthly.

Finally 65% and 58 of the respondents disagreed in that the enterprise has standard procurement report format and project procurement progress reports are prepared and evaluated regularly with project accomplishment.

4.14 Cost monitoring and evaluation

Project evaluation includes cost evaluation. The following questions were asked to the respondent in order to understand the enterprises cost evaluation practice.

Table 4.13 cost, quality, employ performance and risk evaluation.

S/N	Variable	MN	MO	1	2	3	4	5
43	The following project costs are evaluated against plan in the enterprises.							
	a)Direct cost	4.07	4	1 (1%)	3 (3%)	10 (10%)	56 (58%)	26 (27%)
	b)Indirect cost	3.98	4	1 (1%)	5 (5%)	13 (14%)	53 (55%)	24 (25%)
	c)Material cost	4.06	4	1 (1%)	4 (4%)	8 (8%)	58 (60%)	25 (26%)
	d)Labour cost	4.04	4	1 (1%)	3 (3%)	10 (10%)	59 (62%)	23 (24%)
	e)Equipment cost	3.96	4	1 (1%)	7 (7%)	10 (10%)	55 (57%)	23 (24%)
	f)Fuel cost	4.05	4	1 (1%)	5 (5%)	9 (9%)	54 (56%)	27 (28%)
44	The enterprise monitor project finance to ensure that money is spent appropriately as planned and with proper authorization.	4.00	4	1(1%)	5 (5%)	18 (19%)	46 (48%)	26 (27%)

Source: Survey data

From table 4.13 above, it can be concluded that all the cost factors listed and money transferred to projects are evaluated against plan as majority of respondent (more than 72%) agreed and with all construction cost which includes direct, indirect, material labour equipment and fuel costs..

4.15 Project Risk and Quality of work Evaluation

Construction project monitoring and evaluation contains risk and quality evaluation of the project .In order to assess the practice of the project risk and quality of work evaluation four questions were asked to respondents as shown below.

Table 4.14 evaluation of risk and quality

s/n	Variables	MN	MO	1	2	3	4	5
45	Quality audits are done in the project are view to determine where project activities comply with polices, processes and quality requirements.	2.82	2	3 (3%)	47 (49%)	20 (21%)	18 (19%)	8 (8%)
46	The enterprise inspects and evaluates quality of subcontractor's work to ensure compliance with quality requirements.	3.51	4	2 (2%)	19 (20%)	16 (17%)	46 (48%)	13 (14%)
47	Your enterprise monitor and evaluate project risks (i.e. identifying and documenting new risks, closing those outdated and tracking those already identified)	2.17	1	49 (51%)	17 (18%)	1 (1%)	23 (24%)	6 (6%)
48	The enterprise used risk register/log in the risk to document identified risks with their attributes and to track their status while monitoring and evaluating.	2.20	2	47 (49%)	16 (17%)	4 (4%)	25 (26%)	4 (4%)

Source: Survey data

Table 4.14 shows that 51% of the respondents disagreed in the existence of quality audits in the enterprise projects to determine where activities comply with policies ,procedures and quality requirements but 62% agreed in that the enterprise inspects and evaluate quality of subcontractors work to ensure compliance with quality requirements.

The result also shows that the largest percentage (above 63%)of the respondents agreed that the enterprise monitor and evaluate project risks and used register /log in the risk document to identify risks with their attributes and track their status while monitoring and evaluation project risks.

4.16 Employees Performance and Equipment productivity Evaluation

Project skilled manpower and professionals and the equipment productivity have to be evaluated at fixed period of time. The following two question were asked to employees and management staff to the practice of D.C.E.

Table 4.15 Employees Performance and Equipment productivity Evaluation

S/N	Variables	MN	MO	1	2	3	4	5
49	The enterprise have standard for monitoring performance of the project equipment their productivity, maintenance cost, time worked etc	3.58	4	3 (3%)	13 (14%)	20 (21%)	45 (47%)	15 (16%)
50	The enterprise Project Employees performance evaluation tracked regularly & feed backs are provided.	3.72	4	2 (2%)	8 (8%)	21 (22%)	49 (51%)	16 (17%)

Source: Survey data

More than 63% of the respondents as shown in table 4.15 agreed that the enterprise use its own standards to monitor and evaluate performance of the project equipment activity and the employ performance regularly.

4.17 Project Profitability and Delay Evaluation

Table 4.16 contain two questions to asses on factors that affect project profitability and time of completion and resource supply of construction project in D.C.E.

Table 4.16 profitability and delay evaluation

S/N	Variable	MN	MO	1	2	3	4	5
51	The enterprises project profitability is affected by							
	a)increase in cost of input	3.79	4	1 (1%)	6 (6%)	22 (23%)	50 (52%)	17 (18%)
	b)in resource supply delay	4.05	4	1 (1%)	6 (6%)	7 (7%)	55 (57%)	27 (28%)
	c)quality of work	3.50	4	4 (4%)	14 (15%)	21 (22%)	44 (46%)	13 (14%)
52	There is a delay on the enterprises project							
	a)Due to poor planning	4.07	4	9 (9%)	22 (23%)	10 (10%)	37 (38%)	18 (19%)
	b)Due to material supply problem	3.70	4	7 (7%)	5 (5%)	13 (14%)	56 (58%)	15 (16%)
	c)Due to late equipment delivery	3.60	4	4 (4%)	12 (13%)	18 (19%)	46 (48%)	16 (17%)
	d)Due to shortage of labour	3.39	4	5(5%)	23 (24%)	13 (14%)	40 (42%)	15 (16%)
	e) Poor completion time estimate	3.57	4	5(5%)	13 (14%)	17 (18%)	44 (46%)	17 (18%)
	f)Late decision making	3.48	4	5(5%)	17 (18%)	15 (16%)	45 (47%)	14 (15%)
	g)Payment request delay and approval	3.35	4	4(4%)	24 (25%)	17 (18%)	36 (38%)	15 (16%)

Source: Survey data

The analysis in table 4.16 shows that the first three factors, as more than 54% of the respondents agreed, affect the profitability of the enterprises projects .And all the factors described as the cause of delay on the project is agreed by more than 51% of the respondent.

4.18 General information on planning, monitoring and evaluation

The following ten additional multiple choice question was requested in order to asses additional information on planning, monitoring and evaluation of construction project in D.C.E.

Table 4.17 General information on planning, monitoring and evaluation

1	Which software do you apply for planning the project?	primavera	ms project	excel sheet	Others		Total
	Frequency	6	24	231	4		265
	Percent	2.3	9.1	87.2	1.5		100.0
2	Does your company formally participate in the pre-project planning effort?	yes, if the owner is MOND	yes for any project	no	i do not know		Total
	Frequency	40	70	77	78		265
	Percent	15.1	26.4	29.1	29.4		100.0
3	Does your enterprise employ a construction planning specialist firm?	yes	no	i dont now			Total
	Frequency	79	84	102			265
	Percent	29.8	31.7	38.5			100.0
4	How would you describe the level of detail of the planning techniques used in your planning of the projects?	not very detail	detail ed	very detaile d			Total
	Frequency	68	165	32			265
	Percent	25.7	62.3	12.1			100.0
5	How often would you revise your project plan ?	never	daily	weekl y/biwe ekly	Monthl y	quart erly	Total
	Frequency	18	12	55	26	154	265
	Percent	6.8	4.5	20.8	9.8	58.1	100.0
6	Which of the following answers below would best describe the frequency of evaluation of the projects' progress in your company?	never	daily	weekl y/biwe ekly	Monthl y	quart erly	Total
	Frequency	6	19	71	94	75	265
	Percent	2.3	7.2	26.8	35.5	28.3	100.0

7	Please indicate to what extent the procurement systems used in your company influence the degree of accuracy of your time estimates to complete the project?	not at all	to small extent	to large extent			Total
	Frequency	27	123	115			265
	Percent	10.2	46.4	43.4			100.0
8	How often do you require the sub-contractors or supplier to submit their detail activities schedule for you in advance to adjust your actual schedule?	never	daily	weekly/biweekly	Monthly	quarterly	Total
	Frequency	96	21	37	63	45	262
	Percent	36.2	7.9	14.0	23.8	17.0	98.9
9	How do you evaluate your enterprises planning practice ?	not good	good	best			Total
	Frequency	50	170	45			265
	Percent	18.9	64.2	17.0			100.0
10	how do you describe your enterprises project progress monitoring and evaluation ?	not good	good	best			Total
	Frequency	50	181	34			265
	Percent	18.9	68.3	12.8			100.0

Source: Survey data

In table 4.17 the result of a self administered close ended questionnaire. As most of the respondents the enterprise project use excel sheet for project planning and do not know that the enterprise formally participate in the in pre-project planning, but the interview result shows that the project completion dates were fixed by the owner and consultant without the involvement of the enterprise and performing detailed plan.

The respondents were asked to answer whether the enterprise out sources its planning activity and most of the respondents don't have the information .but from the interview result the enterprise outsources the MOND head quarter project master plan preparation work for consulting firm and the firm prepares the master plan with ms project planning soft ware.

Most of the respondent describe the project plan prepared were detailed and revised quarterly but subcontractors and/or suppliers never submit their detailed activity plan for the projects and the procurement system used in the enterprise affect only to small extent the project completion time.

Finally most of the respondent evaluates the enterprise project planning, monitoring and evaluation practice as good but the interview result shows that it needs some improvement.

4.19. Discussion of the results

The enterprise as shown in work schedule plan result prepares detail plan and revise it quarterly but the planning process lacks participating the people who must do the work and completing the plan at project mobilization time .Lewis(2005) described five common mistakes in planning and the first is unilateral planning (not participating people who must do the work) and Jackson,B.J(2010) one of the activities in mobilization time is to prepare and submit project plan to the client & its representative.

Generally, the enterprise prepare its project plan including detail man power as one of the project resource plan as White& Fortune(2002) but it lacks participating the human resource support process people.

As the result shows the enterprise does not consider risks in planning and does not prepare risk response plans. As described in literature review by Jackson,B.J(2010) construction risks has to be considered and risk response plans have to be developed.

The result also shows that the enterprise did not incorporate procurement plan in the project master and revised plan. But as described by Jackson B.J(2010) procurement is one of the three project activity that needs properly planning .Yimer(2011) also suggests that in order to complete the project work on contract time procurement plan must be prepared properly.

As 74% of the responds the enterprise was prepared equipment plan for the project but the equipment plan lacks maintenance and sharing among projects. According to T.Subramani (2014) the construction project plan includes equipment plan that perform work on activities across all projects.

Generally, construction material planning was prepared for the enterprise project. It involves as T.Subramani(2014) identify the material required defining specification, estimate the quantity &forecasting requirements.

The enterprise has organizational policies, procedures & guide lines for safety management but lacks safety plan and creating awareness on the safety management policy of the enterprise according to Olantunji A.A (2010) lack of health and safety plan can exert influence on the delivery time of projects.

Payments according to the research result prepared monthly and the enterprise has quality

management procedures and guidelines but does not have quality plan. According to ministry of work and urban development general condition of contract MOWUD (1994) clause 60, the contractor shall submit payment request statement to the engineer after the end of each month with price escalation and/or price adjustment.

In the first category monitoring and evaluation 4.13(83%) which indicate the existence of above average monitoring and evaluation of projects using project plan as a source. Examining the four major components evaluation i.e. performance the work, resource utilization, equipment efficiency and procurement activity status. Except procurement activity status all the activities were monitored and evaluated. As UNDP (2009) without planning monitoring and evaluation is unthinkable.

The result shows 4.02(80%) that meetings were arranged quarterly by the enterprise management team including the project managers to evaluate the project reports. But the meeting uncovers problems and issues reported by the projects.

The result shows that project planning monitoring & evaluating team neither prepare and submit an observation report nor evaluate and forward feedback to the projects.

The project evaluation and monitoring activity includes according to Jody and Ray(2004) physical progress, finance progress, project quality, risks & equipment productivity. The research shows that the enterprise monitor and evaluate all costs, quality of sub-contractors work, equipment productivity and employees performance but not monitor and evaluate risks & own work quality.

The result shows that the enterprise project plan were not include the purchasing plan for required goods and service which is a causes for a delay on material supply, an increase in cost of input, which leads to work procedures problem and quality of work which also leads to rework and additional cost and which in turn reduce the expected project profit.

Finally, from the research result most of the enterprises project was delayed to due to improper planning, late resource supply and late management decision making.

As Merith.et.al.(2013)project must managed well by continually planning, checking on progress, taking corrective action if not revise the plan to bring progress in to agreement with the master plan otherwise there exist a time and cost overrun.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS & RECOMMENDATIONS

5.1 Introduction

This chapter has three sections. The first section presents the summary of major findings, the second section presents conclusion of the research derived from findings and the third section deals with recommendation that were made on basis of the findings.

5.2 Summary of Major Findings

Based on the results of the study carried out enterprise has written standards, guide lines ,manuals and procedures for planning .In planning process activities are break down ,relationship among activities are identified and sequenced ,needed resources are estimated plans are revised quarterly .the enterprise use fixed finished dates for time planning using excel sheet computer software including subcontractors and or suppliers detail activity plan .But the planning process lacks preparing the plan on mobilization phase of the project , participating all project stakeholders, including procurement plan, considering risk , preparing detailed risk response plans, including construction equipment sharing among project and maintenance plan and project quality plan.

The enterprise use the prepared plan, (except quality, risk and procurement plan) ,as a source for monitoring and evaluation of project performance of the work, resources utilization, all costs and equipment efficiency with project's own report .The report submitted every two weeks contains all the required information to evaluate the project on time by the enterprise evaluation team but the team did not evaluate the report and recommend any possible way to resolve the issues which requires action to be taken by the project stake holders .

The enterprise nether outsource the planning activity to construction planning specialist firm, except MOND headquarter project nor prepare complete project plan and monitor and evaluate accordingly there exists a reduction in the expected profit and a delay on supply of resources and project completion time .

5.3 Conclusions

This study examines the construction project planning, monitoring and evaluation practice at defense construction enterprise.

Generally as the result obtained from the study and based on its specific objectives the following conclusions were drawn:

- ☞ The enterprise did not have the practice of completing its construction project planning in project mobilization phases and did not also participate peoples who actually do the work especially the support activity.
- ☞ The enterprise prepared directives and operational manual for the construction work which guides the planners how and when to prepare and revise the project plan using primavera project planning soft ware but the research result shows the enterprise project used excel sheet.
- ☞ Neither risks considered in planning nor risk response plans were prepared in planning the enterprises project. This is a common mistake in planning project.
- ☞ Special supply item that needs long long-lead time were not given attention to prepare procurement plans which must be included in the project masters revised schedule .the research result shows that procurement plans not prepared by the enterprise and most of the workers and management members don't have the awareness of the importance of project goods and service procurement plan.
- ☞ The plan prepared for the enterprise project includes the required equipments but lacks equipment sharing among projects and protective maintenance plan to facilitate efficient use of the enterprise's equipment
- ☞ The result of the study reveals that the existence of construction safety policy manual at D.C.E but affirms also that the employees don't have the information to use and management members didn't apply it .
- ☞ The enterprise is good at preparing monthly progress payment but the document lacks quality to be approved on time by the consultants and collect the money on time .
- ☞ The study reveals s the enterprise does not prepare a quality plan for the projects.
- ☞ The enterprise project planning, monitoring and evaluation team do not have the practice of formally evaluating each progress report and give feed backs, but the reports include all

the necessary information for evaluation and problems that needs management especial attention is also included .

- ☞ It was revealed in the study that DCE does not have well organized and integrated project evaluation system. The enterprise evaluate projects every quarter based on their own reports in management meetings without planned site observation report and procurement progress report.
- ☞ Survey result reveals that the enterprise project strongly monitor and evaluate it's money and all project cost categories.
- ☞ The enterprise inspects the quality of the subcontractors work but poor in monitoring and evaluation of it's own work quality.
- ☞ There were delays in project due to poor planning, material supply problem, shortage of manpower and late decision making and the projects profitability were mostly affected by quality of work which leads to rework, delay of resource supply and in an increase in the cost of input.

5.4 Recommendation

Based on the result of the study and conclusion reached together with lesson drawn from literature on experience of the construction project planning, monitoring and evaluation practice the following important remarks are recommended.

- ☞ Detailed plan including construction, administration and procurement activities should be prepared on project mobilization time.
- ☞ The enterprise as described in its core process manual should to concentrate more on using software programs in project planning to obtain more accurate data, save time ,and minimize error.
- ☞ It is very important to consider risks and prepare risk response plan in project planning.
- ☞ Special consideration have to be given to items that needs long-lead time in requesting for delivery and in preparing procurement plans
- ☞ In preparing the enterprise's project master and annual plan teams have to be formulated from each support and core process.

- ☞ The enterprise construction equipment administration and support process needs to prepare its equipment maintenance and equipment sharing among project plan by consulting the core process.
- ☞ All progress reports submitted by projects have to be evaluated by road, dam and irrigation and housing and building core process with equipment administration and resource supply support process respectively and feed backs have to be forwarded to projects and enterprise management members.
- ☞ Milestones plans have to be prepared for quality, safety and risk on site evaluation for each projects by the core process.
- ☞ The enterprise management need to focus on creating awareness to all employees on safety issues .
- ☞ Training programs should be compulsory for the enterprise team leaders, project managers, office, construction, site and follow-up engineers to develop their planning, monitoring and evaluation abilities, skills and knowledge.

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APPENDICES

A-C

Appendix A. Questionnaire

Questionnaire for data collection

Dear respondents

I am undertaking a research survey on construction project focusing on planning, monitoring and evaluation practice in defense construction enterprise.

The research is an individual research project as part of my study for MBA Degree at St.Mary's University.

The main purpose of the research questionnaire is to collect information regarding the current condition of construction project planning, monitoring and evaluation practice in defense construction enterprise. As a key staff you are invited to participate in this survey. The information you provide in response to the items in the questionnaire will be used as part of the data needed for the study.

All the information you provide will kept in strict confidentiality and it will be used only for academic research .please answer each question carefully .there is no right or wrong answer. If you are unsure of an answer, please respond with your best estimate. I value your participation and thank you for the commitment of time, energy and effort. If you have any further question, I can be reach at the address below.

Sincerely

Ashenafi Abebe

Email ashenafiabebe44@yahoo.com

Cell phone No. 0911643884.

General Instructions

-There is no need of writing your name

-In all cases where answers options are available please tick (√) in the appropriate box.

Part I. Back ground information about the respondents please use (√) in the relevant box for your response

a. Gender Female Male

b. Educational back ground

- 1. PHD
- 2. MA/MSC
- 3. BA/BSC
- 4. College Diploma

c. Work Experience

- 1. Less than 5 years
- 2. 5-10 years
- 3. 10-15 years
- 4. Above 15 year

d. Job Title

- 1. Top Management
(Manager)
- 2. Middle management
(Team leader)
- 3. Project management
- 4. Others (.....)

Please write your title _____

Part II. Listed below are statements about project planning, monitoring & Evaluation. Please indicate your level of agreement with the statement so that your answer to these questions will enable the researcher to assess what you think about the project planning monitoring and evaluation practice in your enterprise.

S/ N	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Work schedule /plan						
1.	The enterprise prepared detailed project plan on mobilization phase of the project .					
2.	All project stake holders participate in project planning of the enterprise					
3.	The enterprise has written standards, guide lines and manuals & procedures for planning project works..					
4	WBS (work break down structure) is used when defining the schedule activities					
5	Relationships among activities are identified and the activities sequenced in planning process					
6	Estimate of resources (materials, people, equipment ...) needed is prepared					
7	The enterprise revise its plan and communicate with the client of the project					
8	The enterprise uses planning software's for planning					
9	The sub-contractors or suppliers submit their detail activities plan					
10	The enterprise project schedule (finished dates are approved and fixed)					
Human resource /manpower plan						
11	The enterprise human resource management team member's participate in project planning.					
12	The project plan incorporate man manpower plan					
13	The man power plan of the project includes detail skill requirement, Roles & Responsibilities of the position					
Risk plan						
14	Risks are considered in planning the projects activities as assumptions					
15	Detailed risk response plan prepared for risks that warrant action/attention					

S/ N	Questions	Disagree	Strongly Disagree	Neutral	Agree	Strongly Agree
Procurement plan						
16.	The enterprise prepared detailed procurement plan of goods and service needed for a project.					
17	Major and/or special supply items (such as those required in large quantity or those requiring special manufacturing or long lead time etc) identified and special attention is given for them					
18	There is awareness about the importance of project procurement plan in the enterprise.					
19	The procurement plan of the project revised with the revision of a project time plan .					
Equipment/Machinery Plan.						
20	The enterprise project plan includes detail what, how much and when equipments are needed.					
21.	Equipment sharing among projects are planned and facilitated for the enterprise.					
22	The enterprise projects have an equipment maintenance plan.					
Material Plan						
23.	The enterprise has plan to acquire and use project materials					
24.	Risks associated with unavailability and cost increase considered in material planning..					
25.	Material requiring long-lead time and critical items given special consideration in planning.					
Safety plan						
26.	The enterprise prepare safety plan (determining safety standards and requirements and devising action plan)					
27.	The enterprise has organizational policies. Procedures and guidelines for safety management.					

S/ N	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Quality and Payment plan						
28	The enterprise request monthly payment certificates for the accomplished work					
29	The enterprise has quality management policies procedures & guidelines					
30	The project quality plan. (Requirements & quality standards determined and strategic are devised).					
Monitoring & Evaluation						
31	Plans are the source and inputs for project monitoring & evaluation of the enterprise's project activity.					
32	The enterprise use project plan to evaluate					
	a. Performance					
	b. Material usage					
	c. Equipment efficiency					
	d. Procurement activity status					
33	The enterprise has a central project planning, monitoring & Evaluation team.					
34	The enterprise project planning, monitoring and evolutions team have formal meetings for monitoring & evaluating the project progress.					
35	The progress report produced by the enterprise's project provide sufficient information to monitor and evaluate the project activity.					
36	The reports submitted to the enterprise project planning, monitoring & Evaluation team provides feedback that support the project.					

S/ N	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
37	People involved in monitoring and evaluation has knowledge or experience or receive training about monitoring and evaluation of projects					
38	Projects are evaluated					
	a. Projects own report					
	b. On meetings					
	c. On observation report					
39	Progress Reports					
	a. The enterprise have a standard report format					
	b. The report submission dates are fixed					
	c. The report format includes all the necessary information for management decision.					
	d. Reports are evaluated and issues are resolved.					
40	Financial reports are prepared regularly for the project					
41	Project procurement progress reports are prepared and evaluated regularly with project accomplishment					
42	The enterprise has standard procurement report format					

S/ N	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
43	The following project costs are evaluated against plan in the enterprise					
	a. Direct cost					
	b. Indirect cost					
	c. Material cost					
	d. Labor cost					
	e. Equipment cost					
	f. Fuel cost					
44	The enterprise monitor project finance to ensure that money is spent appropriately as planned and with proper authorization					
45	Quality audits are done in the project are view to determine where project activities comply with polices, processes and quality requirements.					
46	The enterprise inspects and evaluate quality of subcontractor work to ensure compliance with quality requirements					
47	Your enterprise monitor and evaluate project risks (i.e. identifying and documenting new risks, closing those outdated and tracking those already identified)					
48	The enterprise used risk register/log in the risk to document identified risks with their attributes and to track their status while monitoring and evaluating.					
49	The enterprise have standard for monitoring performance of the project equipment their productivity, maintenance cost, time worked etc.					
50	The enterprise Project Employees performance evaluation tracked regularly & feed backs are provided.					

S/ N	Questions	Disagree	Strongly Disagree	Neutral	Agree	Strongly Agree
51	The enterprise profitability is affected by					
	a. increase in cost of input					
	b. delay in supply of resource					
	c. Quality of work					
52	There is a delay on the enterprise's project					
	a. Due to poor planning					
	b. Due to material supply problem					
	c. Due to late equipment delivery					
	d. Late manpower assignment					
	e. Completion on estimated time					
	f. Decision making					
	g. payment request and approval					

Part III additional questions. Please tick the appropriate response where applicable,

1. Which software do you apply for planning the project?

- Primavera
- Microsoft project
- Excel sheet
- Others (.....)

2. Does your company formally participate in the pre-project planning effort?

- Yes, if the owner is ministry of defense
- Yes, for any project
- No
- I don't know

3. Does your enterprise employ a construction planning specialist firm?

- Yes
- No
- I don't know

4. How would you describe the level of detail of the planning techniques used in your planning of the projects?

- not very detailed
- detailed
- very detailed

5. How often would you revise your project plan ?

- Never
- Daily
- Weekly/biweekly
- Monthly
- quarterly

6. Which of the following answers below would best describe the frequency of evaluation of the projects' progress in your company?

- Never
- Daily
- Weekly/ biweekly
- Monthly
- Every quarterly

7. Please indicate to what extent the procurement systems used in your company influence the degree of accuracy of your time estimates to complete the project?

- Not at all
- To small extent
- To large extent .

8. How often do you require the sub-contractors or supplier to submit their detail activities schedule for you in advance to adjust your actual schedule?

- Never
- Daily
- Weekly
- Monthly
- Every quarterly

9. How do you evaluate your enterprises planning practice ?

- Not good
- good
- best

10. how do you describe your enterprises project progress monitoring and evaluation ?

- Not good
- good
- best

Appendix B. Interview Question

INTERVIEW QUESTIONS

This interview questions will be answered by purposively selected respondents

1. How are project schedules developed? What scheduling software, methods, techniques are used? Are these software, methods, and techniques effective? What other software, methods, and techniques be more effective for project planning in your organization?
2. What role does each of the project stakeholders on projects within your organization play in the project planning process?
3. Are organizational policies and procedures developed to support the project planning? Would the development of a project management manual increase the effectiveness of the project planning process in your organization?
4. How is project performance observed in your organization? What comparisons are made to standards? What corrective actions are taken?
5. Are project monitoring and evaluation performed in your organization? Who is responsible for project monitoring and evaluation? Are the monitoring and evaluation effective? Why or why not?

Appendix C. Defense Construction Enterprise Organizational Structure

