ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

GRADUATE STUDIES PROGRAM

Project Scope Management Practices of Addis Ababa City Road projects: Managerial Perspective

The Case of Addis Ababa City Roads Authority Road Projects

By

Brook Hailemariam

OCTOBER, 2020

ADDIS ABABA, ETHIOPIA

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Project Scope Management Practices of Addis Ababa City Road projects: Managerial Perspective

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A Project Work Presented For The Partial Fulfillment of the Requirements for the Degree of Masters of Project Management

By

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OCTOBER, 2020

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DECLARATION

I, hereby declare that the research entitled "Project scope management practices of Addis Ababa City road projects: Managerial Perspective (The Case of Addis Ababa City Roads Authority road projects)" is my original work and is my own effort and study. It is done by me independently except for the guidance and suggestion of my research advisor. It is presented, in partial fulfillment of the requirements for the degree of MA in Project Management.

Declared by:

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Signature_____

Date_____

Confirmed by Advisor

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ADDIS ABABA UNIVERSITY

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Department of Business Administration and Information System

[Project Management MA Program]

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Approved by Board of Examiners

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External Examiner		

Acknowledgement

First of all, my gratitude goes to the Almighty God, the father of light whose light has guided my steps thus far, and the mother of Jesus Virgin Mary, my helper in all situations.My sincere thanks and appreciation also go to my mother for all sacrifices which she has paid in bringing me up from my child hood alone without any helper. I want to express my gratitude to my advisor, Dr. AdaneAtara, for his support and supervision. My sincere thanks and gratitude also goes to my estimable boss Dr.Derib Ado, project coordinator of Linguistics Capacity Building project: Tools for inclusive Development of Ethiopia, for his limitless brotherly support all the way throughout my time of education. I would also like to express my deepest gratitude to Tadese Woldegebriel who help me in preparing this project work. I would also like to express my deepest gratitude to employee of Addis Ababa City Roads Authority, particularly officers of Road construction Contract Administration Directorate and Road construction and maintenance Design Revision and Implementation Follow Up Directorate for filling the questionnaire with patience and by scarifying their invaluable time. Lastly, but not least, thanks goes to all staffs of Addis Ababa University in general and particularly to academic and administrative staffs of my department.

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Acronomys

AACRA	Addis Ababa City Roads Authority
PM	Project management
PMI	Project management institute
PMBOK	Project Management Body of Knowledge
TOR	Term of reference of the projects
SPSS	Statistical Packages for Social Sciences
UCBP	University Capacity Building Program
WBS	Work breakdown stricture

Abstract

Usage of general project management procedures, functions, tools & techniques in construction projects is unsatisfactory in Ethiopia. Due to this there is a high rate of project failure starting from the planning stage where objectives, scope, and course of action required to attain the objectives are defined. Accordingly, this study mainly assess the status of scope management practices of Addis Ababa city road Authority. To get information for the study10 projects were selected purposively from a total of 53 currently running projects of the Authority.The study used mixed research approach to gather data and describe the status of the scope management practiced in the projects.The target population of the study were: Engineers of the different consultant firms participating in both the preliminary and detailed design.and engineers of AACRA's two different directorates. Since the size of the respondents in the selected projects is small and manageable, censes method is used. This study used both primary and secondary sources of data. The collected data through questionnaires were analyzed using statistical packages for social sciences (SPSS). Opinions of the respondents when summarised showed that of the total respondents: about 82% of the respondents acknowledge the soundness of practice of planning the management of scope of the projects, only 22% of the respondents shows a response of an agreement in the trust worthiness of practices of the requirement management planning, 65% of the the respondents shows either disagreement or strong disagreement in the reliability of stakeholders' requirement management practices of the road construction projects, 86% of the respondents' responses show either agreement or a strong agreement in the dependability of practices of the scope definition process, 89% of the respondents' responses show either agreement or a strong agreement response that the practices of Work Break Down Structure creation process used in the projects is at good status, 82% of respondents' responses show either agreement or a strong agreement response the practices of scope validation process of the project scope management process 76% of respondents' responses show either agreement or a strong agreement response practices of control scope process used in the projects is at good status.

Key words:Project, Scope, Scope management, Practices

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the study

The construction industry is an industry where large scale projects are undertaken**.** It delivers important ingredients for the development of an economy (Leibing 2001).

It has been developing tremendously since 2001 in Ethiopia. Starting from then onwards the country has been implementing a significant number of construction programs/projects, which include the University Capacity Building Program (UCBP), the housing developroject managmentent program and the road sector programs among others (Ayalew, Dakhli, and Lafhaj, 2016)**.**

The are four main cathegories under the constraction industry. These are residential building category, institutional and commercial building category, specialized industrial construction category, infrastructure and heavy construction category. Types of constructions included in the Residential Building category are condos, townhomes, apartments, nursing homes, etc. The types of construction contained in the Institutional and Commercial Building category are construction projects such as, sports fields, shopping centers, stadiums, hospitals, schools. industrial construction like oil refineries, nuclear power plants and hydroelectric power plants are constituted in the Specialized Industrial Construction cathegory.Infrastructure and Heavy Construction category includes infrastructure and heavy construction projects like construction and advancement of roads, railways, dams etc..

Road construction projects are Infrastructure and Heavy Construction project types through which development strategies are achieved. Successful road projects support developroject managmentent strategies of a country by improving easy accessibility of rural areas, lowering costs associated with transport and opening more areas of developroject managmentent. In the country there are many road construction projects at different levels of completion:completed

mega road projects, projects under construction and projects planned to be constructed. Various efforts have been made in Ethiopia to improve the project implementation trend of the country's road construction projects which will help the achivement of the projects' objectives (Weldegebriel, 2018). Usage of project management practices procedurally helps to achieve the objectives of large scale construction projects (Svejvig, Geraldi, and Grex, 2019).

Gwaya, Masu, and Wanyona (2014) defined project managment practices as a specialized management technique which is used for planning, organizing and controlling of projects under one strong point of responsibility.

Project Managment Institute (2017) on the other hand described project managment as a technique followed to achive requirements of the project by the usage of knowledge, skills, tools, and techniques to the activities of the project.

Similarly, Kissi and Ansah(2013) defined professional project managment practices as the skills and science of planning, designing, and managing activities throughout the project life cycle.

Project managment is very important for an efficient implementation of a project by minimizing risks of cost overruns, schedule slippages, not meeting the desired quality requirments of a project. By properly managing the arising risks, it assists in increasing the probability of successfull implementation of a project. It also provides proactive guidance, control and coordination during projects implementation (PMBOK, 2017).

Lack of sound project managment practices by owners or contractors on projects leads to construction delays and spending of additional costs by both the contractor and owner of of a project (Othman, 2015). In agreement with the above author, Alias, Ahmad and Idris (2012) argued that if management of a progect is not properly practiced it may deliver a different result.

According to the Project Management Institute's Guide to the Project Management Body of Knowledge(PMBOK) (2017), journey of projects from initiation to completion and sign off are managed in five process groups: initiating, planning, executing, controlling, and closing process groups.

Initiating process group of project managment is a formal commitment to start a project. At this phase the problem to be solved by the project is identified and also a project manager is appointed for the project. The apointed project manager identifies the real objectives of the project, identifies the potential stakeholders of the project, and works with the stakeholders aiming at the achievement of objective/s of the project. This phase is completed when management gives approval to move to the planning phase (Biafore, 2011).

Planning process group of project managment is concerned with designing of the specifics of how the problem identified at the initiating phase of the project is going to be solved. In this phase are identified: all the work that must be done, the individual/s responsible to do it, the starting date of the project, the period of the project execution, and total cost of the project. The risks that could arise during the project execution and the corosponding method to be followed to mitigate themare also identified at this phase. Properplanning of projects at their initiation makes the execution phase of the projects simple. Spending more time early in theplanning phase of a project is recomendedthan spendingmore time and resource for correcting errors arising from poor planning during execution of the project.(PMBOK 2017).

Executing process group of project managment covers ongoing work done during the implementation of the project by the project manager and his/her team. In this phase of project managment launching of the project is done primarly then the rules governing the project team are clarified. After that, the project team keeps focused on doing the right things at the right time—as outlined in the project plan (Biafore, 2011).

Controlling process group of project managment is an ongoing activity which focuses on monitoring and measuring performance of the project to see whether the project is going in confirmation with its plan. The project manager determines the correction required to get the project back on track, as changes, issues, shocks, and occasional disasters happen. (Biafore, 2011).

During the final process group of project managment, completion phase, the final deliverables of the project are released to the customer, project documentation are handed over to the business,

supplier contracts are terminated, project resources are released, and the closure of the project is communicated to all stakeholders. At this phase also lessons-learned studies are also conducted to examine what went well and what didn't. Through such analysis, the knowledge of experience is transferred back to the project organization, which will help future project team in forthcoming pfojects (Watt, 2012).

As explained in the Project Management Body of Knowledge Guide(PMBOK)(2017) the project management processes stated in the above five project management process groups are further grouped into ten separate Knowledge Areas. A Knowledge Area is a complete set of concepts, terms, and activities that make up a professional field, project management field, or area of specialization. These ten Knowledge Areas are used on most projects.These ten Knowledge Areas are utilized by team members of projects as appropriate, for their specific project. The Knowledge Areas are: Project Integration Management, Project Scope Management, Project Time Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management and Project Stakeholder Management, project schedule managment (PMBOK 2017).

Project Scope management knowledge area is an important step in the planning process group of project managment. If there is any gap in determining the scope of the project in the first stages of a project's life cycle, it will be hard for a project team to execute the project and met the desired objective of the project (Fageha & Aibinu, 2013).

Unsatsfactorly defined scope at the start of the project will be a reason for a failure in managing the scope of a project which will result in scope creep. A scope creep is the uncontrolled and unexpected changes in a project which will result in time and cost overrun in the project. And perhaps these overruns may cause the projects to be terminated (Shirazi et al., 2017).

The knowledge area of Scope Management is primarily concerned with planning what must be and must not be included. In doing this it pass through six important steps:plan the scope management process, the collect requirements process, the define scope process, the create work

breakdown structure (WBS) process, the validate scope process and the control the scope process**(**Al-Rubaiei, Nifa, Musa, 2016).

Planning the scope managment is the first step in the process of project scope managment. The scope management plan is generated in this phase.The scope management plandocuments, defines and describes the intended project scope as well as specifying how the scope will be validating and control (Monnappa, 2017).

After the project scope management plan is completed, requirements of the project are identified. Requirements identification is the process of determining, documenting, and managing stakeholder needs and requirements to meet the objectives of the project. The key benefit of this process is that it provides the basis for defining the scope of a project in an inclusive way (PMBOK, 2017)**.** Based on the collected and documented requirements the scope of the project is defined. A comprehensive full description of the project and its key required deliverables are the main purpose of this phase by indicating what can and cannot be achieved and accomplished in the project (Monnappa, 2017).

The defined scope of the project is broken down into its constituent elements resulting in an important tool in project scope management, the work breakdown structure (WBS). It is a hierarchical breakdown of the project into deliverables which will help in the accomplishment of the project objective.It helps for a more precise management of a project (Khan, 2006).

The completed project deliverables must get formal acceptance of the project stakeholders. The key benefit of this process is that it brings objectivity to the acceptance process and increases the probability of final product, service, or result acceptance by validating each deliverable. This process is performed periodically throughout the project as needed (PMBOK, 2017).

After doing all the above it is important to check whether the deliverables produced during the execution phase of the project are in line with those that are intended at the planning stage. This is done by performing the control scope phase of the scope management. Scope controling is 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 (PMBOK, 2017).

Since project scope management significantly affects the success of a project, it is one of the most important functions that needs to be accomplished with a great care by the project manager. Failure or uncertainty in project scope management process is directly reflected in the cost, time and quality of the project. The magnitude of the impact can vary from one project to another, however, it could be very significant in mega projects (Al-Rubaiei, Nifa, Musa, 2016).

Despite the existence of many mega infrastructure projects constructed in the past, under construction and planned to be constructed in Ethiopia, they all share a very common problem, failure to meet the initial scheduled and estimated budget. This problem affects almost all infrastructure construction projects in the country. (Almohammad and Jamaludin, 2018).

Regardless of the project failures in Ethiopia and the importance of the scope management for project success little has been done in the area.

This study will be a contribution to the identification of the scoping problems of the Ethiopian road construction projects.

The purpose of this study, therefore, is to assess the scope management practices of road construction projects in Addis Ababa, taking Addis Ababa city Roads Authority road projects as cases of the study.

1.2. Profile of Addis Ababa City Roads Authority

The country's modern road construction is highly interlinked during the regime of Emperor Haile Sellase. During this ruling period of Haile Sellasea number of contractors were organised to carry out constructionof roads.The first one that was established by the government during this ruling period to construct roads was the the public works department. It was established to construct roads in Addis Ababa and its surroundings. After a few years, this department was organized at a moreorganizedhigher level and Addis Ababa city got the chance to establish its road development organizational structure.

When it was decided for Addis Ababa to have a mayor in 1942 G.C., the city roads construction and maintenance was organised under the municipality. To accomplish the construction of roads in Addis Ababa the "Road and Building works" department was established. In this period long roads like MeskelAdebabay- Bole, Torhailoch-Megenagn, MeskelAdebabay- Shiromeda were constructed.

This department stayed until the replacement of the Haile Sellase regime by the Derge regime performing its duties. But no fundamental organizational change of the department was observed and there were no newly built roads by it in the Derge regime, rather it focused on maintaining and improving existing roads.

In 1993 G.C the then government,Ethiopian Peoples' Revolutionary Democratic Front (EPRDF),has established regional government and gave them the power to administer their regions with autonomy. During this time Addis Abba was also established as one of the regions during the period. The Addis Ababa administration during this period established the "Bureau of Works and Urban Development".The bureau organized a department under it to carry out the road construction and maintenance works. The newly established road department constructed and maintained the city's roads till the establishment of the Addis Ababa City Roads Authority on March 15, 1998 G.C by the regulation no. 7/1998.The Addis Ababa City Roads Authority is administered bya board of directors to construct, maintain and administer the road constructions in Addis Ababa city (AACRA, 2011).

As stated in a term of reference(TOR) prepared for a bid by the Authority, Addis Ababa City Roads Authority (AACRA) has been given the mandate for the restoration, expansion and maintenance of Addis Ababa City road network. Its goal is to improve transport operating efficiency and reduce road transport costs, provide access to urban, newly developed areas, and develop the institutional capacity of the sector. AACRA is responsible to the public for ensuring that all road projects are designed and constructed to a high quality that provides the best value for money.

According to the authority's contract administration office, there are 53 projects which are constructed under the authority of Addis Ababa Road Construction Authority. These projects are categorized into three main categories by the Authority for administration purpose: projects constructed by the Authority's construction force, projects constructed by external constructors under the supervision of the Authority and road projects constructed in conjunction with the construction of condominium house projects. Of these 53, projects the focus of the study is on the 19 projects which are constructed by external constructors under the supervision of the Authority. All these road projects are currently being constructed in different places of Addis Ababa.

Information about the selected projects like name of the projects, length and width of the projects, the name of the consultant are shown below:

1.3. Statement of the Problem

Lack of Professional PM Practices particularly in developing countries results in low productivity and poor quality of work. Regardless of the growth of the discipline of professional PM, the application of effective PM techniques is still a serious problem **(**Kissi and Ansah, 2013).

Kissi and Ansah (2013) defined professional PM practices as the skills and science of planning, designing, and managing activities throughout the project lifecycle. PM practices are applicable to many projects running in different sectors of the Economy of a country.Wakjira (2011)states that the construction sector is one of the most important sectors with projects of different types which contributes to the political, economic, social and technological development of Ethiopia. Othman (2015) states that lack of sound PM leads to inefficiencies like construction delays and extra costs.

The sector is under tremendous development since 2001 GC/EC in Ethiopia. A study by Zewdu & Aregaw (2015) indicated that the GDP contribution of the sector has been raised to 5.6% and approaches to the sub-saharan counties' average GDP contribution of the sector (6%).

Despite this prominent share of the construction industry in the Ethiopian economy, like in other developing countries, it faces many challenges in its practice which may bring about project failure. To state some of these challenges are: project time overruns, project cost overruns, poor quality of project deliverables, and a failure to cope with project requirements and the inability to adopt best practices (Zewdu & Aregaw 2015), (Abraham, 2008).

A significant delay of infrastructure and construction projects is one significant problem of Ethiopian construction projects which harms planned economic development (ECIDP, 2014; Li-Yin *et al*, 2006). The study conducted by Kassa (2018) Shows that 88% of the Ethiopian road projects suffered time overruns.

The study of Singh (2009) shows that the problem of project cost overrun is also another major problem of the construction industry of developing countries like Ethiopia. The study conducted by Wakjira (2011) shows that 80% of the Ethiopian road construction projects were experiencing cost overrun.

There are many factors for project time overrun and cost overrun among these factors project scope management process is one. Zewdu and Aregaw (2015) argued that a failure or uncertainty in the project scope management process is directly reflected in the cost, time and quality of the project. The magnitude of the impact can vary from one project to another, however, it's could be very significant in mega projects.

In addition to the above stated situation, it has been seen that many newly built roads are with several problems. Among these problems are: ring roads do not have enough pedestrians crossing bridges at an appropriate intervals, newly built roads are also seen being incapable of accommodating the traffic flow which put the dwellers of the city into a hard situation.

It is believed by many that all these problems are the results of poor planning and management of the road projects and will be resolved by performing the planning and executionphase of the road projects particularly the scope planning and managment stage of the projects rigorously.

Therefore, it is very important to assess the project scope planning and management practices of the road construction projects to identify their strengths and weakness in meeting the objectives for which they are planed to acomplish.

This study assess the project scope management practices of Addis Ababa City road construction projects. It takes Addis Ababa Roads Authority road projects being constructed by external constructors as cases of the study.

Generally, the purpose of this study is to assess the strengths and the weakness of project scope management practices of road construction projects in Addis Ababa.

1.4. Research Questions

1) What management practices are experienced by Addis Ababa city road projects for the project scope management planing phase of the scope management process?
2) What management practices are experienced by Addis Ababa city road projects for the requirements collection phase of the scope management process?
3) What management practices are experienced by Addis Ababa city road projects for the scope definition phase, of the scope management process?
4) What management practices are experienced by Addis Ababa city road projects for the WBS Creation phase, of the scope management process?

1.5. General Objective of the Study

The main objective of this study is to assess the scope management practices of Addis Ababa city roads Authority newly built road projects.

1.6. Specific Objectives of the Study

Specifically, the objectives of this study are:

1) To assess the scope planning practices of Addis Ababa city road projects.
2) To assess the requirement collection practices of Addis Ababa city road projects.
3) To assess the scope definition practices of Addis Ababa city road projects.
4) To assess the WBS Creation practices of Addis Ababa city road projects.

1.7. Significance of the Study

The current study is therefore expected to provide valuable information about the status of the project scope management practices of Addis Ababa city road Authority new road projects constructed by employedexternal contractors. This will also assist the stakeholders involved in road construction projects in the city to have notions of the weakness and strengths of the project scope management practice activity of road projects.

The findings of this study as wellmay provideresearches working in the area to get an overview of the situation in the area.

1.8. Scope of the Study

Currently various road projects are undertaken by Addis Ababa Roads Authority(AACRA).For management purpose these projectsare grouped by AACRA under three different categories as: new road projects constructed by employed external constrictors, Self-administered constriction and maintenance of road projects performed by the authority's work force, and road construction projects of condominium housing projects.The current study is delimited to the scope management practices of new road projects constracted by employed external constructors which are under construction since 2006 G.C and not completed.

1.9. Limitation of the Study

Among some of the standards and guidelines that are better known and mostly used, this study uses the standards of *Guide to the Project Management Body of Knowledge(PMBOK)* issued by the Project Management Institute (PMI). The study only focused on the managerial aspects of scope management of the projects. Moreover, only the activity of the customer and the consultantare taken into consideration, excluding the activities of the contractor since the contribution of the contractor is not as much significant as that of the customer and the consultant in project scope planning and management. This study also focuss on the outputs of the scope management practice. Also this study is limited to the scope management process that are parts of the planning process group.

1.10. Organization of the Study

This research is organized into five chapters and references. Chapter one deals with the introduction, which discuss about general ideas and relevance of the study. It defines the background, the problem statement, the objectives, the scope as well as the organization of the research. Chapter two coversthe literature review, and quotes the various related works done in this area of study. Chapter three attempts to describe in detail the methodology of the project followed in this research study. Chapter fourcontains data presentation and analysis of the information gathered through questionnaire, interview. Chapter five presents conclusions and recommendations of the research.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Theoretical Review

2.1.1. Introduction

2.1.1.1 Projects

A project is a short term work commenced to create a unique result, product, or service. Even if it is a temporary endeavor, the duration of the project may be short or an extended one. Achievement of the project's objective/s is one reason for project termination. A project will be terminated when objectives of the project cannot be achived. It will also be terminated when the need for the project no longer exists. Termination of a project is done after an approval and authorization by an appropriate authority (PMI, 2017).

2.1.1.2. Attributes of a Project

According to Project Management Institute (2017), a project is a work done to achieve a specific objective by performing a unique set of organized tasks and utilizing resources effectively. It has characteristics such as: has a well-defined objective, is carried out through a series of interdependent tasks, utilizes various resources to carry out the tasks, finite life span, is a unique or one-time endeavor, has a customer, involves a certain degree of uncertainty.

2.1.1.3. Project Constraints

Project constraints are thing that can either limit the actions of project team or command their actions. Scope, time and cost are the three primary project constraints. Risk, quality, resources, customer satisfaction are also additional limiting factors constraining project activities. The triple constraints work in tandem with each other implying that a change in one directly affects the other two. The project manager must balance the project constraints while meeting or exceeding the expectations of the stakeholders (PMI, 2017).

2.1.1.4. Project Management

Project management is a management teqhnique used to meet project requirements by the use of skills, knowledge, tools, and techniques to project activities. Project management processes identified for the project are integrated appropriately for its accomplishment. It usually includes activities like: project requirements identification; addressing the project's stakeholders needs, concerns, and expectations; establishing and maintaining active communication with stakeholders of the project; management of the project's resources and balancing the competing project constraints. Implementation of each project management process and prioritization of the project constraints are influenced by the circumstances surrounding the project (PMI, 2017).

Implementing project management techniques helps to complete the full project scope on time, within budget and in a specified quality. This provides satisfaction for both the customer and for the contractor. For a contractor, it could also lead to additional business opportunities from the same customer in the future or to business from new customers referred by previously satisfied customers.

2.1.1.5 The Project Life Cycle

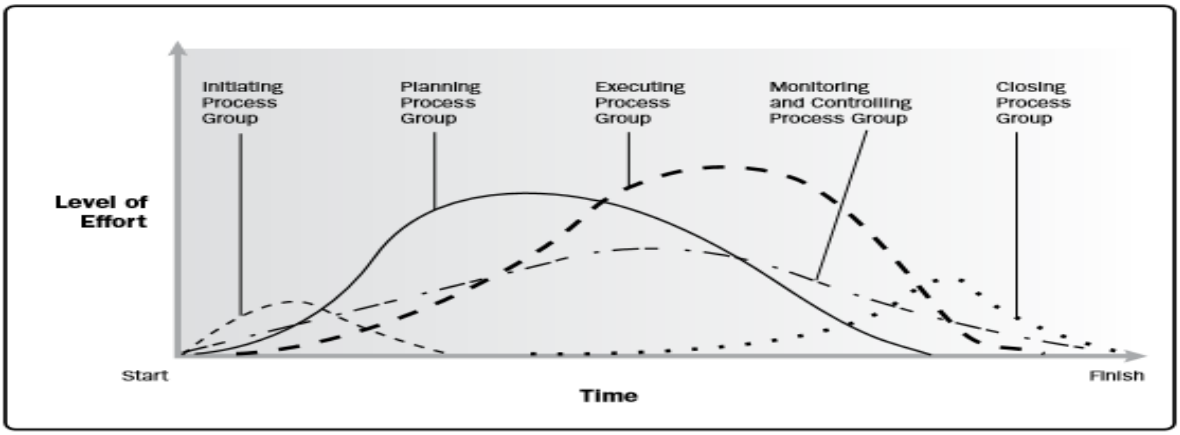
A project life cycle is a sequence of phases of a project from its initiation to its close. A project phase is a group of logically related activities of a project. It ends with the completion of one or more deliverables. It is time bound, with a start and end or control point. It can be sequential, iterative, or overlapping.

The project life cycle is dependent on the characteristics of the organization, the industry in which the hosting organization of the project operates, development method followed by the hosting organization, or technology employed by the organization. Regardless of the specific situation involved, it offers the basic framework for managing the project, Irrespective of the variation in size and the amount of complexity of projects, a typical project can be mapped to the following project life cycle structure: starting the project, organizing and preparing the project, carrying out the work of the project, and closing the project.

2.1.1.6 Project Management Process Groups

Objectives of projects are accomplished by employing project management processes that are grouped in to five Project Management Process Groups: Initiating Process Group, Planning Process Group, Executing Process Group, Monitoring and Controlling Process Group, Closing Process Group

Figure 2.1 Process Group Interactions Within a Project or Phase



Source: PMBOK, sixth edition

2.1.1.7 Project Management Knowledge Areas

The Project Management Knowledge Areas are fields or areas of specialization that are commonly employed when managing projects. A specific Knowledge Area in project management includes a set of processes to be accomplished in performing that particular project issue management. Frequently ten Knowledge Areas are used on most projects. These 10 Knowledge Areas are: Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management, Project Stakeholder Management

2.1.2 Project Scope

In project management 'scope' may indicate Project scope and/or Product Scope.
Project scope is the total sum of work that is required to deliver service, a product, or result with the specified characteristics and functions while Product Scope is the features and functions that characterize a product, service, or result(PMBOK, 2017)**.**

Project Scope is more concerned with the how of the project objective will be achieved. While Product Scope focuses on functional requirements of the project objectives (i.e what it will include) (Team FME, 2014).

2.1.2.1 Project Scope Management

According to the PMBOK (2017), there are ten frequently used project management knowledge areas which will be applicable in the life of a project. Project Scope Management is the second of the ten project management knowledge areasapplicable to a project following theProject integration management.

Heldman and Mangano (2009) definesProject scope management as a knowledge area which states what will be done and what will not be done throughout the project. According to the PMBOK (2017), it demonstrates the boundaries of the project operation and what will be delivered once the project is completed.

Properly managing the scope of the project during the life of the project is as important as defining it in the planning stage of the project. This will help to prevent scope change which results from perpetual pressure from the project stakeholders throughout its life cycle. This pressure comes from stakeholders whose desire are not fully included in the initial project specification and who are not conscious of the associated increase in risk or cost coming from the incremental improvements during the course of the project. 'Requested change' route will be used to include these improvements (Team FME, 2014).

According to Team FME (2014), this phenomenon results in a 'scope creep'. PMI (2017) defined Scope creep as, an uncontrolled increase of product or project scope without alteration of the

predefined resources, cost, and time of the project**.** Team FME (2014) described that, 'scope creep' is a common happening in project work and it is also a major cause of project failure**.**

Project Scope Management is a processes that ensures successful completion of a project by including all the work required but only the required work (Team FME, 2014). The primarily concern of Project Scope Management is identifing and adminstering project works which are included and not included in the project (PMI, 2017).

It is an important process in project management since the scope of the project that will be delivered in this process will greatly influence activities of the project like project scheduling, project budgeting; human resource requirements etc.

2.1.2.2 The Scope Management Process

Project scope management includes six processes. These six processes when put in order of accomplishment are: planning scope management, defining scope, collecting requirements, Creating WBS, Validating scope and Controlling scope (Team FME, 2014).

According to project management Body of Knowledge Guide (2017), 'Plan Scope Management'is the first process of the project scope management knowledge area and in this process the procedures for the management, control and delivery of the project scope is planned**.**Vargas (2008) stated that it documents how the scope of project will be well-defined, confirmed, and controlled, and how the work breakdown structure(WBS) will be created.

The second process of scope management is 'Collect Requirements Process', which is the process of collecting requirements from the stakeholders. Since the stakeholders' requirements or business needs initiate the projects, it is the foundation of the project scope management process (PMBOK 2017).Heldman and Mangano (2009) narrated that the primary purpose of this process is to collect and document business and stakeholders' requirements of a project and develop a plan guiding how these requirements are going to be documented and managed all over the phases of the project**.**

Heldman and Mangano (2009) identified 'Define Scope process' as the third process of project Scope Management and described its result and main objective as the creation of the project scope statement which is used to develop and document a detailed description of the deliverables of the project and the work needed to produce them. According to project management Body of Knowledge Guide (2017), in this process project requirements gathered from several project stakeholders are analyzed to be incorporated in the scope statement.

'Create WBS process', the fourth process of project Scope Management, takes the well-defined deliverables and requirements and performs the process of breaking down the total work of the project via a work breakdown structure (WBS) (Heldman and Mangano, 2009). Mishra and Soota (2005) stated that the Work Breakdown Structure (WBS) provides the skill to break the scope into manageable activities, assign responsibility to deliver the project scope, and establish methods to structure the project scope into a form that improves better coordination and delivery for management.

The fifth process of project Scope Management is 'Validate Scope Process'. It is a process of confirming acceptance of the completed project deliverables. After the project deliverables are completed, it needs to be checked first whether they meet the initial requirements. It also needs to be checked by the stakeholders to ensure that the completed deliverables are in line with that of agreed in the beginning of the project (PMI, 2017).

According to Project management Body of Knowledge Guide (2017), the sixth and the last process of the project scope management knowledge area is 'Control Scope Process' and stated that it is a process of monitoring the state of being of the project and product scope and managing changes to the scope baseline (PMI, 2017)**.**

2.1.2.3 Project Scope Management Process in the Different Phases of the Project Life Cycle

The stated six process of project scope management are components of two project process groups- planning process group and monitoring and control process group (PMI, 2017). The first four processes: creating a project scope management plan, collecting the project requirements,

defining the overall scope of the project, and creating the work breakdown structure belong to the planning process group and the other two processes: validating the scope and controlling changes to the planned scope belong to the monitoring and controlling process group (Team FME, 2014).

Table 2.1.Project Scope management process in the different phases of the project life cycle

	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
Project Scope Management		Plan Scope Management		Validate Scope	
		Collect Requirements		Control Scope	
		Define Scope			
		Create WBS			

Source: **https://www.pmclounge.com/scop-managment-process/**

2.1.2.3.1. Plan Scope Management

Creating a project scope management plan is the first process in the Scope Management Knowledge Area that falls under the Planning Process Group. The process of project and product scope defination, validateion, and controlling is documented in the plan. Scope management plan and requirements management plan are the two outputs of this process (Bccampus OpenEd., 2020).

In developing these outputs this process uses different documents of the initiating organization/s like project charter, project management plan, enterprise environmental factors and organizational process assets as inputs. Expert judgment, data analysis and meetings are used as tools & techniques in this process (PMBOK 2017).

The output of this process - scope management plan-provides guidance and direction on how scope will be managed throughout the project life. The other output of this process-requirements

management plan- provides clarity on as to how project teams will determine which type of requirements need to be collected for the project (PMI, 2017).

Table 2.2 **plan scope management in the project management process group**

	Project Management Process Groups				
	Initiating	**Planning**	**Executing**	**Monitoring & Controlling**	**Closing**
Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	

Source: **https://www.pmclounge.com/plan-scop-managment/**

1) Scope Management Plan

The scope management plan is defined in the Project management Body of Knowledge Guide (2017) as part of the project management plan that details the processes the team will follow in the process of: preparing a project scope statement; creating the WBS from the detailed project scope statement; approving and maintaining the scope baseline. As stated by Heldman and Mangano (2009), **i**t also describes how the scope of the product and/or the project is verified and accepted and also documents how changes to the scope will be handled.

As described by Heldman and Mangano (2009) it is greatly integrated with other project management Processes like Requirements Management, Document Management, Communication Management, Deliverable Management, Quality Management, Change Control Management, and Time (Schedule) Management.

2) Requirements Management Plan

Heldman and Mangano (2009) stated that the requirements management plan is part of the project management plan that states how project and product requirements will be documented, analysed and managed in the project.

Project management Body of Knowledge Guide (2017) narrated that, it also shows how: requirement changes will be initiated, impacts of these changes will be analysed, these changes will be traced and reported; as well as the levels of authorization required to approve these changes.

This document also describes the requirements prioritization process; the metrics+ that will be used and the rationale for using them. Finally, a Requirements Traceability Matrix is prepared to manage all these activities (PMI, 2017).

2.1.2.3.2 Collect Requirements Process

Collect requirements processis the process of determining, documenting, and managing stakeholder needs and requirements to meet the project objectives of the project management task(PMI, 2017).

Project management Body of Knowledge Guide (2017) narrated that, all requirements must support the project's high-level requirements which are described in the project charter**.** Heldman and Mangano (2009) stated that Requirements are different from goals and deliverables. These authors described that they are a further breakdown of the deliverables-they describe the characteristics of the deliverable in very specific detail. Requirements should be defined for each deliverable. Project management Body of Knowledge Guide (2017) stated that, a Requirement should only be included only when it is able to fulfil the stated objectives of the project.

Tonnquist (2009) stated that identification of project stakeholders is the first step before collecting requirements. This author also conveyed that; identification of the project's Stakeholders, together with their interests and level of effect initially, is important for preparation of stakeholder register, and the formulation of a strategy for managing the stakeholders.

Heldman and Mangano (2009) stated that, the next step is to collect requirements from the identified stakeholders. The author also explained that Collect requirements is not the sole responsibility of the project manager, rather primarily it is a user or stakeholder function-the

project manager facilitate the process and the stakeholders tell what the project manager should have to do.

The stakeholders' requirements are gathered using the appropriate tools and techniques and then summarised. A pattern will emerge, which helps to eliminate duplicates, group similar requirements together, and so on. During the process of defining requirements, environmental factors such as the business rules and policies, infrastructure, and organization's culture are take into account. Then, deliverables and requirements which are needed to be done in order for the project to be successful are documented. The next and final step in the collect requirements process is prioritising the requirements which are important to meet the goal of the project.(PMI, 2017)

Table 2.3 **Collect requirements process in the project management process group**

	Project Management Process Groups				
	Initiating	**Planning**	**Executing**	**Monitoring & Controlling**	**Closing**
Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	

Source: **https://www.pmclounge.com/collect-requirements-process/**

In the effort of collecting requirements, historical information and lessons learned from previous projects could be involved. It helps in gaining an understanding of what were the requirements on similar projects (PMI, 2017).

In developing the outputs this process Project charter, project management plan, project documents, business documents, agreements, enterprise environmental factors, organizational process assets, etc… are used as inputs and expert judgment, data gathering, data analysis, decision making, data representation, interpersonal and team skills, Context diagram and Prototypes as tools & techniques of the process etc… (PMI, 2017).

At the completion of this process requirements are documented and Requirements traceability matrix is prepared (PMI, 2017).

1) Requirements Documentation

When the collection of all requirements is completed they are documented. The documentation should be clear and unambiguous. Requirements may initially start out at a high level, as more information about the requirements is known, it becomes progressively more detailed. Requirements need to be unambiguous -measurable and testable, complete, consistent, traceable, and acceptable to key stakeholders before being baselined. The requirements document may be a simple document containing all the requirements divided by stakeholder and priority, or a more detailed form containing an executive summary, detailed descriptions, and attachments. Requirements documentation describes how individual requirements meet the business need for the project (PMI, 2017).

2) Requirements Traceability Matrix

The requirements traceability matrix links initial product requirements to the deliverables that satisfy them. By linking requirement to the business and project objectives, it ensures that each requirement adds business value. It also tracks requirements throughout the project life cycle which helps to ensure that requirements approved in the requirements documentation are delivered at the completion of the project. Finally, it provides a structure for managing changes to the product scope (PMI, 2017)**.**

The requirements traceability matrix also records attributes associated with each requirement. which facilitates the definition of key information about the requirement (PMI, 2017).

2.1.2.3.3 Define Scope Process

Define Scope Process is the third process of Project Scope Managementafter Plan Scope Management Process and Collect Requirements Process. This Process is Primarily concerned with outlining the boundaries of the project, delineating the work that will be delivered during

the course of the project and defining the main deliverables of the project. It completes the project scope(PMI, 2017).

In this process as what is included in the project is defined, defining what is not to be included within the project (i.e., exclusions) is also the main purpose of the define scope process. This helps to clearly describe the expected outcomes of the project (Nicholas, 2004).As Jonasson (2008) described, an unambiguously defined scope definition shows the boundaries of the project while a poorly defined scope will lead to perpetual evaluation of what is include in the project and what is not included in the project (Jonasson, 2008).

Documents (Inputs) Used in Define Scope Process in developing these outputs are project charter, project management plan, project documents, enterprise environmental factors and organizational process assets etc… as inputs and expert judgment, data analysis, decision making, interpersonal and team skills and product analysis etc… as tools & techniques of analysis (PMI, 2017).

Define scope process is the process of developing a detailed description of the project and product. This process results in a document called the scope statement. It also results in an update of project documents (Nicholas, 2004)**.**

Table 2.4 Define Scope process in the project management process group

	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
Project Scope Management		Plan Scope Management		Validate Scope	
		Collect Requirements		Control Scope	
		Define Scope			
		Create WBS			

Source:**http://www.pmclounge.com/define-scope-process/**

1) Project scope Statement

A Scope Statement is a written confirmation of the results that the project will produce and the terms and conditions under which the project work will be performed**.** Before actual project work started, the concerned project stakeholders, project initiator/s and the project team, should agree on all terms in the Scope Statement (Portny, 2010)**.** According to PMI(2017), the project scope statement documents the entire scope of the project- the project scope and product scope. Nicholas (2004) stated that, the document highlights the main areas of work to be performed during the course of the project and the desired deliverables of the project. As Kerzner (2009) stated, this document confirms the project scope against the requirement of the stakeholder documented in the requirements document.

The degree and level of detail of explanation of the project scope statement in describing the work that will be included in the project and the work that is not, assists in controlling the overall scope of the project (PMI, 2017).

Among the abundant benefits it has for a project team during the different phases of a project: during planning, it aids the project team to prepare a more detailed plan for the project; during execution, it guides the work of project team, and provides the baseline for evaluating whether requests for changes or additional work are contained within or outside the project's boundaries. It also provides a common understanding of the project scope among project stakeholders (PMI, 2017).

Richman (2002) lists, components of a complete scope statement as: technical specifications, performance requirements, facilities requirements, ground rules, constraints, exclusions, procedures, logistics, safety regulations, security issues, and environmental considerations etc… Similarly, Nicholas (2004) narrated what is specified in a project scope statement as, the user acceptance requirements, project objectives, or high-level specifications for the main end-item and ancillary side items**.**

Both the project charter and the project scope statement describes the scope of a project, however; the level of detail contained in the project charter and the project scope statement are

different. The project charter contains high level information, while the project scope statement contains a detailed description of the scope components (PMI, 2017).

2) Project Documents Updates

Project documents that may be updated as a result of carrying out this process include: Assumption log, Requirements documentation, Requirements traceability matrix, Stakeholder register (PMI, 2017).

When additional information on existing information or new information is gathered as a result of this process, it is recorded in the respective document which corresponds to the additional or new information obtained (PMI, 2017).

2.1.2.3.4 Create Wbs Process

According to the PMI (2017) Create work breakdown structure is the fourth process of the project Scope Management coming after the Create Scope Management Plan Process, the Collect Requirements Process and the Define Scope Process consecutively. The Create WBS processis the process of subdividing project deliverables and project work into smaller and manageable components (PMI, 2017).

***Table 2.5*Create work breakdown structure process in the project management process group**

	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
Project Scope Management		Plan Scope Management		Validate Scope	
		Collect Requirements		Control Scope	
		Define Scope			
		Creat WBS			

Source:**http://www.pmclounge.com/work-breakdown-structure-wbs/**

This process uses Project management plan, Project documents, Enterprise environmental factors and Organizational process assets etc… as inputs and Expert judgment and Decomposition etc… as Tools & Techniques of the process. At the completion of the create WBS a document of Scope baseline is prepared and Project documents are updated (PMBOK 2017). According to Team FME (2014),outputs of the WBS creation process are developed scope baseline and project documents updates.

1) Scope Baseline

The Scope Baseline is the approved version of a scope statement, work breakdown structure (WBS) and its associated WBS dictionary that can be changed only through formal change control procedures and is used as the basis for comparison to actual results of the project (PMI, 2017). It is a component of the project management plan and includes: Project scope statement, WBS, Work package, Planning package, WBS dictionary as its components(PMI, 2017).

The project scope statement also includes the description of the project scope, major deliverables, assumptions, and constraints (PMI, 2017).

i. WBS

The Work Breakdown Structure (WBS) decomposes the total scope of work hierarchically which is to be carried out by the project team to accomplish the project objectives. (PMI, 2017)**.** It is a deliverable-oriented tool of project management (Portny, 2010)**.** This decomposition of work must be balanced with the control needs of management.The WBS development process will continue to more detailed successive levels until a level is reached that provides the required insight for effective project management (PMI, 2017).

The different levels of WBS hierarchy have their own names. The level at the top is usually called a project and the lowest level of detail is called a work package. The levels in between these two levels are called subprojects, phases, tasks, work assignments, subtasks, and deliverables (Portny, 2010).

This hierarchical presentation enables evaluation of cost, time, and technical performance at all levels in the organization over the life of the project. The WBS also provides information suitable for each level. This information will assist management in making decision regarding the project (Larson and Gray, 2011).

Based on the objective of the project scope management having the aim to include only the work required to accomplish the objective of the project and to exclude those activities not required for the accomplishment of the project the WBS has two goals: to ensure that the project includes all the work needed and also to ensure that the project includes no unnecessary work (PMI, 2017).

If the WBS does not meet either of these two goals, the project may fail. If part of the project work essential for the completion of the project is omitted, the project will be delayed and may experience cost overruns. If unnecessary work is performed, the customer's time and money will be wasted (PMI, 2017).

According to the PMBOK Guide (2017), the WBS is an important tool for a coordinated and integrated planning, Product Scope management, inclusive change Control, performance reporting.

Depending on the type of project and the types of team members who need to access it, several types of formats apply to work breakdown structure documents. They include: Chart Format, Hierarchical Structure, Outline Structure, Tabular View(Portny, 2010).

Work Breakdown Structure Creating

As Reviewed by Roland Morrison on *the Master Project Management Blog,* rules to be followed in the preparation of a sound work breakdown structure are: it is done as a team work; Level of detail must increase as it goes from the level at the top to the lowest level of the work breakdown structure and the final box in each branch must end with a product or deliverable; Some levels will be broken down to further than others; it must include only deliverables that are actually needed for the accomplishment of the project objective/s and exclude activities or deliverables which are not.

Aditionaly he states that Work packages are reached when Deliverables: can be accurately and confidently estimated, can be completed within a short time period, are small enough so that they do not depend on many factors to be completed, can be outsourced or contracted out.

ii. The WBS Dictionary

After creating the WBS, it is required to create a WBS dictionary. WBS Dictionary is a project document that provides detailed deliverable, activity, and scheduling information (PMI Lexicon of Project Management Terms, 2017)**.** It is a project document which is the output of the Create WBS process (Heldman and Mangano, 2009)**.**

The WBS dictionary is where work component descriptions are documented. It contains description at a level of the work package and details about the activities of the work package. Details specified in the WBS dictionary are information of costs, budgets, schedule dates, resource assignments, and activity descriptions. This supports project team members to be well informed about the scope of the project and intern this helps prevent the team from doing unnecessary work or work that is out of the project scope. This facilitates better completion of the project scope and avoids scope creep. It also contributes in making the project easily understood by the project stakeholders (Heldman and Mangano, 2009).

It also specifies information like: Assumptions and constraints available in doing the work, Responsible organization doing the work, Schedule milestones and associated schedule activities, Quality requirements needed to be meet, Acceptance criteria, Technical references, and Agreement information (PMI, 2017).

2) Project Documents Updates

Among the project documents that may be updated as a result of carrying out this process are assumption log and requirements documentation. The assumption log is updated with additional assumptions or constraints that were identified during the Create WBS process. Requirements documentation may be updated to include approved changes resulting from the Create WBS process (PMI, 2017).

2.2 Emperical Review

Many researchers have conducted a study in the different components of project scope management practices.

(Walliman, 2011) investigated the importance of scope management in relation to the overall success of a project and found that an effective scope management of a project certifies the successful management of other strategic project management capacities including time, cost and quality.

(Banda, and Pretorius 2016) investigated the relationship between the level of scope definition and the performance of infrastructure projects and concluded that there is a significant direct correlation between scope definition and the performance of infrastructure projects.

(Mirza, Pourzolfaghar and Shahnazari 2013) investigated the significance of scope definition in Project Success and concluded that clearly defining the project and product scope brings a higher possibility of project success.

(Al-Rubaiei, Akmar Abdul Nifa and Musa 2018) assessed the importance of the scope management, how it is viewed by project management different methods and what is its impact on the project outcomes and concluded that, it is suggested to make the most verified choice of methods or standards resulting from explanation of the task on optimizing the project's scope to the following measures: profit, time, cost and quality.

(Nibyiza1, Shukla and Ndabaga 2015) analyzed the usage of scope change management as a tool for project success and found out that when managing a project there are times when project implementers will have to make decision to change the project scope. Although the project has to meet its objectives but there are times when implementers will see that meeting the project objectives without making any changes in project activities is impossible.

(Ogunberu, Akintelu and Olaposi 2018) examined the application of project scope management practices on project success and found that the application of project scope management practices has significantly impacted project success leading to fulfilled customer expectation and satisfaction; better resource allocation and timely project delivery.

(Nath and Mukit Momin 2014) investigated the importance of Scope Management in relation to the overall success of a project and it came out to be that the project's scope and their deliverance on time ensures the project's success.

(Corvello, Javernick-Will and Maria La Ratta 2017) study whether small and medium construction enterprises, which routinely plan, monitor and control project scope, perform significantly better than small and medium construction enterprises which have not developed project scope management routines and found that defining and controlling project scope influences project performance positively.

(Kermanshachi, Safapour, D. Anderson, Goodrum, and R. B. Taylor 2020) developed an effective project scoping process for highway and bridge construction projects, using the integrated definition modeling technique and developed framework which consists of three main functions which will help transportation agencies produce a project cost estimate and schedule that facilitates programming decision-making and subsequent project delivery activities.

(Ugochi and Ifeanyi 2016) identifies, explores and models the causes and effects of scope creep of large scale public sector construction projects in the South East Geopolitical Zone of Nigeria and identified the causative factors of scope creep of large scale public sector construction projects, ranked them in the order of relative severity index and developed a fishbone/Ishikawa diagram as a visual aid, which will help to address the problems.

(Banda & Pretorius 2016) determined the effect of scope definition on public building projects that are implemented by project implementing agencies in Malawi and found that there is a significant direct correlation between scope definition and the corresponding performance of the sampled infrastructure projects.

As far as the revew of the researcher is conserned no work is obtained on scope management practices done in the context of Addis Ababa on road constraction projects. Despite the very many problems observed in road projects in the city.

CHAPTER THREE

3. METHODOLOGY

3.1 Introduction

This chapter highlights the methodological details appropriate to conduct the study. It describes the proposed study area and period, research approach, population, sampling design, data sources and types, instruments of data collection, data analysis.

3.2 Study Area and Period

This study entitled *"Project scope management practices of Addis Ababa city road construction project: Managerial perspective. The case of Addis Ababa City Roads Authority road projects"*is undertaken on purposely selected road construction projects constructed by employed external contractors and running in different areas of Addis Ababa city. It was conducted in the second semester of the academic year 2019/2020 G.C. of Addis Ababa University.

3.3 Research Approaches

The main objective of this study is to assess the of scope management practices of Addis Ababa city road projects. This study used mixed research approach. A mixed research approach is selected to answer the research question of this study in an all rounded way, using a numerical and narrative facts. Mainly the study used Quantitative approach to gather numerical data. Qualitative approach was also used assisting the main research approach, quantitative research approach, to collect facts which were not addressed by the quantitative research approach and to further elaborate the data collected by the quantitative research approaches.

Mixed research approach is the "mixing" or combining of quantitative research approach and qualitative research approach. The assumption in this approach is that both types of approaches, quantitative study approach and qualitative research approach, provide different types of information, qualitative research approach offers open-ended data while the quantitative approach provides closed-ended data. Both research approaches have their own limitations and strengths. This approach helps to combine the strengths of the qualitative and quantitative

approaches to develop a stronger understanding of the research problem or questions and simultaneously redusing the limitation of each design (Creswell,2014).

3.4 Research Design

Descriptive research design is used in this study which describes scoping management practices of Addis Ababa city road construction projects. It mainly took Addis Ababa City Roads Authority road projects which are currently constructed by employed external contractors as case. Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group. The main characteristic of this method is that the researcher has no control over the variables; he/she can only report what has happened or what is happening (Kothari, 2004).

It combined secondary data with primary data which was collected from the study area using a structured questionnaire, interviews as well as documents related to the projects like; reports, letters, memorandum of understanding, etc.

3.5 Population

The study population is a group of respondants from whom the required information to find answers to a research question of a specific research is obtained (Kumar, 2011)**.** Since the objective of the study was to assess the scope management practices of Addis Ababa city road projects by taking Addis Ababa city Roads Authority road projects which are constructed by employed external constructors, the target population included in the study are egineers of the different consultant firms participating in both the preliminary design and detailed design of the projects, AACRA engineers in two different directorates, Directorate of Road construction Contract Administration and Directorate of Road construction and maintenance Design Revision and Implementation Follow Up, which works in collaboration with the consultant on the design and follow-up of these projects.

3.6 Sampling Design

Curently there are ninten ongoing projects which are constructed by external constructors under the supervision of the Authority and recruited consultants. From these ninten ongoing road projects the researcher purposively selected ten projects whose length and width are more than 3000m and 30m respectively. The nine projects excluded from the study are are an upgrading of an existing road and are covering of a shortest length.

To get information on scope management practices of the ten selected projects of the Authority, all officers of the Authority related to scope management activities in the two directorates of the authority are included in the study.

Similarly, from the consultants' side, all the workers of the consultant participating in the preliminary designs and detailed designs of the Authority's projects constructed by employed external contractors were included in the study.

The reason why both the Authority and the consultant firms were included in the study is that the preliminary and detailed design of the projects where most parts of the scope planning activities are done by the consultant firms under the supervision of the Authority's officers; officers of the Road construction and maintenance Design Revision and Implementation Follow Up Directorate. And also at the stage of construction both the different consultant firms' officers and officers of the Authority, Road construction Contract Administration Directorate officers, are involved.

Table 3.1 No of Addis Ababa City Roads Authority officers of the two Directorates

No	*Directorates involved in the scope management practices of the Authority's road projects*	*Total no of officers of the Directorate related to scope management practices*	*Selected Sample Size*
1	Road construction Contract Administration Directorate	8	8
2	Road construction and maintenance Design Revision and Implementation Follow Up Directorate	16	16

Table 3.2 No of officers of the consultant firms

No.	*Consultant*	*Total no of officers of the Consultant firm related scope management practices*	*Selected Sample Size*
1	United Consulting Engineers Plc.	5	5
2	Engineer Zewde Eskinder & Co. PLC	3	3
3	Highway Consulting Engineers Plc.	4	4
4	Beza Consulting Engineers Plc.	5	5
5	Best Consulting Engineers Plc.	5	5

3.7 Data Sources and Types

The data used for this study was obtained both from primary and secondary sources. Primary data sources to be used to answer the research questions of the study were obtained through questioners distributed to the officers of both the consultant firm and the Authority who participated in the design of the project and controlling of the project during its execution.

Secondary sources of data for the study was obtained from the documentation of the Authority as well as that of the consultants like the term of reference of the projects (TOR), project management plans of the projects, policy of the authority, contracts entered between the authority and consultants, written letters to different external parties related to the work.

3.8 Data Collecting Instruments

3.8.1 Primary Data Collection Instruments

3.8.1.1 Questionnaire

The process of data collection was mainly through questionnaire which involves closed-ended items prepared in English. It was distributed to and field by the officers of the consultants and officers of the authority who participated in the preliminary and detailed designs of the projects and in the controling of the project during construction.

3.8.2 Secondary Data Collection Instrument

3.8.2.1 Documents

The study also employed documentary evidence as an instrument of data collection. Documentary evidence were used to supplement the information obtained by the other instruments used in the study. It is also important to check the reliability of information gathered by interview and questionnaire.

Availability and if available the content of different project documents and situations which are used in the scope management process like project charter (Term of reference/TOR/), factors affecting the scoping practice like organizational process assets, the organization structure of the Authority and other constraining factors were verified and used as inputs of the study.

3.9 Data Analysis

Different procedureswere followed to analyse the data depending on the nature of the instruments employed. Hence, the researcher used the following techniques of data analysis: first, the collected data using the questionnaires will be coded, tallied, organized, entered, cleaned and analysed using statistical packages for social sciences (SPSS). Because of the descriptive nature of the study, mainly percentages and mean score valueswere used as as appropriate means to analyse the collected data using close-ended items. Other data, collected by interview and document analysis were analysed qualitatively. Narratives, quotations and the use of thematic categories were the main approaches to illustrate the main results. The collected data was identified and categorized in line with their themes. Moreover, findings were demonstrated using tables to create convenience for the summary

CHAPTER FOUR

4 DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter presents the analysis of the data collected through questionnaire, and from documents of the projects. The main research question of this project work was that 'what management practices are followed in road projects in managing scopes of the projects?'. In attempting to answer this question, AACRA road projects were used as cases of the project work andoutputs of theoretical and empirical scope management literature were alsoused.

Practices performed inmanaging the scope of a projectinclude the practices of: planning of the scope management, collecting requirements of stakeholders, defining the scope of the project, validating and controlling the scope of the projects. Thus, this project work was conducted to assess the project scope management practices of the selected AACRA road project.

To address the research question(s) and the research objective(s) of this project work,a questionnaire was developed based on a literature reviewed

This chapter is organized into two sections. This section describesa general introduction about the chapter, the second section of this chapter describes profile of the respondent's and their opinion about project scope management practices of the selected case projects.

Originally,46 questionnaires were distributed to respondents. All these questionnaires were physically distributed to the respondents. From these distributed 46 questionnaires 42 are filled and returned successfully. Hence, 91.3% of the distributed questionnaires are responded successfully.

4.2 Assessment of Results

4.2.1 Profile of the Respondents

In this section characteristics of the respondents are presented. The characteristics of respondents included in this section are respondents' characteristics such as gender, age, educational qualifications, their experience in any position of road construction projects and their experience in a road design team.

4.2.1.1 Gender of the Respondents

Regarding the distribution of the respondents sexual characteristics,from the total number of 42(91.3%) respondents, 30 (71%) were male whilst12(29%) were female. There is no missed response.The majority (71%) of the respondents were male while the rest (29%) of the respondents were female (SeeTable 4.1). The number of male respondents is twice more than the female ones. The number of male employees working in road construction projects particularly in road projects designing is much more than that of female employees in Addis Ababa City. This will make features of the road projects which will meet distinctive interests of female inhibitants of the city which must have been included in the roads design are either exclude completly or include at not an appropriate level. This will hold back the activities of the female dwelers by giving no comfort which will intern reduce the productivity of female dwelers.

Table 4.1 Gender of the Respondents

Gender of Respondents	Frequency	Percent	Cumulative Percent
Male	30	71.4	71.4
Female	12	28.6	100.0
Total	42	100.0	

Source: SPSS 26

4.2.1.2 Respondents' Age

Of the four categories of the age groups availed in the questionnaire, the age of the respondents falls in the two categories, 18-29 and 30-40 years. From the the total number of respondents 22(52%) were between the ages of 18 and 29 years and 18 (43%) were between 30 to 40 years of age.No respondents were falling in the other two categories of age groups, 41-49 years and 50 and above.The rest 5% (n=2) is missing.This indicates that almost all of the workers working in road projects design in Addis Ababa city are below the age of 40 which is an active and energetic work force. (See Table 4.2)

This will make the constructed road projects to include only the features of the age groups who participated in the roads design and exclude those of the other members of the socity which will disturb the day to day activity of the city's dweller age groups whose interest are not include. This will deter the the activities of the ageed groups of the socity which is an experienced age cathegory also strongly reduces the they economic, social, environmental etc..contributions to the city.

Table 4.2 Age of respondents

Age of Respondents	Frequency	Percent	Cumulative Percent
18-29 years	22	52.4	55.0
30-40 years	18	42.9	100.0
Total	40	95.2	
Missing	2	4.8	
Total	42	100.0	

Source: SPSS 26

4.2.1.3 Respondents' Educational Qualifications

Regarding the educational level of the respondents, the respondents fall only in the two categories of educational qualifications, 31(74%) had Bachelor's degree and 10(24%) had a Master's degree. The rest 2% (n=1) is missing. In general, 41 (100%) of the respondentshad aBachelor'sdegree and above.(See Table 4.3)

The respondents' profile indicate that most of the respondents have the adequate educational qualification and this indicates their opinion regarding the scope management practices of road projects is based on appropriate academic knowledge.

This helps the roads to be constructed up to the international road standards. Given the limitations statated above this will contribute to the rapid social, economic development of the city.

Table 4.3 Educational Qualifications of Respondents

Level of education of respondents	Frequency	Percent	Cumulative Percent
Master's Degree	10	23.8	24.4
Bachelor Degree	31	73.8	100.0
Total	41	97.6	
Missing	1	2.4	
Total	42	100.0	

Source: SPSS 26

4.2.1.4 Respondents' Experience in Road Projects

Regarding respondents' work experiencesin road projects, 69% of them have work experiences of less than 5 years in road projects, while 26% of the respondents have an experience which is more than 5 years but less than 10 years of work experience. The rest 5% (n=2) is missing. No respondents are falling in the other two categories of work experience, the 11-15 years' experience category and the 16-20 service years' category of experience.Therefore, we can conclude that respondents have enough experience in Road Projects even if it is not magnificent (See Table 4.4). This will shade a shadow on the problem solving capability of the team which are known through rich work experience which will intern be reflected on the road projects constructed.

Table 4.4Experience in Road Projects

Respondents' Experience In Road Projects	Frequency	Percent	Cumulative Percent
1-5 years	29	69.0	72.5
6-10 years	11	26.2	100.0
Total years	40	95.2	
Missing	2	4.8	
Total	42	100.0	

Source: SPSS 26

4.2.1.5 Respondents Experience as member/leader of the road design team

Concerning respondents' experience as member of a road design team, 76% of the total respondents have experience in road project designing of less than 5 years while 21% of the total respondents have an experience in road project designing which fall in the range of 6-10 years of experience (See Table 4.5).

Hence, it can be concluded that even if it is not magnificent most of the respondents have enough experience in a road projects designing. Accordingly, their opinion and view on the project scope management practicesare based on their non-ignorable experience in road projects designing. This will shade a shadow on the problem solving capability of the team which are known through rich work experience which will intern be reflected on the road projects constructed.

Table 4.5 Experience as Design Team Member

Respondent's Experience As Design Team Member	Frequency	Percent	Cumulative Percent
1-5 years	32	76.2	78.0
6-10 years	9	21.4	100.0
Total	41	97.6	
Missing	1	2.4	
Total	42	100.0	

Source: SPSS 26

4.2.2 Road Projects Scope Management Practices

Scope management can make or break a project. If the scope of the project is not managed properly it can quickly go off track, messing up the schedule of the project and depleting the project budget. This causes many projects to fail.

Respondents' opinion on factors relating to projects scope management practices: practices of planning the scope management of the project, requirements collection practices of the project, scope definition practices of the the project, practices of decomposition of the total scope of the work of the project, scope validation practices of the project, scope controlling practices of the project, have been gathered. The analysis of the collected data are presented below using tables, and percentages in six sections.

The targeted respondents of the study are invited to indicate their level of agreement on the statements of inquiry about scope management practices. The responses are rated on a five-point Likert scale where: "1" designates strong disagreement; "2" designates disagreement; "3" designates being neutral; "4" designates agreement and "5" designates strongly agreement, on the inquiry.

4.2.2.1 The Plan Scope Management Process

4.2.2.1.1. Scope Management Plan

The scope management plan is an important document used in managing the scope of the project which details the processes of defining the scope of the project, validating the scope of the project, controlling the scope of the project. Scope management plan is primarily concerned with defining how the scope is explained, developed structured and verified.

This study raised five items of inquiry for the assessment of practices of the scope management planning of road construction projects in Addis Ababa city. As indicated in Table 4.6, on average, on the five items of the inquiry 19[45%] of the respondents have an opinion of strong agreement, 15[37%] of the respondents have an opinion of agree, 6[14%] of the respondents show opinion of Nutral, 1[2%] of the respondents show an opinion of Disagree, 1[2%] of the

respondents shows an opinion of Strong Disagrement on average. When all this Respondents' opinions are sumurized togather respondents have on average a perception level of 4.21 points of likert scale which is near to the likert scale point of 4 which designates Agree and shows the agreement of the respondents on the five items of the inquiry.

This implies that most of the employes of the respondents have a strong confidence on the scope management planning practice of the authority which will help to do their work in an organized way. It will also help to direct all the efforts of the employes in one direction. There will be any lost effort of an employ which will not be part of the deliverables produced in the life of the project.

Table 4.6 Descriptive statistics for the scope management plan

Question	SA	A	N	D	SD	Mean	Median	Mode
A1.1.1	11[26%]	21[50%]	8[19%]	2[5%]		3.98	4	4
A1.1.2	23[55%]	12[28%]	5[12%]	2[5%]		4.33	5	5
A1.1.3	13[31%]	20[48%]	9[22%]			4.10	4	4
A1.1.4	21[50%]	15[36%]	3[7%]	3[7%]		4.29	4.5	5
A1.1.5	26[62%]	10[24%)	3[7%]		3[7%]	4.33	5	5
Overall Average Score	**19[45%]**	**15[37%]**	**6[14%]**	**1[2%]**	**1[2%]**	**4.21**	**4.5**	**4.6**

Source: - SPSS 26

4.2.2.1.2. Requirement Management Plan

The requirement management plan describes how project requirements will be analysed, documented, and managed in the project**.** Four items of inquiry are used to assess the requirement management planning practices of the road projects (SeeTable 4.7) when respondents' opinion on the four items of the inquiry are sumurised, large no of respondents, 17[40%], show an opinion of Disagree. The remaining respondents shows opinion of Strongly Disagree, 16[38%]; Nutral, 7[17%]; and Agree, 2[5%].There is no respondent having opinion of Strongly Agree. When the respondents opinion is sumurized the average respondents' opinion is 1.5 which is between the Likert scale points of 1 and 2 which designates Strongly Disagree and Agree consequetively.

This implies the respondents have disagreement on the four items of inquiry that assess the requirement management planning practices of the projects. This indicates that requirments management process of the projects that are the core part of any project are not planned, tracked and not managed properly.

Table 4.7 Descriptive statistics for requirement management plan

Questions	SA	A	N	D	SD	Mean	Median	Mode
A2.1.1		3[7%]	9[21%]	18[43%]	12[29%]	2.07	2	2
A2.1.2		3[7%]	8[19%]	16[36%]	15[36%]	1.98	2	2
A2.1.3		2[5%]	10[24%]	12[29%]	18[42%]	1.90	2	1
A2.1.4			2[4%]	20[48%]	20[48%]	1.57	2	1
Overall Average Score	**-**	**2[5%]**	**7[17%]**	**17[40%]**	**16[38%]**	**1.50**	**2**	**1.2**

Source: - SPSS 26

4.2.2.2. The Collect Requirements Process

Collect requirements process is the process of determining, documenting, and managing stakeholder needs and requirements to meet the project objectives of the project management task. Stakeholders' requirement management practices used in the selected road construction projectsare assessed by eight items of inquiry.

When the responses the respondents on the eight items of the inquiry are sumurised it gives an average value of 2.27 points of Likert scale which is closer to 2 points of Likert scale which designates Disagree. And also the respondents' opinion value having the highest frequency (Mode) is averaged to 2.25 which is closer to 2 points of likert scale, that designates Disagree. This indicates that responses of most of the respondents shows opinion of disagreement.

All these facts indicates that respondents show opinion of disagreement on the eight items of inquiry raised to assess the requirement management practices of the projects. The disagreement of the employees on the items of the inquiries indicate that all the requirments of the project are not included in the project; the included requirments are not documents and traced well and the

accomplishment of these requirments to the end of the project is not traced properly. This implies that the projects are not meeting the objectives for which they are initiated for due to the exclusion of some requirments from the requirement documentation. Also requirments which are documented also failed to be satisfied due to the lack of formal follow up of their accomplishment. This will raise objections from stakeholders whose requirments are either excluded or not properly managed which will intern lower the moral of the project team and the accomplishment level of the project.

Table 4.8 Descriptive statistics for collection of requirements from stakeholders process

Questions	SA	A	N	D	SD	Mean	Median	Mode
B.2.1		3[7%]	15[36%]	14[33%]	10[24%]	2.26	2	3
B.2.2		4[10%]	18[43%]	14[33%]	6[14%]	2.43	3	3
B.2.3		5[12%]	12[29%]	20[48%]	5[11%]	2.40	2	2
B.2.4		4[10%]	11[26%]	19[45%]	8[19%]	2.26	2	2
B.2.5		8[19%]	13[31%]	15[36%]	6[14%]	2.45	2.5	2
B.2.6			11[19%]	23[55%]	8[19%]	2.07	2	2
B.2.7		2[5%]	9[21%]	25[60%]	6[14%]	2.17	2	2
B.2.8			10[24%]	28[67%]	4[10%]	2.14	2	2
Overall Average Score	**-**	**3[7%]**	**12[29%]**	**20[48%]**	**7[17%]**	**2.27**	**2.19**	**2.25**

Source: - SPSS 26

4.2.2.3. The Define Project Scope process

Define project scope process is primarily concerned with outlining the boundaries of the project, delineating the work that will be delivered during the project and defining the main deliverables of the project.

Respondents' opinion on the nine items of the inquiry which are raised to assess the scope definition practices of the projects fall in the five likert scales which shows the diferent opinions of the respondents. Largest no of respondents, 19[46%], shows opinion of Strongly Disagree.

Then follows opinion of respondents that shows Agree with 17[40%] no of respondents. Opinions of Nutral and Disagre are opinions having the lowest no of respondents which is 5[12%] and 1[2%] respectively. There is no respondent showing an opinion of Strongly Disagree. Most of the respondents show a response of either Strongly Agree or Agree.

This shows that almost all of the respondent have an agreement on the nine items of the inquiry. Most of the respondents have a clear view of where to go and what to achive, have a clear view of the project to be executed, this helps to buld a good team sprit in the project and to move in a similar direction for the achivment of one common objective agreed upon initially. This avoids waste of the project team's time, resourse

Table 4.9 Descriptive statistics for define project scope process

Questions	SA	A	N	D	SD	Mean	Median	Mode
C.3.1	19[45%]	17[17%]	5[12%]	1[2%]		4.29	4	5
C.3.2	26[62%]	14[33%]		2[5%]		4.48	5	5
C.3.3	20[48%]	19[45%]	3[7%]			4.4	4	5
C.3.4	17[40%]	18[43%]	7[16%]			4.24	4	4
C.3.5	9[21%]	18[43%]	9[21%]	3[7%]	3[7%]	3.64	4	4
C.3.6	24[57%]	12[29%]	6[14%]			4.43	5	5
C.3.7	22[52%]	10[24%]	9[21%]	1[2%]		4.26	5	5
C.3.8	15[36%]	25[60%]	2[5%]			4.31	4	4
C.3.9	23[55%]	12[29%]	5[12%]	2[5%]		4.33	5	5
Overall Average Score	**19[46%]**	**17[40%]**	**5[12%]**	**1[2%]**	**-**	**4.26**	**4.44**	**4.67**

Source: - SPSS 26

4.2.2.4 The CreateWork Breakdown Structure process

The Create WBS process is the process of subdividing project deliverables and project work into smaller and manageable components.In order to assessthe practices of the WBS creation of the road construction projects,ten relevant questions were developed to be answered by participants.

Table 4.10 shows that of the 42 respondents on average 22 of the respondents shows an opinion of Strong Agrement, 15 respondents show an opinion of Agree, 3 respondents show an opinion of Nutral and 1 individual shows opinions of Disagree and Strongly Disagree. The mean value of the respondents opinion is 4.36 which is closer to 4 points of Likert scale that designates Agree.

All these indicates that almost all of the respondents have an opinion of agreement on the ten items of the inquiry which are developed to asses the WBS creation practices of the projects.

The agreement of most of the respondents indicates that there is a set point of reference for every activity to be done in the project which will help to see every project activity accomplishment from this set point of reference. This will avoide confusion and strengthens unity in the project team. Also this point of reference is changed only through the full knowledge of the project team raises the confidence of the team on their work. Aditionaly the respondents agreement on the sufficient decomposition of the total project work indicates that they are comfortable with the size of the project work done by an individual and also the adequacy of the time given for its accomplishment.

Table 4.10 Descriptive statistics for Create work breakdown structure process

Questions	SA	A	N	D	SD	Mean	Median	Mode
D.4.1	20[48%]	18[44%]		4[9%]		4.29	4	5
D.4.2	18[43%]	17[41%]	6[14%]		1[2%]	4.21	4	5
D.4.3	25[60%]	14[33%]	3[7%]			4.6	5	5
D.4.4	23[55%]	17[41%]	2[5%]			4.5	5	5
D.4.5	19[45%]	20[48%]	1[2%]	2[5%]		4.33	4	4
D.4.6	17[40%]	16[38%]	4[10%]	3[7%]	2[5%]	4.02	4	5
D.4.7	18[43%]	14[33%]	6[14%]	3[7%]	1[2%]	4.07	4	5
D.4.8	25[60%]	13[31%]	3[7%]		1[2%]	4.45	5	5
D.4.9	22[52%]	17[41%]	3[7%]			4.45	5	5
D.4.10	29[69%]	13[31%]				4.69	5	5
Overall Average Score	**22[52%]**	**15[37%]**	**3[7%]**	**1[2%]**	**1[2%]**	**4.36**	**4.5**	**4.9**

Source: - SPSS 26

4.4 Interview

In addition to the data collected through questionnaire and evidences gathered from the documents of the projects, an in-depth interview was held with team leaders of the two directorates of AACRA, Road construction Contract Administration Directorate and Road construction and maintenance Design Revision and Implementation Follow Up Directorate, and high way engineers/team leaders/ of the consultant firms. The responses of the officers are presented below. The interview questions are also annexed herewith.

From the interview it is understood that in confirmation with the responses in the questioner the team leaders argued that all the scope management process are well practiced except the project requirement planning and management process which is not performed in an integrated manner. The project requirements, transition and readiness requirements, quality requirements are managed in an integrated manner under the three directorates of the Authority; Road construction Contract Administration Directorate and Road construction and maintenance Design Revision and Implementation Follow Up Directorate and Quality assurance directorate. However; the stakeholders' requirement is managed by the two directorates, Road construction and maintenance Design Revision and Implementation Follow up Directorate and write-off directorate, but not in an integrated manner and planned manner.

There are four stakeholders mainly that are related to the write-off activity of the road projects, Ethiopian Telecommunications Corporation (ETC), Ethiopian Electric Light and Power Authority (EELPA), Addis Ababa Water and Sewerage Authority (AAWSA) and dwellers of the city living in the project area. According to the team leaders of the two directorates the problem of write-off related to the three service giving authorities is the problem of unavailability of enough time and lack of sufficient follow up.

However the write-off activity related to the inhabitants of the city living in the project area is that the time given for the write-off activity does not consider the real situation in the ground. Properties of the dwellers to be written-off are of three types. The property may be personal property of the occupant or property of the kebele administration rented to the occupant. The writing-off the property may be full removal or partial removal.

The time given for the resettlement/compensation payment/ of the occupants does not consider all the facts stated above and is set in an unplanned way. And it is not enough to prepare the site for construction by resettling/paying compensation/ the occupants in a place given in exchange for their written-off property.

However; the authority announces for contractor recruitment without either resettling/giving the appropriate compensation or giving an appropriate time for the resettlement activity to be completed. As a result of this the recruitment is processed and a contractor recruited and the construction is started before the completion of the written-off activity.

That is the construction and the write-off goes side by side together. Mostly, the write-off activity is not completed at a time that supports the work schedule of the construction activity. This makes the construction activity to be delayed until the properties are removed. This will cause the project completion time beyond the initially planed project period. This causes both project time overrun and cost overrun.

CHAPTER FIVE

5. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of findings and some recommendations made for improving the management gaps observed during the study. It has four sections. The first sction is an introduction part followed by summary of the findings in the second section. The third section presents the conclusion and the fourth section presents recommendations belived to fill the gap observed in the study.

5.2. Summary of Findings

5.2.1. Plan Scope Management Process

5.2.2.1. Scope Management Plan

The study used five items of inquiry for the assessment of the scope management planning practices of the road construction projects in Addis Ababa city. The average values of the respondents on the five items of the inquiry are in the range of 3.98 to 4.33 points of Likert-scale each of which are closer to the Likert-scale of 4 points. The item of inquiry assessing the clearity of the scope management plan in describing the Process of preparing a project scope statement (A1.1.2) and the item of inquiry assessing clearity of the scope management plan in describing the process of how formal acceptance of the completed project deliverables will be obtained (A1.1.5), take the largest value of respondents' opinions of 4.33 points of Likert scale,than the other three items of the inquiry used in this section of the assessment. The item of inquiry which assess clearity of the scope management plan in describing the process of the creation of the WBS (A.1.1.3) and the item of inquiry assessing clearity of the scope management plan in describing the Process of how the scope baseline will be approved and maintained (A.1.1.4) takes value of respondents' opinions averaging 4.10 and 4.29 points of Likert scale respectively. However, the item of inquiry assessing the prearation of scope management plan & requirements management plan in the scope management process (A.1.1.1) takes the lowest value of

respondents' opinions than the other items of the inquiry used in this section of the assessment which is 3.98 points of Likert scale.

The Majority of the respondents agreed that management of scope of the road construction projects are planed initialy and a scope management plan is prepared to execute this plan. Additionally, they agreed that the scope management plan produced clearly describes the process of preparing the scope statement of the projects, the creation of the WBSof the projects, the scope baseline approval of the projects, obtaining formal acceptance of the completed project deliverables.Opinions of the targeted respondents indicate the existence of sound practices of management used for the planning of scope management of the projects.

5.2.2.2. Requirement Management Plan

In this section of the assessment four items of inquiry are used to assess the requirement management planning practices of the road construction projects running in Addis Ababa city. Average values of respondents' opinion on the four items of the inquiry used in this section of the assessment range from1.57 to 2.07 points of Likert-scale each of which are near to the Likert-scale of 2 points. The item of inquiry evaluating clearity of the requirements management plan in describing how requirements activities will be planned, tracked, and reported (A2.1.1) takes the largest average value of 2.07 points of Likert-scale, clearity of the requirements management plan in describing the process of changes initiation, the impacts of these changes and the tracing, tracking, and reporting of the changes(A.2.1.2) takes the second largest average value of 1.98 points of Likert-scale. Level of describtion of: the authorization levels required to approve these changes (A.2.1.3) and requirements prioritization process(A.2.1.4) in the requirements management plan get an assessment value of 1.90 and 1.57 points of Likert-scale.

A large number of respondents have a view that the requirement management plan lacks clarity in describing how requirements activities are planned, tracked, and reported. Additionally, respondents have an opinion of disagreement on the clearness of the requirement management plan in describing the process of changes initiation, analysis of impacts of these changes and tracking and reporting the changes. Respondents also show disagreement in the precision of the requirements management plan in describing the authorization levels required to approve these

changes and requirements prioritization process. These imply that most of the study's respondents disagreed on the existence of sound practices of management used for the planning of requirements management of the projects.

5.2.3. Collect Requirements Process

In investigating stakeholders' requirement management practices of the road construction projects running in Addis Ababa city eight items of inquiry are used. The average values of respondents'opinion on these eight items of the inquiry are in the range of 2.07 to 2.45 points of Likert-scale which means that all average values of the items of inquiry used in this section of the assesment are close to the 2 points of Likert-scale. The Items of inquiry assessing: documentation of requirments and development of a requirements traceability matrix (B.2.1); components of the the requirement documentation (B.2.2); progressive decomposition of requirements from higher level requirments in to a more detailed requirements (B.2.3) gets opinion of 2.26, 2.33 and 2.40 respectively. Items of inquiry assessing usage of the requirements traceability matrix for: tracking of requirements in the documentation throughout the project life cycle (B.2.4); linking of work requirements from their origin to the deliverables that satisfy them (B.2.5); linking of each requirement to the organizational/ business/ and project objectives (B.2.6); management of changes to the product scope (B.2.7) have an average respondents' opinion of 2.26, 2.45, 2.07 and 2.17 points of Likert-scale respectively.

From the total response of the participants it can be summurised that most of the respondents showed disagreement on almost all the items of inquiry used in this section of the assessment whch assess: the availability of practice of project requirements documentation and the development of requirements traceability matrix which will be used for following up the requirments of the projects; the inclusion of the different varieties of requirements that should have been included in the project's requirements documentation of a project in an organized way; the tractability of requirements throughout the project life cycle; the tractability of the link of project requirements from their origin to the deliverables that satisfy them; the tractability of the link of each requirement to the organizational/ business/ and project objectives, recording requirement's attributes in the requirements traceability matrix; controlling of project scope changes by the requirements traceability matrix. These imply that most of the study's

participants disagreed on the existence of sound practices of management used for managing the requirements of the projects.

5.2.4. Define Scope Process

This section of the assessment used nine items of inquiry for evaluating the scope definition practices used in the road construction projects. The average values of respondents' opinion of the nine items of the inquiry used in this section of the assessment are in the range of 3.64 to 4.48 points of Likert-scale. This indicates that all the nine average values of respondents opinions are above the Likert-scale of 3 points.The item of inquiry assessing definition of the project scope statement in the scope management process (C.3.1) takes an average respondents' opinion of 4.29 points of Likert-scale. The values of average respondents' opinion of 4.48 points of Likert-scale is given for the item of inquiry assessing the roubestness of the project scope statement in describing unique and verifiable work, result, or capability to perform a service that is required to be produced to complete a process, phase, or project (C.3.2). The average value of the respondents opinion for the assessment of the strength of the project scope statement in progressively elaborating the characteristics of the work, service, or result described in the project charter/Term of reference/ and requirements documentation (C.3.3) is 4.4 points of Likert-scale. The average values of respondents' opinion assessing clarity of the project scope statement in describing acceptance criteria of the deliverables (C.3.4), and what is excluded from the project (C.3.5) are 4.24 and 3.64 points of Likert-scale consequetively. The mean value of respondents opinion on the item of inquiry assessing the project scope statement's capacity: in enabling the project team to perform more detailed planning (C.3.6), guiding the project team's work during execution (C.3.7), providing the baseline for evaluating whether requests for changes or additional work are contained within or outside the project's boundaries (C.3.8) and creating common understanding of the project scope among project stakeholders (C.3.9) are 4.43, 4.26, 4.31and 4.33 points of Likert-scale consequetively.

Most of the respondents strongly agree on the availability of a clearly defined project scope statement and on its clarity in describing a unique and verifiable product, result. The respondents likewise showed an agreement on the comprehensiveness of the scope statement in describing the characteristics of the project. The respondents similarliy showed an agremment on its

assistance in enabling the project team to perform more detailed planning andits creation of common understanding of the project scope among project stakeholders. Large no of respondents as well showed an opinion of either an agreement or strong agreement on the precision of the scope statement indescribing the acceptance criteria of the deliverables.

5.2.5. Create Wbs Process

In this section of the study ten items of inquiry are used for the assessment of the WBS creation practices of the road construction projects in Addis Ababa city. Average values of the respondents opinion on the nine items of the inquiry range from 4.02 to 4.69 points of Likert-scale which means that all the average values of the ten items of inquiry are above the Likert-scale of 3 points. The three items of the inquiry having the first three largest average respondents' opinion of 4.69, 4.6 and 4.5 points of Likert-scale are items of inquiry asseing: proper decomposition of the total scope of the work to be carried out by the project team (D.4.3), the level of definition of the project work as moved down the hierarchical decomposition (WBS) (D.4.4) and usage of the scope baseline as a basis for comparison (D.4.10) consequetively.Item of inquiry assessing that the WBS dictionary provides detailed deliverable, activity, and scheduling information about each component in the WBS (D.4.8) and inclusion of the scope baseline as a component of the project management plan (D.4.9) takes an average respondents' opinion of 4.45 points of Likert-scale. While average values of respondent's opinions for the assessments of: components of the scope base line used in the scope management process (D.4.1), procedure followed in changing the scope baseline of the project (D.4.2), ability of the WBS dictionary document in supporting the WBS (D.4.5) and availability of a unique identifier for the lowest level of the WBS, work package (D.4.6) and usage of these identifiers for hierarchical summation of costs, schedule, and resource information(D.4.7) are 4.29, 4.21, 4.33, 4.02 and 4.07 points of Likert-scale respectively.

Respondents strongly agree that the road construction projects have a scope baseline which comprises the WBS, the WBS dictionary and the work package and change of this scope baseline is only through formal change control procedures.The respondents also have a strong agreement on the sufficient decomposition of the total scope of the work to be carried out by the project team. Most of the respondants also strongly agree that: the WBS dictionary effectively suports

the WBS; detailed deliverable, activity, and scheduling information about each component in the WBS are provided by the WBS dictionary;the scope baseline is used as a basis for comparison during constraction of the road projects.

5.3 Conclusion

The objective of this study was to assess the scope management practices of road constraction projects. In order to achcive this objective, relevant literature review was conducted considering scope management practices, i.e, Planning management of scope, requirments collection from stakeholders, define scope of a project, create WBS of a project, validate scope of a project, control scope of a project. In addition, empirical studies in the area were tried to be viewed.

Based on findings of the assessment of this project work, which assess scope management practice of road construction projects of AACRA road project it can be concluded that the scope management practice of the road construction projects is at good status except practices of requirement planning and requirements managementused in the scope management process of the projects

On interviews held with team leaders of the design directorate and contract administration directorate it is understood that the ineffectiveness of most projects in meting their initialy set objectives is the incapability of the authority in managing stake holders' requirments of the projects.

5.4 Recommendation

The following recommendations are made to the scope management practices of Addis Ababa city road projects based on the analysis made above which are recomended to be implemented in the future projects of the city.

It is recommended that Future road projects of the city that they keep the good trends achieved by the projects in the scope management practices of: scope management planning, scope definition, work breakdown creation practices of the projects.

It is also important to improve the requirement planning and management practices of the projects by: making the organizational structure of the authority supportive` for the collaborative work of the units working on requirments planning and mannagment, conducting continuous discussion with the stakeholders of the projects and identifying the problems and situations in the ground; and conducting continuous research on the issue of requirements planning and management in the authority to identify the real problem and to develop a solution for it.

Reference

Addis Ababa city Roads Authority, Finote Addis Bulletin, Meskerem/2011

Alias, Z., Ahmad@Baharum, Z., and Idris, M. F. M. (2012) Project Management Towards Best Practice, in: Procedia – Social and Behavioural Science (ed.) ASIA Pacific International Conference on Environment-Behaviour Studies Mercure Le Sphinx Cairo Hotel, Giza, Egypt, 31 October – 2 November 2012. Malaysia, Elsevier Ltd., pp. 108–120.

Almohammad, M. and Jamaludin, O. B. (2018) A Review OF Major Causes of Delay in Road Construction Projects, *International Journal of Advance Engineering and Research Development,* 5(9), pp.98-102.

Al-Rubaiei, Q.H.S, Nifa, F.A.A, Musa, S. (2016) Project scope management through multiple perspectives: A critical review of concepts. in: AIP Conference Proceedings 2016, 020025 (2018). AIP publisher.

Ayalew, T., Dakhli, Z., Lafhaj, Z. (2016) Assessment on Performance and Challenges of Ethiopian Construction Industry, Journal of Architecture and Civil Engineering, 2 (11) pp: 01-11.

Bccampus OpenEd.(2020) Scope Planning [online] Available from:https://opentextbc.ca/projectmanagement/chapter/chapter-9-scope-planning [Accessed 23rd March 2020].

Creswell, J.W., (2014) *Research Designs: Qualitative, Quantitative and Mixed Methods Approaches.* Third Edition, USA, SAGE Publications Inc**.**

Chu, M., Altwies, D., Walker, E. (2005) Achieve PMP Exam Success: A concise study guide for the busy project manager. USA, Outer Core Professional Development.

Enshassi, A., Al-Hallaq, K., and Mohamed, S. (2006). Causes of contractor's business failure in developing countries: The case of Palestine. Journal of Construction in Developing Countries, 11(2), pp.1–14.

Fageha, M. K., & Aibinu, A. A. (2013) Managing project scope definition to improve stakeholders' participation and enhance project outcome. *Procedia-Social and Behavioral Sciences*, 74, pp.154-164.

Gwaya, A. O., Masu, S. M. and Wanyona, G. (2014) A Critical Analysis of the Causes of Project Management Failures in Kenya, *International Journal Of Soft Computing and Enginering(IJSCE)* 4(1), pp. 64–69.

Hasan, R., Suliman, S. and Al Malki, Y. (2014) An Investigation into the Delays in Road Projects in Bahrain, *International Journal of Research in Engineering and Science*, 2(2), pp. 38–47.

Heldman, K. and Mangano, V. (2009) Project Management Professional Exam Review Guide. Canada, Wiley Publishing, Inc.

Jonasson, H. (2008) Determining Project Requirements. USA, Taylor & Francis Group, LLC

Kassa, Y.F. (2018) Determinants of Infrastructure Project Delays and Cost Escalations: The Cases of Road and Railway Construction Projects in Ethiopia. Master's Thesis. Addis Ababa University, Ethiopia.

Kerzner, H. (2009) Project Management: A Systems Approach to Planning, Scheduling, and Controlling. Tenth Edition. Canada, John Wiley & Sons, Inc.

Khan, A. (2006) Project Scope Management, Cost Engineering, 48(6), 12-16.

King T. D. (2015) Poor Project Management Performance, no. 303, 2015.

Kissi, E. and Ansah, S.K. (2013) Professional Project Management Practices and its Constraints in Developing African Countries: A Literature Review, Covenant Journal of Research in the Built Environment (CJRBE), 1(2), PP.1-16.

Kissi, E. and Ansah, S. K. (2013) Professional Project Management Practices and it's Constraints in Developing African Countries, Covenant Journal of Research in the Built Environment (CJBRE), 1(2), pp. 28–40.

Kothari C.R (2004) *Research Methodology*, second edition, India, New Age International (P) Ltd., Publishers.

Kumar, R., (2011) *Research Methodology: a step-by-step guide for beginners*, Third Edition, India, SAGE Publications India Pvt. Ltd

Larson, E.W. and Gray, C.F, (2011) Project Management: The Managerial Process. USA, The McGraw-Hill Companies, Inc.

Leibing, R. (2001)*The construction industry: Processes, players, and practices.*[online] USA, Prentice Hall, Upper Saddle River, NJ. Availed from: malcat.uum.edu.my/kip/Record/iium.u191149 [Accessed 18 June, 2020].

Master of project blog, blog.masterofproject.com, Accessed on 20/6/2020

Mishra, R.C. and Soota, T. (2005) Modern Project Management. India, New Age International (P) Ltd., Publishers.

Mohammed, S.(2017) An Assessment of The Project Planning Practices of Addis Ababa Housing Project in The Sites Project14, Project13, Kilinto and Head Office. Master's Thesis. St.Marys's University, Ethiopia.

Monnappa, A. (2017) Project Scope Management: What It is and Why It's Important [online] Available from http://www.simplilearn.com./project-scope-managment-importance-rar89-article. [Accessed 29th April 2020].

Neville, C., (2007) *Introduction to Research.* UK, University of Bradford School of Management.

Nicholas, J.M (2004) Project Management for Business and Engineering: Principles and Practice. Second Edition. USA, Elsevier Inc.

Okoye, P. U., Ngwu, C. and Ugochukwu, S. (2015) Evaluation of Management Challenges Facing Construction Practice in Nigeria, International Journal of Appl. or Innovation Engineering Management, 4(1), pp. 19–28.

Othman, A. A. E. (2015) An international index for customer satisfaction in the construction industry, Journal of Construction Engineering and Project Management, 15(1), pp. 33–58.

Portny, S.E. (2010) Project Management for Dummies. Third Edition. Canada, Wiley Publishing, Inc

Project Management Institute (2017) A guide to the project management body of knowledge. Six edition. USA, Project Management Institute, Inc.

Project Management Institute (2017) PMI Lexicon of Project Management Terms.Version 3.2, USA, Project Management Institute, Inc.

Richman, L. (2002) Project Management Step - By -Step. USA, Larry Richman.

Santoso, D. S. and Soeng, S.(2016) Analyzing Delays of Road Construction Projects in Cambodia: Causes and Effects, *Journal of Management in Engineering*, 32(6), p. 05016020.

Shrivastava, A. A., Hariharan, S. (2015) Deliverable Management In Projects. *International Journal of Engineering and Computer Science* 4(6), pp.12716–12718.

Singh, R. (2009) Delays and cost overruns in infrastructure projects: an enquiry into extents, causes and remedies. Economic & Political Weekly, 45(21), pp. 43-54.

Singh, R. (2010) Delays and cost overruns in infrastructure projects: extent, causes and remedies. Economic & Political Weekly, 45(21), pp. 43.

Svejvig, P., Geraldi, J., Grex, S. (2019) Accelerating time to impact: Deconstructing practices to achieve project value, *International Journal of Project Management*, 37, pp.784 – 801.

Team FME (2014)Project Scope Management..[online] free-management-ebooks.com. Available from: http://www.free-management-ebooks.com ISBN 978-1-62620-980-7[Accessed 18 June 2020]

Turkey Wakjira (2011) Risk Factors Leading to Cost Overrun in Ethiopian Federal Road Construction Projects and Its Consequences. Master's Thesis. Addis Ababa University, Ethiopia.

Tonnquist, B. (2009) Project Management A Complet Guide. Denmark, Academica.

Vargas, R. V. (2008) Practical Guide to Project Planning. USA,Auerbach Publications Taylor & Francis Group.

Walliman, N., (2011) *Research methods: The basics,* USA, Taylor & Francis

Weldegebriel, M. (2018) Assessment of Critical Success Factors for Road Construction Projects in Ethiopia, *International Knowledge sharing platform, Civil and Environmental Research* 10(3).

Zewdu, Z. T. and Aregaw, G. T. (2015) Causes of Contractor Cost Overrun in Construction Projects: The Case of Ethiopian Construction Sector, International Journal of Business and Economics Research, 4(4), pp. 180–191.

Appendix

Addis Ababa University

Faculty of Business and Economics

Department of Business Administration and Information System

Project Management MA Program

August, 2020

Dear, sir/Madam

This questionnaire aims at exploring information regarding the scope management practices of road projects running in Addis Ababa. The response will be used for as a component of the data that is needed for the Project work entitled ***"Scope Management Practices of Road Projects in Addis Ababa: Managerial Perspective-The case of Addis Ababa City Roads Authority Road Projects*"**, which is being conducted as partial fulfillment of an MA program in Project management in Addis Ababa University; Business and Economics Faculty, School of Commerce. The result of the study will contribute to the activity of identifying best practices of scope management employed on the road projects and the drawbacks in properly managing scope of road projects.

Since the success of this study depends on the cooperation of all targeted respondents, the information that will be obtained from the questionnaire, you are kindly requested to respond to the questions to the best of your knowledge.

Your honest and thoughtful response is invaluable

Thank you, in advance for your co-operation and participating in the project work

Brook Hailemariam

E-Mail brook131@gmail.com

Brief information of the projects:

Project: _____

Employer: Addis Ababa City Road Authority (AACRA)_____

Consultant: _____

Contractor: _____

Contract Period: _____

Project location: _____

Total length of project in Km: _____

Section I: Questionnaire

Part I: Demographic Profile

Please respond to the following questions by marking (X) sign:

1. Sex

Male ☐ Female ☐

2. Age

18-29 ☐ 30-40 ☐

41-49 ☐ 50 and above ☐

3. Educational status

Diploma ☐ 1st Degree ☐

2nd Degree (MA) ☐ 3rd Degree(PhD.) ☐

Other ☐

4. How long have you been working in road projects?

1-5-year ☐ 6-10-year ☐

11-15-year ☐ More than 15 Years ☐

5. How many years have you worked as member/leader of design team of Road project/s?

1-5-year ☐ 6-10-year ☐

11-15-year ☐ More than 15 Years ☐

Part II: Project scope Management Process

The following set of statements relate to your outlook about the scope management practice of road projects in Addis Ababa City Roads Authority. Read and show to what extent you agree with them by marking (X) sign.

1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

A. Questions on Planning thescope management of theproject

1. Scope management plan

Parameters	5	4	3	2	1
A1.1.1 Scope management plan & requirements management plan are produced in the scope management planning and management process.					
A1.1.2The scope management plan clearly describes the Process of preparing a project scope statement.					
A1.1.3The scope management plan clearly describes the Process of the creation of the WBS.					
A1.1.4The scope management plan clearly describes the Process of how the scope baseline will be approved and maintained.					
A1.1.5The scope management plan clearly describes the Process of how formal acceptance of the completed project deliverables will be obtained.					

2. Requirement management plan

Parameters	5	4	3	2	1
A2.1.1 The requirements management plan clearly describes how requirements activities will be planned, tracked, and reported.					
A2.1.2The requirements management plan clearly describes the process of changes initiation, the process of analysis of impacts of these changes and the process of tracing, tracking, and reporting the changes.					
A2.1.3The requirements management plan describes the authorization levels required to approve these changes. .					
A2.1.5 The requirements management plan clearly describes requirements prioritization process.					

B. Questions on Collection ofrequirements fromstakeholders

Parameters	5	4	3	2	1
B.2.1 Requirements are documented and requirements traceability matrix is developed in the scope management planning and management process.					
B.2.2 The requirement documentation of the project/s include/s requirements of the organization*(Business requirements);Stakeholder requirements*; Features, functions, and characteristics of the product, service, or result; Data conversion and training requirements *(Transition and readiness requirements);* the actions, processes, or other conditions the project needs to meet *(Project requirements);*Quality requirements.					
B.2.2 In the requirements documentation, requirements start out at a high level and become progressively more detailed as more information about the requirements is known.					
B.2.3 Requirements in the documentation are tracked throughout the project life cycle by the requirements traceability matrix.					
B.2.4 Product requirements from their origin are linked to the deliverables that satisfy them by the requirements traceability matrix.					
B.2.5 Each requirement is linked to the organizational/ business/ and project objectives by requirements traceability matrix.					
B.2.6 The requirements traceability matrix records attributes associated with each requirement.					
B.2.7 The requirements traceability matrix manages changes to the scope of the work.					
B.2.8 Requirements made unambiguous /measurable and testable/, traceable, complete, consistent, and acceptable to key stakeholders before being baselined.					

C. Questions onDefineProject Scope

Parameters	5	4	3	2	1
C.3.1 A clear project scope statement is defined /stated/ in the scope management planning and management process.					
C.3.2 The project scope statement describes any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project.					
C.3.3 The project scope statement Progressively elaborates the characteristics of the product, service, or result described in the project charter/Term of reference/ and requirements documentation.					
C.3.4 The project scope statement clearly describes acceptance criteria of the deliverables.					
C.3.5 The project scope statement describes what is excluded from the project.					
C.3.6 The project scope statement enables the project team to perform more detailed planning.					
C.3.7 The project scope statement guides the project team's work during execution.					
C.3.8 The project scope statement provides the baseline for evaluating whether requests for changes or additional work are contained within or outside the project's boundaries.					
C.3.9 The project scope statement creates common understanding of the project scope among project stakeholders.					

D. Questions on CreateWorkBreakdownStructure

Parameters	5	4	3	2	1
D.4.1 A scope base line which includes the WBS, the WBS dictionary, the work package is set in the scope management planning and management process.					
D.4.2 The scope baseline is changed only through formal change control procedures					
D.4.3 The total scope of the work to be carried out by the project team is properly decomposed.					
D.4.5 Each descending level of the hierarchical decomposition (WBS) represents an increasingly detailed definition of the project work.					
D.4.6 The WBS dictionary document supports the WBS.					
D.4.7 The lowest level of the WBS, work package, is with a unique identifier.					
D.4.8 Do these identifiers provide a structure for hierarchical summation of costs, schedule, and resource information and form a code of accounts?					
D.4.9 The WBS dictionary provides detailed deliverable, activity, and scheduling information about each component in the WBS.					
D.4.10 The scope baseline included as a component of the project management plan.					
D.4.11 The scope baseline is used as a basis for comparison.					