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**ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE**

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**ASSESSMENT OF CORE PROJECT CONSTRAINTS MANAGEMENT  
PRACTICE: IN THE CASE OF INFORMATION SYSTEM PROJECT  
IN ETHIO-TELECOM**

**BY**

**TIGIST NIGUSSIE**

**PROJECT WORK SUBMITTED TO ADDISABABA UNIVERSITY SCHOOL OF  
COMMERCE IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
AWARD OF MASTER OF ARTS DEGREE IN PROJECT MANAGEMENT**

**ADVISOR: MENGSTU BOGALE (PHD)**

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**ADDIS ABABA, ETHIOPIA**

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**Approved by Board Examiners:**

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## **DECLARATION**

I, Tigist Nigussie, hereby declare that the research project work entitled "Assessment of Core Project Constraints Management practice in the case of Information System project in Ethio-Telecom" is my own work. The information presented in this project work is true and original to the best of my knowledge and understanding except that such work has been cited and acknowledged. The work had not been submitted to any educational institutions for the requirement of any award.

**Declared by:** Tigist Nigussie

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **CERTIFICATION**

This is to certify that Tigist Nigussie has carried out this research work on the topic entitled "Assessment of Core Project Constraints management practice: in the case of IS project in Ethio-telecom ". The study is an original work and is suitable for the submission for the reward of MA Degree in Project Management.

**Advisor:**      Mengistu Bogale (PhD)

**Signature:**    -----

**Date :**        -----

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# Contents

DECLARATION.....	II
CERTIFICATION.....	III
ACKNOWLEDGEMENT.....	IV
CONTENTS.....	V
LIST OF TABLES.....	VII
ABBREVIATIONS.....	VIII
ABSTRACT.....	IX
CHAPTER ONE: INTRODUCTION.....	1
1.1 BACKGROUND OF THE STUDY.....	1
1.2 STATEMENT OF THE PROBLEM.....	2
1.3 RESEARCH QUESTIONS.....	3
1.3.1 Main research question.....	3
1.3.2 Specific research Questions.....	3
1.4 OBJECTIVES OF THE STUDY.....	3
1.4.1 GENERAL OBJECTIVE OF THE STUDY.....	3
1.4.2 SPECIFIC OBJECTIVES OF THE STUDY:.....	3
1.5 SIGNIFICANCE OF THE STUDY.....	4
1.6 SCOPE OF THE STUDY.....	4
1.7 LIMITATIONS OF THE STUDY.....	5
1.8 ORGANIZATION OF THE RESEARCH REPORT.....	5
CHAPTER TWO: LITERATURE REVIEW.....	6
2.1 INTRODUCTION.....	6
2.2 THEORETICAL OVERVIEW.....	6
2.2.1 Project.....	6
2.2.2 .Project management.....	7
2.2.3 Project Management Process Groups.....	8
2.2.4 Project Management Knowledge Areas.....	9
2.2.5 The core project constraints management.....	11
2.3 PROJECT SCOPE MANAGEMENT.....	13
2.4 PROJECT COST MANAGEMENT.....	16
2.5 PROJECT TIME MANAGEMENT.....	18
2.6 PROJECT RISK MANAGEMENT.....	21
2.7 EMPIRICAL LITRATURE REVIEWS.....	24

CHAPTER THREE: RESEARCH METHODOLOGY .....	26
3.1 INTRODUCTIONS .....	26
3.2 RESEARCH DESIGN .....	26
3.3 RESEARCH APPROACH .....	26
3.4 RESEARCH DATA COLLECTION TECHNIQUES .....	27
3.6 SAMPLE DESIGN .....	28
3.7 METHOD OF DATA ANALYSIS.....	28
3.8 RELIABILITY AND VALIDITY .....	29
3.9 ETHICAL ISSUES .....	29
CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION.....	30
4.1 INTRODUCTION.....	30
4.2 BACK GROUND OF THE COMPANY .....	30
4.3 RESPONSE RATE.....	31
4.4 RESPONDENTS' GENERAL INFORMATION .....	32
4.5 RESPONSE FOR GENERAL PROJECT MANAGEMENT PRACTICE .....	33
4.6 RESPONSE FOR PROJECT SCOPE MANAGEMENT .....	35
4.7 RESPONSE FOR PROJECT TIME MANAGEMENT PRACTICE .....	37
4.8 RESPONSE FOR PROJECT COST MANAGEMENT .....	39
4.9 RESPONSE FOR PROJECT RISK MANAGEMENT .....	41
CHAPTER FIVE: SUMMARY OF FINDING, CONCLUSION AND RECOMMENDATIONS.....	43
5.1 INTRODUCTION.....	43
5.2 SUMMARY OF FINDINGS.....	43
5.3 CONCLUSIONS .....	45
5.4 RECOMMENDATION .....	46

## **List of Tables**

TABLE 0-1: THE RESULT OF FREQUENCY ANALYSIS FOR RESPONDENTS .....	32
TABLE 0-2: RESPONDENT ANSWER FOR PM QUESTIONS .....	33
TABLE 0-3: RESPONDENTS ANSWER FOR PROJECT SCOPE MANAGEMENT QUESTIONS .....	35
TABLE 0-4: RESPONDENT ANSWER FOR PROJECT TIME MANAGEMENT QUESTIONS .....	37
TABLE 0-5: RESPONDENT ANSWER ON PROJECTS COST MANAGEMENT .....	39
TABLE 0-6: RESPONDENTS ANSWER ON PROJECTS RISK MANAGEMENT .....	41

## **ABBREVIATIONS**

**CCPM:**Core Constraints of Project Management

**IPMA:**International project management association

**IS:** Information system

**NGN:** Next Generation Network

**PMBOK:**Project Management Book of Knowledge

**PMI:** Project Management Institute

**PTM:** Project time management

**RMP:** Risk Management Plan

**TEP:** Telecom Expansion Project

## ABSTRACT

*In a country like Ethiopia, where information and communication systems are in the early stage of development, software projects may face several challenges. Scope, time, cost and risk are some of the factors that challenges project performance, and even causes failure. The study assessed the core project constraints management practice in IS projects of Ethio-telecom, the researcher has used descriptive research and quantitative method. The data collection tools were questionnaires with a total of 38 structured questions. The sample size of the study was 30 individuals who were selected through purposive sampling and 25 (83%) of the questioners were fully filled and analyzed. Based on the finding the project teams have the awareness on the need and benefit of project management, standard project management processes all used in managing the project. Concerning the managements support to develop PM in the project shows a bit weakly supported. Also the result shows the project team used the standard project management processes and methodologies in managing the project. With regard to project scope management the finding implies that relevant stakeholders were involved in scoping process, and the presence of formal process to prepare scope management plan are all practiced well. They were in poor practice of using standardized tool in the scope defining process, in preparing scope dictionary, and in scope monitoring and control process. Concerning project time management the project have approved time schedule. Even though there was worthless application of formal time management process, use of WBS in scheduling, identified activities sequenced in the schedule, estimated activity duration. Particularly the project found to be in poor practice on periodic update of project schedule. Relating to cost management the finding implies that IS project was performing well in preparing budget for the project as well to allocate the prepared budget to work packages and resources. whereas all the rest of processes under taken in project cost management are practiced poorly, particularly the use formal project cost management processes and procedures was in its lowest performance level than the rest of time management process. In relation to project risk management the it shows the project found in poor practice of project risk management.*

**Key words:** project, project management, core constraints, descriptive

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of The study

Projects have been used since earliest times, in producing important outcomes to society and culture like The Great Wall of China, Ancient Roman roads, the first steam engine and many others. A project is a new, unique and temporary set of activities, with a defined beginning and end, which uses resources in a planned and organized way with the purpose of reaching certain objectives. Project management was first recognized in the 1950s as a separate management method, different from other management methods employed in government or corporate business (Nielsen, 2006). Nowadays, project management has reached a global level, the methods of project management evolving in guidelines and international standards, generally accepted and employed. Project management is the application of knowledge, skill, tools and techniques to project activities which are accomplished through the application and integration of the project management process of initiating, planning, executing, monitoring and controlling, and closing (PMI, 2004). Project management processes and project management knowledge areas are increasing in importance as more and more projects are becoming constrained to budgets, schedules and other performance factors. Project management brings structured and consistent performance resulting successes which ultimately bring about satisfaction of stakeholders. (Maylor, 2009); In a country like Ethiopia, where information and communication systems are in the early stage of development, software projects may face several challenges. Risk is one of the factors that challenges project performance, and even causes failure. (Mnkandla, 2017.) Successful project management is primarily measured by the project manager's ability to meet the classic triple constraints; project scope, time, and cost goals? This research study examined these factors by eliciting data from practicing project managers, project coordinators and technicians working in Information System project of Ethio-telecom. It focuses on the project to realize if effective project management of the core project management area is given due attention in IS project. It also looked into possible ways of improving project management practice and forward recommendations as a means of improvement according to the research finding.

## 1.2 Statement of the Problem

The importance of project management is becoming obvious in modern organizations to succeed in today's competitive and dynamic business environment. Though it doesn't mean that the absence of project management necessarily cause a project to fail, but the effective use of the processes, tools and templates of project management increases the chance of success of a project. Therefore, organizations undertaking projects need to assess their project management practice Crisan (2010). During the course of a project, a project manager may have to schedule tasks, purchase products, address risks, replace project team members, re-schedule tasks, and accomplishes many other things necessary to ensure successful project completion. Keeping track of these tasks can be overwhelming, and knowing how to manage outcomes when different project processes overlap is crucial and Project management helps a project manager coordinate differing project activities. Even when properly performed, project management ensures smoothly running of those project processes. Managing information technology (IT) projects is oftentimes a daunting and difficult process, which seems to be the norm not the exception for the profession. This is evident by the fact that the vast majority of IT projects experience failures (Chua, 2009). The types of failures reported range from project cancelations to the more common type of classic triple constraint problems, namely exceeded cost budgets, changed scope or requirements, and slipped delivery schedules. (Schwalbe, 2010).

The focus of the researcher was to study whether the IS project was done based on the standard tools, process and procedures. Doing something in the right way may result in a project which was implemented on time, within cost and to some quality parameters requested, but which is not used by the customers, not liked by the sponsors and does not seem to provide either improved effectiveness or efficiency for the organization. Even though there is no compiled reports which shows the success rate of projects in Ethio-Telecom, there are problems related to keeping projects on schedule, within budget and at agreed quality to satisfy the ultimate users of telecommunication services. So, based on the four core project constraints (Scope, time, cost and risk) the researcher assessed the Project management practice of IS project in Ethio-Telecom.

### **1.3 Research Questions**

The research question addressed the practice of core project constraints management practice within Ethio-telecom specifically in IS project.

#### **1.3.1 Main research question**

- How was core project constraints management practiced in IS project of Ethio-telecom?

#### **1.3.2 Specific research Questions**

- How project scope management was practiced in IS project
- How project time management was practiced in IS project?
- How project cost management was practiced in IS project?
- How project risk management was practiced in IS project?

### **1.4 Objectives of the Study**

1.4.1 The general objective of this study was to find out how core project constraints management practiced in IS project of Ethio-telecom, examining by the use of procedures, tools and templates of the core Project constraints management Process.

1.4.2 The Specific Objectives of the study were to assess:

- The Project Scope management practice
- The project cost management practice
- The project time management practice
- The project risk management practices in Information System project.

### **1.5 Significance of the study**

1. The researcher has used the research project as an opportunity to see how the theoretical knowledge acquired during the duration of the course is being implemented in reality.
2. The paper could serve as good sources of information for the organization managers regarding the existing project management office problems and limitations to improve projects achievement, and to reduce the chances of its failure.
3. It can also be useful for further study to those who want to undertake more research in this area.
4. Academicians and researchers can use it as an input to carry out in-depth measurement of project management maturity of various organizations.

### **1.6 Scope of the study**

This study focused on assessing the core project constraints management practice of IS projects undertaken in Ethio-Telecom. With regard to the details of the assessment, it only focused on the core Project constraints Management which are scope, time, cost and risk with their processes, tools and templates. The methodology employed in this study was Descriptive design and quantitative method was used, Data collection instrument was questionnaire with 38 close ended self-administered questions and the sample size was 30 purposively selected from project managers, project coordinators and technicians of the IS project of the Ethio-telecom head office found in Addis Ababa around Lugar.

### **1.7 Limitations of the Study**

Because of the heavy time constraint under which this study was being carried out, the researcher was forced to do the assessment using only the core project constraints management practice and their process groups in one department among many projects in Ethio-Telecom. And forced to use administer questioner to collect the required information since further in-depth investigation could not be undertaken mainly due to the limitations of time. Also the study had some limitations that was not explored all the existing information. Since it was focused on assessing the core project constraints management practice of existing project, thus there were not sufficient back ground information about the subject matter that can highly support the study.

### **1.8 Organization of the Research Report**

This research report has five chapters containing introductory part with background of the study, statement of the problem, research objectives and questions, scope and limitations of the study are included in chapter one.

Chapter two: composed of the review of the relevant literature. Various books and journal articles were reviewed to base the study on existing literature, discuss relevant issues to build understanding of the subject matter.

Chapter three: contains details of the research methodology and the steps used to gather and analyze data from which findings are drawn.

Chapter four: contains the analysis of the data gathered by means of data collection methods and instruments indicated in the methodology part.

Chapter five: is the last chapter discussed about summary, conclusion and recommendation. The references used in the study are listed at the end. Interview guide and questionnaire used are also included in the Appendix part.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents various literature reviews on project management, and gives emphasis on the core project constraints management specifically **time, cost, scope and risk**. And the chapter builds from defining and explaining what project is, and brief explanation on project management, the project management processes groups, the knowledge areas in project management addressed all the ten and finally detail explanation on the core project constraints, the points which are the base for this study as well the researcher tried to review from different point of view each of the four points specifically in detail. And empirical view is the last part of the chapter.

### **2.2 Theoretical overview**

**2.2.1 Project:** project is a temporary endeavor undertaken to create a unique product, service, or result (PMI, 2013). A more elaborate definition stated by Wysocki (2014) Project is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification. Moreover, Kerzner (2009) wrote that a project can be considered to be 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 limits, consume human and non-human resources, are multifunctional. Project has also been defined as a unique set of co-ordinate activities, with definite starting and finishing points, undertaken by an individual or organization to meet specific performance objectives within defined schedule, cost and performance parameters' Maylor(2010).

According to PMI (2013), a project has a definite beginning and end. The project comes to an end at the end of the project's objectives have been met or prior to the scheduled duration project can be terminated because its objectives cannot be met, or when the need for the project no longer exists.

Wysocki (2014) also stated that Projects have a specified completion date. This date can be self-imposed by management or externally specified by a client or government agency. Being able to give a firm completion date requires that a start date also be known. Likewise, Maylor (2010) states that the task of the project is to deliver a particular product, service or result. Projects must have a single goal. However, very large or complex projects may be divided into several subprojects, each of which is a project in its own right Wysocki(2014). Nicholas and Steyn (2012) also stated that, a project involves a single, definable purpose and well-defined deliverable

### **2.2.2.Project management**

Many have attempted to define project management:Project management is defined as an application of knowledge,skills, tools and techniques to project activities to meet project requirements. This is accomplished through the application and integration of the project management processes of initiation, planning, executing, monitoring and controlling and closing (PMI,2004). According to (Oisen,1971) defines project management referencing views from the1950's,Project Management is the application of a collection of tools and techniques to direct the use of diverse resources toward the accomplishment of a unique, complex, one-time task within time, cost and quality constraints. Each task requires a particular mix of these tools and techniquesstructured to fit the task environment and life cycle from conception to completion of the task.According to Williams (2005), Project management started to develop as a discipline and then as a profession from 1950s on ward. Several national and international institute where formed and many of these started to document the best practice methods, and techniques required to manage projects. Two of the most widely known institutes are the project management institute (PMI) and the international project management association (IPMA).

The project management institute (PMI) developed and supported the project management body of knowledge while the other association ,the UK association of project management(APM,1995) defined a body of knowledge called the project management pathways which also provides a definition for project management as: The planning, organization, monitoring and control of all aspects of a project and the motivation of all involved to achieve the project objectives safely and within agreed time, cost and performance criteria.

Kerzner(2009) defined Project management as it is the planning, organizing, directing, and controlling of company resources for a relatively short-term objective that has been established to complete specific goals and objectives.

### **2.2.3 Project Management Process Groups**

There are five process groups in the life cycle of a project. PMI (2013) these processes ensure the effective flow of the project throughout its life cycle. The processes encompass the tools and techniques involved in applying the skills described in the project management knowledge areas.

- **The initiating process group:** This process group consists of those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase. Within the Initiating processes, the initial scope is defined and initial financial resources are committed (PMI, 2013). In this phase no actual project activity is not performed Wysocki, (2014).
- **The planning process group:** this process group consists of 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 (PMI, 2013). Definition of the work requirements, definition of the quantity of work, definition of the resources needed, scheduling the activities, evaluation of the various risks are activities included in this group .(Kerzner,2009)

- **The executing process group:** According to PMI, this consists of those processes performed to complete the work defined in the project management plan to satisfy the project specifications. This process group involves coordinating people and resources, managing stakeholder expectations, as well as integrating and performing the activities of the project in accordance with the project management plan (PMI, 2013).
- **The monitoring and controlling process group:** This process group consists of processes required to track, review, and orchestrate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes (PMI, 2013). Under this group, activities that relate to tracking progress, comparing actual outcome to predicted outcome, analyzing variances and impacts, and making adjustments are performed by the project team (Kerzner, 2009).
- **The closing process group:** consists of processes performed to conclude all activities across all project management process groups to formally complete the project, phase, or contractual obligations come under the closing process group. This process group, when completed, verifies that the defined processes are completed within all of the process groups to close the project or a project phase, as appropriate, and formally establishes that the project or project phase is complete (PMI, 2013).

#### 2.2.4 Project Management Knowledge Areas

Knowledge Area represents a complete set of concepts, terms, and activities that make up a professional field, project management field, or area of specialization and they are used on most projects most of the time (PMI, 2013). PMI(2004) lists the project management knowledge areas in to ten as described below:

1. **Project integration management:** Project Integration Management includes the activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups. It also describes the activities needed to integrate all the other KAs into a cohesive and unified plan that is supported by the project stakeholders.

2. **Project scope management:** is a description of the work required to be accomplished by the project team and focuses on the identification and documentation of client requirements? It includes the processes required to ensure that the project includes all the work required, to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project.
3. **Project time management:**describes the processes related to executing a timely completion of the project. Project Time Management includes both a planning component and a control component. The planning component provides time estimates for both the duration of a project task and the actual effort or labor time required to complete the task. The control component is part of the Monitoring and Controlling Process Group and involves comparing estimated times to actual times as well as managing the schedule and cost variances.
4. **Project cost management:** describes the processes related to estimating costs, budgeting, and project cost control. It includes the processes involved in **planning**, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget.
5. **Project quality management: describes** the processes required to assure that the project will satisfy the operational objectives for which it was formed. It includes the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken. Project Quality Management works to ensure that the project requirements, including product requirements, are met and validated.
6. **Project human resource management: describes** the processes involved in acquiring, developing, and managing the project team. The project team is comprised of the people with assigned roles and responsibilities for completing the project.
7. **Project communication management:**includes the processes that are required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and the ultimate disposition of project information. As effective communication creates a bridge between diverse stakeholders who may have different cultural and organizational backgrounds, different levels of expertise, and different perspectives and interests, which impact or have an influence upon the project execution or outcome.

8. **Project risk management:**describes the processes related to managing various risk aspects of the project. The objectives of project risk management are to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project. Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project. This part will be discussed in detail in the below sections.
9. **Project procurement management:** includes the processes necessary to purchase or acquire products, services, or results related to the project. It includes the contract management and change control processes required to develop and administer contracts or purchase orders issued by authorized project team members. It also includes controlling any contract issued by an outside organization (the buyer) that is acquiring deliverables from the project from the performing organization (the seller), and administering contractual obligations placed on the project team by the contract.
10. **Project stakeholder management:** describes the processes required to identify and manage the individuals, groups, or organizations that can impact and be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution. Stakeholder management also focuses on continuous communication with stakeholders to understand their needs and expectations, addressing issues as they occur, managing conflicting interests and fostering appropriate stakeholder engagement in project decisions and activities.

### **2.2.5 The core project constraintsmanagement**

David .H (2015) defined project constraints as: Constraints are realities that limit or restrict a project in one or more ways. Constraints differ from risks because their impact on a project is a certainty from the start. Risks can potentially occur. Constraints are realities that must be respected. The Triple Constraint of managing the interaction of time, cost and scope is a familiar model to most Program and Project Managers. (Bradbery,W2001).

For many years project managers have been encouraged to look to the Triple Constraints to provide a framework to plan, monitor and control a project but now a days there are different literatures on the number of project constraints .For instance;(Gareth .B) wrote his opinion on project constraints as, Delivering projects on time, within budget and per an agreed scope can be considered to be a “good result” by the project team. But effectively managing these constraints does not guarantee that the project is deemed a success by all of its stakeholders. Additional project constraints need to be taken into account to determine whether project success is achieved. Moreover he states project risk as constraints in addition to the triple project constraints.Likewise;(Langston, 2013) core project constraints distilled down to **cost, time, scope** and **risk**, which are suitable for objective measurement;as he clearly explained on his book rather than suggesting a triangular frame work, four constraints are best illustrated in the form of a tetrahedron where the base of the tetrahedron reflects the traditional iron triangle while the apex is risk and the six edges are occupied by the remaining project management knowledge areas.Moreover,Westerveld (2003)states that success criteria and success factors can be linked at the level of core project constraints. Relating to project failure Hill (2002) wrote in his book that one of the common causes of project failures is that the projectsponsor demands that the project manager must finish the job bya certain time, within budget, and at a given magnitude or scope, while achieving specific performance levels. In other words, thesponsor dictates all four of the project constraints

Research studies investigating the reasons why projectsfail, for example Morris and Hough (1993) andGallagher (1995), provide lists of factors believed to contribute to theproject management success or failure. At the sametime some criteria against which projects can bemeasured are available, for example cost, time and quality.Kerzner’s (2006) criteria for judging project success, includes considerations of time, budget, specification, customer satisfaction, and maintaining status quo within the organization. Moreover it is obvious that Projects are time dependent, so time management is part of project management.In addition to this Ford (2008) implies in his book best practices in project management bring the benefit of saving time and money in dealing with projects, goals that all project based organizations must strive toward, particularly in time of economic Downturn.

In considering time management, since all the projects are time reliant as well it is obvious that proper time management protects the project from unnecessary cost, this shows proper management of project time and cost is significant issue in effective project management

### **2.3 project scope management**

**Scope:** These are the functional elements that, when completed, make up the end deliverable for the project. The scope itself is generally identified up front so as to give the project the best chance of success. Note that the common success measure for the scope aspect of a project is its inherent quality upon delivery.

**Project Scope Management** is a description of the work required to be accomplished by the project team and focuses on the identification and documentation of client requirements. It includes the processes required to ensure that the project includes all the work required, to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project. (PMI, 2017) According to Mirza, Pourzolfagha and Shahnazari (2013) a major contribution to unsuccessful projects is the lack of understanding or defining project and product scope at the start of the project. A properly defined and managed scope leads to delivering a quality product, in agreed cost and within specified schedules to the stake-holders. Moreover, Collins and Baccarini (2004) considered a rigorous scope to be a factor which is necessary for meeting the owner's needs and thus achieving success.

Mirza, et.al (2013) said that, one of the major sub processes of the pre project planning process is the development of the scope definition package. Scope definition is the process by which projects are defined and prepared for execution. It is at this crucial stage where risks associated with the project are analyzed and the specific project execution approach is defined. Mirza et.al (2013) wrote on their article, most of the researchers considered cost, time, quality and stakeholders' satisfaction as the main factors which may affect project success. The eminent researchers considered that time were the most important factor. Cost was another success element of the rare project success criteria which were found to be a very important in overall project success. Success could be measured by determining was the project completed to specifications or whether the project demonstrated for the purpose only.

**ProductScope:** identifies the boundaries of the solution. The decision on the product scope is concerned with determining which of the business requirements (bearing in mind the constraints) could be carried out by the solution. As Ward (1995) stated that the scope of a project must be understood by all the participants, or stakeholders, who have to make decisions throughout the project. Agarwal and Rathod (2006) state that both the customer and development teams agree that delivering the required product is the most important goal. If this goal is not met, the project is a failure. If boundaries are not appointed, final project costs tend to be higher because of changes that interrupt project rhythm, cause rework, increase project time, and lower the productivity as well as the morale of the field work. (Mirza, et.al, 2013).

**Project Scope:** The PMI, (2000) defines product scope as the features and functions that are to be included in a product or service. Whereas, it defines project scope as the work that must be done to deliver a product with the specified features and functions. Tom Kendrick based his analysis on (PERIL) database, which serves as the basis for the analysis of high-tech project risk. The two broad categories of scope risk in PERIL related to changes and defects. By far the most damage was due to poorly managed scope change.

A **scope statement** is a document used to develop and confirm a common understanding of the project scope. Moreover Project scope management is handled throughout the project life cycle; from initiation to closure. However, the high level scope definition in the project charter at **initiation stage** reflects the intentions of the initiators of the project (ITPM, 2007).

It's good practice to develop a preliminary or initial scope statement during project initiation and a more detailed scope statement as the project progresses (ITPM, 2007)

- **The Project Scope Management process:** according to ( PMI,2017) there are six processes undertaken in project scope management processes as listed below:
  1. **Plan Scope Management process:** the process of creating a scope management plan that documents how the project and product scope will be defined, validated, and controlled. The key benefit of this process is that it provides guidance and direction on how scope will be managed throughout the project. This process is performed once or at predefined points in the project.

2. **Collect Requirements process** —this is the process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives. The key benefit of this process is that it provides the basis for defining the product scope and project scope. This process is performed once or at predefined points in the project.
3. **Define Scope process**—the process of developing a detailed description of the project and product. Since all the requirements identified in collect Requirements may not be included in the project, the Define Scope process selects the final project requirements from the requirements documentation developed during the Collect Requirements process. It then develops a detailed description of the project and product, service, or result.
4. **Create WBS:** the process of subdividing project deliverables and project work into smaller, more manageable components and the key benefit of this process is that it provides a framework of what has to be delivered. This process is performed once or at predefined points in the project. The planned work is contained within the lowest level of WBS components, which are called work packages. A work package can be used to group the activities where work is scheduled and estimated, monitored, and controlled.
5. **Validate Scope:** The process of formalizing acceptance of the completed project deliverables. Final product, service, or result acceptance by validating each deliverable. This process is performed periodically throughout the project as needed. The Validate Scope process differs from the Control Quality process primarily concerned with acceptance of the deliverables, while the latter is primarily concerned with correctness of the deliverables and meeting the quality requirements specified for the deliverables. Control Quality is generally performed before Validate Scope, although the two processes may be performed in parallel.
6. **Control Scope:** The process of monitoring the status of the project and product scope and managing changes to the scope baseline. The key benefit of this process is that the scope baseline is maintained throughout the project. This process is performed throughout the project; controlling the project scope ensures all requested changes and recommended corrective or preventive actions are processed through the Perform Integrated Change Control process. Control Scope is also used to manage the actual changes when they occur and is integrated with the other control processes. The uncontrolled expansion to product or project scope without adjustments to time, cost, and resources is referred to as scope creep.

## 2.4 Project Cost Management

**Cost:** is the estimation of the amount of money that will be required to complete the project. Cost itself encompasses various things, such as: resources, labor rates for contractors, risk estimates, bills of materials, and the like. All aspects of the project that have a monetary component are made part of the overall cost structure. Cost is one dimension of project plan. Project cost overruns have been reported as high as 56% (Standish Group, 2003). Many IT professionals believe that cost estimates for IT projects are based on unclear project requirements; consequently there will be cost overruns (McDougall, 2006). As with project time management, a strong relationship exists between project scope management

**Cost management:** is more than just calculating the cost of the overall project. It also consists of creating a budget (identifying the cost of individual elements of work) and the time-scaling of the overall project expenditure (Hill, 2002).

The task for the cost management function is to produce information for internal users who need accurate, detailed and frequent economic information for making decisions (Belkanoui, 1993). Specifically, cost management identifies, collects, measures, classifies, and reports information that is useful to managers for determining the costs of products, customers, and suppliers, and other relevant objects and for planning, controlling, making continuous improvements, and decision making (Hansen & Mowen, 2006).

Project cost management includes three major functions called cost **estimating**, **budgeting** and **cost control** (PMI, 2004). The goal of these functions is to ensure that the project is executed in a cost efficient, profitable manner, according to business principles and from the perspective of the entire company (Artto, 2011). Also, there's the overriding issue of direct vs. indirect costs.

- A **direct cost:** is an expenditure specifically and directly incurred by the execution of your project. According to Hill (2002), these are typically the most obvious categories of costs that include labor cost, material cost, supplies and equipment cost, facility cost, training cost, travel and Other Miscellaneous Costs.
- An **indirect cost** is a cost related to supporting the facilities, general services, and organizational environment within which the project team functions (Hill 2002). It may include fringe benefit costs, facilities costs, general and administrative

According to Kujala & Brady (2014) managing a project's costs starts early during the marketing and sales phase of the project when tentative cost estimates are created. During this phase, estimates are iteratively specified to provide accurate and reliable information to be used in tendering and pricing the delivery project. During the project specification phase, a tentative project budget is set, a specification-to-cost approach is exploited to ensure cost-effective specifications and, typically, the letters of intent with the main suppliers are signed. Before the implementation phase, the project budget is created based on the latest cost estimates. In the project planning phase, the resources for the work tasks are allocated, cash flows are planned and typically cost contingencies are set. During the planning and implementation phases, the actual costs of the project are monitored. In addition, cost estimates and forecasts are constantly updated and then compared with the project budget. In the implementation phase, the project revenues are monitored, invoicing is performed and cost contingencies are released. In some projects, funding is also ensured during the implementation phase. After system delivery, the operating costs of the delivered system are monitored in co-operation with the customer, warranty costs are monitored and a learning loop back to the earlier phases should be created

### **Cost management process**

According to PMBOOK guidelines (2013), **planning, estimating, budgeting, financing, managing and controlling costs**, and interaction of each other to complete within the approved budget, are the sub processes which involved in the project cost management process.

- **Resource Planning:** involves determining what resources (people, equipment, materials) and what quantities of each should be used to perform project activities. It must be closely coordinated with cost estimating (PMI, 1996)
- **Cost Estimating:** developing an approximation of the costs of the resources needed to complete project activities. Cost estimating includes identifying and considering various costing alternatives. According to PMI (1996) Cost estimating involves developing an assessment of the likely quantitative result 'how much will it cost the performing organization to provide the product or service involved'. Cost estimating includes identifying and considering various costing alternatives. According to Harry and Jones (2015), estimating cost is difficult and estimated costs are usually too low. Three different reasons are suggested: bad luck, over optimism, and deliberate underestimation (Jones, 2006).

- **Cost Budgeting:** allocating the overall cost estimate to individual work items in order to establish a cost baseline for measuring project performance (Buchner,2015) .And **Contingency** items are for unplanned but required changes it is not to cover things such as Price escalation and Scope & Quality Changes.
- **Cost Control:** Cost control is concerned with influencing the factors which create changes to the cost baseline to ensure that changes are beneficial, determining that the cost baseline has changed, and managing the actual changes when and as they occur (PMI 1996).Cost control includes searching out the “whys” of both positive and negative variances. It must be thoroughly integrated with the other control processes (scope change control, schedule control, quality control).

## **2.5 Project time management**

**Time:** refers to the actual time required to produce the end result of the project.The amount of time required to produce the deliverable will be directly related to the amount of requirements that are part of the end result along with the amount of resources allocated to the project.

In a study, approximately 50% of all IT projects exceeded their original delivery date by 82%. (The Standish Group,2003).This is a recurring theme with IT projects and the root cause is due to project requirements poorly or incorrectly prepared(Weiss,2008).. In essence, project scope was not fully known, understood, or documented prior to project execution. During project implementation changes to project scope make it very difficult to accurately meet the original baseline end target date, consequently the project delivery end date is not met, i.e. it is difficult to hit a moving target. Modeling and simulation software help to improve project scheduling but only if scope is clearly defined (Ourdev,2007). Therefore, a strong relationship exists between project scope management and project time management. Scope and time management are consequentially tightly coupled.

Project scheduling provides a detailed plan that represents how and when the project will deliver the products, services, and results defined in the project scope and serves as a tool for communication, managing stakeholders’ expectations, and as a basis for performance reporting.

There are many project time management techniques. The most elementary is perhaps the Work Breakdown Structure (WBS) where all of the work necessary for reaching the project targets is broken down into activity level. According to Nyqvist (2015) to estimate project duration, a **top-down or bottom-up** approach can be used. **Top-down** means estimating the durations in the project by experience and references from earlier projects. Milestones are often the starting points of the top-down scheduling. **Bottom-up** means estimating activity durations and then arranging these in an order that enables the project to meet their goals. Statistical scheduling approaches like Project Evaluation and Review Technique (PERT), developed in early 1960s by the US Navy, the PERT method makes use of probability techniques, it is possible to calculate the probability that an activity will be completed by a certain time, And the other method developed in similarly Critical Path Method (CPM) developed by Du Pont in early 1960s, unlike PERT this one does not use probability method but both are common in project management that also are using resource dependencies between activities (Kelley, 1961). According to Hamer & Heikkila (2002) the definition of project success often includes completing the project on time. The importance of ensuring work proceeds efficiently within individual tasks, along with the interfacing of related tasks, is a key message in project time management. The ultimate measure being project success, based on effective control of time management processes, tools and practices. The development and management of realistic project schedule and project plan is a primary responsibility of the project manager to complete the project on time.

**The Processes involved in project time management include:** (PMI, 2013)

**Plan schedule management:** is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule. The key benefit of this process is that it provides guidance on how the project schedule will be managed throughout the project. This process is performed once or at predefined points in the project. The main input used here are the project management plan, project charter, enterprise environmental factor, and the organizational process assets (Kezner, 2009).

**Define activities:** this PTM process is to identify project work packages and decompose into schedule activities to provide a basis for estimating, scheduling, executing, and monitoring and controlling the project work to consider corporate environmental factors and organizational process assets, as well as the project deliverables, constraints, and assumptions documented in the project scope statement. Carcano, Suarez, and Ibarra, 2015).

The above process uses decomposition to take the work packages identified in the WBS and to identify the activities required in order to complete them and is essentially the bridge between the planning involved in scope management and the planning involved in schedule management. Kezrner (2009) identifies the main inputs used in defining activities are scope baseline consisting of the approved project scope statement, the WBS, and the WBS dictionary. **Sequence activities:** is the process of identifying and documenting relationships among the project activities. The key benefit of this process is that it defines the logical sequence of work to obtain the greatest efficiency given all project constraints. This process is performed throughout the project. Every activity except the first and last should be connected to at least one predecessor and at least one successor activity with an appropriate logical relationship. Logical relationships should be designed to create a realistic project schedule. It may be necessary to use lead or lag time between activities to support a realistic and achievable project schedule. The Sequence Activities process concentrates on converting the project activities from a list to a diagram to act as a first step to publish the schedule baseline.

**Estimate activity durations:** the next PTM process which consider historical information maintained as part of organizational process assets, as well as the constraints and assumptions from the project scope statement which used to consider the estimated activity resource requirements and resource calendars since resources assigned to the schedule activity and the availability of such resources will significantly influence the duration of most activities. To estimate activity durations through techniques such as expert judgment, analogous estimating, parametric estimating, three-point estimates, or reserve analysis. To update the activity attributes to include the durations for each schedule activity, the assumptions made in developing the activity duration estimates, and any contingency reserves.

**Develop Schedule:**is the process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create a schedule model for project execution and monitoring and controlling. The key benefit of this process is that it generates a schedule model with planned dates for completing project activities .Developing an acceptable project schedule is an iterative process. The schedule is used to determine the planned start and finish dates for project activities and milestones based on the best available information. Schedule development can require the review and revision of duration estimates, resource estimates, and schedule reserves to establish an approved project schedule that can serve as a baseline to track progress.

**Control schedule:**in this PTM process implement the schedule change control system that defines the procedures by which the project schedule can be changed. It includes the paperwork, tracking systems, and approval levels necessary for authorizing changes.To measure the progress of schedule activities in order to obtain the data required for determining the project schedule performance and to report the progress and current schedule status, including information such as actual start and finish dates, remaining durations for unfinished schedule activities, and the percent complete of in-progress schedule activities.To update the project schedule for determining if the schedule baseline has changed; this includes developing new project schedule network diagrams to display approved remaining durations and modifications to the work plan.

## **2.6 Project risk management**

Risk is the probability of deviation of an out come from expectation. Risk exists on all projects. The type and amount of risk varies by industry type, complexity, and phase of the project. Whittaker (1999) defines project risk management, the systematic process of identifying, analyzing, and responding to risks as project-related events or conditions which are not definitely known and which have the potential of adverse consequences on a project objective.The objectives of project risk management are to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project. Several articles (PMI, 2008, Keelling, 2006) have presented risk management as a series of interconnected processes involving specific techniques and tools.

**Risk identification** is the identification of major elements of a project and their associated risks.

**Risk analysis** is the classification of those elements to different levels of risk. **Risk control** is the

determination of controls that can mitigate the risk, It involves deciding under what circumstances to take action to prevent or mitigate the impact of a risk. **Risk reporting** is the act of informing team members and senior management of those risks. (Kleimand andLudin, 1998).

According to DOD US (2006) risk is understood as a measure of future uncertainties about what can affect the objectives of the program within the restrictions established by cost, timeframe and performance. According to several authors Modarres (2006; PMI, 2008; Keelling (2006), the term risk means not just the occurrence of an undesirable event, but also how probable it is and what its consequences would be.To perform risk management, It needs information, time, expertise, and perspective. The information is necessary to understand the major processes and components, the accompanying threats, and the controls that should be in place. It will take time to collect the information and assemble it in some meaningful form. And need to use the expertise in project management to apply risk management while maintaining a broad perspective to avoid focusing on just one area.Hillson (2001), Ward and Chapman (2003) explain thatanother aspect of the risk concept is its dual characteristic from the negative perspective (as a threat), but also from the point of view of positivity (as an opportunity)

According to Hillson, (2001), Ward and Chapman, (2003). For them, risks are related to uncertain events that can affect project objectives negatively or positively. For each risk perspective different administrative strategies are demanded.

Risk could be categorized as, either acceptable or unacceptable. An acceptable risk is one that negatively affects a task on the noncritical path. An unacceptable risk is one that negatively affects the critical path. And, Risks are either short or long term. A short-term risk has an immediate impact, such as changing the requirements for a deliverable. A long-term risk has an impact sometime in the distant future, such as releasing a product without adequate testing. Also, Risks are viewed as either manageableor unmanageable. A manageable risk is one you can live with, such as a minor requirement change. An unmanageable risk is impossible to accommodate, such as a huge turnover of core team members.

Likewise, risks are either internal or external. An internal risk is peculiar to a project, such as the inability to get the parts of a product to work. An external risk originates from outside the scope of the project, such as when senior management arbitrarily cuts funding by 20 percent (Kleimand and Ludin, 1998).

The PMI (2013) proposed six risk management processes, which are listed below:

- Plan risk management
- Identify risks
- Perform qualitative risk analysis
- Perform quantitative risk analysis
- Plan risk response
- Control risks

According to Demidenko and Sidorenko(2017), principles of risk management should be an integral part of organizational processes and decision making. Picking up on that important point, risk management should be seen as a management tool designed to improve planning, budgeting, performance management and other core business processes. Risk management also helpsmanagement to make more informed business decisions about achieving strategic or operational goals and sometimes may even highlight the need to change the strategy altogether due to an unacceptable level of risk.

Effective risk management increases management confidence in achieving objectives, reduces uncertainty and helps make informed, risk-based decisions (Demidenko and Sidorenko, (2017). And risk management can be integrated into Strategic planning, budgeting, performance management and Decision making.

There are four risk response strategies:

- **Risk acceptance:** do nothing to prevent or mitigate the impact of a risk.
- **Risk adaptation:** take measures that will mitigate the impact of risk.
- **Risk avoidance:** take action that will keep a risk from seriously impacting the project.
- **Risk transfer:** lets someone else assume the risk.

## 2.7 Empirical Literature Reviews

- Some empirical studies have been reviewed regarding to core project constraints management for instance: A Study done in Jomo Kenyatta University of Science and Technology, Nairobi, Kenya in 2015. The study sought to assess the triple constraints in projects taking the perspectives of the project managers. Through a survey of 26 project managers registered by The Kenya Association of Project Managers and Project Management Institute, Kenya Chapter, the study found that constraints are experienced in projects carried out in Nairobi with project scope and project cost each being the most experienced by 20% of the respondents. The study concludes that project scope and project cost are the most common triple constraint elements faced in project management in Nairobi.
- A case study undertaken by Mirzaei and Mabin (2015) Victoria University of Wellington, School of Management, Exploring project constraints in case of construction projects. This case study provides evidence consistent with some of the basic assumptions of CCPM. Some of these assumptions are: considering uncertainty as the core cause for projects' undesirable effects, overestimation of task time in the form of buffers, and wastage of such safety time. Nevertheless, the case indicated that the absence of centralized priorities for the project was a challenge in adopting CCPM. Particularly elimination of deterministic start dates would negatively impact contractor's throughput rate. This is because contractors are involved in multiple projects and their throughput would increase only by increasing working days of their crew. Therefore, they would not risk having their crew waiting. It is argued here, in the context of this project, that CCPM has identified the core problem. However, implementation of the CCPM solution requires unity of purpose across project actors, in order to be able to prioritize several contractors across several projects. If unity of purpose could be achieved, then this would facilitate CCPM application and bring mutual benefits to all parties involved.

- A Survey was conducted of 45 banks, insurance companies and United Nations agency offices in Addis Ababa, Ethiopia. In the study, a very low rate of application of formal risk management models was observed. The study observed a different perception of risk management whereby only watching projects to see if any risks occur during implementation without performing risk identification and mitigation or response plan was considered as a risk management practice by project managers. It was also found that some project managers were not able to confidently tell whether risk management processes have taken place in the projects they manage.(EJISDC ,2017)

## CHAPTER THREE: RESEARCH METHODOLOGY

### 3.1 Introductions

This section describes the research methodology that is used to answer the research questions and to achieve the research objectives. It starts by introducing the research design, what research approach was used, why this research approach was used, research strategy, and the research data collection technique and sampling all be discussed in this chapter.

### 3.2 Research Design

The research design helps the researcher to describe or explain or predict the phenomenon under investigation. The type of the research design to be selected by the researcher depends on his/her intention in a way to address the phenomena. (Saunders, et al., 2009) In order to find sufficient and relevant information about the topic and to identify any causal links between the factors or variables that pertain to the research problem, the researcher in this study uses a descriptive type of study. The researcher also used primary data to get the necessary information.

### 3.3 Research approach

According to Creswell (2009), there are three types of research approach: the first one is **qualitative** research involves emerging questions and procedures, data typically collected in the participant's setting and its purpose is describing and understanding the phenomena. The second one is **quantitative** research; it is a means for testing objective theories by examining the relationship among variables (Creswell 2009). This approach has two strategies of inquiry. The first is survey design and the second type is experimental design. And the analysis is made based on, beginning with certain theory or hypotheses and drawing logical conclusions from it. The last one is mixed method research; it is an approach that combines both qualitative and quantitative forms (Creswell 2009). According to Creswell (2003), **mixed methods** research provides strengths that offset the weaknesses of both quantitative and qualitative research. In this research paper the researcher used **quantitative** approach.

### **3.4 Research Data Collection Techniques**

Different methods of primary data collection might be applied, Asking questions is an obvious method of collecting both quantitative and qualitative information from people. Questionnaires are a particularly suitable tool for gaining quantitative data but can also be used for qualitative data. Using a questionnaire enables you to organize the questions and receive replies without actually having to talk to every respondent. As a method of data collection, the questionnaire is a very flexible tool that has the advantages of having a structured format, is easy and convenient for respondents, and is cheap and quick to administer to a large number of cases covering large geographical areas. However, they do require a lot of time and skill to design and develop. They need to be short and simple to follow, so complex question structures are not possible. Not everyone is able to complete questionnaires (Walliman, 2010). primary data sources are used to collect data for this research, The study used self-administered questionnaires to gather data which is used as primary data sources (Creswell 2009). For primary data collection, Data that has been observed, experienced or recorded close to the event are the nearest one can get to the truth, and are called primary data (Walliman, 2010). Questionnaire was taken as a preferable data-gathering tool for this research since it is one of the most important tools to guide the respondent since it gives clear choices to check. Close ended types of questionnaires were designed. The researcher was prepared this questionnaire in English language and has been distributed to 30 respondents, 25 were completed and turned back for and the questionnaires distributed after pilot study were gathered and used in the analysis.

### **3.6 Sample design**

When deciding a sample, the question inevitably arises: how representative is the sample of the whole population, in other words, how similar are characteristics of the small group of cases that are chosen for the study to those all of the cases in the whole group? Population in research is a collective term used to describe the total quantity of things or cases of the type which are the subject of the study. So a population can consist of certain types of objects, organizations, people or even events. Within this population, there will probably be only certain groups that will be of interest to the study. This selected category is the sampling frame. It is from this sampling frame that the sample is selected (Walliman, 2010). So, the sampling frame is project managers, project coordinators and technicians working in IS project the researcher used purposive sampling from the sampling frame. The use of purposive sampling was prepared because it allows gathering and analyzing quality data from willing, capable and knowledgeable informants. Purposive sampling is thus said to be more efficient in producing the required information than random sampling (Bhattacharyya 2006). Study of research management practice requires gathering data from organizations that are known to have software systems. It is also believed that the result will be as useful and indicative of the situation in Ethiopia if organizations that invest the most resource on information systems are targeted. Thus, purposive sampling, which falls under non-probability sampling, was employed in this study to conduct the research on a selected project.

### **3.7 Method of data analysis**

The data analysis of the paper devotes to analyze and interpret the collected data. For the data analysis, quantitative methods were applied. The analysis was performed with SPSS ver.20. Data which gathered through the use of questionnaire were carefully coded and checked for consistency and entered into the SPSS spreadsheet. Mostly the quantitative data served for producing descriptive statistics and descriptive statistics was employed to analyze.

### 3.8 Reliability and validity

According to Kothari (2004), validity refers to the extent to which a test measure what we actually wish to measure. Reliability has to do with the accuracy and perception of a measurement procedure. Therefore, to ensure the content validity of the data the study used reliable resources as mentioned under data sources. To obtain acceptable response in assessing the practice of project management specifically the core project constraints, structured questioner was prepared which best address the required assessment. The researcher also did Cronbach's alpha test to check reliability, of the questionnaire. The alpha coefficient for the items is 0.829 it is generally considered acceptable, suggesting that the items have relatively high internal consistency. Pilot test was done to check the tendency of the instrument obtains the same result if the measurement was repeated by using the same subject under the same conditions.

The researcher also believes that this study is reliable since the respondents were selected purposively and their answers were expected to be credible. Furthermore, ambiguous terms were not used in questioners to avoid confusion. The under drawn table shows the alpha coefficient value for each of the variables.

Process name	Scope	Cost	Time	Risk	Over all
Alpha test value	0.849	0.807	0.831	0.831	0.829

### 3.9 Ethical Issues

Ethics are standards of behavior that guide the moral choices about our behavior and our relationship with others. All parties in research should observe ethical behavior. Due consideration was given to obtain consent from each participant about their participation in the study. It was strictly conducted on voluntary basis. The researcher tried to respect participants' right and privacy. The findings of the research were presented without any deviation from the outcome of the research. In addition, the researcher gave full acknowledgements to all the reference materials used in the study.

## **CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION**

### **4.1 Introduction**

This paper was done to assess how core project constraints management was practiced in projects under Ethio-telecom specifically in information system (IS) division. It focused on projects to realize if effective project management of the core project constraint was given due attention. It also looked into possible ways of improving project management practice and forward recommendations as a means of improvement according to the research finding. The chapter begins with the background of the company then the researcher analyzed and interpreted results of the questioners that had been done for this research and followed by a discussion of the research findings in a systematic manner as the next step of the research process. The research results were presented analysis of quantitative data that was recorded by the questionnaire and each of them organized based on the research objectives.

### **4.2 Back Ground of the company**

Ethio-Telecom is a sole telecom operator owned by the Ethiopian government and maintains a monopoly over all telecommunication services; it has its own stated vision, mission, and different strategies to achieve its goal in Ethiopia, And it is one of the "Big-5" group of state owned corporations in Ethiopia, along with Ethiopian Airlines, the Commercial Bank of Ethiopia, Ethio-Insurance, and the Ethiopian Shipping Lines. It was established as a public enterprise on 29th day of November 2010 as per the Council of Ministers Regulation No. 197/2010. Hence, it undertook different scaled projects to improve its quality and reach ability for every customer throughout the country. Most of the projects are performed by international vendors that have met the minimum required qualification to deploy projects.

Recently, two mega projects were undertaken in the last decade that were used to introduce new telecom technologies and expand the network coverage in the country. The first one known as (Next Generation Network (NGN) project that cost around 1.5 billion USD was carried by Chinese international telecom construction vender known as ZTE for three years since 2007.the vender's site states that ZTE Corp of Shenzhen exclusively built a nationwide telecoms network in Ethiopia. This project enabled Ethiopia to get new services and opportunity was great for Ethiopians to develop quality of experience in service usage. Not only this but also second large project known as Telecom expansion project (TEP) was undertaken by three different international vendors Huawei, ZTE and Ericsson to swap existing infrastructures and expand the capacity and coverage of the network. The implementation of this project was expected to attract and improve the satisfaction of customers, introduce latest telecom technologies and build reliable network so that domestic and international investors would run their business within the country as telecom improves and paves the success of investments.

This paper was done to assess how core project constraintsmanagement is practiced in projects under Ethio-Telecom specifically in information system (IS) division. It focuses on projects to realize if effective project management of the core project constraint management area is given due attention. It also looked into possible ways of improving project management practice and forward recommendations as a means of improvement according to the research finding.

### **4.3 Response Rate**

The questionnaire was distributed purposively to project managers, project coordinators and technicians. The questionnaire was physically distributed to 30 respondents, out of 30 questioner25 were completed and collected with a response rate of 83 %. The data was analyzed by utilizing Statistical Package for the Social Sciences (SPSS) version 20 for factual examination. The collected data was analyzed, interpreted and presented in the below tables. The measurement was reliable with the average alpha coefficient of 0.829.

#### 4.4 Respondents' general information

For the general questions regarding gender, age, level of education, work experience and years they have participated in the projects, the responses of the respondents and the implication are presented here under.

**Table 0-1: The result of frequency analysis for respondents**

Character	Response	Frequency	Percentage
<b>Gender</b>	Male	19	76%
	Female	6	24%
	Total	25	100 %
<b>Age</b>	20-29 years	2	8%
	30-39 years	13	52 %
	40-49 years	8	32 %
	50-59 years	2	8 %
	Total	25	100 %
<b>Position</b>	Project Manager	11	44 %
	Coordinator	6	24 %
	Technicians	8	32 %
	Total	25	100 %
<b>Level of Education</b>	Degree	11	44 %
	Masters	14	56%
	Total	25	100 %
Experience in project	Below 1 year	2	8 %
	1-3 years	5	20%
	Above 3 years	18	72 %
	<b>Total</b>	<b>25</b>	<b>100 %</b>

(Source: Own Survey, 2018)

The above table reveals that the demographic profile of the respondents in terms of Gender, Age and Educational level. 76% (19) of the respondents were male and 24% (6) female with total of 25 respondents whose age was between 20 and 59 years of age; among which 2 (8%) of the respondents age was between 20 and 29 years old, 13 (52%) between 30 and 39 years and 8 (32%) between 40 and 49 years of age and 2 (8%) of the rest are between 50-59 years of age.

Concerning the educational level, 11 respondents (44 %) were BA degrees holders with 14(56%)of the respondents(56% ) having MA Regarding the work experience of respondents, most of them (48 % ) have 6-10 years of overall work experience; three respondents (12 %) have 2-5 years of work experience, whereas six of them (24 %) had 11-15 years of work experience the rest four of the respondents do have more than 15 years of organizational work experience . Majority of the respondents (72 %) have above three years of work experience in projects . 20 % of the respondents have 1-3 year experience working in project environment and 8 % have less than 1 year of experience in projects. As shown on the table most of the respondents have more than 3 years of work experience on project work.

#### 4.5 Response for general Project Management Practice

**Table 0-2: Respondent answer for PM questions**

Project management Practice-General		Strongly disagree		Disagree		Uncertain		Agree		Strongly agree	
		freq	%	freq	%	freq	%	freq	%	freq	%
<b>1</b>	The need and benefit of Project Management recognized by the project management.	0	0	5	20%	4	16%	12	48 %	4	16 %
<b>2</b>	The management of the project provide support for Project Management development.	4	16 %	7	28 %	4	16 %	10	40 %	0	0
<b>3</b>	The project have standard Project Management processes and methodologies.	<b>0</b>	<b>0</b>	6	24%	5	24 %	12	48 %	2	8%
<b>4</b>	Project Management processes, methodologies and procedures applied formally in managing project.	1	4%	5	20 %	6	24 %	9	36 %	4	16 %

(Source: Own Survey, 2018)

As the table shows majority of the respondents (64%) replied that the project management was recognized and practiced in the project; 20% of the respondents disagreed and the rest 16 % were uncertain. Concerning the managements support for project management development 44% of the respondents replied that the management of the project didn't support, the rest 40 % of the respondents agreed on the management of the project provided support for Project Management development. When it comes to standard project management processes and methodologies considerable number (24%) of the respondents replied that the project had no standard for PM processes and methodologies and majority of the respondents (48%) replied there were standards for PM processes and methodologies in their project. Similarly, 16% of the respondents strongly agreed, moreover 36 % of the respondents agreed that Project Management processes, methodologies and procedures are formally applied in managing projects whereas 24 % replied the application was informal.

Based on the above result the researcher might conclude that ,for the project management of the IS project it doesn't need much effort to apply the processes ,tools and techniques in managing the project because most of the project teams had the awareness .In spite of having the standard project management process and methodology the formal application of those processes and methodologies in the project was not in intended result .Moreover, considering the management support for the development of project management in the IS project even if, as the management of the project put an effort on the project managers and project team to develop their experience through training means a lot for the project as explained on the literature review,in case of this project it was found to be not good enough.

#### 4.6 Response for project scope management

**Table 0-3: Respondents answer for project scope management questions**

Project scope management.		Strongly disagree		Disagree		Uncertain		Agree		Strongly agree	
		freq	%	freq	%	freq	%	freq	%	freq	%
1	Project teams are aware of project scope management.	1	4%	7	28%	4	16%	11	44%	2	8%
2	There is a formal process to prepare a scope management plan.	0	0	6	24%	8	32%	9	36%	2	8%
3	Stakeholders are involved in scoping process.	0	0	7	28%	4	16%	14	56%	0	0
4	There are standardized tools to define scope process	3	12%	15	60%	3	12%	4	16%	0	0
5	work breakdown structure is used in defining scope		0	12	48%	4	16%	7	28%	2	8%
6	WBS Dictionary is prepared	2	8%	17	68%	2	8%	3	12%	1	4%
7	Scope is monitored and controlled properly.	3	12%	6	24%	7	28%	8	32%	1	4%

(Source: Own Survey, 2018)

The table indicates that Concerning project teams' awareness of project scope management the responses obtained from the respondents shows 52% which shows most of them replied that there was awareness about the need or importance of project scope management and 32 % of the respondent replied that they disagreed on the team members' awareness on project scope management, the rest 16 % were not sure about the issue. According to 44% of the respondents there was effort of managing project scope. The other 24% of the respondents replied that the effort of managing scope was not formal the rest 32% replied that they were not sure whether a formal process or not to prepare the scope management plan.

For the question of stakeholders involvement in scoping process 56% of the respondents replied that stakeholders were involved in scoping process,60% of the respondents gave their perception that there was no application of standardized tools to define scoping process only 16% of the respondents replied that standardized tools are there to define scope. Most of the respondents replied that the use of WBS in defining scope was not applicable in the project, the other 36% of them replied WBS was prepared for defining scope. Whereas only 16% of the respondents replied WBS dictionary was prepared for the project whereas 76 % of the respondents replied WBS dictionary was not prepared for the projects. For the question of proper scope monitor and control 36% of the respondent replied that there was an effort to control and monitor scope properly and the other 36% replied that there was no proper cope monitor and control process.

Depending on the above result found the researcher might conclude that even if there was the awareness on scope management among the project teams and stakeholder involvement in scoping process practiced well, there was inadequate application of formal process in preparing scope management plan in addition to this the project management scanty used the application of standardized tools in the process of defining the scope .It is obvious that potential problems can get a chance to happen , risk factors might be the consequence,hard to provide sound estimates and Project deliverables were poorly defined if the scope of the project was not well defined ,considering the IS project using WBS in defining the scope and preparing WBS dictionary both practiced in lowest level even the scope monitoring and controlling process was not well practiced.

#### 4.7 Response for Project Time Management practice

Table 0-4: Respondent answer for project time management questions

Project Time Management		Strongly disagree		Disagree		Uncertain		Agree		Strongly Agree	
		Freq	%	freq	%	freq	%	freq	%	freq	%
<b>1</b>	The project team is aware of project time management.	1	4%	4	16%	3	12%	15	60%	2	8%
<b>2</b>	The project team makes an effort to manage time.	1	4%	5	20%	6	24%	11	44%	2	8%
<b>3</b>	There is formal time management process.	0	0	14	56%	6	24%	4	16%	1	4%
<b>4</b>	The project has approved time schedule	2	8%	2	8%	3	12%	15	60%	3	12%
<b>5</b>	Work Breakdown Structure is used when defining the scheduled activities.	0	0	9	36%	5	20%	9	36%	2	8%
<b>6</b>	Activities identified and sequenced in the schedule.	1	4%	13	52%	6	24%	4	16%	1	4%
<b>7</b>	Formally estimated activity duration is prepared.	1	4%	13	52%	3	12%	6	24%	2	8%
<b>8</b>	project activities' progresses are monitored and controlled continuously	5	20%	10	40%	4	16%	5	20%	1	4%
<b>9</b>	The project schedule is updated periodically.	5	20%	13	52%	4	16%	3	12%	0	0

Source: own survey, 2018

Concerning project time management, Projects are time dependent, so time management is part of project management.(Ford,2008).There are processes to follow in order to manage timeproperly, Plan Schedule Management, Define Activities, Sequence Activities, Estimate Activity Resources, Estimate Activity, Develop Schedule and Control Schedule are all included. (PMI, 2013).Based on the above processes the researcher tried to assess their trained of time management practice in the project where they work for. Most of the respondents (68%) replied that there was awareness of project time management among the project team and 8 % of them stronglyagreed and 16 % of which replied disagreed on the teams'awareness on project time management, which shows majority of the respondents agree on the presence of the awareness on project time management among the project team.

Concerning the teams effort of project time management most of the respondents (52 %) Agreed that the team members were applying effort on projects time management , from which considerable number of respondents replied their disagreement on the presence of teams effort on PTM (8 % of them strongly agreed and 24 % of the respondents disagreed on teams effort on project time management even 4% of them strongly disagree) . concerning formal time management Most of the respondents (56%) replied that there was no formal time management process in their project which 24 % of the respondents are not sure about the formal time management in the project but 20 % of the respondents replied that there was a formal time management process in the project even 4% of them agree strongly on the application of formal time management. Relating the project schedule plan majority (63 % )of the respondents replied that the project have schedules (plans) with approved start and finish dates and the rest 12% were not sure whether the project have approved time schedule or not .10 % of the respondents replied that the project did have formal time scheduled . For the question on the use of WBS in defining scheduled activities some of the respondents (36%) agreed and some of the respondents (36% ) were not agreed on the use of WBS in defining the scheduled activities,20 % of the respondents were not sure whether it used or not. Most of the respondents (56 %) replied that it was not practical in their project to identify the relationships among activities and the activities sequenced in the schedule during project time management from which 4 % of them even disagreedstrongly, but 20 % of the respondents replied that activities were identified and sequenced in the schedule during time management processes. Activity duration estimate was also prepared according to 32 % of the respondents, most of the respondents 56 % replied that there was no formally estimated activity duration in the projects time management process. According to 24 % of the respondents monitoring and controlling of project schedule was performed continuously and 60 % which is more than half of the respondents replied that there is no continuous monitoring and controlling practice in their project. Finally, concerning the periodic update of project schedule more than half of the respondents (72%) replied that no triad of updating project schedule periodically only 12 % of them replied that there is the practice of periodic update of the projects schedule.

According to the above finding the researcher might conclude that the IS project teams were aware of project time management in their project, they put effort on project time management even if it is that much satisfactory and there is approved schedule prepared, Even though the project time management in IS project found to be poorly managed all the rest of time management processes.

#### 4.8 Response for project Cost Management

Table 0-5: Respondent answer on projects Cost management

Project cost management		Strongly disagree		Disagree		Uncertain		Agree		Strongly Agree	
		freq	%	freq	%	freq	%	freq	%	freq	%
1	Project teams are aware of project cost management.	4	16%	9	36%	6	24%	6	24%	0	0
2	Project teams make efforts to manage cost.	4	16%	10	40%	6	24%	4	16%	1	4%
3	Is the effort of cost management formal?	0	0	10	40%	13	52%	2	8%	0	0
4	Cost estimate is prepared properly.	0	0	8	32%	6	24%	11	44%	0	0
5	budget is prepared for the project	0	0	3	12%	1	4%	15	60%	6	24%
6	The budget is allocated to work packages and resources.	1	4%	8	32%	3	12%	11	44%	2	8%
7	The budget reviewed periodically	4	16%	10	40%	6	24%	4	16%	1	4%
8	project cost is monitored and controlled properly	2	8%	10	40%	9	36%	4	16%	0	0

(Source: Own Survey, 2018)

Project cost management part of project management which involves the processes of Plan Cost Management, Estimate Costs, Determine Budget and Control Costs according to PMI (2013). Keeping these processes as a base the researcher assessed about the awareness of project team on project cost management their practice on project time management and did present the findings as; only 24% of the respondents replied that the project teams were aware of project cost management the other 52% of the respondents replied that the project teams were not aware of project cost management. And concerning to the project team effort towards project cost management only 20% of the respondents agreed the other 56% of the respondents replied that the project teams apply no effort in order to manage cost. 52% of the respondents were uncertain about the application of formal cost management process, the rest 40% of them knew that there was no formal cost management procedure. According to the 44% of sample respondents cost estimate in their project prepared properly and the other 32% of the respondents replied that there was no proper cost estimate process in their project. About budget preparation for the project most of the respondents (60%) agree that budget was prepared for the project, 12% of the respondents replied that there was no proper budget preparation for projects. Relating to the budget allocation 52% of the sample respondents replied that budget was allocated to work packages and resources and 36% of the respondents replied that it was not practical in their project that allocating budget to work packages and resources. About periodic review of budget only 20% of the respondents replied it was practical to review the budget periodically the other 56% (more than half) disagreed on the practice of periodic budget review in their project. Concerning monitor and control of project cost only 16% of the respondents agreed that there was a proper project cost monitor and control process applicable in their project, the other 48% replied that there was no proper monitor and control process to manage projects cost. Based on the above information the researcher concluded that in spite of having prepared budget for the project the processes go through in order to manage project cost are all managed weakly and ineffectively.

#### 4.9 Response for project Risk Management

Table 0-6: Respondents answer on projects risk management

Project risk management		Strongly disagree		Disagree		Uncertain		Agree		Strongly agree	
		freq	%	freq	%	freq	%	freq	%	freq	%
1	Project teams are aware of project risk management	0	0	8	32%	4	16%	9	36%	4	16%
2	There is formal risk management plan.	2	8%	8	32%	10	40%	4	16%	1	4%
3	There is formal risk assessment procedures	2	8%	14	52%	4	16%	4	16%	1	4%
4	Risks are identified systematically	1	4%	10	40%	9	36%	4	16%	1	4%
5	There is strategic risk response.	1	4%	12	48%	2	8%	8	32%	2	8%
6	Risk management process is updated continuously	3	12%	16	64%	3	12%	2	8%	1	4%
7	There is formal risk monitor and control process.	0	0	15	60%	4	16%	5	20%	1	4%

(Source: Own Survey, 2018)

The project risk management practice of the IS project in Ethio-Telecom according to the respondents reply analyzed and presented as follows .Based on 52 % of the respondents reply the project teams were aware of project risk management and 32% of the respondents replied that the project teams were not aware of the project risk management in their project .Concerning the projects plan for formal risk management most of the respondents ( 40%)replied as they were not sure whether there is formal risk management plan in the project or not, only 20% of the respondents replied that there was formal project risk management plan in the project .

About the risk assessment procedures 52% of the respondents replied that there was no formal risk assessment procedure in the project. , only 20% of the respondents replied that there was formal risk assessment applied in the project. In addition 44% of the respondents replied as it was not practical to identify risks systematically in their project, only 20 % of the respondents ensured the practice of systematic identification of risks were applied in the project .

Relating to strategic risk response 52% of the respondents replied that it was not practical in their project and 40% of the respondents agreed that there was strategic risk response in their project. For the question on continuous update of the risk management process 76% of the respondents replied that it was not practiced in their project only 12% of the respondents replied the practice of updating the risk management process continuously and the 12% were not sure. Relating to risk monitoring and evaluation 60% of the respondents replied as there was no formal monitoring and controlling process in their project and 33% of the respondents replied that there was formal risk monitoring and controlling process in their project.

Based on the above finding the researcher might conclude that the project teams more than having the awareness on project risk management there was no strongly followed formal project risk management process, In IS project of Ethio-Telecom project risk management was practiced ineffectively.

## **CHAPTER FIVE: SUMMARY OF FINDING, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter presents the summaries of the findings from the analyzed data, conclusions derived from the analysis and the recommendations that are suggested to Ethio-Telecom to enhance the management of core project management constraints for more successful completion of projects and to fill the gap and increase business benefits by avoiding cost overrun, poorquality, uncontrolled expansion of the project and by reducing threats and increasing opportunities.

### **5.2 Summary of findings**

The findings from chapter four analyses are established and outlined as follows:

- ❖ Based on the finding on the analysis of general project management practice of ISproject the analysis revealed that the project teams have the awareness on the need and benefit of project management, whereas concerning the managements support to develop PM in the project shows a bit weakly supported by the management of the project. Relating to the existence and formal application of project management standards, process and procedures,the result shows the project used the standard project management processes and methodologies in managing the project.
- ❖ With regard to project scope management, The finding implies that there were awareness on scope management and relevant stakeholders were involved in scoping process, and the presence of formal process to prepare scope management plan are all practiced well in IS project. There was in poor practice of using standardized tool in the project scope defining process and even it was found in poor practice in prepared scope dictionary in addition the result shows there was poor effort on scope monitoring and control process.

- ❖ The findings of the analysis for the project time management practice revealed that there is awareness and effort on project time management processes in IS project of Ethio telecom and also the project have approved time schedule. Even though there was worthless application of formal time management process, moreover, use of WBS in scheduling, identified activities sequenced in the schedule, estimated activity duration are all not well applied in the projects time management process. Particularly among the processes of project time management IS project time management found to be in poor practice on periodic update of project schedule.
- ❖ According to the research finding on project cost management it implies that the project management of IS project was performing well in preparing budget for the project as well to allocate the prepared budget to work packages and resources. whereas all the rest of processes under taken in project cost management are all practiced poorly ,particularly the use formal project cost management processes and procedures in IS project was in its lowest performance level than the rest of time management process.
- ❖ Analysis of response in relation to project risk management the finding shows that the project team has awareness of project risk management, but the project found in poor practice of preparing formal risk management plan, preparing formal risk assessment procedures and also in poor practice of systematic assessment of risk in the project. Concerning risk response again the project was not in a satisfactorily developed practice. Even if the process of project risk management must be updated continuously throughout the project life cycle, IS project was found ineffectively practiced the process.

### 5.3 Conclusions

This study assessed the practice of core project management constraints management based on the gathered data through questionnaires and from the quantitative data analysis done in the previous chapter, the following conclusions are drawn from the result.

- ❖ As shown in the previous chapter, results analysis and discussion, it might be concluded that the project teams were fairly aware of the need and benefit of the core project management constraints even if the finding shows lower awareness on project cost management.
- ❖ In project management practice of IS project in Ethio telecom, the process in managing all the four constraints which need to follow formal procedure and processes were not well practiced especially project cost management practice was poorly managed relatively with time, scope and risk.
- ❖ The processes which undergo in the project time management, project cost management, project risk management were in poor practice of process periodic update.
- ❖ Moreover the project scope management, project time management, project cost management, project risk management processes all need a continuous monitoring and controlling even though there were poor effort in monitoring and controlling process.

## 5.4 Recommendation

The following recommendations may help in improving the performance and success rate of IS project in Ethio -Telecom which are basically from the research finding and almost all of them recommended at the Company level; specifically the information system project management:

- The main recommendation that can be driven to the project management of IS project of Ethio-Telecom from this research is to give more emphasis to use formal procedures and standards in implementing all the project management processes groups in order to apply effective project management and improve the projects outcome.
- Based on the reality that WBS is the process of subdividing project work into smaller or to activity level more manageable components and the benefit of this process is that it provides a framework of what has to be delivered. A work package can be used to group the activities where work is scheduled and estimated, monitored, and controlled. So using WBS in scoping process, cost estimation, scheduling and even used to develop proactive schedule for risk management that is why it is highly recommended to prepare WBS early in the planning phase of the project. So it is highly recommended to develop and use WBS accordingly.
- It is highly recommended that involving the project teams in the planning process since this processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve. And also because they are the one who stay with the work in order to successfully complete the project.
- Due to the fact that Continuous monitoring gives the project management team insight into the health of the project and identifies any areas that may require special attention and Control includes determining corrective or preventive actions or replanning and following up on action plans to determine whether the actions taken resolved the performance issue, it is highly recommended that management of the project should practice continuous monitoring and controlling process so as to achieve the best outcome.

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## APPENDEX: QUESTIONNAIRE



### ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICS SCHOOL OF COMMERCE MASTERS OF ART IN PROJECT MANAGEMENT

#### QUESTIONNAIRE

**Dear Participants,**

My name is TigistNigussie, I am a graduate student at Addis Ababa University School of Commerce and currently I am conducting a research for the completion of my masters in project management. This research work is a study to the practice of project Integration management in the case of Ethio-Telecom IS project.

I kindly request you to participate in this research study by completing the attached questionnaire. In order to ensure that all information will remain confidential please do not include your name anywhere in the questionnaire. I also sincerely request you to respond to the questions as honestly as possible and return the completed questionnaires. Knowing that your time is valuable please, take few minutes of your time to complete the questionnaire.

In case of any question please contact me via “**tigistnigussie2020@gmail.com** or “**0911391242**”

Thank you in advance for your committed cooperation!

Tigist Nigussie (The student researcher)

**General Instruction and information:**

- + Section I includes demographic of general information.
- + SectionII includes close-ended questions
- + Please attempt to answer all the questions.

**Section I: General Information**

1. Gender: male  female
2. Age (in year) :20-29  30-39  40 -49  50-59  Above 60
3. Level of education: Diploma  Degree  Postgraduate   
Others, please specify: \_\_\_\_\_
4. Years of work experience: Below 2  2-5  6-10  11-15  Above 15
5. For how many years have you worked on the project?  
below 1  1 -3  above 3

**Section II: close-ended questions**

Please encircle the number that best describes your perception

**Strongly Disagree = 1, Disagree = 2, Uncertain = 3, Agree = 4 and Strongly Agree = 5.**

**Project management practice: General**

S.N	General Project management practice	1	2	3	4	5
1	The need and benefit of Project Management recognized by the project management.	1	2	3	4	5
2	The management of the project provide support for Project Management development.	1	2	3	4	5
3	The project have standard Project Management processes and methodologies.	1	2	3	4	5
4	Project Management processes, methodologies and procedures applied formally in managing project.	1	2	3	4	5

### **Project Time Management**

<b>S.N</b>	<b>Project Time Management practices</b>					
8	The project team is aware of project time management.	1	2	3	4	5
9	The project team makes an effort to manage time.	1	2	3	4	5
10	There is formal time management process.	1	2	3	4	5
11	The project has approved time schedule.	1	2	3	4	5
12	Work Breakdown Structure is used when defining the scheduled activities.	1	2	3	4	5
13	Activities identified and sequenced in the schedule.	1	2	3	4	5
14	Formally estimated activity duration is prepared.	1	2	3	4	5
15	project activities' progresses are monitored and controlled continuously	1	2	3	4	5
16	The project schedule is updated periodically.	1	2	3	4	5

### **Project Cost Management**

<b>S.N</b>	<b>Project Cost Management practices</b>					
17	Project teams are aware of project cost management.	1	2	3	4	5
18	Project teams make efforts to manage cost.	1	2	3	4	5
19	Is the effort of cost management formal?	1	2	3	4	5
20	Cost estimate is prepared properly.	1	2	3	4	5
21	Budget is prepared for the project.	1	2	3	4	5
22	The budget is allocated to work packages and resources.	1	2	3	4	5
23	The budget reviewed periodically.	1	2	3	4	5
24	Project cost is monitored and controlled the properly?	1	2	3	4	5

### **Project Scope Management**

S.N	Project Scope Management					
25	Project teams are aware of project scope management.	1	2	3	4	5
26	There is a formal process to prepare a scope management plan.	1	2	3	4	5
27	Stakeholders are involved in scoping process.	1	2	3	4	5
28	There are standardized tools to define scope process.	1	2	3	4	5
29	Work breakdown structure is used in defining scope.	1	2	3	4	5
30	WBS Dictionary is prepared.	1	2	3	4	5
31	Scope is monitored and controlled properly.	1	2	3	4	5

### **Project Risk Management**

S.N	Project Risk Management					
32	Project teams are aware of project risk management.	1	2	3	4	5
33	There is formal risk management plan.	1	2	3	4	5
34	There is formal risk assessment procedures.	1	2	3	4	5
35	Risks are identified systematically.	1	2	3	4	5
36	There is strategic risk response.	1	2	3	4	5
37	Risk management process is updated continuously.	1	2	3	4	5
38	There is formal risk monitor and control process.	1	2	3	4	5

**The END.**