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ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

Project management master's program

The Effect of Project Planning on project success in the case of
the 6000 Solar Direct Drive cold chain equipment project in
Ethiopia

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Advisor: Bantie Workie (Ph.D.)

A Project Work Submitted to Addis Ababa University School of
Commerce in Partial Fulfillment of the requirements for the award of
Masters of Arts in Project Management

June 2022
Addis Ababa, Ethiopia

ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT OF PROJECT MANAGEMENT

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Declaration

I, Bethelhem Tilaye, hereby declare that this project work entitled, “The effect of Project Planning on project success in the case of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia” is my original work and has not been presented in Addis Ababa University or any other university. I have carried out the study independently with the guidance and support of the research advisor Dr. Bantie Workie. Any other research or academic sources used in this study have been duly acknowledged.

Declared by: Bethelhem Tilaye (Student)

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Confirmed by: Dr. Bantie Workie (Advisor)

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Date: _____

Acknowledgement

I want to start by sincerely thanking my adviser, Dr. Bantie Workie, for his invaluable advice and wise suggestions in helping me carry out this study at the Addis Ababa University School of Commerce.

I cannot begin to fully express my gratitude to my exceptional family, for their generosity, faith, and superb guidance. I am also grateful to everyone from the ministry of health department who were generous with their time to give me all information about the project.

Finally, I would like to express my sincere gratitude to all of the responders who gave up their time to complete the survey.

Abstract

This study was intended to assess the impact of project planning on project success in the case of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia. Hence, the data were collected by a structured questionnaire from respondents and were analyzed quantitatively. The specific objective of this study was to assess the impact of scope planning, resource planning, schedule planning, quality planning, and risk management planning on project success. Although research on the importance of planning on project success has been done, in general, this paper comprehensively assessed the impact of these five planning processes on project success. The methodological approach involved a survey of 30 respondents who were people who have a significant connection with the project using a judgmental sampling technique. The primary data was gathered through a structured questionnaire. Descriptive and inferential analyses were conducted using SPSS version 26. The finding of this study revealed that the planning processes significantly correlate with project success. Furthermore, scope planning and quality planning were found to have high significance with a beta value of 0.209 and 0.237 respectively. Lastly, this study recommends project personnel put in more effort in the planning stage and utilize these planning processes thoroughly to achieve project success. Further future studies addressing project planning from a wider perspective are also recommended.

Keywords: project planning, scope planning, resource planning, schedule planning, quality planning, risk management planning, project success

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Acronyms and Abbreviations

A	Agree
CPM	Critical Path Method
D	Disagree
ESBET	Ethiopian Society of Biomedical Engineers and Technologists
HSTP I	Health Sector Transformation Plan I
N	Neutral
OBS	Organization Breakdown Structure
PERT	Program Evaluation and Review Technique
PMBOK	Project management body of knowledge
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
SA	Strongly Agree
SD	Strongly Disagree
SDD	Solar Direct Drive
WBS	Work Breakdown Structure
WHO	World Health Organization

Chapter one

Introduction

Introduction

The goal of this research is described in the introduction chapter. It comprises the study's background, problem statement, research questions, aims, significance, and scope, as well as a definition of key terms.

1.1 Background of the Study

According to the PMBOK Guide, a project is a brief undertaking made to provide a unique product, service, or outcome. Projects' provisional nature emphasizes the fact that they have clear beginnings and ends. The project's end occurs when its goals have been met, when it is terminated because its goals won't or can't be attained, or when there is no longer a need for it. (Newtown, 2013)

According to Idoko (2008), many projects in developing countries experience significant time and cost overruns, fail to realize their intended benefit, or are completely ended and abandoned before or after completion. Similarly to other developing countries, any type of project in Ethiopia faces many of the same problems and challenges that projects in other developing countries face. Given the critical role that projects play in Ethiopia, improving project performance must be a top priority. Previous research has identified inadequate project planning as one of the causes of project failure in developing countries [(Whittaker 1999), [(Dvir, Raz, and Shenhar 2003), and others]. Project planning time will reduce risk and increase project success. Whittaker (1999) identified three common causes of project failure in terms of the factors influencing project outcomes. The first cause is poor (lack of) project planning, or a weak project plan. Aladwani (2002) and Dvir, Raz, and Shenhar (2003) found a positive relationship between project planning and project performance (2003). Their findings revealed a strong link between overall project success and planning efforts. Although numerous factors influencing project outcomes were investigated, planning was identified as a critical success factor.

To enhance the performance of the project outcome, systematic improvement in project planning is therefore necessary. There hasn't been much research done on this topic in the country as far as I can tell. By emphasizing the impact of project planning on project performance, this research aims to close the knowledge gap. Data from the completed project was gathered in order to examine and evaluate the impact of project planning on project performance as well as to pinpoint the main project planning issue areas in the nation. Following a study and identification of the impacts of project planning in Ethiopia, this thesis will make systematic recommendations for the necessary knowledge, actions, and processes to address the issue of project planning in the country.

1.2 Background of the project

The Ministry of Health, Ethiopia is a public institution established in 1948 G.C which works on the health sector development programs (Ellicott, 1944). The mission of the Ministry of Health is to see healthy, productive, and prosperous Ethiopians while the vision is to promote the health and wellbeing of Ethiopians through providing and regulating a comprehensive package of promotive, preventive, curative, and rehabilitative health services of the highest possible quality in an equitable manner (Federal Democratic Republic of Ethiopia Ministry of Health, 2021).

Ethiopia's health service is structured into a three-tier system: primary, secondary, and tertiary levels of care which serve 30,000 to 100,000 people (Wamai, 2009; Gossa, Fetters, and Zazove, 2015). The primary level of care includes primary hospitals, health centers, and health posts. The secondary level of care consists of general hospitals that serve 1 to 1.5 million people (Wamai, 2009; USAID, 2010). The tertiary level of health care specialized hospitals and serves 3.5 to 5.0 million people (Wamai, 2009; Outcomes, Session and Services, 2015). According to MOH 2020 data, 17, 550 health posts, 3, 735 health centers and 353 functional public hospitals were providing healthcare services to the population (Alebachew and Waddington, 2015).

In the first phase of five years, Ethiopia's Health Sector Transformation Plan I (HSTP I) has set ambitious goals to improve equity, coverage, and utilization of essential health services at all levels by 2020. Improving the coverage rates of essential health services, such as immunization of mothers and children was among the important strategic plans included in the HSTP I. Immunization is one of the most cost-effective health investments. By protecting children against

vaccine-preventable diseases, immunization plays a central role in ending preventable child deaths. Despite significant improvements over the past decades, in Ethiopia, only 38.5% of children between 12 and 23 months receive all basic vaccinations (Wondimu *et al.*, 2020). There are also great disparities in access to vaccination services between rural and urban areas.

The achievement of optimized immunization strategic plans requires continued efforts and significant investments, including in innovative technology. One of the key strategies to improve access and utilization of immunization services was to improve the cold chain system, especially at the health post level. Hence, the Ministry of Health invested in solar-powered refrigerators which are more cost-effective and sustainable than refrigerators using gas or kerosene, in remote areas where there is no electricity.

The Ministry of Health has procured over 6,000 Solar Direct Drive (SDD) refrigerators for health posts and woreda health offices in areas without reliable electricity. The devices will store vaccines at health facilities which will help keep millions of children alive and healthy. The devices will ensure the availability and safety of vaccines in remote areas where the country's most vulnerable children live (WHO and UNICEF, 2017). The Ministry of Health fully funded the procurement of these solar refrigerators at a total cost of US\$ 31.4 million. The procurement and commissioning processes were supported by United Nations International Children's Emergency Fund (UNICEF) given its global expertise in handling such large-scale purchases in a short time.

The procurement of the SDD followed a unique bundled procurement services approach which included warranty, delivery of spare parts, installation package, and training of supply chain and immunization personnel at all levels. A project management team led by the Ministry of Health and UNICEF was able to regularly review the progress and efficiency of operations. The Solar Direct Drive (SDD) refrigerators procurement program was launched in March 2016 in the presence of the Ministry of Health State Minister and UNICEF country representative with national media coverage.

The main objective of the project was to ensure the reduction of child mortality and morbidity caused by a lack of immunization. The project aimed to procure, install and commission 6000 SDD refrigerators in 200 health facilities that do not have access to electricity. Moreover,

building the capacity of immunization health workers and technicians, improving the storage and management of vaccines at health posts, increasing the availability of vaccines, and ensuring no child is left behind immunization were the targets of the project.

Both internal and external stakeholders were involved during the implementation of the project. The client of the project is the Ministry of Health while beneficiaries are the health posts, hospitals, and community. Other internal stakeholders are UNICEF and suppliers (B-Medical Systems and Haier Group Corporation). Ethiopian Society of Biomedical Engineers and Technologists (ESBET), regional health bureaus, Custom and Revenue Authority, Ethiopian Food and Drug Authority (EFDA), and Ethiopian Pharmaceuticals Supply Services (EPSS) are among the major external stakeholders of the project.

1.3 Statement of the Problem

The primary goal of any project organization is to complete the project on time and within the budget. Unfortunately, many projects take considerably longer, cost more than required, and some are forced to be canceled due to a variety of factors that are directly or indirectly related to them. Failures of projects have significant economic and political consequences. If the project takes longer, it necessitates more resources and budgets, which raises labor, material, machinery, and equipment costs. According to Azhar and Farouqui (2008), the trend is more severe in developing countries.

The performance issues of project cost overrun, time delay, and quality deficiency are caused by factors such as project selection, planning, execution, and control. However, one of the primary causes of project failure in developing countries, according to Richard (2012), is a general absence planning process. Similarly, most planning processes are ignored, and project execution is frequently begun without developing a project plan or with inadequate planning.

According to Antvik and Sjöholm (2007), project implementation without actual functioning development of a project plan frequently results in delays, high costs, and general project execution problems. The absence of a project plan that was put into action has led to issues in every aspect of project management and prevented the management team from having the necessary control over project activities. Various researchers demonstrate the effects of project

planning on project performance in this regard. Wang and Gibson (2008) found that spending time on project planning processes reduces risk and increases project success. Poor planning will not allow appropriate execution and control processes or achievement of the project's targets. In view of this, it is necessary to understand the impact of effective project planning on project success. Therefore, this study will assess the effect of each project planning process on project outcome in a specific project and prevent future project failure. Understanding the effect of project planning on project success is imperative to achieve the desired goal of any project.

1.4 Basic research questions

The following are the basic research questions

1. How is the current practices of Project Planning Dimensions?
2. How is the current practices of Project success?
3. What is the extent of the relationship of Internal Audit Dimensions with effectiveness of financial management?
4. What is the effects of Internal Audit Dimensions with effectiveness of financial management?

1.5 Objectives of the study

General objective

The general objective of this study is to examine the effect of project planning on project success in the case of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia.

Specific objectives

- To assess the current practices of Project Planning Dimensions
- To assess the current practices of Project success
- To assess the extent of the relationship of Internal Audit Dimensions with effectiveness of financial management

- To assess the effects of Internal Audit Dimensions with effectiveness of financial management

1.6 Hypothesis of the Study

Based on the research objectives, the following hypotheses are formulated to be tested:

H1: Scope planning has a positive impact on project success.

H2: Resource planning has a positive impact on project success.

H3: Schedule planning has a positive impact on project success.

H4: Quality planning has a positive impact on project success.

H5: Risk management planning has a positive impact on project success.

1.7 Definition of terms

Project planning is defined as the creation of a set of detailed instructions that tell the project team exactly what has to be done, when it must be done, and what resources must be used in order to successfully complete the project's deliverables (Meredith & Mantel, 2006).

Scope planning is the process of developing the work required to deliver the project's product. It should be premised on the product/output depiction and the customer's requirements (PMBOK, 2004).

Resource planning is used to determine and identify an approach to ensure that sufficient resources are available for the successful completion of the project. Project resources may include team members, supplies, materials, equipment, services, and facilities.

Schedule planning is the procedure of building policies, methodology, and project documentation that gives way and guidance on how the task timetable will be overseen all throughout the project.

Quality planning refers specifically to the actions of the project management team and or the project management team leader to engage in the act of establishing and conducting a process for

the purposes of identifying and determining exactly which standards of quality are in fact relevant to the project as a whole, and also in making an effective determination as to how to satisfy them.

Risk management planning is the procedure for selecting a strategy and planning the risk management actions for a project.

1.8 Significance of the Study

This study is helpful in understanding the contribution and impact of practical project planning on project success in the case of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia. Specifically, it will contribute to the knowledge of which planning processes actually impact project success. Additionally, it will be a comprehensive starting point for more studies in project management. The paper will contribute to the enhancement of the body of knowledge intended for companies and academicians aiming to enhance project success and ensure the effectiveness of project planning in a competitive business environment. In general, the optimum amount of effort spent on planning and its relationship to success is significant to researchers and practitioners.

1.9 Delimitation/Scope of the Study

This study primarily examines the impact of project planning on project success in the case of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia. There are many project planning processes however, this study only focuses on five main processes namely scope planning, resource planning, schedule planning, quality planning, and risk management planning.

1.10 Organization of the research report

This study is structured into five chapters. The background of the study, the problem statement, the research questions, the general and specific objective, the significance, the scope, and the organization of the study are all included in the first chapter. The second chapter contains a review of the literature, which consists of both theoretical and empirical reviews. The research methods and design are covered in chapter three. The fourth chapter contains an analysis of the results. The fifth and final chapter contains conclusions and recommendations. Lastly,

references, appendices, and other important documents are attached in the last part of the research paper.

Chapter two

Literature review

Introduction

This part consists of a theoretical review, empirical review, conceptual framework, and research hypothesis.

2.1 Theoretical Review

2.1.1 Project management

A project is a brief undertaking started to develop an original good or service (Project Management Institute, 2004). Uniqueness, temporary nature, and predetermined goals are the three key project characteristics (Kerzner, 2006; Meredith and Mantel, 2006). Applying knowledge, skills, tools, and processes to project activities in order to attain project requirements is known as project management.

The Project Management Body of Knowledge (PMBOK® Guide) identifies 44 processes that should be executed by a project manager during the project's life cycle (PMI, 2004). These processes are classified into the five process groups listed below: (1) Initiation is the phase of formally authorizing a new project. This phase links the project to the ongoing work of the performing organization. Projects are normally authorized as a result of one or more of the following: a market demand, a business need, a customer request, a technology advance, or a social need. (2) Planning processes describe and refine objectives and chose the right alternative strategies for achieving the project's objectives. Because a project requires accomplishing something that has never been done before, planning is extremely important. (3) Executing processes coordinate human resources and other resources, such as equipment and material, to carry out the plan in order to perform the project. (4) Monitoring and controlling processes ensure the high-quality achievements of the project plan and update it when necessary. (5) Closing processes formalize acceptance of the project by its customers and other stakeholders and bring it to an orderly end. This study will focus on project planning which includes 21

processes, out of the 44 processes. However, the study will only examine in detail five planning processes performed along with their impact on project success.

2.1.2 Project planning

Planning can be defined as the process of setting goals, developing strategies, outlining the implementation arrangements, and allocating resources to achieve those goals. The literature suggests that project planning has a significant impact on project success (Pinto and Slevin, 1989; Turner, 1999; Johnson et al., 2001; Globerson and Zwikael, 2002; Zwikael and Sadeh, 2007). Project planning is defined as the establishment of a set of directions in sufficient detail to tell the project team exactly what must be done when it must be done, and what resources to use in order to produce the deliverables of the project successfully (Meredith & Mantel, 2006).

Project success and performance to a greater extent depend on planning; therefore, it plays a pivotal role during the phases of project formation (Naeem, S., Khanzada, B., Mubashir, T., & Sohail, H. 2018). Idoro (2012) argues that planning is a thorough continuous process for delivering a project. Many empirical studies regarding success factors of project management indicated planning as the key contributor to project success (Slevin & Pinto, 1987; Aronson & Lechlier, 2009). Interestingly, Dvira, Razb & Shenhar (2002) explain that the formulation of a solid project plan is required by all project managers in order to succeed in the project.

The major outcome of the planning phase is the project plan. The project team creates this document during the project's planning stage. The following components are included in the project plan: an overview, project goals, general strategy, contractual considerations, timetables, resources, personnel, risk management strategy, and evaluation techniques (Meredith and Mantel, 2006). To develop a project plan, several managerial processes should be executed. Possible lists of planning processes can be found in different sources. For example, Russell and Taylor (2003) identified seven planning processes, which include defining project objectives, identifying activities, establishing precedence relationships, making time estimates, determining project completion time, comparing project schedule objectives, and determining resource necessities to meet objectives. Kerzner (2006) identifies nine major components of the planning phase: objective, program, schedule, budget, forecast, organization, policy, procedure, and

standard. The PMBOK, which lists 44 processes, identified 21 as planning processes (PMI, 2004).

Although the relevant planning processes have been recognized, research has not yet clearly identified which of these are more crucial. As a result, project managers and planners are short on time and, therefore, unable to properly perform all planning processes. As a result, they may choose to perform the easiest planning processes, or those mandatory to the start of a project, rather than the ones that contribute the most to the success of the project. The following six planning processes were identified by Zwikael and Globerson (2006) as having a significant impact on the success of a project: "definition of activities to be performed in the project," "schedule development," "organizational planning," "staff acquisition," "communications planning," and "developing a project plan." However, as the conclusions of this paper are primarily based on replies from the information technology sector, it was not specifically focused on construction projects. Hence, its conclusions can hardly extend the knowledge of construction projects (e.g. Pinto and Slevin, 1998; Ibbs and Kwak, 2000; Shenhar et al., 2005). There are also indications that environmental impacts on the identification of critical project processes. For example, Crawford et al. (2006) have found variation in project management knowledge and practices among industries, countries, and application areas. Faniran et al. (1998) have found three critical success factors influencing construction project planning, including (1) investing enough planning time before work on-site, (2) reducing the emphasis on developing schedules for monitoring and controlling project progress, and (3) increasing emphasis on developing operational plans for project implementation.

2.1.3 Project planning knowledge areas and processes

In the project management body of knowledge nine knowledge areas of project management are identified namely: - scope, time, cost, risk, quality, human resources, communications, procurement, and integration knowledge areas (PMI, 2008).

Each knowledge area in the PMBOK is made up of procedures that must be addressed in order to achieve the area's goal. There are a total of 39 processes identified for the nine knowledge domains. The use of all the processes results in project management. However, all the 39 processes are not meant to be performed uniformly in the management of all projects. The

project manager and the project teams need to decide which processes to employ, and the degree of rigor that will be applied to the execution of those processes (PMI, 2004). The planning phase of the nine knowledge areas can be found in the table below; however, the focus of this study will only be on the planning phase of the five knowledge areas namely scope, time, cost, quality, and risk.

Table 1: Project Planning Knowledge Areas and Processes

Knowledge Area	Planning Processes
Integration	Project Plan Development
Scope	scope planning, scope definition
Time	Activity definition, Activity sequencing, Activity duration estimating, Schedule development
Quality	Quality planning
Cost	Resource planning, Cost estimating, Cost budgeting
Human resource	Organizational planning, Staff Acquisition
Communication	Communication planning
Risk	Risk management planning, Risk identification, Qualitative risk analysis, Quantitative risk analysis, Risk response planning
Procurement	Procurement Planning, Solicitation Planning

Scope planning

The Scope planning process is the very first thing you do to manage your scope. The definition of all the work required to successfully complete the project's objectives is a concern of project scope planning. Increased scope definition at the early planning, or pre-project planning, phase of a project can significantly boost the accuracy of cost and schedule estimates as well as the

likelihood of meeting or exceeding project objectives, according to prior studies (Griffith and Gibson 1995).

The project scope management plan, which is the result of the scope planning process, outlines the procedures to be followed for establishing scope, documenting scope, checking and accepting scope and finished deliverables, and regulating and managing requests for modifications to scope. The main project deliverables/products/and conditions listed in the scope statement are examined in the scope definition. The analysis should be based on stakeholder needs and expectations, which will lead to project requirements (Gupta, Aha, Nau, & Munoz-Avila, 2008).

According to Collins and Baccharini (2004), a rigorous scope is considered to be a factor that is necessary for meeting the owner's needs and thus achieving success

Resource planning

It is essential for project management to define how the project team should be structured and identify the responsibilities that are necessary in the early stages of a project (Al-Maghraby, 2008). According to Antvik and Sjöholm (2007), each function on the project team should be given specific areas of responsibility, authority, and needed competency. It is crucial that a role with clearly defined responsibilities also has the power to make decisions within those responsibilities. Without authority, responsibility makes it very difficult for middle management to influence the work, which almost certainly has a negative impact on the project (Walker, 2007). Planning for human resources establishing the project's roles, obligations, and reporting structures, which will result in the staffing management plan, assembling the project team, and acquiring the human resources, are required to finish the project

A study by Umulisa, Mbabazize, and Shukla (2015), revealed a positive and significant correlation between resource planning practices namely, human resource planning, financial resource planning, material and time resource planning; and project success.

Schedule planning

One of the most crucial plans of a project is the time schedule. The development of schedules ought to be based on the previously created WBS. According to Antvik & Sjöholm (2007), it's

critical that activities are precisely sequenced in order to build realistic and feasible schedules. The activity sequencing process entails establishing logical linkages and interconnections between project activities (Guoli, 2010). Schedule planning frequently involves the use of project management software. If the activity duration estimation were accurate, the majority of the schedule development process entails compiling the data into a single document (Antvik & Sjöholm, 2007). It is crucial to identify the essential chain and use the schedule lags to efficiently distribute the project's resources in order to create an efficient timetable.

A research conducted by Zwikael and Globerson (2006), found that processes in the areas of schedule actually have the greatest impacts on project success. According to Pinto and Prescott (1988), a schedule or plan had a correlate with project success of 0.47, whereas specific technical tasks and mission definition had correlations of 0.57 and 0.70, respectively.

Quality planning

Quality planning focuses on determining how you will measure quality and prevent defects using all the information you have at the outset of the project. To set up quality goals that address consumer expectations, quality planning is necessary for a variety of products and processes. The knowledge area of project quality planning encompasses all procedures and activities in the project organization that set quality policies and ensure that the work performed is of satisfactory quality. Quality control, quality assurance, and quality planning are the three main procedures in quality management (PMBOK, 2004). To undertake quality control, the project team must determine which quality standards are applicable to the project. When creating a quality plan, the established standards should serve as the starting point. Quality planning must include not only the quality standards that must be reached for each activity, but also the procedures for achieving those standards (Wei & Yang, 2010).

In a study conducted by Zwikael and Globerson (2006), it was found that the quality planning process, which has a moderate impact on all measures of project success, has a very low actual extent of use by project managers. This means that despite the importance of this process, project managers do not use it often enough.

Risk management planning

The project environment places a high value on risk management, particularly during the planning stage. However, the methods used today for project risk planning have significant shortcomings. Risk management planning is a critical tool for uncertainty reduction, and most risk management practices are performed during the planning phase of a project. A study by Zwikael and Ahn (2010), found that risk management practices moderate the effect of project risk on project success in multiple project scenarios. Although risk levels reduce project performance, effective risk management planning was found to moderate this relationship.

Risk management is now an essential part of the planning process in any industry. The expansion of a project in size and multifaceted nature and, thus, the adoption of a multidimensional strategy for project management necessitate adequate consideration of risk management (Naeem et al., 2018). According to Carbone and Tippett (2004), the success of a project as well as the chances of effectively overseeing project operations increase using a basic hazard management instrument. Encompassing all interlinked risks, risk management aims to ensure the success of a project.

Project Planning Techniques

One of the most important phases of project management is the “Planning phase”, in which all work to be done is determined and defined. Planning is the most time-consuming set of activities but is valuable if done properly. Many diverse methods, including tables, work breakdown structures (WBS), charts, and networks, are employed in this phase. Tables are used to display the project operations and pertinent data, like duration, dependencies, cost, starting and ending dates, and the resources needed. It is used during the planning and controlling phase and can be used for implementation and monitoring. Work Breakdown Structure is an organizational chart that breaks the project into subsystems, components, and tasks that can be readily accomplished. It is used for scheduling, pricing, and resource planning.

It makes reporting progress and expenses easier to summarize. A paradigm called Organization Breakdown Structure (OBS) groups resources for better administration. It can be used to monitor

the distribution of resources and certain task assignments. OBS and WBS are highly dependent on one another (Badiru and Pulat, 1995).

The Gantt chart is one of the oldest and most useful techniques of planning. It is clear, easy to use, and understands. Networks are utilized because it is difficult to depict the interdependence between operations, particularly in large projects. A network is a visual representation of a project's operations that demonstrates their interdependence. Over time, a number of network techniques have been developed and put to use. Depending on the kind of project being considered, deterministic and probabilistic approaches are the two main types of networks that can be employed. The probabilistic method is known as the program evaluation and review technique (PERT). All of the methods use what is known as the critical path method for determining the project duration, critical path(s), floats, and other relevant data.

2.1.4 Project success

In project management literature, the outcome of a project is frequently conceived of in terms of success or failure although identifying just what constitutes these can be problematic. Although they are frequently used, success, failure, and their definitions are not universally agreed upon, and these concepts are seen as ill-defined and challenging to quantify (Fowler and Walsh, 1999). Over the course of project management history, numerous attempts have been made to define appropriate criteria against which to define and quantify project success.

The "iron triangle" of time, cost, and quality is perhaps the most well-known of these and has been around for a while (Atkinson, 1999). Ikal (2009) contends that while the notion of quality in relation to the iron triangle has the potential to be very broad, it is frequently limited to complying with the scope or functional and technical requirements. Several authors have suggested that meeting time, cost, and quality specifications are not only relevant criteria; for example, project management efficiency and effective project team functioning are also important (Baccarini, 1999).

The time dimension of assessing project success is the most common aspect brought out in the literature review. Pretorius et al. (2012) found out that project management organizations with mature time management practices produce more successful projects than project management

organizations with less mature time management practices. Project time is the absolute time that is calculated as the number of days/weeks from the start on-site to the practical completion of the project. Speed of project implementation is the relative time (Chan, 2001).

Another factor used to assess project success is if the project was completed on time and within budget. Cost can be calculated in the form of unit cost, percentage of net variation over final cost, and other metrics, according to Chan (2001). The project monitoring and evaluation team may control the costs using the Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM) techniques. Projects often face cost overruns during the implementation phase; hence a proactive approach is essential for monitoring project costs and detecting potential problems (Cheng et al, 2012). Related to the cost aspect of measuring project success, is technical performance.

Another aspect of determining a project's success is how well it meets quality standards. Project success is significantly influenced by the caliber of projects and project data (Raymond & Bergeron, 2008). Closely related to the quality and technical requirement dimensions is the scope. Project completion within scope is considered one of the success factors. The implementers were required by the project charter or statement of work to create a scope of work that was realizable in a given timeframe and contained attainable goals and milestones (Bredillet, 2009). Customer happiness, time, money, and quality are all important factors in a project's success, according to Pinto & Pinto (1991).

2.1.5 Relationship between project planning and project success

In this study, project planning refers to how well deadlines, milestones, a workforce, equipment, and a budget are outlined (Slevin and Pinto, 1986). The category of management factors includes planning. Whittaker (1999) asserts that weak project plans or insufficient project planning are the primary causes of project failure. Plans are the foundation of every project, so making plans is the main task when working on one. Planning is fundamental to project success.

According to Pinto and Prescott (1988), a schedule or plan had a correlation with project success of 0.47, whereas specific technical tasks had a correlation with project success of 0.57, and mission definition had a correlation with project success of 0.70. Planning elements continue to

be dominant throughout the project lifecycle, according to Pinto and Prescott (1990). The two success factors, "Perceived value of the project" ($R^2=.35$) and "Client satisfaction" ($R^2=.39$), were found to be most affected by planning.

The use of necessary resources, project training and arrangements, and choosing the best techniques that are a part of the project planning process may improve the success of the project (Naeem et al., 2018). The results of a project are affected by an adequate selection of options in the planning procedure (Arditi, 1985; Naeem et al., 2018). Naeem et al. (2018) also found that project success was often the result of extraordinary strategic planning during the project process. However, it is particularly tricky or even difficult to comprehend clearly at the initial planning stage what should be taken into account or ignored during the process to complete the project while taking the cost and time limitations into consideration (Andersen, 1996). Hence, there is evidence attesting to the relationship between project planning and project success.

2.2 Empirical review

The empirical study of Aladwani (2002) also established that there is a relationship between project planning and project success. Different studies demonstrate the important role of planning to project outcomes (Whittaker, 1999; Aladwani, 2002; Belout and Gauvreau, 2003; Nguyen M., 2003). This study considers the impact of planning processes on project successes. The research by (Cleland & King, 1983; Baker et al., 1983; Milis & Mercken, 2002; Dvir et al., 2003) offers plenty of proof that a well-established project plan is essential to the success of the project. According to Keider's research, the single biggest predictor of project failure for any project is poor project planning (Keider, 1984). Setting up a detailed plan at the outset of a project is only one aspect of effective planning.

A study by Ouabira and Fakhravar (2021), states that it is important to conduct quality assurance which is part of quality planning right from the requirements engineering phase of project development to ensure that there are reduced errors and challenges during project implementation.

According to Zwikael and Globerson (2006), the resource planning process supports project managers in estimating the amount of labor required to complete each activity. Rigorous resource planning processes are required in order for the success or subsequent failure of a project or related businesses (Besner and Hobbs 2011). Planning and new product development projects were explored by Salomo, Weise, and Gemünden (2007). Although the contribution of project planning was not particularly significant, they discovered that project risk management and project planning had an R2 impact of .28. In this review, the researcher considers risk planning to be part of the planning step, hence total R2 = .28. Project planning effort and project success have also been examined by Dvir, Raz, and Shenhar (2003). Their findings showed a strong relationship between planning efforts and overall project success.

2.3 Conceptual framework

To assess the impact of project planning on project success the following model has been developed from the findings of the literature review.

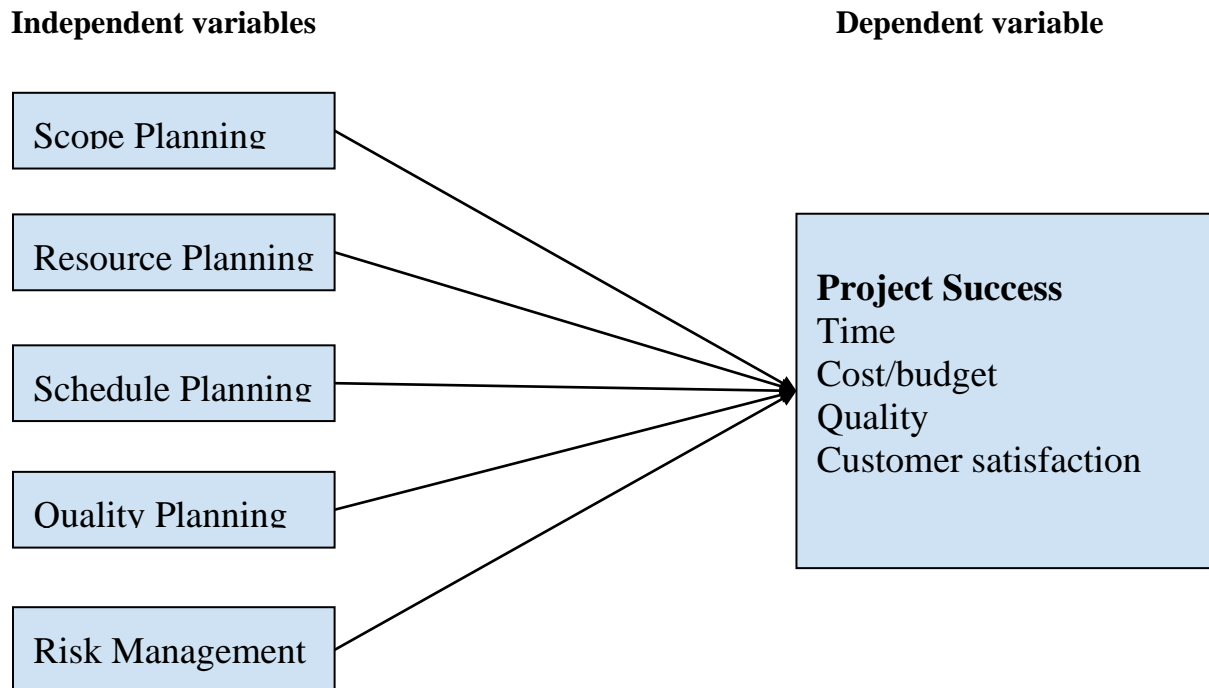


Figure 1: Conceptual framework

Source: PMBOK (2022)

Chapter Three

Research methodology

Introduction

The research approach employed in the study is discussed in this chapter. The study's location, methodology, demographic, and sample are all explained, as well as the study's overall design. The tools used to gather the data and analyze the data collected are described. Also described is the ethical factor.

3.1 Research approach

A quantitative approach was used to collect data regarding planning processes executed in the project and the success of the project. The researcher designed survey questionnaires using the five-point Likert scale for assessing the impact of project planning on project success in the 6000 Solar Direct Drive cold chain equipment project in Ethiopia and distributed them to the target population face to face.

3.2 Research design

The research has an explanatory research design. This study is being conducted to evaluate the impact of project planning on project success and determine whether there is a significant relationship between effective project planning and project success. The goal of explanatory research is to identify causal links between dependent and independent variables that relate to the research problem.

3.3 Sampling design

Population of the study

The target populations of this study were people who have a significant connection with the 6000 Solar Direct Drive cold chain equipment project in Ethiopia such as project managers, project leaders, project coordinators, and others who are involved in project management activities.

Sampling techniques and procedure

A census survey was used because the study attempted to collect data from a small number of population. Therefore, the total population of those who were directly involved in the planning of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia was taken as a sample. Since this study focuses on the planning phase, it is important that the respondents were involved in the planning of this project. The total number of the population is thirty five.

3.4 Sources of data collection

To achieve the objective of the thesis, the researcher used the following methodologies. Complete literature reviews will be conducted regarding the concept of project management; project knowledge areas, planning activities, planning processes, and project planning and its impact on project success. Other than an extensive literature review, both primary and secondary data were collected using a well-structured questionnaire, project report document analysis, and review of previous research works.

3.5 Instrument

To collect relevant data from primary respondents, a structured questionnaire was prepared and distributed to the target population. And secondary data was collected from journals, dissertations, textbooks, research papers, internet sources, and brochures. The questionnaire was prepared on five-point Likert Scales ranging from strongly disagree to strongly agree. The values assigned are 1 =strongly disagree, 2 = disagree, 3 =neutral, 4 = agree, 5 = strongly agree.

3.6 Data analysis

The collected data were analyzed using SPSS, and both descriptive and inferential analysis was conducted to summarize and present the data. The characteristics of the sample population and general data collected through the questionnaire were summarized using descriptive statistics such as frequencies, percentages, means, and standard deviations. Inferential statistics like correlations and multiple regressions were utilized to analyze the data and develop inferences.

3.7 Validity and Reliability

The degree to which an instrument accurately captures the variables under investigation is known as content validity. Numerous questions about the significance of project planning to project success were included in questionnaires to achieve content validity. So as to make sure of the validity, data was collected from reliable sources such as project managers, and project leaders who had a significant connection to the 6000 Solar Direct Drive cold chain equipment project in Ethiopia, and the survey question was based on the reviewed literature.

Reliability, according to Polit and Hungler (1993), is the consistency with which an instrument measures the characteristic that it is intended to assess. Pilot research with responders was done, and a Cronbach Alpha reliability test was run to assess the instrument's internal consistency.

Table 2: Reliability test

Constructs	Number of items	Cronbach's alpha
Scope planning	6	0.735
Resource planning	9	0.808
Schedule planning	10	0.896
Quality planning	3	0.859
Risk management planning	4	0.846
Project success	4	0.790

Source: survey data (2022)

3.8 Ethical considerations

The respondents were given the assurance that their answers would be treated with strict confidentiality and were not needed to provide their identities in order to maintain the anonymity of the data they provided. The questionnaire's introduction section included a statement about the study's goal. Additionally, the researcher made an effort to avoid making false or deceptive claims in the questionnaire. Finally, only willing individuals received the questionnaires. The only use of the data gathered for this study was academic research.

Chapter Four

Results and Discussion

Introduction

This chapter provides a summary and explanation of the quantitative data gathered from respondents. The descriptive and inferential statistics used to test the hypotheses and look into the effects of independent factors on the dependent variable are included, along with demographic data on the respondents. According to the chosen sample size, thirty-two questionnaires were created and given to the intended audience. Only thirty of these, however, were determined to be valid, giving us a response rate of 93.75 percent.

4.1 Demography of respondents

Gender of respondents

Out of the total 30 respondents, 18 (60%) were male and 12 (40%) were female. This is illustrated in table 2 below.

Table 2: Gender of respondents

Gender of respondents					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	18	60.0	60.0	60.0
	Female	12	40.0	40.0	100.0
	Total	30	100.0	100.0	

Source: survey data (2022)

Age of respondents

Regarding the age of respondents, none of them were in the age group of 18-25, 13 (43.3%) were in the age group of 26-35, 12 (40%) were in the age group of 36-44, 5 (16.7%) were in the age group of 45-55, and again none of them were 56 & above. This is illustrated in table 4 below.

Table 3: Age of respondents

Age of respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 26-35	13	43.3	43.3	43.3
36-44	12	40.0	40.0	83.3
45-55	5	16.7	16.7	100.0
Total	30	100.0	100.0	

Source: survey data (2022)

Level of education

As for the level of education of the respondents, 9 (30%) were found to have 1st degree, 4 (13.3%) have 2nd degree, 14 (46.7%) have a masters, while lastly, 3 (10%) have a Ph.D. which is illustrated in the table below

Table 4: Level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1st degree		9	30.0	30.0	30.0
2nd degree		4	13.3	13.3	43.3
Masters		14	46.7	46.7	90.0
Ph.D.		3	10.0	10.0	100.0
Total		30	100.0	100.0	

Source: survey data (2022)

Relevant working experience

Concerning working experience of the respondents, 2(6.7%) have 1-3 years' experience, 11(36.7%) have 3-5 years' experience, 12(40%) have 5-10 years' experience, and finally, 5(16.7%) have more than 10 years working experience.

Table 5: Relevant working experience in years

Relevant working experience in years

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-3yrs	2	6.7	6.7	6.7
	3-5yrs	11	36.7	36.7	43.3
	5-10yrs	12	40.0	40.0	83.3
	>10yrs	5	16.7	16.7	100.0
	Total	30	100.0	100.0	

Source: survey data (2022)

4.2 Descriptive statistics

4.2.1 Analysis of project planning and success items

Data was examined using descriptive statistics, which displays mean and standard deviation, in order to offer quantitative descriptions in an easily understandable format. The average response for the variables from each respondent is shown by the term "mean," and the greater the mean, the more strongly the respondents concur with the statement. The average score for each dimension shows that it is higher than the middle value of three, which suggests that the planning procedures actually have an effect on project success. The standard deviation, on the other hand, demonstrates how varied each respondent's opinions are for a given dimension; the higher the standard deviation, the more radically different each respondent's views are, and vice versa. The frequency, percentage, mean and standard deviation for each variable are shown in the table below.

Table 7: Descriptive statistics of scope planning

Statement	SA		A		Agree%	N		%D	
	Fq	%	Fq	%	SA+A	Fq	%	Fq	%
The project scope was well defined in the planning phase	16	53.3	5	16.7	70	8	26.7	1	3.3

The project requirement was well defined in the planning phase	17	56.7	11	36.7	93.4	2	6.7	-	-
Scope planning was prepared	7	23.3	19	63.6	86.9	4	13.1	-	-
project outputs were well identified	13	43.3	17	56.7	100	-	-	-	-
Customers/users were involved in planning stage	1	3.3	24	80.0	83.3	5	16.7		
project monitoring and reporting mechanisms were included in planning stage	8	26.7	13	43.3	70	9	30.0	-	-
Mean	4.2333								
Standard Deviation	.440								

Source: survey data (2022)

According to the table above, 70% of the respondents agree that the project scope was well defined in the planning phase while 26.7 % were neutral and 3.3% disagree. 93.4 % of the respondents agree that the project requirement was well defined in the planning phase while 6.7 remained neutral. On the statement “scope planning was prepared ” 86.9 % of the respondents agreed while 13.1 remained neutral. 100 % of the respondents agreed that project outputs were well identified. 83.3 % of the respondents agreed Customers/users were involved in the planning stage while 16.7 % remained neutral. 70% agreed project monitoring and reporting mechanisms were included in the planning stage while 30% remained neutral. According to the result of the mean score for scope planning which is 4.2333 which is the second highest indicates ‘strongly agree’ since a mean value from 4.21 to 5.00 represents strongly agree. And the standard deviation of 0.440 indicates that the values are clustered around the mean.

Table 8: Descriptive statistics of resource planning

Statement	SA		A		Agree%	N		%D	
	Fq	%	Fq	%	SA+A	Fq	%	Fq	%
Team members were well experienced in the planning process	8	26.7	12	40.0	66.7	9	30.0	1	3.3
Team members was well committed in planning stage	17	56.7	8	26.7	83.4	5	16.7	-	-
In the planning stage, delegates of the company functional Departments participated actively as project members	15	50.0	14	46.7	96.7	1	3.3	-	-
All resources were allocated (qualified personnel and infrastructure)	17	56.7	7	23.3	80	5	16.7	1	3.3
Team members give more priorities to planning activities	10	30.0	13	43.3	73.3	5	16.7	2	6.7
Training was given to project team member	11	36.7	13	43.3	80	5	16.7	1	3.3
Resource for the project was determined	4	13.3	19	63.3	76.6	7	23.3	-	-
Human resource planned	22	73.3	8	26.7	100	-	-	-	-
Project team acquired	9	30.0	20	66.7	96.7	1	3.3	-	-
Mean	4.0833								
Standard deviation	.553								

Source: survey data (2022)

According to the above table, 66.7% of the respondents agree that Team members were well experienced in the planning process while 30 % were neutral and 3.3% disagreed. On the statement “In the planning stage, delegates of the company functional Departments participated

actively as project members” 96.7% of the respondents agreed while the remaining 3.3% were neutral. 80% of the respondents agree All resources were allocated (qualified personnel and infrastructure) while 16.7% were neutral and 3.3% disagree. 73.3% agree that team members give more priority to planning activities while 16.7% are neutral and 6.7% disagree. 80% agree that training was given for project team members while 16.7% are neutral and 3.3% disagree. 76.6% agree resource for the project was determined while 23.3 remained neutral. On the statement “Human resource was planned” 100% of the respondents agree. 96.7% of the respondents agree that a project team was acquired while 3.3% remained neutral. Further, the mean score for resource planning which is 4.0833 indicates ‘agree’ since mean values from 3.41 to 4.20 represents agree. And the standard deviation of 0.553 indicates that the values are clustered around the mean.

Table 9: Descriptive statistics of schedule planning

Statement	SA		A		Agree%	N		%D	
	Fq	%	Fq	%	SA+A	Fq	%	Fq	%
Work breakdown structure was used	17	56.7	11	36.7	93.4	1	3.3	1	3.3
Gantt chart was used	13	43.3	13	43.3	86.6	3	10.0	1	3.3
Critical path method(CPM) was used	1	3.3	23	76.7	80	5	16.7	1	3.3
Project Evaluation and Review Technique (PERT) was used	-	-	14	46.7	46.7	14	46.7	2	6.7
Project management software was used	2	6.7	20	66.7	73.4	7	23.3	1	3.3
Schedules was well prepared	12	40.0	16	53.3	93.3	2	6.7	-	-
Activities was well defined	15	50.0	11	36.7	86.7	2	6.7	2	6.7

Activity duration was well estimated	15	50.0	4	13.3	63.3	9	30.0	2	6.7
Project activities was well sequenced	17	56.7	9	30.0	96.7	3	10.0	1	3.3
Integrated project schedule prepared	6	20.0	18	60.0	80	4	13.3	2	6.7
Mean	4.1889								
Standard deviation	.714								

Source: survey data (2022)

According to the data in the above table, 93.4% of the respondents agree that the work breakdown structure was used while 3.3% remained neutral and 3.3% disagreed. 86.6% of the respondents agree that the Gantt chart was used while 10% were neutral and 3.3% disagreed. 80% of the respondents agree that the Critical path method (CPM) was used while 16.7% were neutral and 3.3% disagreed. As for the statement “Project Evaluation and Review Technique (PERT) was used” 46.7% agreed while 46.7% of them were neutral and 6.7% disagreed. 66.7% of the respondents agree that Project management software was used while 23.3% were neutral and 3.3% disagreed. 93.3% of the respondents agree that Schedules were well prepared while 6.7% remained neutral. 86.7% of the respondents agree that Activities were well defined while 6.7% remained neutral and another 6.7% disagreed. 63.3 % of the respondents agree that Activity duration was well estimated while 30% of them were neutral and 6.7% disagree. 96.7% agree that project activities were well sequenced while 10% were neutral and the remaining 3.3% disagreed. 80% of the respondents agreed with the statement Integrated project schedule prepared while 13.3% remained neutral and 6.7% disagreed. The mean score for schedule planning which are 4.1889 indicates ‘agree’ since mean values from 3.41 to 4.20 represents agree. And the standard deviation of 0.714 indicates that the values are clustered around the mean.

Table 10: Descriptive statistics of quality planning

Statement	SA		A		Agree% SA+A	N		%D	
	Fq	%	Fq	%		Fq	%	Fq	%
Quality standard identified	6	20.0	18	60.0	80	3	10.0	3	10.0
Quality planning performed	17	56.7	9	30.0	86.7	3	10.0	1	3.3
Quality management plan was performed	13	43.3	11	36.7	80	4	13.3	2	6.7
Mean	4.3111								
Standard deviation	.468								

Source: survey data (2022)

According to the above table, 80% of the respondents agree the Quality standard was identified and 10% were neutral while the remaining 10% disagree. 86.7% of the respondents agree Quality planning was performed while 10% remained neutral and the rest 3.3% disagreed. 80% of the respondents agree the Quality management plan was performed while 13.3% remained neutral and 6.7% disagreed. In addition, the mean score for quality planning is the highest mean which is 4.3111 indicating ‘strongly agree’ since mean values from 4.21 to 5.00 represents strongly agree. And the standard deviation of 0.468 indicates that the values are clustered around the mean.

Table 11: Descriptive statistics of risk management planning

Statement	SA		A		Agree% SA+A	N		%D	
	Fq	%	Fq	%		Fq	%	Fq	%
Project Risk identified	5	16.7	17	56.7	73.4	5	16.7	3	10.0

Quantitative risk analysis prepared	11	36.7	12	40.0	76.7	5	16.7	2	6.7
Qualitative risk analysis prepared	6	20.0	13	43.3	63.3	6	20.0	5	16.7
Risk response planning prepared	-	-	14	46.7	46.7	11	36.7	5	16.7
Mean	3.7333								
Standard deviation	.568								

Source: survey data (2022)

According to the above data, 73.4% of the respondents agree that Project Risk was identified while 16.7% remained neutral and the rest 10% disagreed. 76.7% of the respondents agreed that Quantitative risk analysis was prepared, 16.7% remained neutral and the rest 6.7% disagreed. 63.7% of the respondents agree that Qualitative risk analysis was prepared while 20% remained neutral and the rest 16.7% disagreed. 46.7% of the respondents agree that Risk response planning was prepared while 36.7% remained neutral and the rest 16.7% disagreed. The mean score for risk management planning which is 3.7333 indicates 'agree' since a mean value from 3.41 to 5.20 represents agree. And the standard deviation of 0.568 indicates that the values are clustered around the mean.

Table 12: Descriptive statistics of project success

Statement	SA		A		Agree%	N		%D	
	Fq	%	Fq	%	SA+A	Fq	%	Fq	%
The project was completed on the original(planned) schedule	6	20.0	16	53.3	83.3	6	20.0	2	6.7
The project completed with the planned budget	8	26.7	15	50.0	76.7	7	23.3	-	-

The delivered product met all specification in the planning stage	10	33.3	17	56.7	90	3	10.0	-	-
The project result satisfies the customer needs	9	30.0	18	60.0	90	2	6.7	1	3.3
Mean	4.2390								
Standard deviation	.577								

Source: survey data (2022)

As illustrated above, 83.3% of the respondents agreed that The project was completed on the original(planned) schedule while 20% remained neutral and the remaining 6.7% disagreed.76.7% of the respondents agree that the project completed with the planned budget while 23.3% remained neutral. 90% of the respondents agree that the delivered product met all specifications in the planning stage while 10% remained neutral. Lastly, 90% of the respondents agree that the project result satisfies the customer needs while 6.7% remained neutral and 3.3% disagreed. Furthermore, the mean score for project success is 4.2390 indicating ‘strongly agree’ since mean values from 4.21 to 5.00 represents strongly agree. And the standard deviation of 0.577 indicates that the values are clustered around the mean.

4.2.2 Correlation analysis

Correlation analysis, which examines the degree of relationships between the variables under investigation, was utilized in this study. The validity of the focalized approach was demonstrated using Pearson correlation analysis. In general, correlation values between.10 and .30 are regarded as being little or low, .30 to.70 are well thought of as being strong, .70 to .90 are regarded as being extremely strong, and .90 to 1.00 are regarded as being remarkably big relationships (Marczyk, Dematteo and Festinger, 2005). The following correlation analysis was created using SPSS version 26 based on the questionnaire.

Table 13: Correlation analysis

Correlations

		Scope planning	Resource planning	Schedule planning	Quality planning	Risk management planning	Project success
Scope planning	Pearson Correlation	1	.465**	.614**	.917**	.635**	.679**
	Sig. (2- tailed)		.010	.000	.000	.000	.000
	N	30	30	30	30	30	30
Resource planning	Pearson Correlation	.465**	1	.636**	.537**	.492**	.537**
	Sig. (2- tailed)	.010		.000	.002	.006	.002
	N	30	30	30	30	30	30
Schedule planning	Pearson Correlation	.614**	.636**	1	.691**	.613**	.642**
	Sig. (2- tailed)	.000	.000		.000	.000	.000

	N		30	30	30	30	30	30
Quality planning	Pearson Correlation		.917**	.537**	.691**	1	.634**	.706**
	Sig. (2-tailed)		.000	.002	.000		.000	.000
	N		30	30	30	30	30	30
Risk management planning	Pearson Correlation		.635**	.492**	.613**	.634**	1	.577**
	Sig. (2-tailed)		.000	.006	.000	.000		.001
	N		30	30	30	30	30	30
Project success	Pearson Correlation		.679**	.537**	.642**	.706**	.577**	1
	Sig. (2-tailed)		.000	.002	.000	.000	.001	
	N		30	30	30	30	30	30

** . Correlation is significant at the 0.01 level (2-tailed).

Source: survey data (2022)

Correlation between scope planning and project success

The outcome of the Pearson correlation test conducted between the independent variable scope planning and the dependent variable project success as indicated in the table above shows there is a strong relationship between the variables ($r=0.679$). This means that the project's success is strongly related to scope planning being done well.

Correlation resource planning and project success

The result of the Pearson correlation test performed between the independent variable resource planning and the dependent variable project success as indicated in the above table shows there is a strong relationship between the variables ($r=0.537$). This means that the project's success is strongly related to resource planning being done well.

Correlation between schedule planning and project success

The outcome of the Pearson correlation test conducted between the independent variable schedule planning and the dependent variable project success as indicated in the table above shows there is a strong relationship between the variables ($r=0.642$). This means that the project's success is strongly related to schedule planning being done well.

Correlation between quality planning and project success

The outcome of the Pearson correlation test conducted between the independent variable quality planning and the dependent variable project success as indicated in the table above shows there is a strong relationship between the variables ($r=0.706$). This means that the project's success is strongly related to quality planning being done well.

Correlation between risk management planning and project success

The outcome of the Pearson correlation test conducted between the independent variable risk management planning and the dependent variable project success as indicated in the table above shows there is a strong relationship between the variables ($r=0.577$). This means that the project's success is strongly related to risk management planning being done well.

4.3 Inferential statistics

4.3.1 Assumption test for regression analysis

Test of normality

To determine if the data sets are regularly distributed or not, the normality test is utilized. Skewness and kurtosis have been used in this study's testing of the normality. Kurtosis measures whether the data is heavy-tailed or light-tailed in comparison to a normal distribution, whereas skewness measures symmetry precisely the lack of it. According to George & Mallery (2010), all of the variables are within the permissible range of normality, which is between (-2 and +2), as shown in the table below.

Table 14: Test of normality

	N	Mean	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Scope planning	30	4.2333	-1.076	.427	-.013	.833
Resource planning	30	4.08333	-.966	.427	-.053	.833
Schedule planning	30	4.1889	-1.458	.427	1.446	.833
Quality planning	30	4.3111	.096	.427	-1.332	.833
Risk management planning	30	3.7333	-1.342	.427	1.785	.833
Project success	30	4.2390	-.464	.427	-.809	.833
Valid N (listwise)	30					

Source: survey data (2022)

Multicollinearity test

According to Raykov and Marcoulides (2006), the existence of multicollinearity in a regression analysis implies the use of redundant information in the model, which can easily result in unstable regression coefficient estimations. Prior to performing a regression analysis, multicollinearity should be performed. Correlation analysis is computed and tested in the table above. A high correlation coefficient between two variables suggests the possibility of multicollinearity. When the variance inflation factor (VIF) and tolerance values are checked, multicollinearity is implied if the tolerance value is less than 0.1 and/or the VIF value is larger than 10.

Table 15: Multicollinearity test

Model	Collinearity Statistics	
	Tolerance	VIF
1 (Constant)		
Scope planning	.151	6.641
Resource planning	.566	1.766
Schedule planning	.395	2.530
Quality planning	.130	7.684
Risk management planning	.508	1.967

a. Dependent Variable: Project success

Source: survey data (2022)

4.3.2 Regression analysis

To determine how much the independent variable explains the dependent variable, regression analysis is used. Since correlation does not imply causation, multiple linear regressions were

carried out to determine how independent factors affect the dependent variable. Project success was utilized as the dependent variable, while scope planning, resource planning, schedule planning, quality planning, and risk management planning were employed as independent variables. A change in an assumption or input is referred to as an independent variable when determining how it would affect a dependent variable.

Table 9: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.755 ^a	.570	.481	.35241

a. Predictors: (Constant), Risk management planning, Resource planning, Scope planning, Schedule planning, Quality planning

Source: survey data (2022)

As indicated by the model summary, the predictors namely scope planning, resource planning, schedule planning, quality planning, and risk management planning account for 57.0% with estimated standard error of 0.35241 as R square shows the proportion of variance in the dependent variable which can be predicted from the independent variables.

Table 10: ANOVA

ANOVA^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.955	5	.791	6.369	.001 ^b
	Residual	2.981	24	.124		
	Total	6.935	29			

a. Dependent Variable: Project success

b. Predictors: (Constant), Risk management planning, Resource planning, Scope planning, Schedule planning, Quality planning

Source: survey data (2022)

According to the above ANOVA table, the significance value of F statistics shows a value of 6.369 and p- value (.001), which is less than 0.05, implies the model is significant. This indicates that the variation explained by the model is not owing to chance.

Table 11: Coefficients

		Coefficients^a				
		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	.965	.739		1.306	.020
	Scope planning	.198	.326	.209	.606	.008
	Resource planning	.147	.196	.134	.751	.024
	Schedule planning	.165	.176	.199	.935	.013
	Quality planning	.212	.332	.237	.639	.005
	Risk management planning	.086	.152	.107	.568	.047

a. Dependent Variable: Project success

Source: survey data (2022)

The standardized coefficient measures how strongly the independent factors influence the dependent variable, as shown in the above table. For each unit of change in the independent variable, it displays how much the dependent variable has changed. Scope planning, resource planning, schedule planning, quality planning, and risk management planning all have regression standardized coefficients (β) of 0.209, 0.134, 0.199, 0.237, and 0.107, respectively, with significance levels (p) less than 0.05, indicating a significant relationship with the dependent variable. The table below provides a summary of the hypothesis test.

Table 12: Hypothesis test

Hypothesis	Remark
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H1	Scope planning has a positive impact on project success. $\beta=0.209$, $p<0.05$	Supported
H2	Resource planning has a positive impact on project success. $\beta=0.134$, $p<0.05$	Supported
H3	Schedule planning has a positive impact on project success. $\beta=0.199$, $p<0.05$	Supported
H4	Quality planning has a positive impact on project success. $\beta=0.237$, $p<0.05$	Supported
H5	Risk management planning has a positive impact on project success. $\beta=0.107$, $p<0.05$	Supported

Source: survey data (2022)

Chapter Five

Summary of findings, conclusion, and recommendation

Introduction

This chapter presents a summary of the major findings of the study in accordance with the objectives, conclusions drawn from the findings, and recommendations that focus on how to address the problems identified in the study.

5.1 Summary of the major findings

This study was conducted to assess the impact of project planning on project success in the case of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia. More specifically, the researcher considered five planning processes namely scope planning, resource planning, schedule planning, quality planning, and risk management planning. To meet the research objective and answer the research questions, the researcher conducted various analyses such as correlation analysis, regression analysis, descriptive analysis, etc using SPSS version 26.

The correlation analysis indicated that the independent variables namely scope planning, resource planning, schedule planning, quality planning, and risk management planning significantly correlate with the dependent variable project success.

The findings from the descriptive statistics are summarized as follows. A mean value of 4.2333 indicates that respondents strongly agree that scope planning was done, the mean score of 4.0833 indicates that respondents agree that resource planning was performed, the mean value of 4.1889 indicates that respondents agree that the schedule planning process was performed, and mean score of 4.3111 indicate that respondents strongly agree that quality planning was performed, mean score 3.7333 indicate that respondents agree that risk management planning process was performed, lastly, with a mean score of 4.2390 respondents agree that the project was successful.

According to the above-discussed results of the research, the findings are summarized as follows; quality planning was found to significantly relate to project success with a beta value of 0.237, scope planning was found to significantly relate to project success with a beta value of 0.209, schedule planning was found to significantly relate to project success with a beta value of 0.199,

resource planning was found to significantly relate to project success with a beta value of 0.134, and risk management planning was found to significantly relate to project success with a beta value of 0.107 which led to the acceptance of all the formulated hypotheses. To sum up, all five planning processes were found to significantly impact project success.

5.2 Conclusion

The objective of the study, which was completed, was to assess the impact of project planning on project success in a specific project. To achieve the objective of this study, the researcher analyzed various prior studies and theories to identify the five planning processes to impact project success. Furthermore, regression and correlation analyses were conducted whose results support the assumption that the identified planning processes do in fact significantly impact project success.

According to the descriptive statistics, it can be concluded that all five planning processes namely scope planning, resource planning, schedule planning, quality planning, and risk management planning were performed in the planning phase of the project. From the regression analysis, it is concluded that quality planning and scope planning with beta values of 0.237 and 0.209 respectively are the most significant variables that impact project success in the case of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia. In addition, the other variables (resource planning, schedule planning, and risk management planning) also impact project success which supports previous studies mentioned in the literature review. Therefore, according to the analysis performed, all five hypotheses are accepted.

5.3 Recommendations

The following recommendations are provided in light of the analysis, results, and hypothesis testing in this study;

Scope planning and quality planning were found to be the variables that highly impact project success according to the results of this study thus, it is recommended that project management personnel should not only use these planning processes but also give them more emphasis. The other identified planning processes namely resource planning, schedule planning, and risk

management planning also impact project success therefore it is highly recommended that these planning processes are thoroughly performed while conducting project planning.

In order to achieve project success, project managers should put in more effort in the planning stage and utilize each planning process effectively. Planning, in general, should be more emphasized by project managers. The project team members should spend more time on the following planning processes and activities such as quality planning, quality standard identification, scope definition, schedule development, and activity duration estimation during the planning phase. Furthermore, team members should have good knowledge and experience in project planning processes and be able to utilize them properly. To increase the efficiency of project management it is recommended to know the importance of project documentation in project planning.

Recommendation for future researchers

Due to time and budget limitations, this study only focused on the five planning processes while accessing the impact of project planning on project success however, this can be further explored in future research as there are many other planning processes that directly impact project success. Planning should be studied in the future from a more comprehensive, all-encompassing perspective that takes into account organizational, human, and information handling factors in addition to planning techniques and processes.

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Appendix

Questionnaire

Addis Ababa University School of Commerce

Project Management Department

Questionnaire for Research

Dear respondent, this questionnaire is designed to collect data on the Importance of Project Planning on project success in the case of the 6000 Solar Direct Drive cold chain equipment project in Ethiopia. The research is being conducted by a student of Addis Ababa University School of Commerce as partial fulfillment of the requirement for a master's degree in project management. The questionnaire is organized into two sections, the first section is general information and the second one is project planning processes. The information gathered through this questionnaire will be accessed only by the student researcher and will be kept strictly confidential and the result of the study will be used for academic purposes only. I kindly request you to take a few minutes and respond to all questions honestly. Thank you in advance for your cooperation!

Part one: General Information

1. Gender: Female Male
2. Age: 18- 25 26- 35 36-44 45-55 56 & above
3. Level of Education: 1st degree 2nd degree Masters Ph.D.
4. Relevant working experience in years: <1yrs 1-3yrs 3-5yrs 5-10yrs >10yrs

Part two: Planning processes

Instruction: Please consider the 6000 Solar Direct Drive cold chain equipment project in Ethiopia and answer the following question by putting a “√” mark on the space provided.

	Description	Scale				
		strongly disagree	Disagree	Neutral	Agree	strongly agree
	Scope planning					
1	The project scope was well defined in the planning phase					
2	The project requirement was well defined in the planning phase					
3	Scope planning was prepared					
4	project outputs were well identified					
5	Customers/users were involved in planning stage					
6	project monitoring and reporting mechanisms were included in planning stage					
	Resource planning					
7	Team members were well experienced in the planning process					
8	Team members was well committed in planning stage					
9	In the planning stage, delegates of the company functional Departments participated actively as project members					
10	All resources were allocated (qualified personnel and infrastructure)					
11	Team members give more priorities to planning activities					
12	Training was given for project team Member					
13	Resource for project was determined					
14	Human resource planned					
15	Project team acquired					
	Schedule Planning					
16	Work breakdown structure was used					

17	Gantt chart was used					
18	Critical path method(CPM) was used					
19	Project Evaluation and Review Technique (PERT) was used					
20	Project management software was used					
21	Schedules was well prepared					
22	Activities was well defined					
23	Activity duration was well estimated					
24	Project activities was well sequenced					
25	Integrated project schedule prepared					
	Quality planning					
26	Quality standard identified					
27	Quality planning performed					
28	Quality management plan was performed					
	Risk management planning					
29	Project Risk identified					
30	Quantitative risk analysis prepared					
31	Qualitative risk analysis prepared					
33	Risk response planning prepared					
	Project success					
34	The project completed on the original(planned) schedule					
35	The project completed with the planned budget					

36	The delivered product met all specification in the planning stage					
37	The project result satisfies the customer needs					