Factors Affecting the Success of Construction Projects in Petroleum Distributing Companies in Ethiopia: with a specific case of National Oil Ethiopia and Mulege Petroleum

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Approved by Board of Examiners:

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Statement of Declaration

I, the undersigned, declare that this thesis entitled ''Factors affecting the success of construction projects in petroleum distributing companies in Ethiopia: with a specific case of National Oil Ethiopia and Mulege Petroleum '' is my original work. I have undertaken it independently with the advice and suggestion of my advisor for the project, Dr. Abraraw Chane. All sources of materials used for the thesis have been duly acknowledged.

Name _____

Signature _____

Date _____

Addis Ababa University, Addis Ababa, September 2019

Statement of Certification

This is to certify that student Maranatha Assefa has carried out her project on the topic of "Factors affecting the success of construction projects in petroleum distributing companies in Ethiopia : with a specific case of National oil Ethiopia and Mulege Petroleum '' under my supervision. In my opinion this project qualifies for the Partial fulfillment of the award of Master's degree in Project Management at Addis Ababa University, School of Commerce.

Abraraw Chane (PHD) _____

Project Advisor Signature

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A lot of time and effort has been put to bring this project to its final form. First and for most I would like to praise the Almighty God for giving me the courage and ability to complete this project.

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Acronyms

EPSE –Ethiopian Petroleum Supplies Enterprise

FCY-Foreign Currency

NOC –National Oil Company

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Abstract

Oil and Gas industry is an important industry that plays a vital role in socio-economic development of a country. A stable supply of oil and gas is needed to sustain continued development of our economies. However, Poor schedule and budget performance are major problems faced by today's petroleum industry. Hence, this study tried to identify the major inhibiting factors for the success of construction projects undertaken by the Oil and Gas distributing companies in Ethiopia with a specific case of NOC Ethiopia and Mulege Petroleum. The study used survey data obtained through questionnaires distributed to the different Office Engineers, Site Engineers Contractors and Project Supervisors working with the two companies were taken and descriptive analysis was used to analyze the data collected. Cronbach Alpha was used to determine the "reliability" of the questionnaire and the result was 0.869 which shows that the questionnaire is reliable.

Hypothesis test based on independent t -test at 95% confidence level were also made. Results show that inflation and lack of foreign currency, design & scope changes, delay in commencement of projects and delay in provision of resources are the basic factors responsible for the cost overrun and schedule slippage of projects in the companies. Finally, a recommendation in which companies should have clear and detailed plan of project work, use efficient resource planning and avoid delay in commencement of projects and providing sufficient trainings can help to improve the performance of the projects was made based on the factors identified as affecting the success of projects in the industry.

Key Words: *Project Success Factors, Budget Overrun, Schedule Slippage*

CHAPTER ONE

Introduction

1.1 Background of the study

The petroleum industry is considered to be one of the largest and most powerful industries in the global market with its operations covering every corner of the globe and with the world's energy heavily dependent of oil and gas products (Amnesty International, 2004).The industry involves multi-million dollar transactions and is believed to be the driving force behind many other sectors too.

In Ethiopia, the petroleum industry consists of one major public supplier, Ethiopian Petroleum Supply Enterprise (EPSE) and 28 petroleum distributor companies in whichfour are multinational while the remaining are local companies.

Though, in general the petroleum industry worldwide involves in the exploration, production, refining, transportation, and distribution of petroleum & related products, the current existing petroleum industry in our country is involved only in the importation and distribution of the refined products.And EPSE has been the sole importer of refined petroleum products to the country since its establishment in 1967 G.C. The refined products are mainly purchased through open international tenders and are imported via Djibouti.

Similar to the other foreign countries, the oil and gas business in our country usually undertakes various constructions like Depots, Stations, Warehouses… etc. for the smooth running of the business. In fact some of the constructions involved are pre requirements to join the sector.

As known, a proper project management plan greatly helps in the construction process of different projects run in the sector.And according to PMI [Project Management Institute],a project is temporary endeavor in that it has a defined beginning and end in time, and defined scope & resources. Therefore, a project is unique in that it is not a routine operation, but a specific set of operations designed to accomplish a singular goal. Scope, time, and cost are the triple constraints of project management and leading factors in defining the project performance.

According to Jeffrey and Dennis (1987) a project is generally considered to be successfully implemented if it comes in on-schedule, comes in on-budget (monetary criterion), achieves

basically all the goals originally set for it (effectiveness criterion) and it is accepted and used by the clients for whom the project is intended (client satisfaction criterion).

The petroleum industry exists to supply a wide range of essential products to a variety of end-user markets and inorder to accomplish its aim of sufficient distribution, construction of reserve depots and stations are vital to the industry. However, the constructions of these different projects are not on time and budget. Different factors that are either external or related to project management can be the considered as the cause.

When we come to the factors that affect the success of construction projects, Maina, & Jane (2014)stated that economic, legal and technological can be taken from external factors and different factors related to project management such as Proper contract planning and management, Realistic project duration & budget, Top management support , Proper Risk Management, Client knowledge and experience …etc can be considered.Tsiga, Emes and Smith (2017) stated that, the achievement of critical success factors (CSFs) provides implementers with a better understanding of how to improve the project outcomes.

1.2 Statement of the Problem

The petroleum industry being considered as one of the most crucial sector, have the potential to affect a country's economy.And Ethiopia, like other developing economies, requires large quantities of affordable energy supplies to sustain economic growth. According to EPSE report, in the first three month of 2011, the country has imported 907,140 Metric Tons of refined petroleum products with a total cost of a USD 630,263,479.47. However, the business environment within which the petroleum industry operates has been very volatile.

A number of literatures (e.g. Silva, Warnakulasuriya&Arachchige (2016))opine that the inability to complete projects on time and within budget continues to be a chronic problem worldwide and a far worsening case. According to Jin and Ling 2006, a number of external environmental factors, such as political, economic, social, legal and those related to advances in technology or even factors related to nature, may affect project performance.In addition to these external factors, there exist different critical success factors that influence the performance of projects. Lack of innovative control systems can also be another reason for which project budget and schedule overruns are becoming one critical challenge within the petroleum industry.

Though a limited number of researches has been conducted related to the petroleum distributing companies, no research was conducted before related to the poor performance of projects in the sector and factors responsible for it.

Though the personal observation of the problem was the main driving force to do the research, the internal reports of the companies also confirms that the different stations, depots, head office buildings and various expansion construction projects undertaken are not being completed within the set time and budget which indicates the problem exists in the sector.

1.3 Research Questions and Hypothesis of the study

Because there hasn't been much study undertaken to reflect all the available information regarding the market, this paper is expected to contribute to the information gap that exists regarding the petroleum industry. Accordingly, this research answered the following questions:

- What are the major factors ensuing in budget overrun ofthe various construction projectsundertaken by the petroleum distributing firms?
- Which factors have an impact in the schedule slippage of the construction projects of petroleum companies?

Hypothesis development is very important because the acceptance and rejection of a hypothesis shows the significance of the study. On the basis of literature review and theoretical frame work the below hypothesis were developed:

1. H_0: Lack of Foreign Currency and Inflation has no effect on cost overrun of construction projects by Petroleum Companies.

   H_A :Lack of Foreign Currency and Inflation has an effect on cost overrun of construction projects by Petroleum Companies.

2. H_0: Delay in commencement of projects and provision of materials has no effect on the success of projects of Petroleum Companies

   H_A: Delay in commencement of projects and provision of materials has an effect on the success of projects of Petroleum Companies.

3. H_0: Adequate Training and skill development programs do not have a positive

effect on the success of projects of Petroleum Companies.

H_A: Adequate Training and skill development programs have positive effect on the success of projects of Petroleum Companies

1.4 Objectives of the study

General objectives

The main objective of this research was toidentifyfactors that affect the different construction projects done in the petroleum industry and list the main factors behind the schedule and cost over run in the industry.

Specific objectives

- To identify the factors resulting in schedule slippagesof construction projects of Oil and Gas companies in Ethiopia
- To identify the factors resulting cost overrun of construction projects of Oil and Gas companies in Ethiopia
- To assess which economic factor majorly affect the success of the projects in the industry

1.5 Scope of the study

Though various types of projects are being executed by the petroleum firms in our country, the study covered only the construction projects held by the two petroleum distributing companies and giving more emphasis to the causes behind cost and schedule overrun. No information regarding quality of the projects was included.

1.6 Significance of the study

The significance of this research is to add to the knowledge and understanding of the matter at hand by providing information based on aforementioned objectives of the research.

Identifying factors affecting success of projects will serve as inputof the issues since by giving an insight to the management of the two petroleum firms so that they will be able to understand which specific factor is influencing the performance of their projects and take appropriate measures.

In addition, the findings from this study will provide an input for further research works related to the topic.

1.7 Limitation of the study

Though the title of the research paper seems causal, because of the limited number of researches done in the sector and those reviewed for this study were descriptive, the study mainly depended on qualitative data and used descriptive statics for analysis.

1.8 Organization of the study

This paper is organized into four chapters. The first chapter presents the introduction part that includes background of the study, brief statement of the problem, objectives, significance, scope and limitations of the study, the research methodology and data analysis and presentation of the study.

The second chapter presents the review of related literature which discusses the definition of the terms project and project success and what factors determine the success of construction project in the industry. The third chapter will be devoted to the research design and methodology to be applied. Source of data, sampling technique, instrument of data collection and methods of data analysis will be presented in brief.

The fourth chapter will be comprised of the analysis and presentation of the data collected. While the last chapter will be concerned with the output of the study in the form of summary, conclusion and the respective recommendations based on the research findings.

Chapter 2

Literature Review

2.1 Definition of Project, Project management and Project success

2.1.1Project

A project is defined as a temporary endeavor which is undertaken to create a unique product or service by Project Manegement Institute (2004). A project is also defined as a complex, non-routine, one-time effort limited by time, budget and resource and performance specifications designed to meet customer needs.

Many organizations use projects to response to requests that cannot be handled within the normal organizational limits. The size and length of a project can vary from one person to thousands and from a few weeks to more than five years (PMBOK, 2004).

A project ends when the objective has been reached, or when it becomes clear that the objective cannot be met, or if the need of the project no longer exists. The fact that a project is temporary does not mean that the result of the project also will be temporary. Most projects are undertaken to create a long lasting result (PMBOK, 2004).

2.1.2 Project Management

As defined by PMI (2013), project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirement and all management work is based on processes as: initiating, planning, executing, controlling and closing.

In addition, Kerzner(2003) defines project management is the planning, organizing, directing, and controlling of company resources for a relatively short-term objective that has been established to complete specific goals and objectives.

The PMI, Project Management Institute, has defined nine categories of project management knowledge areas. Project Integration Management, Project Scope Management, Project Time Management, Project Cost Management, Project Quality Management, Project Human Resources Management, Project Communications Management, Project Risk Management and Project Procurement Management.

2.1.3 Project Success

Project success is an abstract concept and determining whether a project is successful is subjective and extremely complex (Parfitt&Sanvido, 1993; Chan, 2002). Oxford Advance Learners' Dictionary defines "success" as "the fact that you have achieved something that you want and have been trying to do or get". Therefore, the Project success could be defined as the fact that a project has achieved the objectives or goals of a particular project.

In general, the knowledge developed in the field of project management now considers that the "golden triangle" is not enough to define project success (Cooke-Davies2002). Several researchers argue that success criteria should now be linked to the sustainability constraints of a project, expanding these parameters to include social and environmental impact as well as time, economy and quality (Chan and Chan, 2004 ; Elattar, 2009; Almahmoud et al., 2012)

Project success can be defined as meeting the required expectation of the stakeholders and achieving its intended purpose. PMI 2013 states thatas projects are temporary in nature, the success of the project should be measured in terms of completing the project within the constraints of scope, time, cost, quality, resources, and risk as approved initially.

Based on Kerzner(2009) the earlier definition of project success has been modified to include completion:

- Within the allocated time period
- Within the budgeted cost
- At the proper performance or specification level
- With acceptance by the customer/user
- With minimum or mutually agreed upon scope changes
- Without disturbing the main work flow of the organization
- Without changing the corporate culture

Ibrahim (2013), indicated that time, cost and quality have their proven importance as a prime measures for project success. And construction projects are commonly measured by the achievement of the above specifications.

2.2 Factors affecting the success of construction projects

Since the success of projects are measured mainly in terms of the three primary forces which are cost, quality and time, there exists different factors having an influence on each of these

measures. Time is the available time to deliver the project, cost represents the amount of money or resources available and quality represents the fit-to-purpose that the project must achieve to be a success.

The concept of success in a construction project according to some researchers is corresponding to efficiency and effectiveness measures. Efficiency measurers deal with time, budget and specifications; effectiveness measurers refer to achievement of project objectives, user satisfaction and the use of the project. (Takim & Adnan, 2008).

According to Kumara Silva, Warnakulasuriya B N F &Arachchige B J H (2016), success factors can be categorizes as Internal factors(those one can have control over) and External factors in which one can't control.

The following are considered as internalsuccess factors according to their study:

- ✓ Adequate communication among team members
- ✓ Top management support and commitment to the program
- ✓ Availability of advanced technology
- ✓ Detailed project planning, estimating and scheduling
- ✓ Frequent project monitoring
- ✓ Implementing an effective safety program
- ✓ Managing and control of subcontractor's work
- ✓ Adequate fund or cash flow management
- ✓ Availability of resources as planned throughout the project
- ✓ Clear and detailed procurement process & strategy
- ✓ Clearly defined scope/goals and objectives
- ✓ Effective project risk management system
- ✓ Availability of skill full workforce
- ✓ Effective allocation and control of man power
- ✓ Effective Site Management, Control and Coordination
- ✓ Contractor's Experience
- ✓ Establishing an effective document control system
- ✓ Adequate training and skill development programs
- ✓ Effective contract management system
- ✓ Team member commitment

While below is the list of external Factors:

- ✓ Political instability
- ✓ Delay of payments
- ✓ Design and material changes by clients
- ✓ Rapid changes in economic environment
- ✓ Inefficiency of government's policies
- ✓ Limited allocation of funds
- ✓ High inflation rate
- ✓ Project nature related factors
- ✓ Influence of nature like weather conditions
- ✓ High Labor Turnover
- ✓ Inadequate support from banking sector

2.2.1 Factors Impacting the Budget of a Project

In General, cost is believed to be an indicator ofperformance of project management. The project budget is very important and influences all areas in both planning and execution of a project.

Poor cost performance in construction project is a common problem worldwide resulting in significant amount of cost overrun. Different studies have revealed that there are various factors responsible for cost overrun of Construction projects and project cost management is important. Project cost management includes the processes of cost estimating, cost budgeting and cost control. The main objective of cost management is to complete the project within the approved budget (PMBOK, 2004).

Some of the factors identified from the different literatures reviewed are scope change, in accurate cost estimation, delay in schedule, inflation (increase in material cost), Shortage of materials in the market, lack of foreign currency to import the necessary goods, poor contract management, selection of inappropriate contractors, funding problem, political instability of a country can be listed.

Lee (2008) examined cost overrun problem in Korean social overhead capital projects. In a study of 161 completed projects the causes of cost overruns were found as changes in scope, delays during construction, unreasonable estimation and adjustment of project costs and no practical use of the earned value management system. Sriprasert (2000) studying cost overrun problems in construction industry of Thailand mentioned that low quality materials cause higher construction cost than expected because of the loss of materials during construction.

In Malaysia, Ali and Kamaruzzaman (2010) through questionnaire survey in different projects at Klang Valley found that main factors that contribute to cost overruns include inaccurate/poor estimation of original cost, construction cost underestimation, improper planning, poor project management, lack of experience, poor contract management, inflation of project costs, high cost of machineries, fluctuation in price of raw materials, unforeseen site conditions, insufficient fund, obsolete/unsuitable construction equipments and methods and mistake in designs.

2.2.2 Factors Impacting the Schedule of a Project

A project needs to be kept within budget (cost) and prescribed schedule (time) to have a successful outcome. This takes good planning and requires sound judgment. To minimize and avoid these delays, it is important to define the causes of delays first.(Ahmed et al., 2002).

Sanders and Eagles (2001) define delay as an event that causes extended time to complete all or part of a project. Delay may also be defined as the time overrun, either beyond the date for completion specified by the contract or beyond the extended contract period where an extension of time has been granted.

According to Abbas (2006), late completion of works as compared to the planned schedule or contract schedule is what is known as delay. There are number of definitions for delay: to make something happen later than expected; to cause something to be performed later than planned; or to not act timely each of these definitions can be describe a delay to an activity of work in a schedule. The type of delay we focus on in this study is the time overrun beyond the date for completion specified by the contract not considering whether an extension of time has been granted.

Previous studies on construction delays have been done by a number of authors from a variety of countries. Factors that cause delays on construction projects are a universal problem and often occur. By identifying possible delays, there is a better chance to manage and control possible causes through the life cycle of a project. Afshari et al. (2011**)**

There are a number of factors that play a role leading to these delays. Not only do site related challenges cause delays, the parties involved can contribute as well (Frodell and Josephson, 2009). And delays often cause disputes, as both the client and the contractor are affected in a negative way because of the delay.

There are several causes or factors of delays that have been identified by researchers in the field of project management in the construction industry. Some of these researchers have even attempted to categorize the causes of delays based on certain factors.

Ahmed et al. (2003) grouped delays into two categories – internal causes and external causes. Internal causes arise from the parties to the contract (e.g. contractor, client, and consultant). External causes, on the other hand, arise from events beyond the control of the parties. These include the act of God, government action, and material suppliers.

Alaghbari et al. (2007) identified that financial problems were the main factor causing delay in construction projects in Malaysia. In fact, Delayed financing affects the commencement of the other components leading to overall delay in the project. From the available literature the structure and timing of financial provision may impose certain constraints on the design and scheduling of the project.

As stated on the research report of Al-Turfi (2017) , according to the surveys carried out by 13 authors in 12 Middle Eastern countries, including projects in the construction sector, changes in design or changing orders are the greatest cause of project delays in 10 out of 12 countries. This factor is jointly followed by the two second highest causes of projects delay in 8 out of 12 countries: (a) difficulties in financing or delayed payments for completed work by the owner, and (b) unqualified people working in the domain of the project. Poor project planning is ranked in third place among the factors that caused the delay of projects in 6 out of the 12 Middle Eastern countries. Finally, the last major factor that caused a delay in projects in 4 out of 12 countries is slow decision-making by the owner.

In Short, a general summary of list of factors are identified form the different researches done around the world. Economic factors, unrealistic Schedule, delay in provision of resources and machineries, inappropriate material procurement, Inadequate planning and changes in design& scope, equipment unavailability, poor supervision, poor communication and delayed payments are the most common ones.

In conclusion, delays are inevitable; however, they can be avoided or minimized when their causes are effectivelyidentified and analyzed.

2.3 Economic Factors affecting the success of projects in the oil industry

Economic factors refer to the issues influencing the economic feasibility of the project including the changes in domestic economic conditions of the recipient country or inaccurate project development plan due to unpredictable economic conditions. Based on the study of Maina, Charles &Gathenya, (2014) Economic factors affecting the performance of project management in petroleum marketing firms are grouped in to:

-Funding

-Foreign currency exchange rate

-Foreign investments

-Joint venture

According to Bhattacharyay (2008) project funding, foreign currency exchange rate as well as foreign investments and joint venture affect the success of projects in various ways. This may be caused by increased competition, decreased consumption, and regulatory changes requiring changes in selling price of the product or renegotiating concessions awarded to the project and would reduce the profit margin.

The availability of resources is considered to be a factor necessary for the successful completion of projects. The financing of a project involves the arrangement of adequate funds to pay for the development and operation of a clearly defined project. In some cases it is also necessary to raise finance to cover maintenance and operation. The structure and form of finance will be influenced by the nature of the project. For some projects, the majority of funding will come from Head offices of companies, local or central government sources or in other cases the project will be revenue-generating and this revenue will be used to pay back loans and pay for maintenance and operation. Financing problem has been known to contribute to delayed project completion (Leurs, 2005).

The project's political context, its relationship with the local community, the general economic environment, its location and the physical conditions in which it will be built, are the most important external factors. Some of the components cannot be executed before others as indicated by Barccarini (2005).

2.4 Possible measures to minimize cost and schedule over run

Different mitigation measures against delay and cost overrun of construction projects have been suggested by different professionals . According to Memon, Rahman and Azis (2012) study on" Time and Cost Perfomance in Costruction Projects in Southern and Cenrtal Regions of Malaysia", 13 mitigation measures to improve time performance and 15 measures to improve cost performance of construction projects which were classified into 3 categories as proactive, reactive and organization.

2.4.1 Mitigation Measures to Improve Time Performance

Below are the 13 measures stated in Memon, Rahman and Azis (2012) study:

- Proper planning work
- Committed leadership and management
- Send clear and complete message to worker to ensure effective communication
- Hire skilled workers to achieve good progress, avoid poor quality of work, more rectification and double handling
- Close monitoring
- Training and development of all participant to support delivery process
- Focus on the quality, cost and delivery of the project
- Use new construction technologies (IBS-Industrialize Building System)
- Adoption of tools and techniques i.e.: Value Management, Lean Thinking, Total Quality Management
- Provide knowledge/training to unskilled workers based on their scope of work.
- Fully utilize the construction team
- Focus on client's need

2.4.2 Mitigation Measure To Improve Cost Performance

The following are the 15 measures identified in the studyof Memon, Rahman and Azis (2012) study:

- Effective strategic planning
- Proper project planning and scheduling
- Effective Site management and supervision
- Frequent progress meeting

- Proper emphasis on past experience
- Use of experienced subcontractors and suppliers
- Use of appropriate construction methods
- Use up to date technology utilization
- Clear information and communication channels
- Frequent coordination between the parties
- Perform a preconstruction planning of project tasks and resources needs
- Developing human resources in the construction industry
- Comprehensive contract administration
- Systematic control mechanism
- Improving contract award procedure by giving less weight to prices and more weight to the capabilities and past performance of contractors

2.4.3 Effective Project Control System

Delay and cost overrun are inherent part of most projects despite the much acquired knowledge in project management. Given the high level of uncertainty within projects, proper monitoring and control of project performanceis vital to avoid cost overruns, limit financial losses,and improve predictability. The utilization of a project controlsystem (PCS) that measures and evaluates the variancebetween the project plan and actual project performanceplays an essential role in achieving successful outcomes.

A PCS involves data gathering, analysis, and managementprocesses that are used to forecast, predict, andunderstand the time and cost outcomes of a project orprogram. PCS is the process of integrating all aspects of the project plan, validating thatthe plans are comprehensive and consistent with requirements,initiating mechanisms for project control, and communicatingthe integrated project plan to those responsiblefor the project's work packages.

Projectplanning and control mechanisms are generally consideredas a root cause of many enablers and barriers of PCS implementation.Backlund (2000) suggests three criteria for successful PCS implementation: (1) planning and controlling process,(2) the experience and analytical ability of project personnel,and (3) the commitment of a high management.

The measurements that underlie project controls have several purposes:

- They quantify an evaluation of feasibility.

- They represent a benchmark for performance.
- They measure interim performance to highlight needed improvements.

Project controls can be a key to project success. Effective controls provide a core means of communication about the metrics of project success and a means to facilitate that success. Well designed controls systems are relevant to the project management and scalable to the needs of the project.

To be used in successful projects, controls systems must avoid:

- Arbitrary imposition of project goals that do not reflective of reality.
- Overly simplistic views of the project and influences upon it.
- The trap of mistaking the tools of project controls for their application.

In conclusion, Project controls are relevant to the extent they help us arrive at better decisions, better allocate the project resources, and initiate better actions.

2.5 Empirical Literature

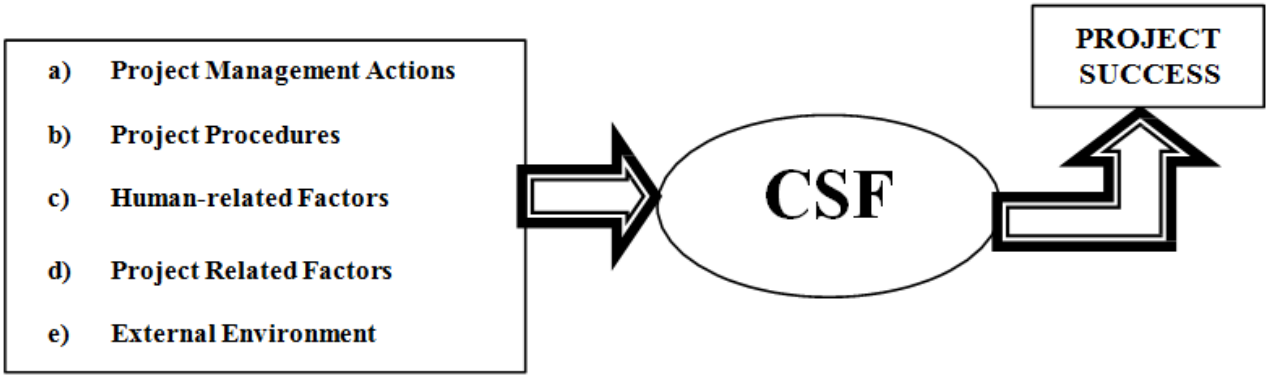
Different studies have revealed that there are various factors responsible for cost overrun of Construction projects. Kaming, Olomolaiye, Holt, and Harris (1997), who studied 31 construction projects in Indonesia, found that from a contractor's point of view, cost overruns were mainly caused by inaccuracy of material take-off, increase in material costs and cost increase due to environmental restrictions. Le-Hoai et al. (2008) ranked the three top causes of cost overruns in Vietnam as material cost increase due to inflation, inaccurate quantity take - off, and labor cost increase due to environment restriction. Kaliba, et al. (2009) concluded that cost escalation of construction projects in Zambia are caused by factors such as inclement weather, scope changes, environment protection and mitigation costs, schedule delay, strikes, technical challenges and inflation.

Kaming et al, (1997) and Mansfield et al,1994 also 23 identified design change, inadequate planning, unpredictable weather condition, and fluctuation in construction materials as factors influencing cost overruns. Another critical causes for time cost overrun were identified: incomplete design at the time of tender; additional work at owner's request; changes in owner brief; lack of cost planning/monitoring during pre and- post contract stages; site/poor soil conditions; adjustment of prime cost and provisional sums; re-measurement of provisional works; logistics due to site location.

Researches in developing countries especially Africa have made progress in determining the causes behind project delays. Agaba (2009) attributes delays in construction projects to poor designs and specifications, and problems associated with management and supervision. Sambasivan and Soon (2007), and Alinaitwe (2008) established that poor planning, poor site management, inadequate supervisory skills of the contractor, delayed payments, material shortage, labor supply, equipment availability and failure, poor communication and rework were the most important causes of delays in the Malaysian Construction Industry.

2.6 Conceptual Framework

This conceptual framework illustrates the variables for project performance which were applied to capture the relevant data:



Source: Chan et.al (2004)

In the conceptual framework, the relationship between variables for project performance, CSF and the project outcome was used in this study.

Determining success factors will give organization/company a competitive edge and is the bottom line of success in fulfilling the responsibility of a project management companies. This in turn will give rise to satisfied investors, professional bodies and make the project management company.

Chapter Three

Methodology

3.1 Research Design and Setting

This research tried to explore factors affecting the success of construction projects undertaken by oil marketing companies in Ethiopia with a specific case of National Oil Ethiopia and Mulege Petroleum. The research setting is in the capital city of Ethiopia called Addis Ababa since the head offices of both petroleum companies are located in Addis.

3.2 Research Approach

As the study was done to identify factors affecting majorly cost and time overrun of construction projects in the industry, qualitative approach was used. Primary data has been collected to identify the factors resulting in the deviations from the head offices of selected companies. Semi Structured questionnaires were distributed to Site and Office Engineers, Contractors and Project Supervisors working in the different projects of the companies. Literature review was used as a preliminary data to the identification of the factors affecting the performance of the projects in the sector and secondly the responses given by the respondents were used. Also secondary data taken from the internal reports of the company were used to show that the problem exists.

3.3 Data Sources and Methods of Data Collection

To achieve the specified objectives of the study, both quantitative & qualitative data types from primary and secondary sources were used. The primary data was gathered from selected companies through semi structured questionnaires while the secondary data was collected from internal documents of the two companies.

3.4 Sampling Techniques

Since there exist limited number study units in the selected oil companies, census method were used to collect data. Therefore, two Contractors, all Office and Site Engineers, Project Supervisors & other professionals in the selected oil distributing firms that have direct connection with the topic was considered. A total of 21 respondents were involved. The survey was self-administered in which the researcher personally distributed and collected the questionnaire.

3.5 Data Analysis and Presentation

Statistical analysis techniques using SPSS software was used to analyze the data collected. Results were displayed with the aid of percentages, graphs, tables. Cronbach alpha test were used to test reliability of the data and also independent t- test were used to test the hypothesis. Spearman correlation coefficient also used to see the degree of association between the variables using SPSS.

3.6 Ethical Considerations

The researcher reflected on ethical issues in every aspects of the activity in doing this study. When distributing the questionnaire, purpose of the study has been explained to the respondents so that they will be contented to reply and respondents are guaranteed that the information they provide is confidential and used for academic purpose only. Moreover a statement conform the prohibition of including any identity detail or personal references in the questionnaire. This was to avoid any biased response and to make participants safer in filling the questionnaire. Thus the gathered data is kept confidential and would not be used for any personal interest.

Chapter Four

Data presentation and Analysis

This chapter deals with the presentation and analysis of the data gathered in relation with the factors affecting projects success in two petroleum distributing firms inEthiopia. The analysis is based on primary data and secondary data gathered. The collected data are presented by using summary of tables, percentages and graphs.

4.1 Background of the sector and companies

Since Ethiopia does not produce oil, to meet the country's oil requirement, the country imports fuels from overseas. The petroleum industry of the country as mentioned earlier is dominated by one major supplier, EPSE for the past 50 years and currently the number of petroleum distributing companies has reached a number of 28. And Petroleum Licensing and Administration is a section within the Ministry of Mines that oversees all activities related with petroleum operations in the country.

Oil Companies purchase fuel from EPSE and distributes the product either using the network of stations they have or direct to the sites of those customers who purchase in bulk for their own consumption.

National Oil Ethiopia

National Oil Ethiopia (NOC) is the first indigenous and leading company in the importation and distribution of petroleum products to a wide range of customers in the different economic sectors of Ethiopia. Since its inception about 15 years ago, NOC has captured a confirmed overall market share of 37% with 180 service stations.NOC alsoserves over 1,000 corporate customers in these different economic sectors across the country by supplying various petroleum products including Fuels, Lubricants, LPG, Bitumen, Petroleum coke, Steam Coal and Chemicals.Its vision and mission is stated as below:

Vision

- To be the Customer's First Choice for supply of Quality lubes, bitumen and Main fuels at competitive price and second to none quality services.

Mission

- To be engaged in the importation, distribution and retailing of petroleum products including Jet Fuels, Gasoline, Gas oil, Kerosene, Fuel Oils, Lubricants, Bitumen, LPG, Petroleum Coke, Chemicals and products of petroleum.

NOC business units are organized to deliver products & services in the most cost effective and efficient manner. And as a responsible Corporate Citizen delivering on its social responsibility in the social and economic development of Ethiopia, Health, Safety and Environment Management System is t the center of their Business model.

Mulege Petroleum

Mulege Petroleum is a private limited company licensed by the ministry of trade and industry of the FDRE government. The company was established in May 2009 by 2 founding shareholders who are Ethiopian nationals.

MG Petroleum joined the oil industry in order to cater the ever increasing energy demand of the country and to be the reliable choice in the industry.The company supplies fuels and different types of lubricants by constructing depots and fuel stations in different parts of the country. As its core business, the company sells & distributes different type of fuels and below is its vision and mission statement:

Vision

- looking to improve and continuously exceed customer's expectations

Mission

- provide efficient, high quality value adding services by providing high quality petroleum products.

Currently, in order to achieve its goal, the company is constructing 10 fuel stations in different parts of the country. And MG pays great attention to corporate social responsibility by supporting the vulnerable groups and local communities.

4.2 Data presentation and analysis of secondary data

Three Projects from the two companies were selected to show that the problem exists and below is the presentation:

Table 4.1: Schedule Variance of Projects

Project Name	Planned time for completion	Actual time of completion	Variance from the schedule
MG Moyale Station	Aug 22, 2018	Aug 31, 2019	374 days
Tulu Dimtu Noc Station	April 30,2018	Jan 08, 2019	218 days
MG Bule Hora Station	Aug 27, 2017	April 01, 2019	458 days

Source: companies internal report

The average completion period granted by the oil companies for construction of fuel stations is between 4 month to 1 year depending on the agreement signed between the dealer and the company. From the above table we can see all the three projects have faced schedule delay.

Table 4.2: Budget Variance of Projects in Birr

Project Name	Budgeted Cost	Actual Cost	Variance from the budget
MG Moyale Station	4,259,153.66	6,048,026.70	1,7,88,873.04
MG Bule Hora Station	25,209,761.04	26,901,504.01	1,691,743.00

Source: companies internal report

From the above table, we can see that there was variation of cost from the initial estimation which is attributed to different factors.

4.3 Data presentation and analysis of primary data

Primary data was found to be crucial to identify the possible factors resulting in project delays and cost overrun of project deliverables.

In order to determine if the questionnaire could reliably measure the latent variable, Cronbach alpha test was conducted. The acceptable reliability value is 0.6.Therefore if your questionnaire's reliability result is more than 0.6 then your questionnaire is considered reliable.

The table given below is the reliability statistics table which provides the value for Cronbach alpha which in this case is 0.805 and reflects higher reliability of the measuring instrument. Furthermore, it indicates high level of internal consistency with to the study units.

Reliability Statistics

Cronbach's Alpha	N of Items
.805	24

Below is the presentation of the hypothesis tested and the results found are:

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Inflation and lack of foreign Currency results in cost overrun of projects	48.466	29	.000	4.500	4.31	4.69

Inflation and Lack of foreign Currency results are statistically significant at 95 % confidence level. Therefore, inflation and lack of foreign currency affects cost overrun.

From the result of test statistics, delay in commencement and provision of material statistically significant at 95% confidence level. Therefore, delay in commencement and provision of material has negative effect on schedule performance.

One-Sample Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Short term training will help to complete projects successfully	19.746	29	.000	1.100	.99	1.21

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Delay in Commencement of projects and provision of materials has an effect on schedule performance	26.926	29	.000	2.500	2.31	2.69

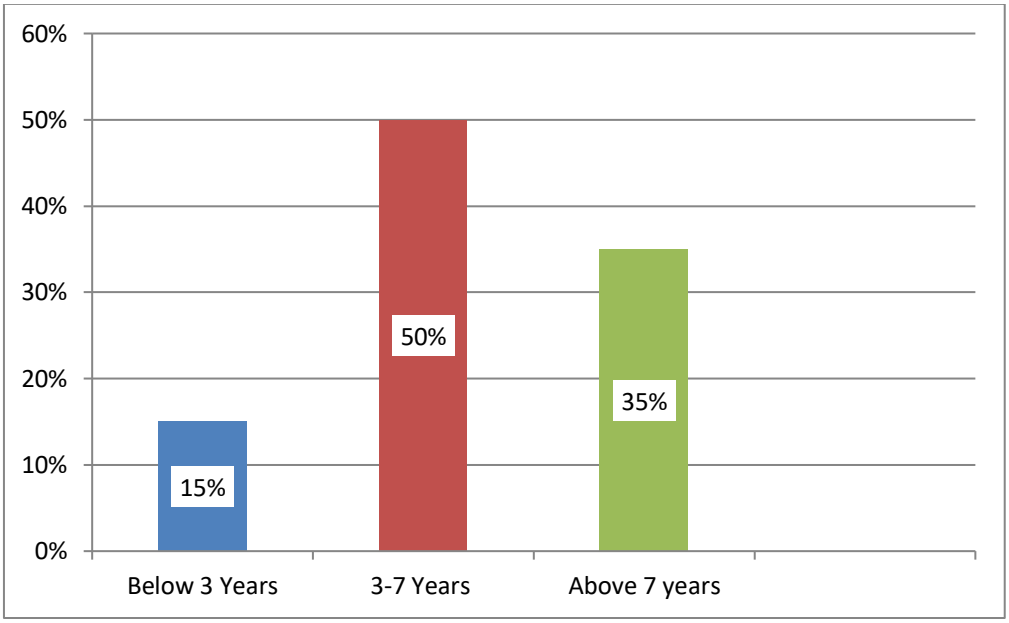
From the above t-test result we do have enough evidence to reject the null hypothesis at 95% confidence level. Therefore short term training positively affects the success of the project.

Twenty one semi-structured questionnaires were distributed to Site and Office Engineers, Project Supervisors and Contractors. Accordingly the information gathered is presented as below:

Part -1 Respondents profile

- **No of years of experience**

Graph 4.1: Experience in the sector



Source: sample survey

The study results depicted above reveals that out of the total respondents, 15% of them have a total number of years' experiencein the sector below 3 years, While 50% of them have worked in the sector for b/n 3 to 7 years and the remaining 35% of individuals have an experience of above 7 years. This shows that majority respondents had enough work experience in the petroleum marketing firms.

- **Response Rate**

  From the total 21 respondents selected for this study, only 20 of them returned the questionnaire which shows the total response rate was 95%.

Part II – General Questions

- **The different construction projects done in the sector**

  According the reply given by the respondents, among the different construction related projects undertaken by the companies; the major ones are depots construction

for keeping a reserve of fuel which is a pre requirement to join the sector, construction of service stations with various types of buildings and purposes like cafeteria, construction of Commercial customer sites, construction of Head office buildings, construction of stores for lubricants & LPGs products and different maintenance and expansion projects of already constructed depots and stations.

- **Rating of the success of the various construction projects among the petroleum distributing firms in regard to budget and schedule**

Table 4.3: Rating of the success of projects in the sector

Rating	Percent
Very Successful	-
Successful	45%
Less Successful	55%
Not Successful	-
Not Sure	-

Source: sample survey

As seen in the above table, 55% of the respondents replied that from the implemented the projects most face the challenges of schedule delay and cost overrun.

- **Percentage of projects completed within Schedule**

Table 4.4: Percentage of projects completed within Schedule

Rating	Frequency	Percent
More than 90%	-	-
70 to 89%		
50 to 69%	2	10%
Less than 50%	18	90%

Source: sample survey

Based on the respondent's reply that more than 50% of the projects face the problem of schedule delay.

- **Percentage of projects completed within budget**

Table 4.5: Percentage of projects completed within budget

Rating	Frequency	Percent
More than 90%	-	-
70 to 89%	1	5%
50 to 69%	2	10%
Less than 50%	17	85%

Source: sample survey

The above table shows that about 85% of the respondents were of the opinion that more than 50% projects came out of budget.

- **Rating of the influence of economic factors on the success of projects**

Table 4.6: Rating of the influence of economic factors on project's success

Economic Factors	1 = Very Little Extent	2 = Little Extent	3 = Moderate Extent	4 = Great Extent	5 = Very Great Extent
Lack of foreign currency and Inflation	-	-	1	4	15
Funding Problem	1	12	9	-	-
Foreign investment	18	2	-	-	-
Joint Venture	20	-	-	-	-
Others ……	-	-	-	-	-

Source: sample survey

From the above table, 75% of the respondents rated the effect of t inflation and lack of foreign currency as to a very great impact on the performance of projects in the oil sector is high. And one can conclude that based on the responses of the respondents, the other economic factors has a very little effect on the overall performance of the projects.

- **Factors resulting in cost overrun of projects in the sector**

Table 4.7: Rating of major causes of cost overrun

Factors	No of times identified on the below extents				
	Very Little Extent	Little Extent	Moderate Extent	Great Extent	Very Great Extent
Unrealistic Budget Estimation	-	11	9	-	-
Inflation and Lack of foreign currency	-	-	-	6	14
Design and Scope Changes	-	-	7	13	-
Problem in optimal utilization of resources	9	7	4	-	-
Delay in Schedule	-	1	14	5	-
Poor implementation of the plan	5	15	-	-	-
Inadequate planning	-	2	17	1	-

Source: sample survey

Based on the response of the respondents as presented above, one can see that Inflation and lack of foreign currency in addition to Design and Scope changes are contributing to cost overrun to great extent while Delay in schedule and inadequate planning are also contributing some moderate proportion in incurring additional cost of projects in the sector.

- **Factors resulting in Schedule Slippage of projects in the sector**

Table 4.8: Rating of major causes of schedule slippage

Factors	No of times identified on the below extents				
	Very Little Extent	Little Extent	Moderate Extent	Great Extent	Very Great Extent
Inadequate planning and Poor Designs	-	4	13	3	-
Delay in commencement of projects	-	-	4	16	-
Technical incompetency and lack of skilled manpower	3	15	2	-	-
Design and scope changes during implementation	8	9	3	-	-
Delay in provision of resources	-	1	6	15	-
Weather conditions	14	5	1	-	-
Poor Monitoring and Evaluation	-	2	14	4	-
Insufficient funding / Funding Problem	6	10	4	-	-

Source: sample survey

As presented in the above table, Delay in commencement of projects (80%) and delay in provision of resources (75%) are the major factors responsible for the schedule slippage of projects in the sector based on the respondents reply. In addition, Poor monitoring and

evaluation and inadequate planning are the other factors identified as contributing to the overall delay of projects.

- **Other factors affecting the performance of construction projects in the sector**

  From the responses given by the respondents, below are the lists:

  - ✓ Lack of adequate trainings and skill development
  - ✓ Urgency from the stakeholders/Management
  - ✓ Not allocating sufficient time for design review and approval
  - ✓ Like other projects in the country, corruption is in the system which is affecting the performance of the projects
  - ✓ Lack of advanced technology
  - ✓ Lack of availability of experienced professionals & skillful workforce
  - ✓ Contractor's experience
  - ✓ Lack of commitment to the project

- **Measures to enhance success of construction projects in the sector**

  The respondents suggested the following to improve the performance of construction projects in the sector:

  - ✓ Develop standard procedure in regard to design changes and adequacy of
  - ✓ Decision making and responsibility should be given to technical personnel
  - ✓ Implementation of proper monitoring and evaluation
  - ✓ Facilitate adequate capacity &skill development trainings to project teams
  - ✓ Implement internal project control system
  - ✓ Government should increase the allocated amount foreign currency to the sector and give special attention
  - ✓ Transparency should be promoted.
  - ✓ Since most projects in the sector require a good amount of investment, detailed planning and estimation should be done
  - ✓ Clear and detailed procurement should be done

Chapter Five

Summary, Conclusion and Recommendation

5.1 Summary of Findings

- The different projects undertaken by the oil marketing companies in Ethiopia face the challenges of cost and schedule slippage.
- From the various projects done, construction of depots, construction of service stations with various types of buildings for multi purposes, construction of Head office buildings, construction of stores for lubricants and LPGs products and different maintenance and expansion projects are the major one.
- Based on the respondents reply, less than 50% of the projects are completed on schedule and budget.
- Inflation and lack of foreign currency has been identified by the respondents as the main economic factors influencing the performance of projects in the oil sector
- Design & Scope changes as well inflation and lack of foreign currency are identified as major factors resulting in cost overrun of projects. In addition to the above identified factors, delay in schedule and inadequate planning are also contributing some percentage for incurring additional costs.
- Delay in commencement of projects and delay in provision of resources are the basic factors responsible for the schedule slippage of projects in the sector. In addition, Poor monitoring and evaluation and inadequate planning are the other factors identified as contributing to the overall delay of projects.
- Lack of adequate trainings and skill development, Urgency from the stakeholders/Management, Not allocating sufficient time for design review and approval, Lack of advanced technology, Lack of availability of experienced professionals & skillful workforce and Lack of commitment to the project are the other factors identified by the respondents for causing schedule and cost overrun in the sector.

5.2 Conclusion

Though effective project management has been defined as completing projects within time, cost and quality constraints, poor time and cost performance are major challenges faced by today's projects undertaken by oil and gas companies.Hence, this study assessed time and cost performance in construction projects of petroleum distributing companies in Ethiopia and identified major inhibiting factors.

The research found that the influence of economic factors majorly inflation and lack of foreign currency on the performance of projects in the oil sector is high.

In addition, from the different factors listed inflation & lack of foreign currency and design and scope changes are identified as primary factors as affecting the performance cost in the sectorwhile inadequate planningand delay in schedule are also contributing to some percentage.

Moreover to the above stated factors, delay in provision of resources& commencement of projects are identified as a major factor whereas poor monitoring and evaluation and inadequate planning are identified as a secondary factor to poor time performance of projects in the sector.

5.3 Recommendations

- Companies should have a clear and detailed plan of project work and the scope of work involved before executing projects. In addition sufficient time should be allocated to review and approve designs.
- Though there is some percentage of foreign currency allocated by the government to the sector, it is still not sufficient to satisfy the demand. And because of the effect of the industry on overall economy, government should revise the allocated percentageto the sector.
- Companies should avoid delay in commencement of projects and implement efficient resource planning.
- The utilization of a project control system (PCS) by companies that measures and evaluates the variance between the project plan and actual project performance can play an essential role in achieving successful outcomes.

- In order to improve the performance the projects in the industry, companies should think of preparing different training and skill development programs to their employees.

5.4 Directions for future researches

This study examined the different factors contributing to cost overrun and schedule slippage of the two oil companies in Ethiopia. Though the success of a project is considered within the constraints of cost, schedule and quality, the research only investigated time and cost performance. Therefore a future study on quality performance of the projects by the oil companies would be useful to identify and fill the gaps regarding project management practice by the companies. Furthermore, the researcher recommends for the analysis of dependence of cost overrun of projects on delays.

References

Abbas, M.I (2006). Causes and Effects of Delays in Aceh Construction Industry, Master Thesis, UniversityTechnology

Afshari, A., Khosravi, S., Ghorbanali, A., Borzabadi, M. and Valipour, M. (2011).Identification of causes of non-excusable delays of construction projects.

Ahmed, S.M., Azhar, S., Castillo, M. and Kappagantula, P. (2002). Construction delays in Florida: An empirical study. Report Department of Construction Management Florida International University, Miami.

Ahmed, S. M. Azhar, S., Kappagantula, P., and Gollapudi, D., 2003. Construction Delays in Florida: A brief study of the Florida construction industry. Proceeding of the 39th Annual Conference of the Associated Schools of Construction. Clemson, South Carolina: Clemson University. Final report, Miami, F1 33174, USA.

Alaghbari, W.E., Kadir, M.R.A., Salim, A. and Ernawati (2007) The significant factors causing delay of building construction projects in Malaysia. Engineering, Construction and Architectural Management 14 (2): 192–206.

Ali A.S. and Kamaruzzaman S.N. (2010). Cost performance for building construction projects in klang valley. Journal of Building Performance 1:1 P110-118

Amnesty International (2004). Nigeria: Are human rights in the pipeline? Al Index: AFR 44/020/2004, London: Amnesty International.

BacklundA . The definition of system. MCB UP Ltd 2000; 29(4): 444–451.

Bhattacharyay, B. (2008). Infrastructure and Regional Cooperation Concept Paper for ADB/ADBI Flagship Study

Chan, Albert & Scott, D & Lam, EWM.(2002). Framework of success criteria for design/build projects.Journal of Management in Engineering. 18. 120-128.

Chan, A. C., Scott, D., & Chan, A. L. (2004).Factors Affecting the Success of a Construction Project. Journal of Construction Engineering & Management, 130(1), 153-155.

Cooke-Davies, Terry. (2002). The “real” success factors on projects. International Journal of Project Management. 20. 185-190

Frodel, M. and Josephson, P.E. (2009).Perceived Constraints when Establishing and Maintaining Contractor Supplier Relations in Construction. Construction Management, Chalmers University of Technology

J.-K. Lee, "Cost Overrun and Cause in Korean Social Overhead Capital Projects: Roads, Rails, Airports, and Ports," Journal of Urban Planning and Development @ ASCE, pp. 59-62, 2008.

Jin, Xiao-Hua& Ling, Florence.(2006). Key relationship-based determinants of project performance in China. Journal of Building Environment, 41(7), 915-925.

Kaliba, C. Muya, M. &Mumba, K. (2009) Cost Escalation and Schedule Delay in Road Construction Projects in Zambia, International Journal of Project Management

Kaming, P.F., Olomolaiye, P.O., Holt, G.D., & Harris, F.C. (1997), Factors influencing Construction time and cost overruns on high-rise projects in Indonesia

Kerzner H., (2003), Project Management A Systems Approach to Planning, Scheduling, and Controlling, Baldwin-Wallace College Berea Ohio, John Wiley, New Jersey

Le - Hoai, L., Lee, Y.D., & Jun, Y. L. (2008), Construction Management and Economics

Maina, Charles &Gathenya, Jane.(2014). Influence of Economic Factors on Performance of Project Management among Petroleum Marketing Firms in Kenya.International Journal of Academic Research in Business and Social Sciences. 4.

Mansfield, N.R., Ugwu, O.O., & Doran T. (1994), Causes of delay and cost overrun in Nigeria construction projects, International Journal of Project Management, 12(4)

Memon, Aftab& Abdul Rahman, Ismail &Asmi Abdul Azis, Ade. (2012). Time and Cost Performance in Construction Projects in Southern and Central Regions of Penisular Malaysia. International Journal of Advances in Applied Sciences (IJAAS). 1. 45-52.

Parfitt, M. K., &Sanvido, V. E. (1993). Checklist of critical success factors for building projects. Journal of Management in Engineering. 9(3), 243-249

Pinto, Jeffrey & P. Slevin, Dennis.(1987). Critical Factors in Successful Project Implementation.Engineering Management, IEEE Transactions on.EM-34.22-27.

PMI (2004), A Guide to the Project Management Body of Knowledge (PMBK) Guide Project Delays on Cost Overrun Risks: A Study of Gasabo District Construction Projects Kigali, Rwanda-ABC Journal of Advanced Research, Volume 5, No 1 (2016)

Sanders, D. and Eagles, W. D. (2001). Delay, Disruption and Acceleration Claims: Borden Ladner Gervais LLP

Sambasivan M. and Yau W.S., (2007). Causes and effects of delays in Malaysian construction industry. International Journal of Project Management 25: pp. 517 -526.

SK Silva, BNF Warnakulasuriya, BJH Arachchige (2016),Criteria for construction project success,International Journal of Business & Social Science 7 (3), 27-37

Sriprasert, E., 2000. Assessment of Cost Control System: A Case Study of Thai Construction Organizations. Asian Institute of Technology, Bangkok.

Takim, R., & Adnan, H. (2008). Analysis of effectiveness measures of construction project success in Malaysia, Asian Social Science, 4(7), 74-91

Tsiga, ZD &Emes, Michael & Smith, A. (2016). Critical success factors for the construction industry. PM World Journal. 5.