Addis Ababa University School of Commerce

Department of Project Management Post Graduate Program

The Factors Affecting Project Planning and the Effect of Planning on Project Success.

A Research Project Submitted in Partial Fulfillment of the Requirements for the Award of Master of Arts Degree in Project Management

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June 2022 G.C

Addis Ababa, Ethiopia

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DECLARATION

I, Netsanet Million, declare that this thesis entitled '**The Factors Affecting Project Planning and the Effect of Planning on Project Success**' is my own original work. It contains no material which has been accepted for the award of any other degree of the university or any other institution of higher learning. All sources of materials used for the research paper have been duly acknowledged.

Netsanet Million		28 June 2022
Name	Signature	Date

ENDORSEMENT

This thesis entitled **'The Factors Affecting Project Planning and the Effect of Planning on Project Success'** has been submitted to Addis Ababa University School of Commerce, Department of Project Management, with my guidance and approval as a university advisor.

Dr. Adane Atara

Advisor

18/07/2022

Signature & Date

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CERTIFICATION BY BOARD OF EXAMINATION

Approved by Board of Examiners

Advisor	**Signature**	**Date**
Internal Examiner	**Signature**	**Date**
External Examiner	**Signature**	**Date**

ACKNOWLEDGEMENT

I would like to thank God for giving me all the opportunities as well as the required provisions throughout the post graduate study.

It is with great respect and feeling of admiration that I would like to extend gratefulness to my advisor Dr. Adane Atara who has greatly expanded my viewpoint besides his beneficial lessons.

I would also like to thank Yosef G/Meskel and others who gave me their valuable time and assistance in provide relevant documents.

I am grateful to my Family who has always been supportive and whose precious moral support throughout this study made the realization of this work possible.

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ACRONYMS

COCOMO- Constructive cost model

CPM - Critical Path Method

OBS - Organizational Breakdown Structure

PMLC Project Management Life Cycle

PMBOK- Project management body of knowledge

PERT - Program evaluation and review technique

PMI - Project Management Institute

RPN Risk Priority Number

SPSS Statistical Package for the Social Sciences

SWOT Strengths, Weaknesses, Opportunities, and Threats

WBS - Work Breakdown Structure

ABSTRACT

Projects play a major role in the economic development of a country. They are the building blocks for generating additional capital and for ensuring a flow of goods and services. The objective of the project management is to realize the planned project objectives (economic development, generation of additional capital...). The success of any project is measured by its completion time, within the budget cost and meet the planned performance based on the initial plan. Therefore, planning has an important role on the project success. This paper aimed mainly at evaluating ***The Factors Affecting Project Planning and the Effect of Planning on Project Success****. This paper examines the relationship between project planning processes and project success. Four planning input factors (human, management, technical and organizational factors) are considered which is believed to affect the quality of planning. The study is based on data obtained from different construction projects performed in Ethiopia and Includes an analysis on statistical correlation between planning input factors and planning processes, and between planning processes and project success. The approach that used in this research was a quantitative research approach which makes the descriptive method more reliable and explanatory. The study used relative important index, correlation and regression Analysis to identify the key determining factors of project planning on success. The finding suggests that planning processes are insensitive to human factor. Moreover, only three project planning processes (time, cost and risk) are positively associated with the project success. Furthermore, the findings show that there are 13 important planning activities which influence projects. This report recommends an organization that conducts any project should identify the factors affecting project planning and the effect of planning on projects success.*

Keywords: Planning Knowledge Areas, Planning input factor, Project success

CHAPTER ONE -INTRODUCTION

1.1 Background of the Study

Projects play a major role in the economic development of a country. They are the building blocks for generating additional capital and for ensuring a flow of goods and services. The objective of the project management is to realize the planned project objectives (economic development, generation of additional capital, etc.). These project management has different phases and processes within it. Each phase contains rigorous and comprehensive activities to be performed.

The success of any project is measured by its completion time, within the budget cost and meet the planned performance based on the initial plan. Therefore, planning has an important role on the project success. To accomplish all these projects successfully, each of them must undergo different phases where the level of efforts and impacts to the project success depends on the phases.

Among these different phases of the project, project planning is one of the important phases. Although earlier studies have considered many factors that influence project outcome, planning was mentioned as an important factor for project success. Previous researches have indicated poor project planning is one of the reasons for project failure. Moreover, researchers discovered that there is positive interaction between project planning and project success (Aladwani, 2002) (Dvir, D., Raz, T., & Shenhar, A.J., 2003) Project planning processes can be affected by different factors. Researches of (Chatzoglou, P., & Macaulay, L., 1998) and (Whittaker, 1999) identified that the management factors have a direct impact on project planning processes. Moreover, (Chatzoglou, 1997); (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999) identified that the techniques used for project planning influences the planning. Furthermore, researchers discovered that the personal/Human Factor has a great importance in the planning stage of the project (Aladwani, 2002) (Chatzoglou, 1997)and (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999)

These researches deal with the determinants of project success worldwide. Thus, studies discovered causes of project success and standards for measuring project success (Baccarini, D, 1999). Success criteria need to be separated from success factors, as both appear often in literature. The measures of projects judged in terms of failure or success are criteria.

(Adeyemi, L., Idoko, M., 2008)showed that project failure in developing countries is significant and involves considerable time and cost overrun. Even though, in general most projects have a significant contribution to the economy, the success of the project remains generally low in a developing country. The success and failure of projects are very serious for the so-called capital-starved countries. Therefore, a through attention must be given for planning activities to have successful projects.

There are different activities to be executed to accomplish the planning stages fully and each of these activities have different contributions to make for the project's success. These activities require considerable time and effort of the project manager. However, it is evident that the project manager has limited time scheduled for numerous responsibilities. Therefore, they need to give attention to those activities which yield greater results for project success (Berhan E., & Beshah B., 2017).

Hence, the purpose of this study is to identify the key determining factors that influence project success in the planning phase.

This paper studies about the factors affecting project planning and the effect of planning on project success, examines the relationship between different planning input factors and planning processes, and planning processes with project success. The objective of this research is to differentiate key factors of the planning input factors and planning processes that yields better impact on the project success. The analysis is based on data collected from projects performed in Ethiopia and includes four planning input factors (human, managerial, technical and organizational) and the nine project planning processes (time, cost, risk, scope, quality, procurement, human resource, integration and communication).

1.2 Statement of the problem

Projects are needed to be completed within the time frame, budgeted cost and required quality. However, unfortunately many projects take longer time to complete, cost more than necessary and some projects are cancelled because of inefficient planning and related challenges directly and/or indirectly related with it.

If the project takes longer time it requires additional resources, and budgets and this increases labor, material, machinery and equipment cost. This affects the budget of other projects and in general, it affects the economy of the country. Similarly, due to delay in project implementation the people and the economy must wait for the provision of public and services facility longer than necessary.

Thus, failure of project limits the growth of the economy because the output provided by infrastructure, construction and manufacturing. The performance problems of project cost overrun, time delay, quality deficiency is caused by either in selection, planning, execution or control phase of the project and other factors. However, according to (Macaulay & Faniran O. O, 1998) one of the main reasons of project failure in developing countries is lack of effective planning and implementation process.

Most construction projects schedule prepared at the beginning of the project as the contract forced the contractor to do so but was not revised without delay due to this time overrun on the completion time of the project.

Execution without proper development of a project plan often causes delays, high cost and general execution problems in the project. The lack of an implemented project plan has caused problems in all project management areas and has made it impossible for the management team to have the required control of project activities. In this regard, different researchers show the effects of project planning on project performance. The studies by (Whittaker, 1999)shows that time spent on project planning activities will reduce risk and increase project success.

As a practitioner in one of the well-known GC 1 Construction Companies in Ethiopia, the researcher has witnessed that there are planning related challenge on executing projects efficiently and effectively. Due to this, companies are exposed to unnecessary cost and time overruns.

Although different researches showed that the quality of the planning processes are determined by different factors, there are few researches i.e. ((Berhan E., & Beshah B., 2017); (Baker, B.N. Briner, Hastings & Geddes, 1996)) conducted to measure the vital project planning activities considering the input factors of project planning on the project success. Differing from previously conducted local researches which suggested that human factor is insensitive as compared with other project planning factors (management, technical and organizational), the current study tried to unveil all the project planning factors mentioned above.

A projects success depends on the projects planning, scheduling and implementation. Therefore, careful study assessment on the factors affecting project planning and effect of planning on project success is essential on construction Project. Accordingly, this study will identify and assesses on the factors affecting project planning and effect of planning on projects success to take corrective action and prevent project failure.

1.3 Research Questions

The following research questions have been developed to address the purpose and objectives of the study.

1.3.1 General Research Question

The general research question that the study tries to answer is:

What are the factors affecting project planning and the effect of planning on project success?

1.3.2 Specific Research Questions

1. What are the common factors affecting project planning?
2. What are the common problem areas in project planning activities?
3. What is the effect of the project planning on project success?

1.4 Objectives of the Study

1.4.1 General Objective

The general goal of this research project is to assess on the factors affecting project planning and the effect of planning on projects success.

1.4.2 Specific Objectives

In assessing the factors affecting project planning and the effect of planning on projects success, the following three specific objectives have been established.

- To differentiate key factors of the planning input factors
- To identify planning processes that yields better impact on the project success.
- To come up with a better recommendation on project planning improve projects performance.

1.5 Significance of the Study

The outputs of the research will show the factors affecting project planning and the effect of planning on project success. Hence, the research will benefit different stakeholders and to the industry in such a way that;

a) **To Contractors**

The study will help contractors produce a good and realistic plan for the project and finally help the project to be successfully completed on time by using it for internal purposes during progress monitoring and evaluation.

b) **To Consultants and Employers**

The plan preparation process will be reviewed by consultants and clients as well as ideas related to factors to be considered during the review of a planning, submission and approval of the work program, progress monitoring, deliverable tracking and remedial rights review.

Finally, the parties will also benefit from the recommendations and improvement actions that will be made and suggested based on the industry's actual data obtained.

c) Academic researcher

This study may use as good ground for further study, governmental and non-governmental organizations that may have interest to undertake study with similar theme areas. Moreover, the study contributes an important finding that becomes part of empirical knowledge in the area by filling knowledge gap.

1.6 Scope of the Study

The aim of this study is to identify the factors affecting project planning and the effect of planning on project success. This study is only concentrated on accessing the factors affecting project planning and the effect of planning on project success, through the generally accepted project management knowledge areas defined by PMBOK, which will enhance the management of projects.

1.7 Limitations of the Study

The limitation of the study is even if the study was for academic purpose some contractors were not willing to give all the information requested for the study. Some of the respondents were not willing to fill the questionnaire. However, considerable care has been taken in the collection and analysis of all the evidential matter to minimize the impact of these shortcomings.

1.8 Terms and Definitions

Project planning involves the process of preparing for the commitment of resources in the most economical manner. It defines the activities and events of the project together with

the required resources, cost, time, and success milestones for achievement of project objectives.

The plan must indicate the materials, equipment, facilities, human and other resources that are necessary to complete the project.

A *project* is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification (Wysocki. & Turner, J., 2014).

Project management is an organized common-sense approach that utilizes the appropriate client involvement to meet sponsor needs and deliver expected incremental business value (Wysocki. & Turner, J., 2014).

1.9 Organization of the Study

This thesis is organized in to five chapters. The first chapter discusses the general introduction to the research, statement of the problem, research questions, objectives of the study, significance of the study, scope, limitations of the study and definition of terms. Empirical and theoretical literature review from professional journals, books and internet searches will be reviewed in the second chapter. The third chapter will briefly present the research design and the methodology followed to achieve the objectives of the study. In chapter four, the results of the data obtained from the questionnaire survey were presented and interpreted accordingly. Finally, chapter five will summarize the study; conclusions and recommendations were forwarded based on the major findings of the study and discussed how the research objectives align with the findings.

CHAPTER TWO - LITERATURE REVIEW

2.1 Overview of the project planning and effect of planning on success

This chapter will provide valuable insights in to the concept of planning, factors affecting project planning and effect of planning on project success by reviewing the existing theoretical and empirical literatures. The aim of this literature review is to define the fundamental concepts and principles on which the research is focused, as well as to identify the gaps and shortcomings in the knowledge base practice.

2.2 Theoretical Review

2.2.1 Project and project management

There is a clear distinction between project and project management. Project is defined by (Bjeirmi, B.F. & Munns, A , 1996) as the collection of unique and complex activities/processes that requires resources to achieve the desired objective. On the other hand, (PMI, 2008)defines Project Management the application of tools, techniques, knowledge and skills to the project these activities/processes to achieve the objectives. Therefore, the achievement is subjected to time, cost and quality constraint. The use of these tools and techniques depends on the activities/processes based on the phases/lifecycle of the project (Atkinson, 1999).

2.2.2 Project planning

Researches indicated that project success is influenced by project planning (Aladwani, 2002) (Dvir, D., Raz, T., & Shenhar, A.J., 2003); (Whittaker, 1999) . Project planning involves the process of preparing for the commitment of resources in the most economical manner. It defines the activities and events of the project together with the required resources, cost, time, and success milestones for achievement of project objectives. The plan must indicate the materials, equipment, facilities, human and other resources that are necessary to complete the project.

2.2.3 Project planning input factors

Project planning processes can be affected by different factors. Researches of (Chatzoglou, 1997) and (Whittaker, 1999) identified that the management factors have a direct impact on project planning processes. Moreover, (Chatzoglou, 1997); (Verner, J. M., Overmyer,

S. P., & McCain, K. W., 1999) identified that the techniques used for project planning influences the planning. On the other hand, (Yeo, 2002) identified that the organization of the project is a valuable instrument for project planning activities. Furthermore, researchers discovered that the personal/Human Factor has a great importance in the planning stage of the project (Aladwani, 2002); (Chatzoglou, 1997) ; (Macaulay & Faniran O. O, 1998); (Dvir, D., Raz, T , & Shenhar, A.J., 2003); (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999)

2.2.4 Project success

Many researches support and suggested cost, time and quality as the success criteria for project (De Wit, 1998) (Olsen, 1971) and (Pinto, J. K., & Prescott, J.E., 1988). Projects measured against cost, time and quality are measuring the delivery stage, doing something right.

Historically the understanding of project success criteria has evolved from triple constraint concept, known as the iron triangle (time, cost and quality) to something that encompasses many additional success criteria such as quality, stakeholder satisfaction, and knowledge management (Atkinson, 1999). Projects are said to be successful if the iron triangle criteria are met: delivered on time, within budget and meeting the predetermined quality measures (Atkinson, 1999).

A variety of models for measuring project success were developed for measuring success with different underlying assumptions (Dvir, D., Raz, T., & Shenhar, A.J., 2003) ; (Pinto, J. K., & Prescott, J.E., 1988) (Zwikael, 2009). However, researches in the field of project success agree that it depends on the dimensions considered for the measurement of success perspective (Koops, L., Bosch-Rekveldt, M., Coman, L., Hertogh, M., & Bakker, H., 2016).

2.2.5 Project Planning Knowledge Areas

9 knowledge areas of project management are defined in Project Management Knowledge Body: - scope, time, cost, risk, efficiency, personnel resources, communication, acquisitions, and information integration sectors (PMI, 2008). Every field of knowledge of PMBOK consists of processes which are required to achieve the objective of the fields of knowledge. Since this research focuses on the preparation of the nine areas of expertise, this is discussed in this section of the report.

Project Integration planning knowledge areas

Knowledge planning project alignment co-ordinates the different project components, which is an integral part of planning processes. In integration management, priority should be put between competing priorities and alternatives. A concise and reliable document can be used to direct project execution and monitor in the creation of the project plan (Lindhard, s. & Larsen, J. K, 2016). The strategy includes general arrangements for all project areas, e.g. project priorities, schedule, budget, etc. (PMBOK, 2004). Because the Project Plan is the primary document established in the planning phase, the allocation of appropriate time and resources is very necessary for this phase. The most likely outcome of a project with a poorly designed project plan is high delays and high costs (Antvik, S., & Sjoholm, H., 2007). In order that we can achieve a complete and integrated project schedule, coordination between the various elements of the Schedule is a dynamic process and thus therefore needs to be iterated several times.

Project Scope planning knowledge areas

Project scope management preparation is a mechanism that ensures that all work needed for the project is done successfully and removes work not necessary. This field consists of the preparation of scope, the concept of scope and the development of WBS (PMBOK, 2004). For many projects the value of a well-designed scope of research has been seen. It is not unusual for a project to be launched without adequate planning and preparation. This often leads to concerns as there are likely to be extra costs and delays (Antvik, S., & Sjoholm, H., 2007). A specific project scope promotes the actual size of the task and offers insights into the milestones needed in the project to be achieved by the project organization (Baker, B.N. Briner, Hastings & Geddes, 1996).

Scope preparation is the process of designing the research required to produce the project product. The product / output definition and consumer specifications (PMBOK, 2004) shall be the basis of this report. The product of the scope preparation is a scoping strategy that explains primarily how to handle Defining the reach of the project has an impact on the overall performance of the project. The development of the project scope management plan and the details of the project scope start with a project charter analysis of information, a preliminary project scale declaration, the last approved version and historical data contained in the business process assets and all

relevant company environmental factors; the project management plan.

Project Time planning knowledge areas

Project time planning knowledge area includes all planning processes that are required to ensure a timely completion of the project the planning processes in time knowledge area include activity identification, activity scheduling, activity resource estimating, activity period estimating and schedule creation (PMBOK, 2004). The time schedule is one of the most important plans in a project. The layout of the timetable be based on the WBS. According to (Antvik, S., & Sjoholm, H., 2007), it is critical that activities are precisely sequenced to create practical and achievable schedules.

Project Cost planning knowledge areas

The knowledge field of project cost planning covers demand analysis and demand estimating methods. The key aim of information cost planning is to complete the project under the budget approved (PMBOK, 2004). The budget of the project is critical and affects all aspects of project planning and implementation. A skilled budget not only limits the expense of the project but provides good conditions for maintaining a well running cash flow in the project. The result of insufficient cash flow in a project is often associated with high additional costs and delays, since a temporary project stoppage is highly risky (Antvik, S., & Sjoholm, H., 2007). The project size, the WBS and the project schedule should be linked with the cost estimate. It is necessary to estimate each activity based on the conditions for carrying out the activity, to obtain an accurate estimate.

Project Quality planning knowledge areas

To assess quality policies in the project and to check that the work is of acceptable quality it includes all procedures and activities in the project organization. Quality preparation, quality assurance and quality control are the core mechanisms of quality management (PMBOK, 2004). To carry out quality management, the project team must define the quality requirements that are applicable in the project.

Project Human Resources planning knowledge areas

The methods used to ensure that the project is developed in a way that offers good

opportunities to succeed for the project are human resources planning fields of knowledge. Human resource planning, the creation of project managers, growth and project team management are main processes of human resources management (PMBOK, 2004).

It is important for the project management to decide how the project team be structured in the early stages of a project and to define the appropriate tasks. It's necessary to have the authority to take decisions within a given area of responsibility.

Project Communication planning knowledge areas

The methods used to ensure the needed information is provided to the appropriate person at the right time are project communications management planning. Communication planning (PMBOK, 2004) are the key preparation processes of communications management. For order to carry out successful research and reduce risks, how contact is handled in a project needs to be planed. To ensure that internal and external project communication is efficiently enforced, a communication plan is required.

The plan should include details of which information should be distributed, who needs information to be received, the purposes of the information, the frequency of distribution and the person responsible for issuing the information.

Project Risk planning knowledge areas

The primary objectives of project risk management are to increase the likelihood and impact of project-positive events and reduce the likelihood and impact of project-negative events. Risk planning includes defining risks, assessing qualitative and quantitative threats and preparing risk response (PMBOK, 2004).

There are uncertainties in all projects that can be a chance or a risk. In areas where management is not quite conscious of the current circumstances, complexities sometimes arise. Managing effectively will turn several uncertainties into a chance instead of a possibility (Antvik, S., & Sjoholm, H., 2007) Risk analysis also occurs early in a project when the knowledge in several areas is highly limited. The research should be tracked throughout this project to handle risks and opportunities effectively, as the management team becomes increasingly aware of knowledge

The purpose of a risk analysis is to take over the project's uncertainties. Therefore, it

is important to establish a plan for reacting to the risk when the risks are detected (PMBOK, 2004).

Identification of risk defines the threats and records their characteristics for the project. It should be encouraged to recognize threats to all involved in the project. To order to establish and retain a sense of control and responsibility for risk in a project and associated risk response, the project manager must engage in the identification process.

Project Procurement planning knowledge areas

The procedures for managing, executing contracts and buying orders from sources outside of the project organization are procurement management planning. Procurement (defining the project requirements can be better met by procurement of products or services other than the projects) and application planning (preparation of documentation necessary to support the application / applications) are essential processes within procurement management planning (PMBOK, 2004).

The procurement plan is a vital method for effective procurement around the project. It should be built based on the WBS and the timeline of the project, so that all procurements are included and incorporated into the project.

A procurement manager is also responsible to the supervision and management of procurement operations in large projects. Purchases are prepared and conducted by the procurement manager.

2.2.6 The Relationships among the Project Planning Processes

The project plan is a blend of several component plans drawn up during the project planning process. Two interrelated methods, core methods and process facilitation, form the project planning phase. The relationships between the two systems. Core processes represent a series of essential activities that are mutually dependent and conducted specifically. The following provides a brief description of the period of core processes and the outcomes of this program. A more comprehensive overview and concept outline are given in this section for every proposal that can be delivered. The execution of the core processes starts with the project scope and priorities of the project charter being reviewed and updated. The framework for job breakdown (WBS) is constructed from the simplified scope and priorities of the project. The WBS is a project attribute grouping capable of organizing the project and determining its

overall scope (PMBOK). The WBS becomes the basis for organizational disruption structure (OBS) production, activity sequencing and resource plan creation. Input from the OBS is also needed to establish the resource plan. The OBS shall specify the organizational units which are responsible for a project or task and the resource plan shall define the necessary tools to be used for the project or task.

2.2.7 Project Planning Major Outputs

To assess the planning process consistency, the results of each process must be assessed. This means that a large portion or 48 % of the project manager activities are related to planning (Zwikael, 2009). Process can have several outputs and each set may also have several products, but for each planning phase one main product can be found. The key product for all planning processes is given in Table 2.2.7 1

Table 2.2.7 1 Planning processes and its outputs (sources)

No.	Knowledge Area	Planning Processes	Major product
1	Integration	Project Plan Development	Project Plan
		Solicitation Planning	Procurement Documents
2	Scope	Scope planning	Project Deliverables
		Scope definition	Work Breakdown Structure
3	Time	Activity definition	Project Activities
		Activity sequencing	PERT or Gantt Chart
		Activity duration Estimating	Activity Duration Estimates
		Schedule development	Activity Start and End Dates
4	Quality	Quality planning	Quality Management Plan
5	Cost	Resource planning	Activity Required Resources
		Cost estimating	Resource Cost

		Cost budgeting	Time-phased Budget
6	Human resource	Organizational planning	Role and Responsibility Assignments
		Staff Acquisition	Project Staff Assignments
7	Communication	Communication planning	Communications Management Plan
8	Risk	Risk management planning	Risk Management Plan
		Risk identification	Risk List
		Qualitative risk analysis	Project Overall Risk Ranking
		Quantitative risk analysis	Prioritized List of Quantified Risks
		Risk response planning	Risk Response Plan
9	Procurement	Procurement Planning	Procurement Management Plan

2.2.8 Importance of Planning

There are various reasons for the failure of the project or its full potential. Many projects have a big and most popular problem and become plentiful at some point. Such issues are mostly caused by a lack of preparation. "If you don't know where you're going, you're probably going to end up somewhere else," (Anthony, E., 2007), said. Without a strategy, a complex project would probably fail. the strategy is a complete, coherent and accurate expression of the stakeholder's expectations for those who want to meet customer's needs. Preparation can be a good way to accomplish a goal, but we do not have a clear path without preparation, and our actions can lead to unintended objectives or outcomes. It is difficult to truly understand without adequate preparation what it takes to effectively complete a project.

Research has shown that greater project preparation efforts can lead to significant costs and scheduling savings. Effective preparation and preparing in any project, and failure is almost inevitable without proper planning and preparation.

The main driver for project planning is, according to (Kerzner, H. R, 2013), the reduction of uncertainty supported by (Zwikael, 2009). Planning enables the Project

Team to tackle the various factors that decide the success or failure of projects, such as quality, expense, timetables, performance and support (Akinsola, A O., Potts, K. F., Ndekugri, I., & Harris, F. C., 1997).

2.2.9 Project Planning Techniques

One of the most critical stages of project management is the preparation phase, which describes and determines all the work to be carried out. Planning is a long-term kit, but if done correctly it is worth it. Many different techniques, like tables, WBS, charting is used. Tables are used for the presentation of specific information on the project activities such as time, reliance, costs, start-up, end-use and resources needed. It is used during the planning, control and execution and monitoring processes.

WBS is an organizational map that devises the project into easy-to-accomplish subsystems, modules and tasks. It is used for preparation, pricing and allocation of services. This simplifies the integration of development and costs and studies. The OBS is a model which organizes resources in groups for better management. The Structure for Organization Breakdown This can be used to monitor the distribution of resources and different tasks. OBS and WBS are highly interdependent (Badiru and Pulat, 1996).

The Gantt map is one of the most popular and effective strategy methods. It is simple, easy to use and easy to understand. It is not easy to represent the interdependence among activities, particularly in large projects, and networks are therefore used. For representation, the project is modeled using either the activity-on-arrow (AOA) or the activity-on-node (AON). The probability technique is called the PERT, whereas the deterministic approach is known as either the PDM (Precedence diagramming) method used in the AON representation process, or the AOA method of arrow diagramming (ADM). Both approaches are used to evaluate projects existence, critical path(s) and floats and other related data using what is called the critical path method.

2.2.10 Criteria for Evaluating Success or Failure of Project

The assessment of project success has different parameters. In this section, the findings of various studies on project assessment parameters be described. Time, expense and efficiency were the basis for assessing project performance. Such three principals were known as the Iron Triangle (Atkinson, 1999). He also implies that while different project management concepts have been developed, the performance

metrics, namely expense, time and quality, remain and are included in the actual description. Among these three fundamental factors (Pinto, J. K., & Prescott, J.E., 1988), the project performance indicators include project psychosocial results and the completion of interpersonal interactions with team leaders in the project team.

They include budget meeting, scheduling and production quality; customer service and project management; technology transfer; environmental friendliness, safety and security. Different literatures indicate different parameters were hypothesized by different researchers. The integrated framework to assess project success is shown in Figure 2.2.10

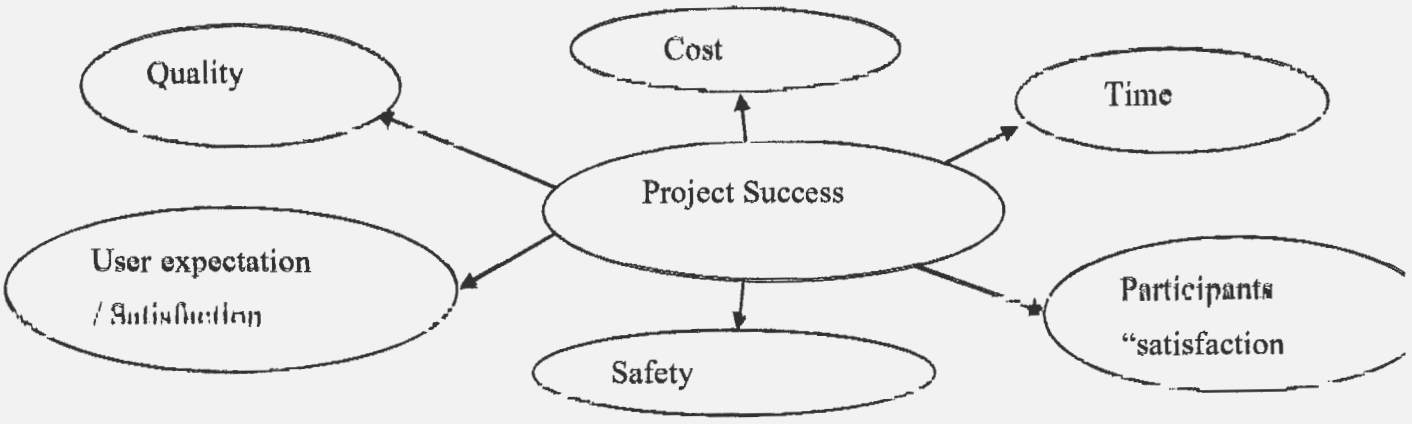

Figure 2.2.10 | Combined structure for measuring project success

The time, cost, quality and customer satisfaction parameters for project assessment are therefore selected in this report. This is mainly because of the objective (unbiased) nature of cost, time and quality metrics which allow a direct comparison between different projects of various types, sizes and scope across various industries.

2.2.11 Project Planning Assumption and Constraints

The portion of constraints and expectations of the project plan helps you to define factors that limit or restrict a project. Those are the elements that limit the choices of a project team (PMI, 2008) .

Assumptions involve a level of risk (PMI, 2008) and risk planning is an essential component in project and task management. It is noteworthy that a segment relating to the investigation of project danger is omitted from the project charter template. Assumptions are external variables which can influence (or even determine) the performance of a project but are not explicitly monitored by project managers.

There are constraints on all projects and these must be established from the beginning. The project manager would be better at designing the project plan if he knows the

constraints that apply to a project including the project context or parameters – time frames and deadlines, financing, ability levels, available resources, etc.

2.2.12 Critical Planning Input Factors for Project Success or Failure

The theoretical basis for this work is revising previous studies on essential planning input factors for successful planning results. This section presents a description of the relevant studies. Important feedback preparation considerations can be defined as human factor, factor of management, technological considerations and structure of organization. Human factors include the characteristics of individuals and groups influencing the efficiency of planning processes (including project managers, project team leaders, customers, and parent company related personnel). While there are many stakeholders connected to a project, the review of multiple studies showed that usually only the project team and clients affect a project's success or failure.

Regarding the project team, the role of the project manager and the knowledge and experience of the project team are critical. Customers are evaluated based on their knowledge, experience and involvement in the project. Factors of management include support for management, preparation and establishing project objectives. Within the next parts the effects of these variables on project outcomes are discussed.

Relationship between personnel and project success

There is a substantial correlation between higher staff ability in project teams and planning. (Aladwani, 2002) thought that the planning process may be adversely influenced by a diversified membership. (Chatzoglou, 1997) suggested that the expertise, engagement, awareness and interpersonal contact of project team leaders are rated as very important factors relevant to success planning. Regarding the position of project manager, in his study (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999) found that project managers' skill plays an important position in project success, especially project failure. Regarding the position of customers, (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999) found that the higher the degree of customer trust in the project manager and project team, the higher the success of the project. The work carried out by (Dvir, D., Raz, T., & Shenhar, A.J., 2003) concluded that user engagement would begin at the project's first stage and continue until its successful conclusion.

Previous studies have shown that the greater potential of project managers and team leaders, the better performance in project preparation and the outcomes of the project.

Customer participation in the project also affects the results of the project. Hence the role of project manager, team leaders and customer in planning be taken into consideration in this report.

Relationship between applying techniques and project success

(Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999) suggested that incorporating effective and productive strategies in the project planning process would improve the potential for project success. (Chatzoglou, 1997)found the approaches and strategies used in projects planning affect the process. (Whittaker, 1999) research examined the application of project management approaches. They studied the common use of project management in many forms of projects. The Gantt chart and project management tools were the most used techniques.

Relationship between management factors and project success

(Chatzoglou, 1997) defined management styles and the available resources as essential to project success planning and control. (Kline, 2011) defined a list of 34 hazards as a project predictor. Bad plans were rated a high-risk factor in that. This was followed by "resources are not well distributed," "customer service failure" and "management support failure."

According to (Whittaker, 1999), two common reasons for project failure were inadequate project planning and lack of involvement of the management and planning stage support. This research analyzes the relationships between planning management variables and project results in the projects.

Relationship between planning and project success

In this report, project planning refers to the degree to which timetables, goals, staff, facilities, and budget are set (Pinto, J. K., & Prescott, J.E., 1988). Planning is a part of the management factors community. The most common explanation for project failure is poor / inadequate / project planning, or the project plan was bad, according to (Whittaker, 1999). (Aladwani, 2002)'s empirical research also established the relationship that exists between project planning and project performance. Different studies indicate the important role of preparation in the result of the project (Whittaker, 1999); (Aladwani, 2002). This research looks at the impact of planning processes on project successes.

2.3 Empirical Literature

This section of the literature will present articles and reviews related to the topics of the research. (De Wit, 1998) conducted a study on the preparation of the impact construction and collected the information using a questionnaire. The interaction between the variable's sets were explored using simple correlation. Correlation analysis showed that planning effectiveness is likely to be improved if more time is invested in construction planning prior to commencement of work on-site, attention is focused during construction planning on systematically evaluating alternative construction methods and selecting the most appropriate and construction plans are regularly reviewed and revised after construction work has commenced on-site. The findings also showed that there are important associations between project environment variables and organizational characteristics of construction firms with planning activities and productivity in planning.

Previous studies by [(Whittaker, 1999), (Dvir, D., Raz, T., & Shenhar, A.J., 2003) and others] showed poor project management as one of the reasons for project failure in developing countries.

(Whittaker, 1999) identified three common reasons for project failures regarding the factors influencing the project results, the first reason being bad (lack of) project planning or the project plan was weak. Therefore, it is important to define the key problem areas in strategic planning activities and to take corrective action. In this respect, little or no research has been done in the country as far as the research is concerned.

According to (De Wit, 1998) , timely completion of a project depends on monitoring the development process, hiring experienced professionals, objectively evaluating timeframes, and predicting that some unexpected issues are likely to occur.

In his research entitled "Factor Influencing the Planning of Construction Work Schedule," (Milis, K, & Mercken, R, 2002) cited the scope of the project, the recognition of essential tasks and project type as the three main factors influencing the planning of work programs.

2.3.1 Literature Review Findings

In the literature reviews above the main input factors for project planning were discussed in more detailed. So, what we understand from the literature is that for better project planning performance, project managers and team member experience, effort spent in planning stage and participation of customers in planning plays a vital role. And the literature also suggests that the introduction of effective methods and

strategies to project managers in planning phases increases the potential for project success. The key input factors described in the above literature are for the planning processes to be successful top management support, the participation of various functional departments, resource availability, requirement specification and project scope.

The analysis of the literature has shown the relationship between planning processes and performance of projects. Poor planning could be the main cause of project cost overrun and time delay, consumer frustration and lack of quality. The first contribution of this research is project planning evaluation of project success in Ethiopia.

2.4 Literature Gaps

Different studies demonstrate the value of scheduling and execution of project work for project performance. For example, the research works of [(Whittaker, 1999), (Dvir, D., Raz, T., & Shenhar, A.J., 2003) and others] indicated that project planning is one of the reasons for project failure in developing countries. (Whittaker, 1999) identified three common reasons for project failures about the factors influencing the project results, the first reason being bad project planning, or the project plan was weak. A positive relationship between project planning and project performance was also reported by (Aladwani, 2002). The relationship between project planning effort and project success was also studied by (Dvir, D., Raz, T., & Shenhar, A.J., 2003). Their results showed a high correlation between the planning activities and the overall success of the project.

Although many factors affecting project results have been identified by previous studies, scheduling has been listed as an important factor for project success or failure.

2.5 Conceptual Framework

A theoretical model is developed based on the literature reviews to analyze the effect of the field of planning processes and to define the relationships between planning processes and various project outcomes. The first element of this system considers the relationships between the systems of individual, leadership, technological and organizational culture and planning.

Based on the study of (Chatzoglou, P., & Macaulay, L., 1998), these factors are developed and based on the synthesis of previous studies on critical factors for project success or failure.

The planning process is evaluated by 9 planning information areas (21 project planning activities) results. The second part of this framework examines the relationship between the processes of planning and the factors of project success. Results in terms of completion time, completion cost, and quality and customer satisfaction are evaluated for project success.

Figure 2.5 1 conceptual Framework

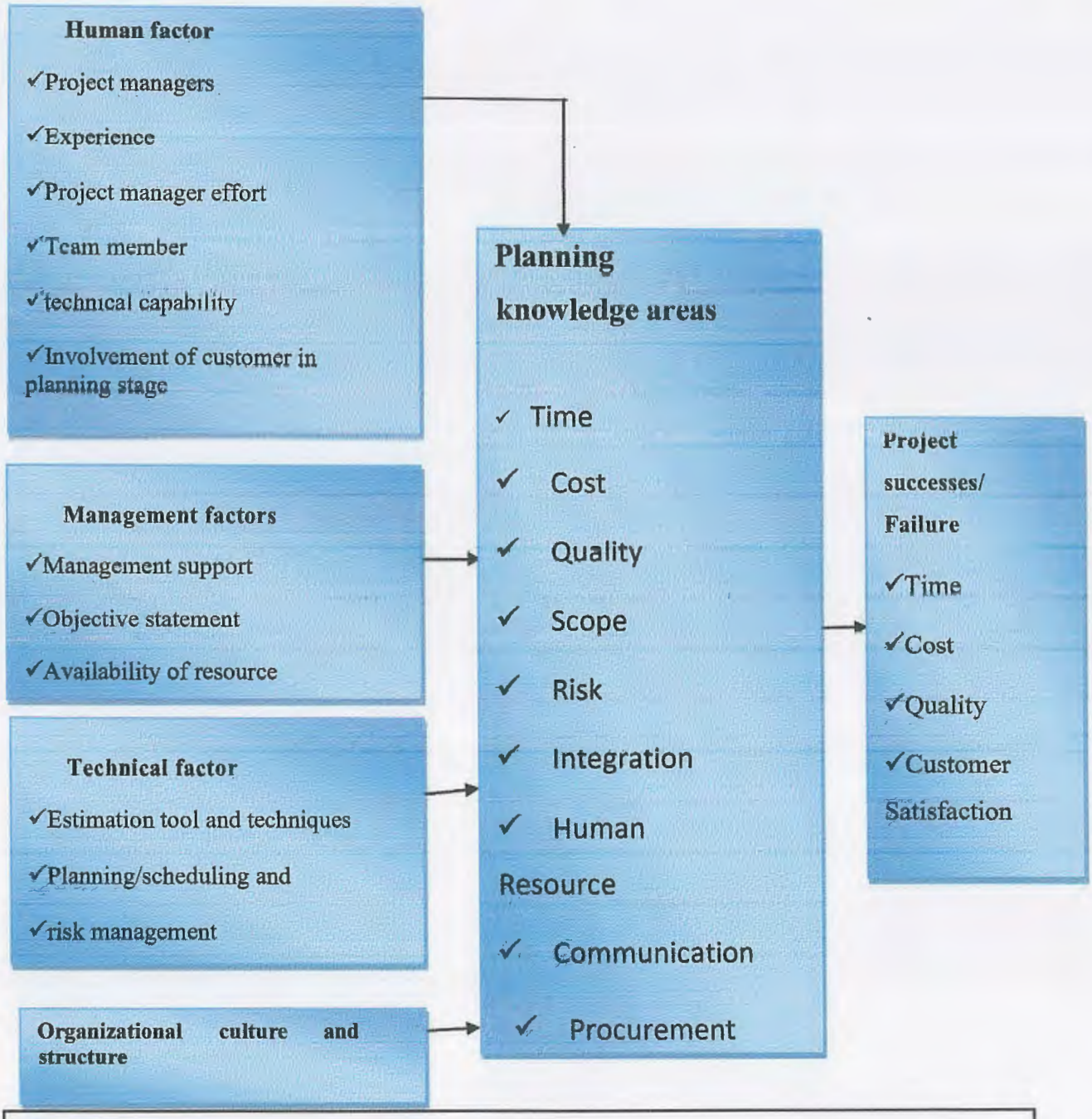

Figure 2.5 1 Conceptual frameworks of planning input factors, planning knowledge areas and Project successes

CHAPTER THREE RESEARCH DESIGN AND METHODOLOGY

3.1 Description of the study area

This section describes all the procedures for achieving the goals set out in this study. The protocols that have been implemented include all the information relevant to data collection. In addition, sources of data and information, research tools, sample size and analytical methods are discussed.

The research done in Addis Ababa, Ethiopia on the selected construction for assessing the planning processes, the input factors that affects the planning processes, the relationship between planning processed and project successes factors of the only focused on GC-1 contractors.

3.2 Research Design and Approach

Research Design used in this research is descriptive. The research strategic approach is categorized as quantitative research approach: quantitative (concerned with the measurement of issues). The decision in the choice of the research type is mainly depends on the type of study and availability of the information required for the study.

Quantitative research is an objective measurement of a problem based on a theory composed of variables that can be measured in numbers. For this research one types have been implemented, since it is possible to get adequate information from research questions that are related to the respondent's attitude and opinion.

3.3 Sample Design

3.3.1 Target population

The research conducted on the population of national Grade I General Contractor (GC-1). Therefore, the target population was currently existing GC-1construction companies in Addis Ababa. The sampling frame constitute all firms that exist in the sub city.

3.3.2 Sampling Frame

The study was conducted on 18 construction projects found in Addis Ababa where project planning and implementation practice assessment on performance is practiced.

3.3.3 Sampling Unit

The sampling unit is capable to apply and understand utilizing Planning & implementation practice on construction projects who were participated in project manager, project site engineer, supervisors, project office engineer and project team members.

3.3.4 Sampling Technique

To make every member of the population to be part of the researcher first selected the sample population by using stratified sampling technique to partition the heterogeneous population in to homogeneous groups and then the applied Simple Random sampling technique enables every member of homogenous group to be included in study. The study applies probability sampling method.

3.3.5 Sampling Size

The research conduct on the population of national Grade 1 General Contractor (GC-1). The total number of Projects in the selected areas are 18. So, to get representative sampling size, from each company the researcher takes the project managers, project site engineers, office engineers, supervisors, project coordinator, budget and development planner and project team members purposively to fill the questionnaire and believed that they know the sector problem from the grass root.

Names of sample	Total size of firms in the study area	Required sample size from each selected firm representative
Selected Projects	18	72
Total	**18**	**72**

Table 3.3.5 1 Sampling Size

Source: own survey, 2022

So that, the total sample of the study be 72. From a total 72 questionnaires were distributed from these 60 questionnaires returned this means 83 percent of response rate which is acceptable for research.

The survey questions contain 53 questions requiring types of answers including;

- Brief answer for organizational information,
- Nominal scale such as Yes or No, and
- Liker Scales including strongly disagree, disagree, normal, agree, and strongly Disagree 72 questionnaires were distributed.

3.4 Data source

3.4.1 Primary Data

The primary data source was in the form of questionnaires to gather enough data from construction works. The primary function of the survey analysis is to collect information that can be evaluated and to infer to access on factors affecting project planning and the effect of planning on project success.

3.4.2 Secondary Data

The secondary data collected includes information from empirical studies, manual books and internet resources.

3.5 Data Analysis

Different statistical techniques were employed based on the nature of the data collected. In analyzing the quantitative data, respondents were categorized, and frequencies were tallied. Percentage and frequency counts were used to analyze the response obtained from the respondents. In analyzing the data obtained through a questionnaire, first summary sheets were prepared and then responses were analyzed by using Stata Version 14 for both the econometric as well as descriptive statistics analysis. The five-point Likert scale was interpreted as 5= Strongly Agree, 4= Agree, 3= Neutral, 2= Disagree, and 1= Strongly Disagree. For easy analysis and interpretation, the mean values of each item and dimension were interpreted. The mean values from 1.00-2.49 were represented as low, from 2.50-3.49 as moderate, from 3.50-4.49 as high, and from 4.50-5.00 as very high.

The sample for this study is relatively small. As a result, the analysis had combined all groups of respondents (clients, consultants, contractors) to obtain significant results. Data was analyzed by calculating rank and Relative Importance Index (RII). The Relative Importance Index (RII) is calculated as follows.

$$RII = \frac{4n1+3n2+2n3+1n4+0n5}{4N} \quad \text{---------- \{Equation 3.3\}}$$

Where:

N = Total number of respondents

N i = the variable expressing the frequency of the I^{th} response.

n1= Number of frequency 'extremely significant' response,

n2= Number of frequency 'very significant' response

n3 = Number of frequency 'moderately significant' response

n4 = Number of frequency 'slightly significant' response.

n5 = Number of frequency 'not significant' response.

The values of RII ranges from 0 to 1 (0 not inclusive); the higher the RII, the more important the cause of delay is. The RII value is ranked and the results are shown using tables and/or graphs. The RII is used to rank different causes. The RII then being classified based on the RII classification table as shown below in table.

Scale	Level of Importance	RII
1	1 Not Important at all	$0.0 < RII \leq 0.2$
2	Slightly Important	$0.2 < RII < 0.4$
3	Moderately Important	$0.4 < RII \leq 0.6$
4	Important	$0.6 < RII \leq 0.8$
5	Highly Important	$0.8 < RII \leq 1.0$

Table 3.5 : Classification of RII

Finally, the econometrics analysis using Relative Importance Index, correlation and regression analyses was conducted on factors affecting project planning and the effect of planning on project success.

3.6 Development of the Hypotheses

Many preceding studies affirm the essential contribution of planning to project achievements. This research examines the role of various input factors in the planning process / survey / in more detail. It examines the relationship between the planning process and the successes of the project. The hypotheses of this study are described based on the research objectives and the established model / structure/.

3.7 Hypothesis

This study is based on the following hypothesis drawn in respect of the model established

Hypothesis 1: The relationship between human factor and the planning processes is positive.

Hypothesis 2: The management variables and the planning processes have a good relationship.

Hypothesis 3: The technological considerations and the planning processes have a good relationship.

Hypothesis 4: The relation between the organizational structure and the planning processes is positive.

Hypothesis 5: Efficient planning processes and project quality have a positive relation.

Hypothesis 6: There is a relation between successful planning processes and completion time of the project.

Hypothesis 7: There is a relationship between successful planning processes and cost of completing a project.

Hypothesis 8: The relation between successful planning processes and customer satisfaction is positive.

3.7.1 The role of personnel/human factors on planning processes

Team leaders and consumers have the staff element (Chatzoglou, 1997). The project manager can monitor team members from the management point of view and will please the client. This model will classify personnel / human/ factors as external and internal stakeholders. Internee stakeholders say project team leaders. In various researches the essential position of project manager was confirmed. According to (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999) findings, over half of the unsuccessful projects encounter problems with the project manager, such as no experience, inadequate time spent on project planning and lack of an integrated project plan. But the respondents had not always reflected on the project manager in productive projects. (Antvik, S., & Sjoholm, H., 2007) established the connection between the power of the project leader and the planning time of the project. The shorter the time the greater the strength. (Macaulay & Faniran O. O, 1998) the relationship between a competent project manager and future project performance was also established.

3.7.2 The role of technical factors on planning performance

In the planning stage, technological considerations relate to the efficiency of the methods and equipment used / used / and their productive usage. (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999) concluded that the implementation of suitable and effective methods and resources in the planning process would increase the likelihood of success of a project. In this analysis, the implementation of the tools and techniques will be considered during the planning stage. The (Antvik, S., & Sjoholm, H., 2007) research assessed the application of project management

techniques This study assumes that the implementation of project management methods and techniques In the planning of projects can increase planning performance.

3.7.3 The impact of management factors on planning performance

This study investigates the effect on planning efficiency of the management support, objective environment, resource availability and management style.

Management support in planning stage

According to (Whittaker, 1999) the lack of interest and help in the management was a reason for project failures. (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999) also suggested that the absence of a higher level of managerial support influenced almost all the failed projects. (Pinto, J. K., & Prescott, J.E., 1988) have identified and confirmed a positive correlation between management support, committed sponsor / support / and project success. In addition, project preparation activities require the top management support that is essential to project success [(Gibson, G., Wang, Y., Cho, C., & Pappas, M., 2006); (Lindhard, s. & Larsen, J. K, 2016) and (Zwikael, 2009); Projects are bound to fail without organization's support. Management support in the planning stage be regarded in this study as: top management support, dedicated sponsorship / support / and early participation of different departments.

Objectives setting

Defining the plan, aim and scope of the project clearly is very critical for project success. The action will take place at the very beginning of the planning process. (Atkinson, 1999) found that planning and resource allocation had different effects in project objectives. This affects project efficiency significantly. (Yeo, 2002) findings have showed that one of the main failure factors in a project is a poor understanding of the specifications and project scope. (Pinto, J. K., & Prescott, J.E., 1988) established the connection between the project mission described in the planning stage and the progress of a project. Defining project objectives in the context of this study affects the planning performance.

Availability of resources

The availability of allocation-related tools in project planning affects project outcomes. In general, resources mean men, time and money. (Chatzoglou, P., & Macaulay, L., 1998) found that investing less than 15 per cent of total time and 15 per cent of total preparation costs was inadequate to complete the cycle successfully.

(Antvik, S., & Sjoholm, H., 2007) listed "adequate funds and services" as the main factor affecting the outcomes of a project. Resource distribution is calculated in the project plan, and the availability of adequate resources is a planning constraint. For planning purposes services such as trained workers or facilities would be helpful. In this analysis, resource availability is seen as a significant factor of management that influences planning efficiency.

3.8 The Role of Planning Processes on Project Successes

(Whittaker, 1999) suggested that the main reasons for project failure are poor project planning, specifically insufficient risk management and a weak project plan. Planning of projects has a stimulating impact on the relation between project uncertainty and project progress (Aladwani, 2002). The most important cause of project failure was inadequate project preparation (Macaulay & Faniran O. O, 1998). The relationship between project planning processes and different factors for project outcomes is discussed in this report. In this study the planning processes are evaluated by implementing all the planning activities defined in the knowledge body of project management (time, expense, quality, scope, risk, integration, communication, procurement, human resource). The standard criteria used for assessing factors of project performance or the most frequently used assessment criteria are: Time, expense and quality of the project results (Atkinson, 1999) (Dvir, D., Raz, T., & Shenhar, A.J., 2003))

3.9 Variables Identified from Literature

This research defined the following independent and dependent variable from the literature examined, and conceptual context. A five-point Likert scale is built (used) for these variables to calculate the specified variables.

3.9.1 Variables related to planning input factors and planning processes

I. Dependent variable

The dependent variable for Hypothesis 1 to 4 is method planning

As defined in the conceptual framework, performance / process planning is assessed by implementing project planning processes including time, expense, scope, efficiency, human resource, procurement, integration, risk and communication, respondents were asked to indicate how they assess these tasks / activities in planning.

II. Independent variables

The independent variables for Hypothesis 1to 4 include: Human factors, Management factors, Technical factors and Organizational structure.

3.9.2 Variables related to planning processes and project successes

Dependent variables:

The dependent variables for Hypothesis 5 to 8 are drivers of project success, and they include: Completion time, Completion cost, required specification /quality and Customer satisfaction.

Independent variable:

The independent variable for hypothesis 5 to 8 is the planning of information areas which indicate the level at which the planning activities are carried out and includes this variable- Time, Cost, Quality, Risk, Scope, Human resource, Integration, Commination and Procurement.

3.10 Model Specification and Operationalization

The following models was developed to test the Hypotheses

Model 1: - Named as the role of planning input factors on knowledge areas

Which is used to test hypothesis 1 to 4 predicts the impact (effects) of input factors on planning processes. Mathematically this model is expressed as:

MODEL 1: - The role of planning input factors on knowledge areas

PP= f (pif) = f (hif, mif, tif, oif)

Where: PKF = planning knowledge areas

PIF = planning input factors

HIF= human factors

MIF = management factors

TIF = technical factors

OIF = organizational culture and structure

Model 2: - Effects of planning knowledge areas on project successes

Model 2 analysis the effects of planning process with project successes. This model is used to test hypothesis 5 to 8 which predicts the relationship between planning processes and project successes/performance. Mathematically this model is expresses as: -

MODEL 2: -Effects of planning processes on project successes

PS= g (Pkf) = g (Pkfr, Pkfq, Pkfcu, Pkfi, Pkfs, Pkfp, Pkfh, Pkfco, Pkft)

Where: - PS= project successes

Pkf = planning knowledge areas

Pkft = Time planning knowledge areas

Pkfco = Cost planning knowledge areas

Pkfq = Quality planning knowledge areas

Pkfr = Risk planning knowledge areas

Pkfs = Scope planning knowledge areas

Pkfh = Human resource planning knowledge areas

Pkfi = Integration planning knowledge areas

Pkfcu– Communication planning knowledge areas

Pkfp = procurement planning knowledge areas

Model 2a: - Impacts of planning processes/activities on completion cost of project

PSC = g1 (Pkf) = g1 (Pkfr, Pkfq, Pkfcu, Pkfi, Pkfs, Pkfp, Pkfh, Pkfco, Pkft)

Model 2b: _ Impacts of planning processes/activities on completion time of project

PST = g2 (Pkf) – g2 (Pkfr, Pkfq, Pkfcu, Pkfi, Pkfs, Pkfp, Pkfh, Pkfco, Pkft)

Model 2c: - Impacts of planning processes/activities on quality of project

PSQ= g3 (Pkf) = g3 (Pkfr, Pkfq, Pkfcu, Pkfi, Pkfs, Pkfp, Pkfh, Pkfco, Pkft)

Model 2d: - Impacts of planning processes/activities on customer satisfaction

PSCS = g4 (Pkf) = g4 (Pkfr, Pkfq, Pkfcu, Pkfi, Pkfs, Pkfp, Pkfh, Pkfco, Pkft)

Where: - PP= planning processes

PS1= project successes factor 1(completion cost)

PS2=project successes factor 2 (completion time)

PS3=project successes factor 3 (project quality)

PS4= project successes factor 4 (customer satisfaction)

3.11 Reliability Test and Validity

The study used Cronbach alpha to assess the internal consistency of the research instrument. Cronbach's α (alpha) [1] is a coefficient of reliability. It is commonly used as a measure of the internal consistency or reliability of a psychometric test score for a sample of examinees. The reliability in this study as assessed by coefficient alpha, was found to be 0.829 (table 3.7 1), as indication of acceptability of the scale for further analysis. The variables were tested for reliability by using Cronbach's Coefficient Alpha which results

that all factors have a Cronbach's Coefficient Alpha greater than 0.80, which indicates all the constructs are reliable.

Table 3.7 1 Cronbach's Alpha reliability test

Factors	No. of items	Cronbach's Alpha
PS1	6	0.830
PS2	7	0.832
PS3	6	0.830
PS4	5	0.824

Table 3.7 2 Cronbach's Alpha reliability test

Reliability Statistics	
Cronbach's Alpha	No of Items
.829	24

Source: own survey ,2022

3.12 Ethical Consideration

Ethics refers to the appropriateness of the researcher's behavior in relation to the rights of those who become the subject of the research work or are affected by it. Research ethics therefore relates to questions about how we formulate and clarify our research topic, design our research and gain access, collect data, process and store our data, analyze data and write up our research findings in a moral and responsible way.

In conducting this research, the privacy of participants has been kept, and it's made known to every participant that the nature of participation was voluntary. The confidentiality of data and the participants' anonymity is maintained. The researcher takes in to account the issues of feasibility and sufficiency in relation to gaining access to data and the impact of these on the nature and content of the research questions and objectives.

CHAPTER FOUR - DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

The main research findings are summarized in this chapter. The findings of several hypothesis tests to verify the theoretical assumption are discussed relative important index, correlation and regression analyzes. This chapter describes the results that have been obtained from processing of sixty (60) questionnaires using Excel and statistical package for social sciences (STATA).

This research tries to measure the project success using the iron triangle with the perspective of the project management processes. However, these processes are tedious and cumbersome taking substantial time and efforts of the project manager. Different researches have shown that the project success depends on project management processes (Dvir, D., Raz, T., & Shenhar, A.J., 2003) ; (Zwikael, 2009). These researches tried to point out the important processes that affect the project success (Berhan E., & Beshah B., 2017).

(Keider, S. P., 1984); (Milis, K, & Mercken, R, 2002) Research works indicate that lack of good project planning is ranked as the most likely the single cause of project failure. Effective planning is more than just setting up an elaborate plan at the start of a project. Planning allows the project team to address different factors of success parameters and supportability that determine project success or failure (Akinsola, A O., Potts, K. F., Ndekugri, I., & Harris, F. C., 1997).

The research by (Kerzner, H. R, 2013) clearly demonstrated that the primary motive of project planning is uncertainty reduction, an idea which was also supported by (Zwikael, 2009). The studies by (Gibson, G., Wang, Y., Cho, C., & Pappas, M., 2006) show a positive relation on the efforts of project planning with project success and inversely related to the risks.

However, according to the Project Management Institute (PMI), 48% of the project management processes is taken by project planning activities and considered to be time consuming by project managers (PMI, 2008). Accordingly, (Zwikael, 2009) identified the

relative importance of the project management activities used during the planning phases and their impact on project success. However, he fails to consider the planning input factors which were proved to have an impact on the project planning activities.

In short, previous studies have verified the effect of the commitment and experience of the project manager on project outcomes. (Chatzoglou, 1997) considered the role of the team members' expertise and knowledge in the allocation of planning resources.

This study focuses on planning, so it explores the impact of project managers on planning success in terms of their commitment and experience. There are two factors the first is the time project managers expend on planning. In this analysis, project managers are expected to achieve the better planning results if they expend more time in the planning stage. The second attribute is experience of project manager. As (Verner, J. M., Overmyer, S. P., & McCain, K. W., 1999) said, more experienced project manager can reduce the probability of a project failure.

Regarding the role of team leaders, (Keider, S. P., 1984) found that in planning processes a project team of more competent workers experiences a substantially lower number of errors. The project team members can affect the resource allocation for the project, according to (Chatzoglou, 1997)and (Macaulay & Faniran O. O, 1998). The members of the project team are judged by their planning phase experience. (Baker, B.N. Briner, Hastings & Geddes, 1996) have considered project management skills as a variable that can affect the time unit-measured project planning effort to complete the project requirements. The project team's expertise and the time the project team is investing on meeting project specifications could be viewed as two different dimensions affecting project outcomes (Berhan E., & Beshah B., 2017).

Team leaders must identify and evaluate the needs of the customers during preparation. The skill of team members may influence the performance of the planning in terms of identifying requirements and deliverable specifications. Accordingly, the following hypothesis is suggested:

The Consumer is the primary stakeholder. (Chatzoglou, 1997)'s research suggested various customer considerations that could affect success in project planning. Such

considerations are the awareness of the client, the incentive, user issues, and customer engagement in the planning process and contact with members of the project team.

In several previous research consumer engagement was addressed. According to the (Olsen, 1971) report, consumer and user problems impacted approximately 50 percent of failed ventures. One of those issues is the user community's inadequate participation in planning processes. According to (Yeo, 2002), from the outset the lack of user participation and its inputs are main factors linked to project failure. (Pinto, J. K., & Prescott, J.E., 1988) suggested that the greater consumer or user participation, the greater the likelihood of project completion. (Dvir, D., Raz, T., & Shenhar, A.J., 2003) have found that the participation of end-user members is the most significant planning factor. In this analysis, the customer involvement is expected to affect the efficiency of the planning.

A clear project plan with detailed forecasting, effective scheduling and enough risk analysis help to complete the project on schedule and within budget.

The most critical criteria for the assessment of project outcomes are planning output (processes) affects project outcome / success / in terms of time, expense, quality and customer satisfaction. When planning the requirements of the customer are known as product specifications. In addition to the product quality criteria, customer satisfaction depends on how much they meet the requirements. For this purpose, the concept of product requirements and preparation parameters may influence the quality of the product and customer satisfaction.

This study considers the processes of planning to be linked to the achievement of project outcomes and the probability of project completion. It is proposed that the better the planning processes the more project results (the lower the time and expense of completion of the project).

4.2 Demographic Background of the Respondents

Table 4.2.1. shows gender categories of the sample respondents. Among the respondents, 37(61.67%) are males and 23(38.33%) are females. The number of male respondents is more than two times that of female respondents.

4.2.1. Gender of Respondents

As the below table shows, 61.67 % of the respondents are male, while 38.33% are female. This shows that most of the respondents are male.

Table 4.2 1 Gender of respondents

Gender	Freq.	Percent	Cum.
Male	37	61.67	61.67
Female	23	38.33	100.00
Total	60	100.00	

4.2.2. Educational Level of Respondents

From the table below, most of the respondents were grouped under the educational level of Diploma covering 6.67% of the total respondents. The rest of the respondents were categorized under the educational level of bachelor's degree and above with covering 93.33% respondents respectively.

Table 4.2 2 Education and Level of performance

education	Freq.	Percent	Cum.
diploma	4	6.67	6.67
degree &above	56	93.33	100.00
Total	60	100.00	

Source: own survey, 2022

4.2.3. Work experience of Respondents

Table indicates the work experience of the respondents, since employed in the construction. 8(13.33%) of the respondents have 0-2 years of experience in the construction. 2-3yrs experience cover 13(21.67%), 3-5 yrs. 16(26.67) and 5and above 23(38.33).

Table 4.2.3 1 Work Experience of Respondent

experience	Freq.	Percent	Cum.
0-2yr	8	13.33	13.33
2-3yr	13	21.67	35.00
3-5yr	16	26.67	61.67
5&above	23	38.33	100.00
Total	60	100.00	

4.3 Relative Importance Index Analysis and ranking of Planning Input Factors

This section describes the planning factors, preparation and input statistics in the projects studied, knowledge areas and project results. It starts by summarizing individual, financial, technological and organizational factors with planning input factors. Following this is an overview of project performance and preparation processes. In conjunction with the mean result of research, the report determines the principal input factors that are mal performed in the studied project.

Reliability test were conducted in the beginning of the section analysis to check the reliability of data before they were analyzed. The reliability coefficient normally ranges between 0 and 1. The closer is to 1 the greater the internal consistency reliability of the criteria in the scale. Relative index analysis was used to rank the criteria according to their relative importance.

a) Human input factors of Planning

Table 4.3.a) shows that the Relative Importance Index of all the 5 factor of human input factor of planning for the respondents. This means that all the five factors are considered as inadequately involved of planning processes. Human input factor to have high important levels in planning processes with a RI value between 0.51 and 0.713.

Table 4.3 a 1 *Relative Importance Index statistic for human input factors*

Human input factors of planning	Strongly disagree	Disagree	Neutral	Agree	strongly agree	Total respondents (N)	Weighted total	RII	Rank
Project managers were well trained in process planning	1	9	14	27	9	60	214	0.713	1
More scheduling time was expended relative to other stages	6	15	16	16	7	60	183	0.610	4
Team members have had a proper planning experience		16	21	16	7	60	194	0.647	3
In the planning phase, team members were well committed	2	12	21	19	6	60	195	0.650	2
Customers / users participated in planning phase	12	20	13	13	2	60	153	0.510	5

Source: own survey, 2022

b) Management input factors in planning

As stated in Table 5, the highest ranking for Management input factors is the project manager received full supervisory authority to planning process (0.703). The ranking followed by Delegates of the company's functional divisions took an active part in the planning stage as team leaders (0.7) in planning stage is high compared to other management input factors. the scope of the project was established well during the planning phase (0.677). The fourth performed management factors are in the planning stage there were no conflicting objectives between the project team and the customer is high. The availability of resources such as infrastructure, qualified people and budget could affect the performance of planning processes. This finding indicates that 0.663 of the project resources were available well, which have the highest RII value. From the finding it is possible to say that during planning stage Clients were involved and Parent organization's functional divisions were active in the planning stage in planning stage very low (RII=0. 593,0.56 Rank=6,7) participating during planning stage.

Table 4.3 b .1 RII statistics for Management input factors in planning

Management input factors in planning	strongly disagree	Disagree	Neutral	Agree	strongly agree	Total respondents (N)	Weighted total	RII	Rank
Parent organization's functional divisions were active in the planning stage	7	19	15	17	2	60	168	0.560	7
Clients were involved in planning stage	9	11	19	15	6	60	178	0.593	6
The project manager received full supervisory authority	3	9	16	18	14	60	211	0.703	1
Delegates of the company's functional divisions took an active part in the planning stage as team leaders		11	18	21	10	60	210	0.700	2
There were no conflicting objectives in the planning stage between the project team and the client to describe the goal definition process		11	24	19	6	60	200	0.667	4
The scope of the project was established well during the planning phase	3	10	14	27	6	60	203	0.677	3
All resources (qualified staff and infrastructure) have been allocated.	5	11	13	22	9	60	199	0.663	5

Source: own survey, 2022

c) Technical input factors in planning

The first objective in table 6 was to assess the extent to which technical input factors in planning factors affect project performance building construction projects. The result indicates that Training for project team leader &PERT got the lower RII score 0.613and 0.61 respectively, only 45% of the project use PERT, and 25% Training for project team leader for planning process.

The research undertaken established that Gant chart was used input factors had a high impact building construction projects with an aggregated relative importance index of 0.83 and was ranked as the top most cause of perform planning processes.

This indicates that most of the project 0.763, 0.83 and 0.76 of the projects uses WBS, Gant chart and project management software respectively for their project planning processes.

Table 4.3 c 1 Technical input factors in planning

Technical input factors in planning	strongly disagree	Disagree	Neutral	Agree	strongly agree	Total respondents (N)	Weighted total	RII	Rank
A structure of work breakdown was used	2	3	14	26	15	60	229	0.763	2
Gant chart was used		4	4	31	21	60	249	0.830	1
Method of Critical Path(CPM)	1	4	18	24	13	60	224	0.747	4
Technique for the Assessment and Analysis of Projects (PERT) was used	4	14	20	18	4	60	184	0.613	7
Mechanisms for project control and reporting were included in the planning stage	2	9	14	29	6	60	208	0.693	6
Software for the management of projects was used	2	2	11	36	9	60	228	0.760	3
Team members give their usual duties more priority than planning activities	1	9	17	24	9	60	211	0.703	5
Training for project team leader	6	14	16	19	5	60	183	0.610	8

Source: own survey, 2022

d) Organizational input factors in planning

Concerning to organizational structure planning input factors the finding result presented in table 4.3.d) This input factors includes communication between project managers and organizations, involvement of project managers in planning stage and assigning appropriate project managers influences. The finding of the result indicates that most of the factors score the highest RII value. This indicates that these factors were experienced in most of the projects.

Table 4.3 d 1 Organizational input factors

Organizational input factors in planning	strongly disagree	Disagree	Neutral	Agree	strongly agree	Total respondents (N)	Weighted total	RII	Rank
Suitable project managers were named	2	6	14	27	11	60	219	0.730	1
Project managers took part in planning phase	3	8	6	35	8	60	217	0.723	2
During the planning phase, project managers and organizations were well aware	2	7	18	22	11	60	213	0.710	3

Source: own survey, 2022

4.3.1 Relative Importance Index Analysis and ranking of Planning Knowledge Areas

This section presents the descriptive statistics of planning knowledge areas /planning processes/. The main problem areas in project planning were identified by comparing their relative Importance Index Analysis and ranking of the processes. The lower the relative important index score indicates the poorly/inadequately/ performed knowledge areas in the processes. The relative important index value of knowledge areas is calculated by taking the average of the processes belonging to each knowledge areas.

The 9 Knowledge Areas was assessed as the average extent of use/importance of planning performance/ of the related planning processes. The result of the analysis is presented in table 4.3.1.

The result in table 4.3.1 shows risk planning knowledge areas have the lowest relative important index value (RII=0.527, rank= 9), only 14(23%) of the project includes risk planning in their project plan. This indicates that risk was not properly identifying, quantified and their response did not plan at planning stage. The second lower mean score/poorly performed knowledge areas/ of the processes is communication planning knowledge area (RII=0.557, rank= 8), in the studied project only 15(25%) projects includes drawn up a communication strategy in their planning processes. The result also indicates that only 23(33%) of the project includes Procurement Planning Knowledge area in their planning processes, which have the third lowest relative important index score (RII=0.633, rank= 7).

This indicates that these knowledge areas were inadequately performed during planning stage. Integration knowledge areas were the fourth knowledge areas poorly performed in the processes which has low relative important index value (RII=0.647, rank= 6), only 27(45%) of project develops integration planning. The next poorly performed processes were Costs Planning Knowledge area (RII=0.677, rank= 5). only 30(50%) of the project includes scope planning knowledge areas in their planning processes. Relatively Scope and quality knowledge areas were performed well in the processes, which have a RII value and rank of 0.68,4 and 0.697,3 respectively.

The research finding also indicates that time planning knowledge areas got the highest relative important index score (RII=0.73, rank= 1), 40(67%) of project performs this

knowledge area well, which indicates that this knowledge area was performed well during planning processes. The next knowledge areas which have the highest mean value is human resources planning knowledge areas, 63% of the project performs human resources planning processes well during planning processes.

Whereas the 9 fields of knowledge are an essential process for the success of the project shows that most of the process has not (practiced) been carried out okay, back on process of preparation. The result therefore identifies the inadequate / insufficient executed areas of knowledge as: -risk, Procurement, communication, integration and costs knowledge planning.

Table 4.3 1 Relative importance Index and ranking of planning knowledge area

Planning knowledge factors in planning	strongly disagree	Disagree	Neutral	Agree	strongly agree	Total respondents (N)	Weighted total	RII	Rank
Time Planning Knowledge area	1	10	9	29	11	60	219	0.730	1
Costs Planning Knowledge area	2	11	17	22	8.0	60	203	0.677	5
Risk Planning Knowledge area	12	18	13	14	3	60	158	0.527	9
Scope Planning Knowledge area	3	11	12	27	7	60	204	0.680	4
Quality Planning Knowledge area	2	6	17	31	4	60	209	0.697	3
Human Planning Knowledge area	1	6	15	33	5	60	215	0.717	2
Communication Planning Knowledge area	4	26	15	9	6	60	167	0.557	8
Integrated Planning Knowledge area	3	11	19	23	4	60	194	0.647	6
Procurement Planning Knowledge area	3	11	23	19	4	60	190	0.633	7

Source: own survey, 2022

4.3.2. Summary Planning Input Factors

The questionnaire of this study considered 49 factors which Planning Input Factors of project performance, and those factors were distributed into five groups as mentioned before, namely, Organizational input factors in planning; Technical input factors in planning; Management input factors in planning; Planning knowledge factors in planning and Human input factors of planning. Table 4.3.2 gives the result of a collected data in the second section of the questionnaire, namely, Planning Input Factors of project performance and illustrates the mean and ranking of each group.

Table 4.3 2 Weighted average and ranking over-all Planning Input Factors

Group No.	Main groups	Weighted average (all groups)	Rank
Group 4	Organizational input factors in planning	0.721	1
Group 3	Technical input factors in planning	0.715	2
Group 2	Management input factors in planning	0.652	3
Group 5	Planning knowledge factors in planning	0.651	4
Group 1	Human input factors of planning	0.626	5

Source: own survey, 2022

4.4 Correlation Analysis

Analysis/test/correlation was performed to take account of the relation between variables/constructions/. Any positive correlation coefficient(r) shows a direct or positive association of two variables measured. Negative rate refers to a relationship indirect or inverse. Tables 4.4.1 and 4.4.2 provide the definition of each element.

4.4.1 Correlation between planning input factor and planning knowledge

The correlation test in this section has been performed to find the correlation ship between the factors that affect planning output (correlation between input planning factors and project planning knowledge), the results were presented in Table 4.4.1. The result for correlating the planning data actor that affects the performance of each knowledge area of planning is identified. In accordance with table 4.4.1, the following facts have been interpreted: -

The connection of human input factors and knowledge, risk, cost, quality, scope, human resource, time, communication, integration, and procurement planning is positive and significant Zones.

The link between technical input factors is positive and important Time, cost, risk, scope, human resources, communication, integration, quality and the knowledge fields of procurement planning. Management inputs and time, cost, quality, procurement, human resources and knowledge management planning areas have a positive and significant correlation.

The link between organizational factors and the knowledge-related areas of time, human resources, risk planning has been positive and significant.

This result allows to conclude that the four input factors identified in the planning phases are affected by the performance / quality / cost, risk, integration, procurement and communication planning knowledge areas and technical, management and organizational inputs also affect the performance of time planning knowledge areas. The knowledge field of quality planning is influenced by management factors as well as organizational factors; knowledge fields of human resources planning are affected by technological input factors. The results show that planning factors play an important role in the role of these factors in the planning projects should therefore be recognized as effective planning performance.

Table 4 4 1 Correlation between planning input factors and planning processes

pwcorr hif mif tif oif pkfr pkfq pkfcu pkfi pkfs pkfp pkfh pkfco pkft

	hif	mif	tif	oif	pkfr	pkfq	pkfcu	pkfi	pkfs	pkfp
	pkfh	pkfco	pkt							
hif	1.0000									
mif	0.3874*	1.0000								
tif	0.4721*	0.4759*	1.0000							
oif	0.6013*	0.4192*	0.4100*	1.0000						
pkfr	0.5045*	0.2237	0.5535*	0.2595*	1.0000					
pkfq	0.2622 *	0.4863*	0.5120*	0.2168	0.3583*	1.0000				
pkfcu	0.4412*	0.2171	0.3326*	0.1235	0.3981*	0.1821	1.0000			
pkfi	0.3108*	0.1531	0.2823*	0.0149	0.1265	0.3319 *	0.5067*	1.0000		
pkfs	0.4371*	0.1966	0.5866*	0.1378	0.6891*	0.4994*	0.3119*	0.3308*	1.0000	
pkfp	0.2920*	0.4641*	0.3938*	0.1427	0.4632*	0.5793*	0.2120	0.1843	0.5274*	1.0000
pkfh	0.5080*	0.4765*	0.4844*	0.3303*	0.2845*	0.6330*	0.4246 *	0.4650*	0.4482*	0.4366*
pkfco	1.0000									
pkft	0.4333*	0.3615 *	0.4668*	0.1194	0.4342*	0.3115*	0.3292*	0.4662*	0.4763*	
	0.4292*	0.5174*	1.0000							
	0.5136*	0.3022*	0.3588*	0.4337*	0.0898	0.3225*	0.3092*	0.5388*	0.1616	
	0.3381*	0.4665*	0.4782*	1.000						

Note: * significant at 0.05 level, where hif= human factor, mif=management factors, tif= technical factors, oif= organizational structure, pkft= time planning processes, pkfco= cost planning processes, pkfr – risk planning processes, pkfs= scope planning processes, pkfq= quality planning processes, pkfh= human resource planning process, pkfcu= communication planning process, pkfi=integration planning processes, pkfp=procurement planning process

Source: own survey, 2022

4.4.2 Correlation between planning knowledge areas and project outcome

This section explains the relationship between project planning and project results. This section provides details. Tariffs pkfr to pkft apply to planning fields of expertise and project success / output variable t to cs. Table 4.4.2 displays the findings of the analysis: -

The relationship between project quality and knowledge time & quality planning exists positively and significantly. Customer satisfaction is positively and significantly correlated with quality, communication, integration, procurement, human resource and time knowledge areas.

Time is positively and significantly correlated with quality, integration, procurement, human resource and time knowledge areas. There is a positive and significant correlation between Completion cost of the project and scope planning knowledge area.

There is a positive and significant correlation between Completion time of the project and time, quality, integration, human resource, cost planning knowledge area.

Table 4.4 2 Correlation between planning knowledge areas and project success factors

	pkfr	pkfq	pkfcu	pkfi	pkfs	pkfp	pkfh	pkfco	pkft	t	c	q	cs
pkfr	1.0000												
pkfq	0.3583*	1.0000											
pkfcu	0.3981*	0.1821	1.0000										
pkfi	0.1265	0.3319*	0.5067*	1.0000									
pkfs	0.6891*	0.4994*	0.3119*	0.3308*	1.0000								
pkfp	0.4632*	0.5793*	0.2120	0.1843	0.5274*	1.0000							
pkfh	0.2845*	0.6330*	0.4246*	0.4650 *	0.4482*	0.4366*	1.0000						
pkfco	0.4342*	0.3115*	0.3292*	0.4662*	0.4763*	0.4292*	0.5174*	1.0000					
pkft	0.0898	0.3225*	0.3092*	0.5388*	0.1616	0.3381*	0.4665*	0.4782*	1.0000				
t	0.0330	0.2770*	0.1698	0.3853*	-0.0218	0.2251	0.3151*	0.0404	0.5169*	1.0000			
c	0.1159	0.2209	-0.0808	0.1940	0.3391*	0.2023	0.2928*	0.2213	0.0577	0.4487*	1.0000		
q	0.0771	0.4030*	0.2237	0.2500	0.0073	0.2007	0.3004*	-0.0223	0.3490*	0.7240*	0.3082*		
cs	1.0000												
	0.1840	0.4493*	0.3233*	0.3992*	0.1843	0.3214*	0.4206*	0.1976	0.5512*	0.6808*	0.3704*		
	0.8197*	1.00											

Note: * significant at 0.05 level
Where pkft= time planning processes, pkfco= cost planning processes, pkfi= risk planning processes, pkfs= scope planning processes, pkfq= quality planning processes, pkfh= human resource planning process, pkfcu= communication planning process, pkfi=integration planning processes, pkfp=procurement planning process, cs= customer satisfaction, q= quality, c= cost, t= time

4.5 Normality Test of variable in Stata

In Stata, normality is tested by either graphical or numerical methods. The graphical method includes drawing a stem-and-leaf plot, scatterplot, box-plot, histogram, probability-probability (P-P) plot, and quantile-quantile (Q-Q) plot. The numerical involve computing the Shapiro-Wilk, Shapiro-Francia, and Skewness/Kurtosis tests. In these tests, the null hypothesis states that the variable is normally distributed.

Many statistical tests require one or more variables to normally distributed for the results of the test to be reliable.

A formal way to test for normality is to use the **Shapiro-Wilk Test**.

The null hypothesis for this test is that the variable is normally distributed. If the p-value of the test is less than some significance level (common choices include 0.01, 0.05, and 0.10), then reject the null hypothesis and conclude that there is enough evidence to say that the variable is not normally distributed

This test is used when the total number of observations is between 4 and 2,000.

swilk displacement

```
. swilk displacement
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
displacement	74	0.92542	4.803	3.423	0.00031

Interpretation of the output of the test:

Obs: 74. This is the number of observations used in the test.

W: 0.92542. This is the test statistic for the test.

Prob>z: 0.00031. This is the p-value associated with the test statistic.

Since the p-value is less than 0.05, the null hypothesis of the test is rejected.

Shapiro-Wilk Test is also performed on more than one variable at once by listing several variables after the **swilk** command

swilk displacement mpg length

```
. swilk displacement mpg length
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
displacement	74	0.92542	4.803	3.423	0.00031
mpg	74	0.94821	3.335	2.627	0.00430
length	74	0.97165	1.825	1.313	0.09461

Using a 0.05 significance level, we would conclude that *displacement* and *mpg* are both non-normally distributed.

4.6 Multicollinearity Test in Stata

Multicollinearity in regression analysis occurs when two or more explanatory variables are highly correlated to each other, such that they do not provide unique or independent information in the regression model. If the degree of correlation is high enough between variables, it can cause problems when fitting and interpreting the regression model.

Response variable: Cost

Explanatory variables: Time, Quality, Customer Satisfaction

In this case, the explanatory variables time and quality are likely to be correlated. This means that multicollinearity is likely to be a problem in this regression.

Multicollinearity test using a metric known as the **variance inflation factor (VIF)**is used, which measures the correlation and strength of correlation between the explanatory variables in a regression model.

```
. regress price weight length mpg
```

Source	SS	df	MS		
Model	226957412	3	75652470.6	Number of obs	= 74
Residual	408107984	70	5830114.06	F(3, 70)	= 12.98
				Prob > F	= 0.0000
Total	635065396	73	8699525.97	R-squared	= 0.3574
				Adj R-squared	= 0.3298
				Root MSE	= 2414.6

price	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
weight	4.364798	1.167455	3.74	0.000	2.036383	6.693213
length	-104.8682	39.72154	-2.64	0.010	-184.0903	-25.64607
mpg	-86.78928	83.94335	-1.03	0.305	-254.209	80.63046
_cons	14542.43	5890.632	2.47	0.016	2793.94	26290.93

vif

```
. vif
```

Variable	VIF	1/VIF
weight	10.31	0.097010
length	9.79	0.102095
mpg	2.95	0.338610
Mean VIF	7.69	

This produces a VIF value for each of the explanatory variables in the model. The value for VIF starts at 1 and has no upper limit. A general rule of thumb for interpreting VIFs is as follows:

- A value of 1 indicates there is no correlation between a given explanatory variable and any other explanatory variables in the model.
- A value between 1 and 5 indicates moderate correlation between a given explanatory variable and other explanatory variables in the model, but this is often not severe enough to require attention.
- A value greater than 5 indicates potentially severe correlation between a given explanatory variable and other explanatory variables in the model. In this case, the coefficient estimates and p-values in the regression output are likely unreliable.

The VIF values for both weight and length are greater than 5, which indicates that multicollinearity is likely a problem in the regression model.

correlation price weight length mpg

```
. corr price weight length mpg
(obs=74)
```

	price	weight	length	mpg
price	1.0000			
weight	0.5386	1.0000		
length	0.4318	0.9460	1.0000	
mpg	-0.4686	-0.8072	-0.7958	1.0000

The length is highly correlated with both weight and mpg, and it has the lowest correlation with the response variable price. Thus, removing length from the model could solve the problem of multicollinearity without reducing the overall quality of the regression model.

To test this, perform the regression analysis again using just weight and mpg as explanatory variables:

regress price weight mpg

```
. regress price weight mpg
```

Source	SS	df	MS	Number of obs	=	74
				F(2, 71)	=	14.74
Model	186321280	2	93160639.9	Prob > F	=	0.0000
Residual	448744116	71	6320339.67	R-squared	=	0.2934
				Adj R-squared	=	0.2735
Total	635065396	73	8699525.97	Root MSE	=	2514

price	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
weight	1.746559	.6413538	2.72	0.008	.467736	3.025382
mpg	-49.51222	86.15604	-0.57	0.567	-221.3025	122.278
_cons	1946.069	3597.05	0.54	0.590	-5226.245	9118.382

The adjusted R-squared of this model is **0.2735** compared to **0.3298** in the previous model. This indicates that the overall usefulness of the model decreased only slightly:

VIF

```
. vif
```

Variable	VIF	1/VIF
mpg	2.87	0.348469
weight	2.87	0.348469
Mean VIF	2.87	

Both VIF values are below 5, which indicates that multicollinearity is no longer a problem in the model.

4.7. Regression Analysis

The overview of the relationships between planning input factors and planning areas of knowledge and project success factors evaluated using multi-linear models of regression is shown / described below.

4.7.1. Multiple linear regression analysis

A linear regression analysis is the method used to evaluate the model. Planning input factors play an important role for better (effective) planning results. The availability of input planning factors linked to efficient planning processes. Model1 analysis considers the role of the planning input factors in the planning process, using independent variables, which plan factors of input and dependent variables and plan the areas of knowledge. The use of these four regression models is tested for Hypotheses 1 – Hypothesis II4. Planning knowledge areas are also supposed to influence project performance / success/.

Further project performance is achieved in the better planning awareness fields, in which the efficiency, customer satisfaction, delivery times and expenses needed meet their needs. Model 2 (including model 2a – model 2d), the effect / impact of each planning knowledge area on project output is considered as a planning knowledge and a dependent variable as a project outcome / success factor, according to the independent variable. Hypotheses 5 – The use of these four regression models test H8 hypotheses.

4.7.1.1. The role of planning input factors on planning knowledge areas

The relation between input planning factors (independent variable) and knowledge planning fields (dependent variables) is described in Table 4.7.1.1 which presents the results of the analysis. The hypothesis regarding time planning knowledge areas from analysis result statistically shows human in put factor areas has positive effect on time, scope, risk, staff resources and communication and it has significant relationship with implementation success with positive coefficient value of β=0.476,0.353 and 0.4121 at 0.000,0.02 and 0.008 respectively as indicated significance with P value $p < 0.05$ (See table 4.7.1.1).The R-squared of the model for this study are 0.57 as indicated above which implies that the 57% of planning knowledge areas explained by the human input factor & the remaining factors 43% is not explained.

This result indicates that human input factor has a positive influence on 33% planning processes.

The Technical input factors positive affect the time, scope, quality, and risk knowledge planning areas.

The hypothesis tested whether Technical input factors has positive and significant impact on time, scope, quality, and risk knowledge planning areas. Regression analysis coefficient resulted in 0.23, 0.28, 0.265 and 0.245 at respectively a significance level of 0.085, 0.090, 0.088 and 0.125 respectively. When $p < 0.05$ which means that the hypothesis is accepted (see table 4.7.1.1). The R-squared of the model for this study are 0.40 as indicated above which implies that the 40% of planning knowledge areas explained by the human input factor & the remaining factors 60% is not explained.

The hypothesis asked for the management input factor when planning knowledge areas. The results depicted coefficient of 0.209, 0.3102 and 0.241 at a significance level of 0.192, 0.076 and 0.126 when $p < 0.05$ (see table 4.7.1.1). The hypothesis is hence accepted since the significance level yielded a value below the p-value stating that it is statistically significant to say that management input factor describes a project performance. Hence, the management input factor is significantly important factor for good project performance.

The organizational structure also has a positive connection with the knowledge areas of time, human resource and risk planning as indicated result coefficient of 0.64, 0.353 and 0.41 at a significant level 0.000, 0.044 and 0.022.

The findings explain the essential factors to boost performance / good / planning. For the information areas of time, expense, risk, reach, human resources and procurement planning, the human factor, technical input factor and management input factor is assessed as most relevant. The human input factor has no effect on the success of expertise areas of cost, scope, quality, communication, integration and procurement planning. The result also indicates that the all-in put factor aspect has an impact on most planning fields.

Table 4.7.1. 1 Regression result b/n planning input factors and planning processes

Planning input factor / Planning Knowledge areas	Human β (p)	Management β (p)	Technical β (p)	Organization β (p)
Time	.476(0.000***)	.02511(0.866)	.2316(0.085*)	.63721(0.000***)
Cost	-.0711(0.595)	.209(0.192*)	.1162(0.411)	-.2591(0.100*)
Scope	.1391(0.361)	-.2657(0.145)	.2755(0.090*)	- 0335(0.850)
quality	-.2072(0.156)	.3102(0.076*)	.26452(0.088*)	-.0243(0.885)
Human resource	.353(0.020**)	.203(0.250)	.0622(0.689)	.353(0.044**)
Communication	.091(0.476)	.1115(0.460)	.07084(0.596)	-.0783(0.596)
Integration	-.1273(0.360)	-.1694(0.306)	-.1415(0.335)	-.3285(0.046**)
Procurement	.1324(0.314)	.24064(0.126*)	-.1624(0.243)	-.197(0.201)
Risk	.4121(0.008**)	.01052(0.953)	.245(0.125*)	.4099(0.022**)
df	59	59	39	59
R2	0.5689	0.3907	0.5197	0.4159

Where .476(.000), .476=β Coefficient, 0. 000=p

Note: ***, **and *, indicates statistically Significant level at 1%, 5% and 10% respectively.

Source: own survey, 2022

4.7.1.2. The role of planning knowledge areas on project successes

This section explores the relationships between the planning fields of expertise and the success factors of the project evaluated in the regression model. All four project performance factors are believed to be affected significantly by planning information areas.

I. Impacts of knowledge planning areas on project cost completion

Model 2a refers to the relationship between the planned areas of knowledge (independent variable) and project cost (independent variables). In Table 4.7.1.2, several linear regressions analyzed the relations between certain variables.

The result shows a positive relationship between project completion costs and costs (Positive β coefficient) and information planning areas of scope and human resource. The scope and human resource β coefficient of 0.3123 &0.325 a p-value of 0.0123 and 0.099 respectively as means that the joint significance test of all variables in the model is

significant at 1% level as P<0.05, implying that the variables correctly predict the model. The R-squared of the model for this study are 0.46 as indicated above which implies that the 46% of planning knowledge areas explained by the human input factor & the remaining factors 54% is not explained.

This result shows that the "well estimated cost," the "well identified scope, human resources, integration and procurement" of the project is the best result of its cost completion. The result also found a negative connection between time planning, quality, communication and project risk. This suggests that the greater the time required for planning, the lower the cost of the project (the expense of completing the project promptly).

II. Impacts of planning knowledge areas on completion time of project

The relationship between planning (independent variable) and project completion time (dependent variables) is expressed in model 2b. Table 4.7.1.2 shows that only 3 of the 9 paths have positive coefficients with a project completion time. This means that the project's completion time is influenced by information preparation time, integration and risk. That means the β coefficient 0.438, 0.378 &0.302 at a significant level 0.003, 0.018 and 0.075.

III. Impact of knowledge planning areas on project quality

The 2c model shows the relation between project preparation (independent variable) and project quality (independent). These relationships were analyzed by the multiple linear regressions presented in Table 4.7.1.2. The outcome shows a positive relationship between project time and quality planning areas of knowledge.

IV. Impacts on customer satisfaction in planning knowledge areas

Model 2d expresses how planning (independent variable) is linked with the satisfaction of customers (dependent). The results in Table 4.7.1.2 show a positive link between customer satisfaction and knowledge planning fields are positive in time and quality. The result shows that all planning processes affect customer satisfaction. Regression analysis coefficient resulted in 0.448 and 0.2637 at respectively a significance level of 0.003, and 0.11 respectively. When significant at 1%, 5% &10% level as $p < 0.05$ which means that the hypothesis is accepted (see table 4.7.1.1). The R-squared of the model for this study are 0.44 as indicated above which implies that the 44% of planning knowledge areas explained by the human input factor & the remaining factors 56% is not explained.

This finding further shows the power / effects / preparation areas of expertise for different project success / outcomes. There are no impacts in the finalization of the projects on

schedule according to cost, scope, quality and communication planning areas. Cost, scope, procurement and areas of human resource affect the project to complete according to the projected cost. Project quality is also affected by knowledge planning areas of time, quality human resource, communication, integration, procurement and risk. The finding also indicates that customer satisfaction is not affected by scope and cost planning knowledge areas.

Table 4.7.1. 2 Regression b/n planning processes and project successes factor

Project outcome / Planning Knowledge areas	Time β (p)	Cost β (p)	quality β (p)	Customer Satisfaction β (p)
Time	.438(0.003***)	-.142(0.393)	.282(0.070**)	.448(0.003**)
Cost	-.45153(0.004)	.021(0.907)	-.358(0.032)	-.246(0.109*)
Scope	-.3638(0.036)	.3123(0.123*)	-.323(0.086*)	-.1353(0.433)
quality	-.001(0.995)	-.133(0.487)	.379(0.036**)	.2637(0.113*)
Human resource	.22985(0.167)	.325(0.099**)	.0871(0.628)	.0704(0.674)
Communication	-.1524(0.285)	-.363(0.034**)	.101(0.514)	.099(0.492)
Integration	.378(0.018***)	.2281(0.215)	.123(0.469)	.1185(0.452)
Procurement	.18534(0.209)	.0739(0.669)	.0367(0.818)	.0505(0.734)
Risk	.302(0.075***)	-.059(0.765)	.1964(0.284)	.1515(0.373)
df	59	59	59	59
R2	0.4599	0.25	0.359	0.4447

Note: ***, **and *, indicates statistically Significant level at 1%, 5% and 10% respectively.

Source: own survey, 2022

The outcome of the result showed from the analysis of gathered data identifies the main planning input factors for effective planning performance as: - human, management, technical and organizational culture factors. The result indicated that there is a high correlation between the planning efforts and overall project success.

CHAPTER FIVE - SUMMARY OF FINDINGS, CONCLUSIONS & RECOMMENDATIONS

5.1 Summary of findings

The aim of this study was to assess on the factors affecting project planning and the effect of planning on project success. This paper studies about the factors affecting project planning and the effect of planning on project success, examines the relationship between different planning input factors and planning processes, and planning processes with project success. The objective of this research is to differentiate key factors of the planning input factors and planning processes that yields better impact on the project success. The analysis is based on data collected from projects performed in Ethiopia and includes four planning input factors (human, managerial, technical and organizational) and the nine project planning processes (time, cost, risk, scope, quality, procurement, human resource, integration and communication).

The approach that used in this research was a quantitative research approach which makes the descriptive method more reliable and explanatory. To meet the objectives of the study the researcher collected primary data using Questionnaire from a population of 72 employees; however, 60 questionnaires were retrieved from the respondents and analyzed. Accordingly, the findings of the study are summarized as follows: the main planning input factors that affect the performance of planning processes (human, management, technical and organizational input factor).

The time, cost, quality and customer satisfaction parameters for project assessment are therefore selected in this report. This is mainly because of the objective (unbiased) nature of cost, time and quality metrics which allow a direct comparison between different projects of various types, sizes and scope across various industries. And similarly, the finding identifies the main problem areas in planning processes as time, cost, scope, risk, scope, quality and human resource knowledge areas were incompetently achieved in the studied project. The result of the finding also identifies 13 influential planning activities that affect the performance of project outcome.

5.2 Conclusion

The study evaluated the factors affecting project planning and the effect of planning on project success. Furthermore, key input planning factors were identified which affect the quality, performance and planning processes. Also identified are the existing problem areas for project planning and the most significant planning activities. The results obtained provide a clear understanding of a substantial input for planning that influences the quality / performance / planning processes. And it identifies the impacts on project outcomes of the planning fields of knowledge. From analyzing the collected data, the results identify the major planning inputs for effective quality / success planning as: - human, managerial, technical and organizational culture / structure / factor. When this factor is implemented, the organization's quality / performance / planning process is significantly / effective. However, most input factors are not effectively experienced according to the finding of the study. Project owners / customers participated in the planning processes only 25%, the team members committed 42% to the project, the client organization's 32% of the functional department participated in the planning stage, CMP and PERT, respectively, were used by just 62% and 37%. This development of these poorly experienced input factors demonstrates good planning process efficiency. The other study is evaluating the role of planning areas of knowledge in the outcome of a project. These findings support the important role of project success planning. In addition, a study of correlation and regression from the collected data established the effect of each planning knowledge sector on each outcome. Time, scope, risk, human resources, quality and information integration fields have been established as important factors to satisfy customers;

The findings also identified areas of planning knowledge that were poorly performed in the project studied:-risk, cost, communications, integration and the planning of scope of the knowledge are poorly, rarely and only in 27.3%, cost 50%, communication 25%, integration 45%, procurement 38.5% and scope of application were performed Improvement of low performance / quality / in these areas of knowledge increases planning performance and improves project results. In this study, 13 important / planning / activities / processes / activities that impact project success are listed. Identifying the influential / important / planning tasks / activities / assist project managers to focus more effort / invest greater effort to achieve their desired results. This improves / increases / enhances the chances of project success by improving weak planning processes, spending more time / effort on the defined planning actions.

5.3 Recommendation

The following suggestions are provided based on the study findings and conclusions. It is recommended that to improve the quality / performance / planning processes:

- In planning, the project managers should spend more effort.
- The team members must have sufficient knowledge on planning processes.
- In the planning phase, companies should help project managers more.
- The functional the department must engage in the planning process:
- Team leaders should obtain the necessary support during assigning project managers should be allocated during planning phases
- It is advised for respondents, both reality and project type, to prepare a method statement and schedule for the project.
- Respondents should have trained technical personnel with enough expertise who can plan and execute a project in a specified time frame.
- Consultancy Service and Trainings should be given on construction planning by Ministry of Urban Development and Construction.

The study indicates that the four success factors in the project (time, expense, price, customer satisfaction) are linked to planning activities. Therefore, the project team members should spend more time on the next planning activities during the planning phase. Schedule preparation, risk management planning, hiring and retention of personnel, human resource planning, resource planning, cost estimate, period of operation estimates, quality analysis, risk identification, quality norm identification, communication planning.

5.4 Recommendation for Future Research

The researcher would like to suggest the followings for future researchers:

- Analysis of the best approaches for project planning.
- Comparison of foreign and domestic contractors' project planning. The findings of this analysis help to share lessons with the domestic contractor.
- To study on how contractors and financing projects can improve their cash flow to achieve the project objectives. The results of this study help contractors understand the key factors and learn how to allocate adequate budgets.

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Appendix

Appendix. A. QUETIONNAIRE FOR SURVEY

Project Planning & Management

April 2022

TO WHOM IT MAY CONCERN

Dear Sir/Madam

LETTER OF INVITATION FOR RESEARCH SURVEY

The department of project planning and management at Addis Ababa University School of Commerce, is conducting a research project titled "**THE FACTORS AFFECTING PROJECT PLANNING AND THE EFFECT OF PLANNING ON PROJECT SUCCESS"** we kindly request that you complete the following short questionnaire. Answering this questionnaire will take approximately 15minutes of your time. Your response is of the utmost important to us. To protect your anonymity, please do not enter your name or contact details on the questionnaire. Should you wish to know the findings of this results will be available at the department of Project Planning & management.

If you have any queries or comment regarding this survey, you are welcome to contact me telephonically at +251-912-35-84-60 or e-mail me at netmillion9@gmail.com.

Thanking you in advance.

Netsanet Million

Section A: General Background Information

This section of the questionnaire refers to the background or biographical information. Although we are aware of the sensitivity of the questions in this section, the information will allow us to compare groups of respondents. Once again. We assure you that your response will remain anonymous. Your co-operation is appreciated.

Name of the organization_____

Project type_____

Name of project_____

Origin of your company:

Local ☐ Foreign ☐ Local private or joint- stock companies ☐

Personal Details of the Respondent

Gender _____

Your current position/ Job title/ in the organization _____

Your work experience/service year/ in this organization _____

Educational background. _____

How many projects have you participated in as project managers/ leaders or as others _____

Section B: Planning Input Factors

Instructions:

Please consider the recently completed project in your organization and answer the following question. For each of the questions, please tick[x] in the provided space the most suitable answer using the given scale. Please also answer all the questions to enhance the objectivity of the project work.

No	Human input factors of planning	Scale				
		strongly disagree	Disagree	Neutral	Agree	strongly agree
1	Project managers were well trained in process planning					
2	More scheduling time was expended relative to other stages					
3	Team members have had a proper planning experience					

4	In the planning phase, team members were well committed					
5	Customers / users participated in planning phase					
No	**Management input factors in planning**	**Scale**				
		strongly disagree	**Disagree**	**Neutral**	**Agree**	**strongly agree**
6	Parent organization's functional divisions were active in the planning stage					
7	Clients were involved in planning stage					
8	The project manager received full supervisory authority					
9	Delegates of the company's functional divisions took an active part in the planning stage as team leaders					
10	There were no conflicting objectives in the planning stage between the project team and the client to describe the goal definition process					
11	The scope of the project was established well during the planning phase					
12	All resources (qualified staff and infrastructure) have been allocated.					

No	Technical input factors in planning	Scale				
		strongly disagree	Disagree	Neutral	Agree	strongly agree
13	A structure of work breakdown was used					
14	Gant chart was used					
15	Method of Critical Path (CPM)					
16	Technique for the Assessment and Analysis of Projects (PERT) was used					
17	Mechanisms for project control and reporting were included in the planning stage					
18	Software for the management of projects was used					
19	Team members give their usual duties more priority than planning activities					
20	Training for project team leader					

No	Organizational input factors in planning	Scale				
		strongly disagree	Disagree	Neutral	Agree	strongly agree
21	Suitable project managers were named					
22	Project managers took part in planning phase					
23	During the planning phase,					

	project managers and organizations were aware					

No	Planning knowledge factors In planning	Scale				
		strongly disagree	Disagree	Neutral	Agree	strongly agree
24	Schedules were well organized					
25	Activities had been well described					
26	The length of the operation was reasonable estimated					
27	Work on the project was well sequenced					
28	Costs of the project were well calculated					
29	Resource decided for project					
30	Project budget was well defined (aggregating the estimated cost of Individual activities or job packages to create an agreed cost base)					
31	Risk found for the project					
32	Prepared quantitative threat analysis					
33	Prepared qualitative hazard analysis					
34	Preparation of risk response planning					
35	Prepared Scope Planning					
36	Project Well described scope					

37	The results of the project have been well identified					
38	Performance preparation conducted					
39	Stated quality standard					
40	Planned Human Resource					
41	Timed idea acquired					
42	Drawn up a communication strategy					
43	Prepared Integrated Project Schedule					
44	Developed procurement strategy (identifying what project requirements can best be fulfilled by procurement outside the project organization)					
45	Solicitation planning prepared (preparing the documents needed to support solicitation/request)					
46	The project completed on the original schedule(planned)					
47	The project has been completed with the budget envisaged					
48	In the planning phase the delivered product met all the specifications					

49	The project outcome meets customer needs					

50. Project time estimated / planned_____ month/year

52. Actual completion time of the project_____ month/year

53. Other comments you may forward with regard to the subject matter

_____

_____

_____

_____

_____

----- The End -----

Please kindly check that no points are escaped and Thank You for Your Time!!!

Appendix. B STATA OUTPUT

* Correlation between planning input factors and planning processes

. pwcorr hif mif tif oif pkfr pkfq pkfcu pkfi pkfs pkfp pkfh pkfco pkft, star(5)

	hif	mif	tif	oif	pkfr	pkfq	pkfcu
hif	1.0000						
mif	0.3874*	1.0000					
tif	0.4721*	0.4759*	1.0000				
oif	0.6013*	0.4192*	0.4100*	1.0000			
pkfr	0.5045*	0.2237	0.5535*	0.2595*	1.0000		
pkfq	0.2622*	0.4863*	0.5120*	0.2168	0.3583*	1.0000	
pkfcu	0.4412*	0.2171	0.3326*	0.1235	0.3901*	0.1821	1.0000
pkfi	0.3108*	0.1531	0.2823*	0.0149	0.1265	0.3319*	0.5067*
pkfs	0.4371*	0.1966	0.5866*	0.1378	0.6891*	0.4994*	0.3119*
pkfp	0.2920*	0.4641*	0.3938*	0.1427	0.4632*	0.5793*	0.2120
pkfh	0.5080*	0.4765*	0.4844*	0.3303*	0.2845*	0.6330*	0.4246*
pkfco	0.4333*	0.3615*	0.4668*	0.1194	0.4342*	0.3115*	0.3292*
pkft	0.5136*	0.3022*	0.3588*	0.4337*	0.0898	0.3225*	0.3092*

	pkfi	pkfs	pkfp	pkfh	pkfco	pkft
pkfi	1.0000					
pkfs	0.3308*	1.0000				
pkfp	0.1843	0.5274*	1.0000			
pkfh	0.4650*	0.4482*	0.4366*	1.0000		
pkfco	0.4662*	0.4763*	0.4292*	0.5174*	1.0000	
pkft	0.5388*	0.1616	0.3381*	0.4665*	0.4782*	1.0000

. * NB:-significant at 0.05 level, where hif= human factor, mif=management factors, tif= technical factors, oif= organ
> izational structure, pkft= time planning processes, pkfco= cost planning processes, pkfr= risk planning processes, p
> kfs= scope planning processes, pkfq= quality planning processes, pkfh= human resource planning process, pkfcu= commu
> nication planning process, pkfi=integration planning processes, pkfp=procurement planning process

B. Correlation between planning knowledge areas and project success factors

. pwcorr pkfr pkfq pkfcu pkfi pkfs pkfp pkfh pkfco pkft t c q cs, star(5)

	pkfr	pkfq	pkfcu	pkfi	pkfs	pkfp	pkfh
pkfr	1.0000						
pkfq	0.3583*	1.0000					
pkfcu	0.3981*	0.1821	1.0000				
pkfi	0.1265	0.3319*	0.5067*	1.0000			
pkfs	0.6091*	0.4994*	0.3119*	0.3308*	1.0000		
pkfp	0.4632*	0.5793*	0.2120	0.1843	0.5274*	1.0000	
pkfh	0.2845*	0.6330*	0.4246*	0.4650*	0.4482*	0.4366*	1.0000
pkfco	0.4342*	0.3115*	0.3292*	0.4662*	0.4763*	0.4292*	0.5174*
pkft	0.0898	0.3225*	0.3092*	0.5388*	0.1616	0.3381*	0.4665*
t	0.0330	0.2770*	0.1698	0.3853*	-0.0218	0.2251	0.3151*
c	0.1159	0.2209	-0.0808	0.1940	0.3391*	0.2023	0.2928*
q	0.0771	0.4030*	0.2237	0.2500	0.0073	0.2007	0.3004*
cs	0.1840	0.4493*	0.3233*	0.3992*	0.1843	0.3214*	0.4206*

	pkfco	pkft	t	c	q	cs
pkfco	1.0000					
pkft	0.4782*	1.0000				
t	0.0404	0.5169*	1.0000			
c	0.2213	0.0577	0.4487*	1.0000		
q	-0.0223	0.3490*	0.7240*	0.3082*	1.0000	
cs	0.1976	0.5512*	0.6808*	0.3704*	0.8197*	1.0000

. * Note:significant at 0.05 level

.

. Where pkft= time planning processes, pkfco= cost planning processes, pkfr= risk planning processes, pkfs= scope plan
> ning processes, pkfq= quality planning processes, pkfh= human resource planning process, pkfcu= communication planni
> ng process, pkfi=integration planning processes, pkfp=procurement planning process, cs= customer satisfaction, q= qu
> ality, c= cost, t= time

Regression Out put

A. Regression result b/n planning input factors and planning processes

```
. regress hif      pkfr    pkfq    pkfcu    pkfi pkfs       pkfp    pkfh    pkfco    pkft,beta
```

Source	SS	df	MS	Number of obs	=	60
				F(9, 50)	=	7.33
Model	19.4479995	9	2.16088884	Prob > F	=	0.0000
Residual	14.7353338	50	.294706676	R-squared	=	0.5689
				Adj R-squared	=	0.4913
Total	34.1833333	59	.579378531	Root MSE	=	.54287

hif	Coef.	Std. Err.	t	P>|t|	Beta
pkfr	.2710841	.0977211	2.77	0.008	.412064
pkfq	-.2055531	.1427217	-1.44	0.156	-.2072001
pkfcu	.0806339	.0843403	0.96	0.343	.0905187
pkfi	-.0985927	.1066913	-0.92	0.360	-.127295
pkfs	.1017171	.1103392	0.92	0.361	.1391075
pkfp	-.1110252	.1091983	-1.02	0.314	-.1377771
pkfh	.5065645	.2101941	2.41	0.020	.3530056
pkfco	-.0707127	.1319995	-0.54	0.595	-.0711424
pkft	.4228844	.1109635	3.81	0.000	.4756719
_cons	.0646687	.5122836	0.13	0.900	.

```
. regress mif      pkfr    pkfq    pkfcu    pkfi pkfs       pkfp    pkfh    pkfco    pkft,beta
```

Source	SS	df	MS	Number of obs	=	60
				F(9, 50)	=	3.56
Model	11.4269834	9	1.26966482	Prob > F	=	0.0018
Residual	17.8230166	50	.356460333	R-squared	=	0.3907
				Adj R-squared	=	0.2810
Total	29.25	59	.495762712	Root MSE	=	.59704

mif	Coef.	Std. Err.	t	P>|t|	Beta
pkfr	.0064002	.1074729	0.06	0.953	.0105171
pkfq	.2846249	.1569642	1.81	0.076	.3101581
pkfcu	.0690803	.0927569	0.74	0.460	.1114863
pkfi	-.1213323	.1173382	-1.03	0.306	-.1693509
pkfs	-.1796942	.1213502	-1.48	0.145	-.2656653
pkfp	.1866844	.1200922	1.55	0.126	.2406375
pkfh	.2692117	.2311698	1.16	0.250	.202808
pkfco	.1920099	.1451721	1.32	0.192	.2088328
pkft	.0206824	.1220368	0.17	0.866	.0251496
_cons	.6932685	.5634054	1.23	0.224	.

```
. regress tif     pkfr   pkfq    pkfcu   pkfi pkfs      pkfp    pkfh    pkfco   pkft,beta
```

Source	SS	df	MS		
				Number of obs	= 60
				F(9, 50)	= 6.01
Model	11.2950527	9	1.25500585	Prob > F	= 0.0000
Residual	10.4382806	50	.208765613	R-squared	= 0.5197
				Adj R-squared	= 0.4333
Total	21.7333333	59	.368361582	Root MSE	= .45691

tif	Coef.	Std. Err.	t	P>|t|	Beta
pkfr	.1284438	.0822476	1.56	0.125	.2448598
pkfq	.2092406	.1201226	1.74	0.088	.2645185
pkfcu	.0378388	.0709855	0.53	0.596	.0708441
pkfi	-.0873757	.0897973	-0.97	0.335	-.1414821
pkfs	.1606029	.0928676	1.73	0.090	.2754571
pkfp	-.1085866	.0919049	-1.18	0.243	-.1623796
pkfh	.0712146	.176911	0.40	0.689	.0622386
pkfco	.0921276	.1110982	0.83	0.411	.1162424
pkft	.1641445	.0933931	1.76	0.085	.2315561
_cons	1.449795	.4311664	3.36	0.001	.

```
. regress oif     pkfr   pkfq    pkfcu   pkfi pkfs      pkfp    pkfh    pkfco   pkft,beta
```

Source	SS	df	MS		
				Number of obs	= 60
				F(9, 50)	= 3.96
Model	19.4344185	9	2.15937983	Prob > F	= 0.0007
Residual	27.2989149	50	.545978297	R-squared	= 0.4159
				Adj R-squared	= 0.3107
Total	46.7333333	59	.792090395	Root MSE	= .7389

oif	Coef.	Std. Err.	t	P>|t|	Beta
pkfr	.3153613	.133009	2.37	0.022	.4099801
pkfq	-.0281689	.1942597	-0.15	0.885	-.0242845
pkfcu	-.061321	.1147964	-0.53	0.596	-.0782935
pkfi	-.2974771	.1452184	-2.05	0.046	-.328484
pkfs	-.0286071	.1501836	-0.19	0.850	-.0334599
pkfp	-.1927313	.1486267	-1.30	0.201	-.1965428
pkfh	.5916393	.2860969	2.07	0.044	.3526125
pkfco	-.3010901	.1796657	-1.68	0.100	-.2590724
pkft	.6623722	.1510333	4.39	0.000	.6372088
_cons	.991522	.6972734	1.42	0.161	.

B. Regression b/n planning processes and project successes factor

```
. regress t      pkfr   pkfq    pkfcu   pkfi pkfs      pkfp    pkfh    pkfco   pkft,beta
```

Source	SS	df	MS		
				Number of obs	= 60
				F(9, 50)	= 4.73
Model	50.8604131	9	5.65115702	Prob > F	= 0.0001
Residual	59.7229202	50	1.1944584	R-squared	= 0.4599
				Adj R-squared	= 0.3627
Total	110.583333	59	1.87429379	Root MSE	= 1.0929

t	Coef.	Std. Err.	t	P>|t|	Beta
pkfr	.3577236	.1967338	1.82	0.075	.3023225
pkfq	.0017599	.2073297	0.01	0.995	.0009863
pkfcu	-.1835604	.1697954	-1.08	0.285	-.1523576
pkfi	.5268803	.2147927	2.45	0.018	.378217
pkfs	-.478449	.2221367	-2.15	0.036	-.3637932
pkfp	.2795747	.2198339	1.27	0.209	.1053409
pkfh	.5932351	.4231662	1.40	0.167	.2290455
pkfco	-.807218	.2657437	-3.04	0.004	-.4515274
pkft	.7008	.2233935	3.14	0.003	.4382706
_cons	-1.007576	1.031338	-0.98	0.333	.

```
. regress c      pkfr   pkfq    pkfcu   pkfi pkfs      pkfp    pkfh    pkfco   pkft,beta
```

Source	SS	df	MS		
				Number of obs	= 60
				F(9, 50)	= 1.85
Model	21.2263135	9	2.35847928	Prob > F	= 0.0823
Residual	63.7736865	50	1.27547373	R-squared	= 0.2497
				Adj R-squared	= 0.1147
Total	85	59	1.44067797	Root MSE	= 1.1294

c	Coef.	Std. Err.	t	P>|t|	Beta
pkfr	-.0611814	.2032962	-0.30	0.765	-.0589763
pkfq	-.2077604	.2969141	-0.70	0.487	-.1328087
pkfcu	-.3830213	.1754592	-2.18	0.034	-.3626131
pkfi	.2785426	.2219574	1.25	0.215	.2280637
pkfs	.3600766	.2295464	1.57	0.123	.3122836
pkfp	.0977538	.2271668	0.43	0.669	.0739167
pkfh	.7352065	.4372816	1.68	0.099	.3249032
pkfco	.0321928	.274608	0.12	0.907	.0205394
pkft	-.1987436	.2308452	-0.86	0.393	-.1417675
_cons	-.031493	1.06574	-0.03	0.977	.

. regress q pkfr pkfq pkfcu pkfi pkfs pkfp pkfh pkfco pkft,beta

Source	SS	df	MS	Number of obs	=	60
				F(9, 50)	=	3.11
Model	30.0336556	9	3.33707284	Prob > F	=	0.0048
Residual	53.6996778	50	1.07399356	R-squared	=	0.3587
				Adj R-squared	=	0.2432
Total	83.7333333	59	1.41920904	Root MSE	=	1.0363

q	Coef.	Std. Err.	t	P>|t|	Beta
pkfr	.2022085	.1865496	1.08	0.284	.1963894
pkfq	.5083334	.2724557	2.16	0.036	.37892
pkfcu	.1057784	.1610057	0.66	0.514	.1008969
pkfi	.148618	.2036736	0.73	0.469	.1226016
pkfs	-.3693666	.2106375	-1.75	0.086	-.3227543
pkfp	.0481192	.2084539	0.23	0.818	.0366596
pkfh	.1955182	.4012604	0.49	0.628	.0870546
pkfco	-.5569603	.2519871	-2.21	0.032	-.3580248
pkft	.3927097	.2118292	1.85	0.070	.282238
_cons	.3847982	.9779491	0.39	0.696	.

. regress cs pkfr pkfq pkfcu pkfi pkfs pkfp pkfh pkfco pkft,beta

Source	SS	df	MS	Number of obs	=	60
				F(9, 50)	=	4.45
Model	30.9723921	9	3.4413769	Prob > F	=	0.0003
Residual	38.6776079	50	.773552158	R-squared	=	0.4447
				Adj R-squared	=	0.3447
Total	69.65	59	1.10050047	Root MSE	=	.87952

cs	Coef.	Std. Err.	t	P>|t|	Beta
pkfr	.1422981	.1583209	0.90	0.373	.1515327
pkfq	.3733563	.2312277	1.61	0.113	.2636551
pkfcu	.0946929	.1366423	0.69	0.492	.0990346
pkfi	.1310591	.1728537	0.76	0.452	.1185443
pkfs	-.1411896	.1787638	-0.79	0.433	-.1352713
pkfp	.0604386	.1769106	0.34	0.734	.0504861
pkfh	.1442279	.3405417	0.42	0.674	.0704114
pkfco	-.3489207	.2138564	-1.63	0.109	-.2459259
pkft	.5679733	.1797752	3.16	0.003	.4475695
_cons	-.2804519	.8299659	-0.34	0.737	.