



Addis Ababa University

School of Commerce

**ASSESSING PROJECT MANAGEMENT PRACTICES OF PREPAID
ENERGY METERING PROJECT IN ETHIOPIAN ELECTRIC UTILITY:
THE CASE OF ADDIS ABABA**

By

EDEN TAMIRU GETACHEW

ADVISOR: WUBESET BEKALU (PhD)

**A Research Project Submitted to Addis Ababa University School of
Commerce in Partial fulfillment of the Requirement for Master of Arts in
Project Management (MAPM)**

Dec, 2018

Addis Ababa

**ASSESSING PROJECT MANAGEMENT PRACTICES OF PREPAID
ENERGY METERING PROJECT IN ETHIOPIAN ELECTRIC
UTILITY: THE CASE OF ADDIS ABABA**

by

Eden Tamiru Getachew (GSE/8311/08)

Approved by:

Name _____

Signature _____

Date _____

Approved by:

1. Name _____ Signature _____ Date _____

2. Name _____ Signature _____ Date _____

Statement of Declaration

I, Eden Tamiru Getachew, declare that this project work entitled “Assessing Project management Practices of prepaid Energy Metering Project in Ethiopian Electric Utility: The case of Addis Ababa” is outcome of my own effort and that all source of materials used for the study have been duly acknowledged. I have produced it independently except the guidance and suggestion of the research advisor. This study has not been submitted for any degree in this University or any other University. It is offered for the partial fulfillment of the degree of Masters of Art in Project Management.

By: Eden Tamiru Getachew

Signature _____

Date: _____

Statement of Certification

This is to certify that Eden Tamiru Getachew has carried out this project work entitled “Assessing Project management Practices of Prepaid Energy Metering Project in Ethiopian Electric Utility: The case of Addis Ababa”. The work is original in nature and is suitable for submission for the reward of the MA degree in Project Management.

Advisor: WUBESET BEKALU (PhD) _____

ACKNOWLEDGEMENT

First and foremost, I would like to express my deepest gratitude to the almighty God for his blessing and for making me accomplish this huge achievement. Secondly, I would like to thank Dr.Wubenet Bekalu for all his expert advice, guidance and encouragement during the development of my capstone. Thirdly, I would like to thank my friends (Emebet B, Tesfaye H, Moges N & Temesegen T) you have played a great role in accomplishing this project work. Finally, and most importantly, I would like to acknowledge Ethiopian Electric Utility staffs for devoting their time for giving response to the questionnaire and interview. Moreover, my heart full thanks go to everyone that has contributed to this project work directly or indirectly.

Table of Contents

Table of Contents

Statement of Declaration	iii
Statement of Certification.....	iv
ACKNOWLEDGEMENT	v
List of Figures	viii
List of Tables	ix
Acronyms	x
Abstract	xi
CHAPTER ONE	1
INTRODUCTION.....	1
1.1Background of the Study.....	1
1.2 Background of the Project.....	3
1.3 Statement of the Problem.....	6
1.4 Research Question	6
1.4.1 Main research question.....	6
1.4.2 Sub research questions	6
1.5 Objectives of the Study	7
1.5.1 General objective	7
1.5.2 Specific objectives	7
1.6 Significance of the Study	7
1.7 Scope & Limitation of the study	8
1.8 Organization of the Study	8
CHAPTER TWO	9
LITERATURE REVIEW.....	9
2.1. Theoretical literature	9
2.1.1 Evolution of project management	9
2.1.2 What is a project?	10
2.1.3 Project management definition.....	11
2.1.4 Project success and failure	12
2.1.5 Project success and failure factors.....	13
2.1.6 The practice of project management.....	14
2.1.7 Project cycle management &logical framework approach	15
2.1.8 Project Life Cycle	17

2.1.8.1 Project initiation.....	17
2.1.8.2 Project planning	19
2.1.8.3Project Execution	22
2.1.8.4 Project closure	25
2.2 Empirical Literature Review	26
2.3 Conceptual Framework.....	31
CHAPTER THREE	32
RESEARCH METHODOLOGY	32
3.1 Research Approach	32
3.2 Research Design.....	33
3.3 Population	33
3.4 Sampling.....	33
3.5 Data Source and Types.....	34
3.6 Data Collection Procedure	35
3.7 Validity and Reliability.....	35
3.7.1 Validity.....	35
3.7.2 Reliability	36
3.8 Data Analysis and Presentation	36
3.9 Ethical Consideration	37
CHAPTER FOUR	38
DATA ANALYSIS, FINDINGS AND DISCUSSIONS.....	38
4.1 Reliability Analysis	38
4.2 Demographic Information.....	40
4.3 Practices of Project Management	42
4.3.2 Descriptive statistics for project planning	43
4.3.3 Descriptive statistics for project execution	45
4.3.4 Descriptive statistics for Project Closure	46
CHAPTER FIVE.....	48
SUMMARY, CONCLUSION AND RECOMMENDATION.....	48
5.1 Summary of Major Findings	48
5.2 Conclusion	49
5.3 Recommendation	49
5.4 Recommendations for Future Studies	51
References	52

List of Figures

Figure 2- 1 Project initiation activities 18

Figure 2- 2 Project planning activities 20

Figure 2- 3 Project execution 22

Figure 2 -4 Conceptual Framework..... 31

List of Tables

Table 4. 1 Questionnaire Distribution and Response Rates	38
Table 4. 2 Reliability Statistics	39
Table 4. 3 Respondent Gender	40
Table 4. 4 Respondent Age	40
Table 4. 5 Respondent Education status	41
Table 4. 6 Respondent Work Experience	41
Table 4. 7 Descriptive Statistics for Project Initiation.....	42
Table 4. 8 Descriptive Statistics for Project Planning	44
Table 4. 9 Descriptive Statistics for Project Execution	45
Table 4. 10 Descriptive Statistics for Project Closure	47

Acronyms

EEU: Ethiopia Electric Utility

EIA: Environmental Impact Assessment

ERP: Enterprise Resource Planning

LFA: Logical Framework Approach

PCM: Project Cycle Management

PIR: Post Implementation Review

PM: Project Management

PMBOK: Project Management Body of Knowledge

PMI: Project Management Institute

SC: Service Center

SPSS: Statistical Package for Social Sciences

Abstract

Project management systems are considered dynamic systems, similar to those in nature, which means they change over time and are hard to predict. Project management provides a framework to help accomplish goals, reduce operational costs and ensure timely delivery of projects. Therefore, this study aimed to assess the project management practices of project initiation, planning, execution & closure phases of prepaid energy metering project in Ethiopian Electric Utility. The research approach was mixed research approach. The study adopted a descriptive survey design, and questionnaire and interview were used to collect information from 34 project engineers and interview from Ethiopian electric utility management. The data was analyzed by obtaining the means and standard deviations. Accordingly, the results showed a moderate level of project initiation& planning practice. However, the findings indicated that there is a low practice of change, risk and quality management plan. Moreover, the overall project execution practice indicated moderate level but the result also revealed low practices of acceptance, risk, change and quality management. Regarding the practice of project closure, the findings indicated that projects were not evaluated after closure and lessons learned from the projects were not disseminated. As a result, the project closure revealed low level of practice. From the findings, the study concludes that there is an inefficiency of project management practices followed within prepaid energy metering project, and these practices could be graded as moderate with respect to best practices. Therefore, the findings strongly sustain that there is a need to reinforce and develop the project management practices of prepaid energy metering projects by filling the gap between the real practices in the project and the theory.

Keywords: Ethiopian Electric Utility, Project Management, Prepaid Energy Metering Project.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Project Management Institution (PMI) defines a project as a temporary endeavor undertaken to create a unique product, service or result, temporary means that the project has a definite ending point and unique means that the product or service differs in some distinguishing way from all similar products or services (Cobb, 2012). Project management is discipline - a set of methods, theories and techniques that have evolved to manage the complexities of work that is unique and temporary (Verzuh, 2008). Whereas, Maylor (1999) defined project management as the process of planning, organizing, directing and controlling activities in addition to monitoring what is usually the most expensive resource on the project-the people.

Project management is defined as an application of knowledge, skills, tools and techniques to project activities to meet project requirements. This is accomplished through the application and integration of the project management processes of initiation, planning, executing, monitoring and controlling and closing (PMI, 2004). When describing the functions of project management, reference is included to an objective or purpose, a time-frame, budget and resources as well as performance requirements (Larson & Gray 2011). The reference to these elements, that include scope, time, cost, quality, human resources, communications, risk, procurement and finally how to integrate these elements to manage the project describe the nine knowledge areas of the Project Management Body of Knowledge (Project Management Institute 2008). These knowledge areas provide a map to manage a project according to a five step process of initiating, executing, monitoring, controlling, and closing a project to deliver an outcome.

Project management in organizations is managed within increasingly complex environments driven by regulatory changes and organizational restructuring. New product development, post deal integration, outsourcing and policy, implementation, in addition to traditional, but vital, system development and implementation, are amongst the current key project initiatives organizations must manage. The ability to successfully execute these projects is what drives

the realization of intended benefits and the achievement of business strategies. Organizations that execute projects successfully employ effective project management practices as a tool to drive change and achieve business objectives. Given the strategic impact that projects have on a business, organizations must follow effective project management processes that measure progress and risks and ensure the right projects can be delivered in alignment with organizational priorities. Modern project management practices include agile project management, lean and extreme project management (Meredith, 2010).

The use of prepayment services either in electricity, water or piped gas has been proposed as an innovative solution aimed at facilitating affordability and reducing the cost of utilities. This mechanism, essentially, requires that users pay for the delivery of goods or services before their consumption. In this way, consumers hold credit and then use the service until the credit is exhausted. During the last one & a half decades, most companies have adopted prepayment solutions that include mobile telecommunication companies, energy utilities and debit cards for financial institutions, (Tewari and Tushaar, 2003).

The use of project management approach has been widely used in implementing prepayment projects in different organizations. Practitioners are increasingly using project management tactics to plan and organized resources to achieve a specified outcome within a given timeframe and a constrained budget. They also try to manage and anticipate risks in a structured manner. Organizations using project management have shown better utilization of resources, shorter development times, reduced costs, interdepartmental cooperation that builds synergies across the organization, and a better focus on results and quality (Morris, 2007).

Each project proceeds through a life cycle (almost typical) from preplanning to post evaluation. During implementation changes and differences are encountered and decisions are bound to be taken so that the project can proceed to completion. Management teams are usually grouped from various disciplines and backgrounds reflecting different attitudes and beliefs imposing distant views and solutions that lead to severe conflicts.

Effective project management practices ensure that the project would meet not only key technical objectives (budget, time and quality) but also the needs of stakeholders. It also ensures that the project fulfills the requirements for which it was initiated. On the other hand, ineffective project management practice would lead to project failure.

EEU, public utility enterprise, established to engage in the business of distributing and selling electrical energy in accordance with economic and social development policies and priorities of the government and to carry out any other related activities that would enable it achieve its purpose. EEU undertakes projects including Enterprise Resource Planning (ERP), Prepaid Energy Metering Project, and Power network Rehabilitation in eight major cities of Ethiopia.

However, Performance of EEU during project implementation is not up to expectations. This is due to different reasons. The absence of clear internal co-ordination mechanisms and regulation within EEU, inefficient personnel and absence of motivation are among these causes. EEU reacts to performance inefficiency in many ways. Possible solutions may be oriented towards training of personnel, change of regulations, change in organization structure and adoption of new methods and tools. (EEU, 2018)

There is no evidence that the above measures are definitely successful in improving project performance. However, given the critical role EEU plays in providing electric power to customers, improving the performance ought to be a priority action.

Systematic and sustained improvement effort requires knowledge of where the current status of the project management practice is. Therefore, the researcher interested to investigate the project management practices & tried to describe the existing situation of prepaid energy metering project in particular the case Addis Ababa.

1.2 Background of the Project

The concerns for universal service in utilities have motivated firms and regulators to identify technological and regulatory options aimed at encouraging access, and making it easier for consumers to pay for their services.

The prepaid metering system is a new billing approach in the energy sector that includes a superior electronic customer accounts management system. It integrates metering equipment with smartcard technology. It not only provides a utility but also substantial savings in manpower and money, while providing new payment options for customers. It reduces operational costs because it applies paperless revenue collection system and can replace any electromechanical meter in the market (Hangzhou Pax Electronic Technology, 2012).

Globally, there has been an increase in the number of customers preferring to use prepaid meters. For instance, in the United Kingdom, there has been a long tradition of offering

prepaid metering as an option to customers. Up to 15-20 percent of customers have signed up for the option (Chartwell, 2003). Northern Ireland Electricity which has a customer-friendly prepayment system has increased prepayment enrolment to 25 percent (Energy watch, 2005). At Arizona's Salt River Project, more than 50,000 customers (about 6 percent) are on prepaid meters (Chartwell, 2008). In Ontario, Woodstock Hydro reports that 25 percent of residential customers have opted to use the prepaid system.

Prepayment systems enable power utilities to collect electricity bills from the consumers prior to its consumption. The prepaid meter is also attributed with prepaid recharging ability and information exchange with the utilities pertaining to customer's consumption details. Literature has witnessed quite an amount of work in this area (Nwaokokosi JOY, 2006). This mechanism requires users pay in advance for the delivery of service before consumption. In this way, consumers hold credit and then use the service until the credit is exhausted (Tewari and Tushaar, 2003).

Prepaid Energy meters, the only direct revenue interface between utilities and the consumers, have undergone several advancements in the last decade. The conventional electro-mechanical meters are being replaced with electronic meters to improve accuracy in meter reading.

The prepayment technology was initially developed in South Africa in the late 1980s with the objective of supplying energy to a large number of low-income and geographically dispersed users. The system was initially geared to minimizing the difficulties arising from users' irregular incomes and to overcoming the limited development of the infrastructure required for the dispatch and reception of credit slips. By the late 1990s, prepayment systems were very popular in India and in some OECD countries (Estacheet *al.*, 2000), and had probably reached their highest development in Great Britain (Waddamset *al.*, 1997). In Argentina, prepayment meters were firstly introduced in 1993, when Energía Mendoza Sociedad del Estado (EMSE) put a few running in small shops at the Mendoza Bus Central Station. The experience was soon extended to other communities in the country.

Developing countries are currently looking to introduce prepaid electricity meters across their distribution network. The existing inherent problems with the post-paid system are the major driving factor for this market.

The social dimension of utility reforms in less developed countries involves at least two clearly related problems. The first is to improve access to infrastructure services, a challenge that has spurred industry restructuring, private sector involvement and consequential regulatory reforms. The second challenge, which originates in the economic efficiency goal of establishing cost-reflective tariffs, is to ensure that consumers can afford the cost of utilities services. Casarin, A. & Nicollier L. (2008)

The major upcoming of market drivers to introduce prepaid energy metering in EEU were power sector reforms and increased non-technical losses. The upcoming competitive and customer focused deregulated power distribution market will force the market participants to make the existing metering and billing process more competent. This is likely to drive the prepaid market. Metering errors, tampering with meters leading to low registration and calibration related frauds are some of the key components of non-technical losses.

In EEU, the introduction of modern Information Technology for the implementation of prepaid energy meter technology was started way back in 2008 after signing a deal with Egyptian company named El Sewedy groups. EEU introduced the Prepayment Metering Project whose objectives were to: reduce commercial or nontechnical losses that occurred through post-paid billing system thereby improving EEU's financial status; improve energy accountability and energy balancing; ensure effective revenue collection and help reduce customer debt owed; and to improve on customer relations (EEU, 2018).

In the first stage of the project, the cooperation prepaid billing system has been implemented. This is the main breakthrough for the cooperation in using modern systems as a result of technology dynamism. It is apparent that only Addis Ababa and Adama cities were incorporated during this stage of implementation. In line with this, EEU started prepaid electricity metering on pilot basis. Rolling of the project commenced in 2008, and currently, more than 521,000 prepaid meters had been installed throughout the country with a majority of them in Addis Ababa. The project is still rolling out to other regions in the country (EEU, 2018).

1.3 Statement of the Problem

The meaning of project management can differ among different people. Quite often, people misunderstand the concept because they have ongoing projects within their company and feel that they are using project management to control these activities. According to Kerzner (2009), undertaking project activities do not necessarily indicate the presence of project management practice in the organization.

It is clear that unless there is a structured and scientific approach to the practice of management, organizations would find themselves adrift in the ocean called organizational development and hence would be unable to meet the myriad challenges that the modern era throws at them. Hence, the importance of project management to organizations cannot be emphasized more (Lipovetsky, Tishler, Dvir & Shenhar, 2002).

In EEU, prepaid energy metering project was started way back in 2008. However, as far as the researcher knowledge is concerned, no research has been done on project management practices related to this project, while previous researches focused on the quality of prepayment customer system (Seyoum, 2012) and factors affecting the successful implementation of prepayment energy metering system (Biniyam, 2018). Therefore, this study attempt to investigate the project management practices of prepaid energy metering project in EEU.

1.4 Research Question

Based on the above statement of the problem, the study attempts to address the following questions:

1.4.1 Main research question

What is the current status of project management practices of prepaid energy metering?

1.4.2 Sub research questions

- ✓ How is the project initiation practice of prepaid energy metering project?
- ✓ How is the project planning practice of prepaid energy metering project?
- ✓ How is the project execution practice of prepaid energy metering project?
- ✓ How is the project closure practice of prepaid energy metering project?

1.5 Objectives of the Study

1.5.1 General objective

The general objective of the study is to investigate the project management practices of prepaid energy metering project.

1.5.2 Specific objectives

- ✓ To assess the project initiation practice of prepaid energy metering project.
- ✓ To assess the project planning practice of prepaid energy metering project.
- ✓ To assess the project execution practice of prepaid energy metering project.
- ✓ To assess the project closure practice of prepaid energy metering project.

1.6 Significance of the Study

According to Marczyk, et al., (2005) engaging in research can be exciting and rewarding endeavor. Through research scientists attempt to answer age old questions, acquire new knowledge, describe how things work, and ultimately improve the way we all live. Therefore, any kind of research has something to add to the accumulated body of knowledge, also uses to solve particular problem. This research will go along way to help the stakeholders of the prepaid energy metering project to effectively manage the project and reduce the operational costs of the company. In particular, EEU is set to benefit in the elimination of bad debts, improvement of billing accuracy and elimination of disconnection and reconnection costs, improvement of cash flow, no need for account posting or additional billing system. Customers also stand a chance to understand, appreciate and embrace this new technology. It enables the customers to better manage their budget, control energy usage, no cost for disconnection/ reconnection, the customer can refill the service without paying an additional deposit.

This study, therefore, is significant in the way that the assessment of the project management practices, will show the position of the project offices in using effective project management and help decision makers to improve their project management practices, in order to increase the probability of success of their project within time, within budget and according to the specification and to ensure the project will serve the purpose for which they are implemented as well.

The researcher believes that the research findings will contribute, to other organizations to know the importance of project management practices. On the other hand, the study can also be used as a reference for researches in the area and project managers and practitioners used as an input to the importance of effective project management practice.

1.7 Scope & Limitation of the study

This study aims to investigate the project practices of Prepaid Energy Metering Project in EEU: case of Addis Ababa. To achieve this aim, the scope of the study is to conduct professional employees' survey on Addis Ababa project offices. The population of the study was limited to Addis Ababa, capital city of Ethiopia due to time and financial constraints. With regard to detail of assessments, it only focuses on the project life cycle management. There is limited or no literature and research reference on prepaid energy metering project.

1.8 Organization of the Study

The study consists of five chapters. The first chapter contains introduction; which consists of background of the study, statement of the problem, research question, and objective of the study, significance of the study, scope and limitation of the study. Review of literatures in the second chapter. The third chapter holds research methodology, the fourth chapter analysis, findings & discussions. The last and the fifth chapter address, summary, conclusion recommendation, and further research.

CHAPTER TWO

LITERATURE REVIEW

Knowledge does not exist in a vacuum, and a researcher's work only has value in relation to other people. The research work and findings will be significant only to the extent that they were the same as, or different from, other people's work and findings (Saunders et al, 2003). This chapter presents theoretical literature, empirical review and conceptual framework.

2.1. Theoretical literature

The purpose of this section is to provide an understanding to evolution of project management, reviews many definitions and concepts of project management (PM), and Practices of project management.

2.1.1 Evolution of project management

The industrial revolution marked the beginning of what is referred to today as the modern organization in early 50s. This is the era in which the economic activity was in full swing in many western countries, with engineering and construction project making a major impact on the environment. This rapid growth demanded a tool and technique which is capable of organizing and managing projects at various locations (Abbasi and Al-Mharmah, 2000). During this era, network analysis and planning techniques, like Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM) formed the focus of development in project management.

The 1960s witnessed an intellectual push to apply general management theories to project management, particularly in terms of the "system approach" and organizational factors such as differentiation, integration, and interdependence. The late years of 1960s witnessed a shift from focus upon organizational and scheduling aspects to more comprehensive texts on project management (Morris, 1994). In 1960s, these techniques continued to be popular in the construction industry (Crawford et al 2005). Development in the field of project management in the 1960s also included the formation of two major professional associations. IPMA (International Project Management Association) & PMI (project

MangementInstitute).Shenhar (1996) cited in Crawford et al (2006) noted that the focus on teamwork was the defining feature of project management in 1970s. While Stretton (1994) cited in Crawford et al (2006) notes 70's era as an emphasis on work breakdown structures and systems concepts.

During 1980s, project management began to become a mature management discipline "The eighties was a period of integration of the many different areas of emerging experience into accepted principles and practices common to most application areas" (Stretton, 1994b). The 1980s were typified by a focus on project organization, project risk and the external influences (Crawford et al. 2006). This era also led to the development of the international standards for project management.

2.1.2 What is a project?

The definition of a project has been the subject of considerable debate over the years among the practitioners of project management and the goal of developing a comprehensive definition of what a project is has remained elusive over the years (Cleland & Ireland, 2002; Crawford & Pollack, 2007).

The term project is described in different ways in the research literature. This is illustrated below:

Project is defined as a temporary endeavour undertaken to create a unique product or service. Temporary means that the project has a definite ending point, and unique means that the product or service differs in some distinguishing way from all similar products or services (PMI, 1996, p.4)

Project has been termed as a human endeavour and may legitimately be regarded by its stakeholders as a project when it encompasses a unique scope of work that is constrained by cost and time, the purpose of which is to create or modify a product or service so as to achieve beneficial change defined by quantitative and qualitative objectives (Cooke-Davies, 2001, p.20).

Project is described as a "value creation undertaking based on specifics, which is completed in a given or agreed timeframe and under constraints, including resources and external circumstances" (Ohara, 2005, p.15).

A project is regarded as a business case that indicates the benefits and risks of the venture, demonstrating a unique set of deliverables, with a finite life-span, by using identified resources with identified responsibilities (Bradley, 2002).

The common themes in these definitions is that projects are unique in their output, having a definite starting and ending point, are temporary in nature and are carried out to manifest the organization's strategic objectives. These temporary structures are playing a vital role in today's modern organizations and a growing interest is recorded in the significance of these temporary structures in organizations.

2.1.3 Project management definition

Project management is defined in different ways in the research literature. Some of these definitions are as follows:

The term Project Management is referred to as the “application of knowledge, skills, tools, and techniques to project activities to meet the project requirements” (Project Management Institute, 2008) within a specified period of time. When describing the functions of project management, reference is included to an objective or purpose, a time-frame, budget and resources as well as performance requirements (Larson & Gray 2011). The reference to these elements, that include scope, time, cost, quality, human resources, communications, risk, procurement and finally how to integrate these elements to manage the project describe the nine knowledge areas of the Project Management Body of Knowledge (Project Management Institute 2008). These knowledge areas provide a map to manage a project according to a five step process of initiating, executing, monitoring, controlling, and closing a project to deliver an outcome.

Cleland (1994) described project management as “an idea whose time has come - a distinct discipline to be applied to the management of ad hoc activities in organizations”. The importance of adhering to project management methods and strategies reduces project risks, cut costs and improves success rates of projects. Project management is important for several reasons that include: Organizing chaos, managing risk, managing quality, managing integration and change, retaining and use of knowledge and finally learning from failure.

In its early days the project management was solely concerned with the implementation of single project in that era (Kartam et al. 2000). But, today many organizations have embraced

the concept of project management. This is mainly because of its systematic approach of managing the projects (Morgan, 1987). It's a way to generate consistent results when undertaking new initiatives and a powerful business tool that can transform an organization's ability to perform well (Artto et. al, 2008). Project management can also be used thought out the organization to boost personal and collaborative productivity. This can be done by building a standardized system that embeds best practiced into the way projects are managed (Milosevic and Patanakul, 2005).

2.1.4 Project success and failure

Freeman and Beale (1992) stated that project success has different meanings to different people and it is very context dependent. "Trying to pin down what success means in the project context is akin to gaining a consensus from a group of people on the definition of good art" (Jugdev& Muller, 2005).

At its most basic level, project success is seen as finishing project deliverables on time, on budget and to a quality grade (Greer, 1999). As found in the early literature and practice, "the Iron Triangle (schedule, scope and budget) was a measure of success" (Cooke-Davis, 2002; Hartman, 2000).

Thomsett, following extensive study of 20 failing projects over a period of 18 years, expands this criteria of success as what "satisfies stakeholder groups, meets requirements, meets quality expectations / requirements, within cost (paid, unpaid and business expert costs), within deadline, delivers sustained and actual benefits and provides the team with professional satisfaction and learning" (Thomsett, 2002).

Lim and Mohamed (1999) used the analogy of the forest and the trees to illustrate the difference between the macro and micro points of view of project success. The micro point of view is concerned with assessing project management success based on project completion, while the macro point of view involves the longer range perspective of product use to measure customer satisfaction. The point is that determining whether or not the project has succeeded could not be determined until the operational stage that occurred after the project had passed to the receiving organization and the project received evaluation input from the users and stakeholders. "Lim and Mohammed's work was significant because it referred to setting expectations at the project's onset. This approach contributed to alignment between

project deliverables and expectations so that the work could be guided along those lines" (Jugdev& Muller, 2005).

2.1.5 Project success and failure factors

The project management literature reviewed shows that the concept of project success has been and continues to be a major concern in this field. The two different aspects of concern are the following: (a) How success is measured (success criteria), and (b) what are the factors that contribute to project success (Crawford, 2002).

Project success factors (PSFs) are factors or characteristics that, when present, improve the likelihood that projects will be implemented successfully (Kerzner, 1997, 2003; Pinto & Slevin, 1987). Kerzner (1987) also defined PSFs as "elements required to create an environment where projects are managed consistently with excellence".

Greer (1999) states that "Planning is everything and ongoing", and expands this by saying "planning and re-planning must be a way of life for project managers", and due to the dynamic nature of many projects, the plan must be regularly revised. The planning and control of project scope is important to avoid higher costs and late delivery (Butterick, 2000). Well defined requirements are an important input into the scope management process.

The management of change in a project is a critical success factor, a formal method of recording change requests, assessing the effect of the change on the project and a change approval process are required to be controlled (Thomsett , 2002).

Management of Risk in a project is another element of successful projects. Risk management should begin during project planning and identify risks that can cause problems later in the project. Some risks can never be totally eliminated and they may change during a project, but ongoing well thought out risk assessment and risk mitigation strategies together with risk contingencies in the project budget are required to avoid unpleasant project surprises (Cameron, 2002).

Butterick summarizes the results of a benchmarking study into project success factors across a wide range of industries into ten "lessons learned". One of these lessons is to "use the same, simple and well defined framework with a staged approach in all circumstances". Constantly using the same staged approach minimizes confusion and the need for relearning for people connected with the project. The staged approach allows planning of the next stage in detail

while further stages are planned in summary form. Separating each stage is a decision point or gate. The gate allows for quality control checks, prioritization and a point from which to plan forward. Traditionally the gate ends each phase. Some organizations use the gate as an entry point to the next phase which allows phases to overlap (start before the previous phase has finished) without increasing risk (Butterick, 2000).

In conclusion, the main causes of project failure include: poor project sponsorship, undefined requirements and miscommunication. However the number one cause of project failure is the lack of adoption of a formal project methodology. Without adopting a clear methodology or framework for delivery, most project teams start building deliverables before their scope and objectives are clearly thought through. They have no structured processes for undertaking project tasks, and so they fail to effectively manage time, cost, quality, risks, issues and changes within the project. It is inevitable that such projects suffer from scope creep, milestone delays, poor deliverable quality and a lack of customer satisfaction. So, to avoid project failure: a repeatable project methodology to be used with structured project processes for initiating, planning, executing and closing projects effectively.

2.1.6 The practice of project management

The project management literature has a variety of definitions of the project life cycle and the number of stages it contains. However, there is agreement that a project life cycle exists and that the individual stages can be distinguished from each other (Ford and McLaughlin, 2013). These stages or phases can frequently be reduced to four broad groups. Adams and Barndt (1988) refer to these as Conceptual; Planning; Execution; and Termination, whilst Briner, Geddes and Hastings (1990) argue that “every project goes through the same phases: definition, planning and resourcing, implementation, and hand-over. Project goals and objectives are defined during the conceptual or definition phase. During the planning phase the detailed steps, or work packages, are defined that must be undertaken in order to achieve the desired or specified results. A project is managed in most industries and disciplines according to a project life cycle. This cycle describes a period of time when a project is initiated, planned, executed, and closed (Project Management Institute, 2008). The project is monitored and controlled throughout this project lifecycle to ensure that the project is delivering to the agreed plan.

This study is based on the chaos theory. In common usage, ‘chaos’ means a state of disorder. However, chaos theory is a field of study in applied mathematics and studies the behavior of dynamic systems that are highly sensitive to initial conditions, an effect which is popularly referred to as the butterfly effect. Small differences in initial conditions, such as those due to rounding errors in numerical computation, yield widely diverging outcomes for chaotic systems, rendering long term prediction impossible in general (Nicollier,2008).

This happens even though these systems are deterministic, meaning that their future behavior is fully determined by their initial conditions, with no random elements involved. In other words, the deterministic nature of these systems does not make them predictable. This behavior is known as deterministic chaos, or simply chaos. Chaotic behavior can be observed in many natural systems, such as the weather. For a dynamic system, to be chaotic it must have the following properties: It must be sensitive to initial conditions; It must be topologically mixing; and its periodic orbits must be dense (Ford and McLaughlin, 2013).

Project management systems are considered dynamic systems, similar to those in nature, which means they change over time and are hard to predict. This increasingly fast-paced system is ‘a breeding ground’ for a chaotic management system (Yoke, 2003). This breeding ground is creating a complexity explosion, which is affecting the way project managers need to manage. Even though they are changing, there is usually an underlying predictability that can be identified. This is where chaotic behavior comes into play. Behavior in systems can be placed into two zones. One, the stable zone, where the system, if disturbed, returns to its initial state and two, the zone of instability where some small activity leads to further divergence (Rosenhead, 1998).

2.1.7 Project cycle management & logical framework approach

Project Cycle Management

In general we can define Project Cycle Management as a tool that describes the management activities and decision making procedures used during the life-cycle of a project. The following sections show the definition given to PCM in different documents.

RPRLGSP, May 2009: The systematic process of initiating, planning, implementing, managing and evaluating projects or programmes is known as ‘Project Cycle Management’, PCM ; it is also defined as an approach in project management used to guide management

activities and decision-making procedures during the life-cycle of a project, from the first idea until the last ex-post (afterwards) evaluation.

European Commission (March, 2002): Project Cycle Management defines different phases in the project life with well-defined management activities and decision making procedures. PCM provides a structure to ensure that stakeholders are consulted and relevant information is available, so that informed decisions can be made at key stages in the life of a project.

European Commission (May 1999): The way in which projects are planned and carried out follows a sequence that has become known as the project cycle. The cycle starts with the identification of an idea and develops that idea into a working plan that can be implemented and evaluated. Project Cycle Management integrates the phases in the project cycle so that issues are examined systematically, by means of an approach and methodology which ensures that objectives and issues of sustainability remains in focus.

Logical Framework Approach

Project planning and management tools provide the practical mechanisms by which relevance, feasibility and sustainability can be achieved. The core tool used within PCM for project planning and management is described as Logical Framework Approach (LFA).

The LFA is a tool for the systematic management of projects and programs that focuses on results and not on activities. It provides the tools for logically establishing project objectives and defining their causal relationships. Additionally, it describes external factors that influence success; assumptions for implementation and the risks confronting the project. The LFA also supports regular monitoring and evaluation through the identification of verifiable and measurable indicators that help determine whether objectives have in fact been met.

The LFA is a purposive approach that entails stakeholder involvement to ensure project relevance or sustainability. It has two phases; namely the analysis phase and the planning phase. The LFA also is defined as a tool for planning and managing development projects. It looks like a table (or framework) and aims to present information about the key components of a project in a clear, concise, logical and systematic way. The log frame model was developed in the United States and has since been adopted and adapted for use by many other countries. (Cordingley, 1995)

The LFA summarizes, in a standard format the following:

- What the project is going to achieve?
- What activities will be carried out to achieve its outputs and purpose?
- What resources (inputs) are required?
- What are the potential problems which could affect the success of the project?
- How the progress and ultimate success of the project will be measured and verified?

(Cordingley, 1995)

(WWF. 2005) The logical framework approach provides a set of design tools that when applied creatively can be used for planning, designing, implementing, monitoring and evaluating projects. Log frames give a structured, logical approach to setting priorities, and determining the intended purpose and results of a project. Used correctly, log frames can provide a sound mechanism for project development. Logical frameworks also lay the basis for activity scheduling, budgeting, monitoring and for evaluating the impact, effectiveness, efficiency and relevance of a project.

2.1.8 Project Life Cycle

The idea of a life cycle suggests that a project has a life. This implies a sequence of phases, including birth, growth, maturity, aging and death.

The project life cycle model describes the different phases that a project normally passes through as it progresses to a conclusion. The model is based on the idea that, although all projects are different, they all progress through similar phases. Each phase completes a stage of the project. (Martin, 2006)

The project cycle also provides a structure to ensure that stakeholders are consulted and relevant information is available throughout the life of the project, so that decisions can be made at key stages in the life of a project.

According to (Westland, 2006), the project life cycle consists of four phases: Project Initiation, planning, execution & closure.

2.1.8.1 Project initiation

The initiation phase is the first phase of a project and it is the most crucial phase. During this phase a business problem or opportunity is identified and a business case providing various solution options is defined. Next, a feasibility study is conducted to investigate whether each

option addresses the business problem and a final recommended solution is then put forward. Once the recommended solution is approved, a project is initiated to deliver the approved solution.

Project charter is completed outlining the objectives, scope and structure of the new project and a project manager is appointed. The project manager begins recruiting a project team and establishes a project office environment. Approval is then sought to move into the detailed planning phase. The project initiation phase involves the following six key steps:

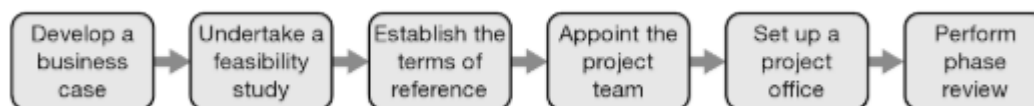


Figure 2-1 Project initiation activities

✓ **Develop a business case**

This document justifies the need for the project, and it includes an estimate of potential financial benefits. The trigger to initiating a project is identifying a business problem or opportunity to be addressed. A business case is created to define the problem or opportunity in detail and identify a preferred solution for implementation. The business case includes: detailed description of the problem or opportunity, list of the alternative solutions available, analysis of the business benefits, costs, risks and issues, description of the preferred solution & summarized plan for implementation. The business case is then approved by an identified project sponsor, and the required funding is allocated to proceed with a feasibility study.

✓ **Undertake a feasibility study**

This is an evaluation of the project's goals, timeline & costs to determine if the project should be executed. It balances the requirements to see if perusing the project makes sense.

✓ **Establish the project charter**

After the business case and feasibility study have been approved, a new project is formed. At this point, project charters are created. The project charter defines the vision, objectives, scope and deliverables for the new project. They also describe the organization structure, activities, resources and funding required to undertake the project. Any risks, issues, planning assumptions and constraints are also identified.

✓ **Appoint the project team**

The project team is now ready to be appointed. Although a project manager may be appointed at any stage during the life of the project, the manager will ideally be appointed prior to recruiting the project team. The project manager creates a detailed job description for each role in the project team, and recruits people into each role based on their relevant skills and experience.

✓ **Set up a project office**

The project office is the physical environment within which the team is based. Although it is usual to have one central project office, it is possible to have a virtual project office with project team members located around the world. A project office environment should include equipment, communication infrastructure, documentation & tools.

✓ **Perform a phase review**

At the end of the initiation phase, a phase review is performed. This is basically a checkpoint to ensure that the project has achieved its objectives as planned.

2.1.8.2Project planning

Once the project received the green light, it needs a solid plan to guide the team, as well as, keep them on time and on budget. A well written project plan gives guidance for obtaining resources, acquiring financing and procuring required materials. The project plan gives the team direction for producing quality outputs, handling risks, creating acceptance, communicating benefits to stakeholders & managing suppliers. The project plan also prepares team for the obstacles they might encounter over the course of the project, & helps them understand the cost, scope & timeframe of the project.

By now, the project costs and benefits have been documented, the objectives and scope have been defined, the project team has been appointed and a formal project office environment established. It is now time to undertake detailed planning to ensure that the activities performed during the execution phase of the project are properly sequenced, resourced, executed and controlled. The activities undertaken are:

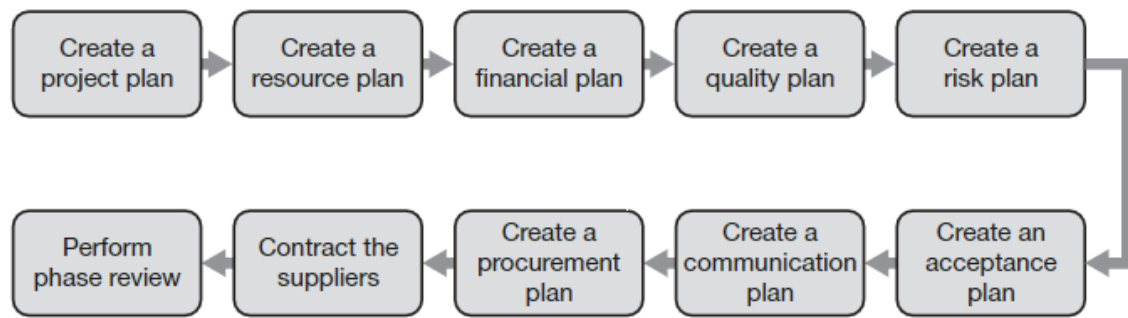


Figure 2-2 Project planning activities

✓ **Create a project plan**

The first step in the project planning phase is to document the project plan. A work breakdown structure (WBS) is identified which includes a hierarchical set of phases, activities and tasks to be undertaken to complete the project. Then, an assessment of the level of effort required to undertake each activity and task is made. The activities and tasks are then sequenced, resources are allocated and a detailed project schedule is formed. This project plan is the key tool used by the project manager to assess the progress of the project throughout the project life cycle.

✓ **Create a resource plan**

Immediately after the project plan is formed, the level of resource that is required to undertake each of the activities and tasks listed within the project plan will need to be allocated. Although generic resource may have already been allocated in the project plan, a detailed resource plan is required to identify the following: type of resource required, such as labor, equipment and materials; quantification of each type of resource required; roles, responsibilities and skill-sets of all human resource required; specifications of all equipment resource required; items and quantities of material resource required. A schedule is assembled for each type of resource so that the project manager can review the resource allocation at each stage in the project.

✓ **Create a financial plan**

Financial plan is created to identify the total amount of money required to undertake each phase in the project (in other words, the budget). The total cost of labor, equipment and materials is calculated and an expenses schedule is defined which enables the project manager to measure the forecast spend versus the actual spend throughout the project.

Detailed financial planning is an extremely important activity within the project as the customer will expect the final solution to have been delivered within the allocated budget.

✓ **Create a quality plan**

Meeting the quality expectations of the customer can be a challenging task. To ensure that the quality expectations are clearly defined and can be reasonably achieved, a quality plan is documented. The quality plan should: define the term 'quality' for the project; list clear and unambiguous quality targets for each deliverable; each quality target provides a set of criteria and standards to be achieved to meet the expectations of the customer; provide a plan of activities to assure the customer that the quality targets will be met (in other words a quality assurance plan); and identify the techniques to be used to control the actual quality level of each deliverable as it is to be built (in other words a quality control plan).

✓ **Create a risk plan**

The next step is to document all foreseeable project risks within a risk plan. This plan should identify the required actions for prevention as well as mitigation measures in case any of those risks occur. Developing a clear risk plan is an important activity within the planning phase as it is crucial to scrutinize all project risks prior to the execution phase of the project.

✓ **Create an acceptance plan**

To deliver the project successfully, the deliverables should meet or exceed requirements to the satisfaction and acceptance of stakeholders. An acceptance plan is created to help achieve this by clarifying the completion criteria for each deliverable and providing a schedule of acceptance reviews. These reviews provide the customer with the opportunity to assess each deliverable and provide formal acceptance that it meets the requirements.

✓ **Create a communications plan**

Prior to the execution phase, it is also necessary to identify how stakeholders will be kept informed of the progress of the project. The communications plan identifies what information to be distributed, means and frequency of distribution and those of charge of the process.

✓ **Create a procurement plan**

The last planning activity within the planning phase is to identify the elements of the project to be acquired from external suppliers. The procurement plan provides a detailed description of the products (that is, goods and services) to be acquired from suppliers, the justification for acquiring each product externally as opposed to from within the business, and the schedule

for product delivery. It also describes the process for the selection of a preferred supplier (the tender process), and the ordering and delivery of the products (the procurement process).

✓ **Contract the suppliers**

Although external suppliers may be appointed at any stage of the project, it is usual to appoint suppliers after the project plans have been documented but prior to the execution phase. Only at this point will the project manager have a clear idea of the role of suppliers and the expectations for their delivery. A formal tender process is undertaken through a short-list of capable suppliers. The tender process involves creating a statement of work, a request for submission of offers. Once a supplier has been selected through a selection process, a contract is reached that governs the delivery processes.

✓ **Perform a phase review**

At the end of the planning phase, a phase review is performed. This is a checkpoint to ensure that the project has been well planned to achieve its objectives.

2.1.8.3 Project Execution

The execution phase is the third phase of the project management life cycle, and it's usually the longest phase of the project. During the execution phase, the project team develops the product or service and presents the final product to the customer.

The execution phase is the longest in duration because there are three primary steps. This include building the deliverable, monitor& control and review.



Figure 2-3 Project execution activities

✓ **Build the deliverables**

This phase involves physical construction. The activities undertaken to construct each deliverable will vary depending on the type of project being undertaken. Activities may be undertaken in a 'waterfall' fashion, where each activity is completed in sequence until the final deliverable is produced, or an 'iterative' fashion, where iterations of each deliverable are constructed until the deliverable meets the requirements of the stakeholders. Regardless of the method used to construct each deliverable, careful monitoring and control processes should be employed to ensure that the quality of the final deliverable meets the acceptance criteria.

✓ **Monitor and control**

Monitor & Control sometimes combined with execution because they often occur at the same time. As teams execute their project plan, they must constantly monitor their own progress. To guarantee delivery of what was promised, teams must monitor tasks to prevent scope creep, calculate key performance indicators and track variations from allotted cost & time. This constant vigilance helps keep the project moving ahead smoothly.

✓ **Time management**

Time management is the process of recording and controlling time spent on the project. As time is a scarce resource within projects, each team member should record time spent undertaking project activities on a timesheet. This will enable the project manager to control the amount of time spent undertaking each activity within the project. A timesheet register is also completed providing a summary of the total time spent so that the project schedule can always be kept updated.

✓ **Cost management**

Cost management is the process by which costs/expenses incurred are formally identified, approved and paid. Different expenses forms are prepared for manpower, equipment and materials. Expense forms are approved by the project manager and recorded within an registers for auditing purposes.

✓ **Quality management**

Quality is defined as the extent to which the final deliverable conforms to the customer requirements. Quality management is the process by which quality is assured and controlled,

using quality assurance and quality control techniques. Quality reviews are undertaken frequently and the results recorded on a quality review form.

✓ **Change management**

Change management is the process by which changes to the project scope, deliverables, timescales or resources are formally requested, evaluated and approved prior to implementation. A core aspect of the project manager's role is to manage change within the project. This is achieved by understanding the business and system drivers requiring the change, identifying the costs and benefits of the change, and formulating a structured plan for implementing the change. To formally request a change to the project, a change form is completed.

✓ **Risk management**

Risk management is the process by which risks are formally identified, quantified and managed. The process entails completing a number of actions to reduce the likelihood of occurrence and the severity of impact of each risk. A risk process is used to ensure that every risk is formally identified, quantified, monitored, avoided, transferred and/or mitigated.

Although a risk process is undertaken during the execution phase of the project, risks may be identified at any stage of the project life cycle. In theory, any risk identified during the life of the project will need to be formally managed as part of the risk management process. Without a risk management process in place, unforeseen risks may impact the ability of the project to meet its objectives. The risk management process is terminated only when the execution phase of the project is completed.

✓ **Issue management**

Issue management is by which issues currently affecting the production of the required deliverables are formally managed. After an issue form has been completed and the details logged in the issue register, each issue is evaluated by the project manager and a set of actions are to be undertaken to resolve the issue identified.

✓ **Procurement management**

Procurement management is the process of sourcing products from an external supplier. Purchase orders are used to purchase products from suppliers and a procurement register is maintained to track each purchase request to completion.

✓ **Acceptance management**

Acceptance management is the process of gaining acceptance for deliverables produced. Acceptance forms are used to enable project staff to request acceptance for a deliverable once completed. Each acceptance form identifies the acceptance criteria, review methods and results of the acceptance reviews undertaken.

✓ **Communications management**

Communications management is the process by which formal communications are identified, created, reviewed and delivered within a project. The most common method of communicating the status of the project is via a project status report. Each communication released is recorded in a communications register.

✓ **Perform a phase review**

At the end of the execution phase, a phase review is performed. This is a checkpoint to ensure that the project has achieved its objectives as planned and that the deliverables produced are compatible with the acceptance criteria. Once all of the deliverables are produced and compatible with the acceptance criteria up to the satisfaction and consent of the stakeholders, the project is ready for closure.

2.1.8.4 Project closure

Following the acceptance of all project deliverables, the project will have met its objectives and be ready for closure. Project closure is the last phase in the project life cycle and must be conducted formally so that the business benefits delivered by the project are fully realized by the stakeholders.

Project closure involves releasing the final deliverables to the stakeholders, handing over project documentation, completion of supplier contracts and releasing project resources. The last remaining step is to undertake a post-implementation review to quantify the level of project success and put recommendations for future projects.

✓ **Project closure report**

First, it is important to ensure that project closure criteria have been fully satisfied and that there are no outstanding items remaining. Then, release plan should be identify for project deliverables, documentation, supplier contracts and resources. Finally, it is needed to initiate

a communication plan to inform all project stakeholders that the project has not been closed. Each of these activities and many more are described in this project closure report.

✓ **Post -Implementation Review**

Following the closing of any project, it is important to always review its overall success by undertaking a post implementation review. This review helps to determine whether the project delivered the business benefits, met the customer's requirements and remained within scope & budget. It will also help determine whether the project conformed to the management processes identified, such as change management & quality management.

2.2 Empirical Literature Review

This section contains reviewed literature that was relevant to this study. Literature reviewed show that, there have been studies done to assess the effectiveness, efficiency and benefits of electricity prepayment systems. However, since this is new technology, not much has been done in terms of research in the area of prepaid electricity metering system. In this study, both local and international studies were reviewed.

Seyoum(2010) conducted a study entitled “prepayment customer service” in Ethiopia. In this study, the researcher wanted to assess and analyze the existing practice (quality) of prepayment customer service both from the employee and the corporation's perspectives, and there by propose possible marketing strategies that are capable of improving the customer service quality for subsequent adoption of prepayment service.

SERVQUAL, as methodological approach to service quality measures, was employed to measure the prepayment service quality by company customers' perception of the received service against their expectations. During data collection unstructured and semi-structured observation and informal talks were employed in order to gather as much information as possible. The study targeted employees & customers, who involved in different stages of the data collection process. The study was conducted in Addis Ababa, the capital of Ethiopia.

The study revealed, despite its limitations, that there has been a substantial gap between customer's expectations and perception of the service rendered, for which different possible marketing strategies were suggested for improvement.

Simiyu (2010) conducted a study focusing on prepaid electricity metering system in Nairobi. The study was titled “Factors Influencing Adoption of the Electricity Prepayment Metering

System: A case of Makadara and Embakasi Divisions, Nairobi Province”. The objectives and research questions of the study were to establish how and to what extent the following factors influenced the adoption of the new electricity prepayment metering system: Access to information or lack of it, the level of education, economic status, the benefits of the prepayment metering system and the income levels. The aim was also to gauge the success of prepayment project based on the number of residents in the pilot phase who had adopted this system. The researcher used data collection methods such as open-ended and close-ended questions and interviews.

The study reveals that a good percentage of Nairobi’s residence would prefer the electricity prepayment metering system as opposed to postpaid. The researcher also stated since the population country wide is not yet exhausted, with extensive marketing from the power utility- to create awareness & disseminate information, more customers are likely to be brought on board.

Both studies were conducted in the area of interest to the current study, that is, prepaid electricity. However, the study did not attempt to examine the project management practice which is the focus of the current study. There was, therefore, need for this study to be conducted.

Tewari and Tushaar (2002) conducted a study entitled, “An assessment of South African prepaid electricity experiment, lessons learned, and their policy implications for developing countries”. The study results indicated that prepaid electricity had a number of benefits to both consumers and the utility company (Eskom). The results showed that these benefits accrue in various forms and contribute to efficient functioning of electricity production, distribution and revenue generation function.

On the part of customers, Tewari and Tushaar (2002) also discovered that customers using prepaid electricity enjoyed a number of benefits as well. These included, having a better understanding of how much energy was being consumed. In addition, The customer no longer had to pay for disconnection/ reconnection and there was no more waiting for reconnection.

However, the study also noted that there were disadvantages of using the prepaid metering system to both the customer and Eskom. According to the figures collected by Tewari and Tushaar (2002) from the utility company (Eskom), the cost of maintenance of prepayment

meters was not going down; instead, it was going up due to some unanticipated circumstances that cropped up, such as meter failure. It was also observed that prepayment could not handle large size current at that stage; therefore, it was not a solution to the problems experienced under the credit (post-paid) payment system. In addition, the customers also considered prepayment to be an instrument of control by the power utility company (Eskom) and the government. This view was highly prevalent in highly politicised communities such as Soweto, in Johannesburg.

Tewari and Tushaar (2002), therefore, concluded that prepaid electricity was not necessarily cheaper than conventionally billed electricity and that it is not necessarily a well-received innovation in all segments of the South African society. They further concluded that the experiment benefited large masses of small and dispersed consumers.

The weakness of the study was that the methodology used when conducting the study was not contained in the report. Therefore, it may be difficult to replicate the study and also raises questions of how valid and reliable the results are. In addition, the sample size used in the study was not indicated in the report.

Nevertheless, this study was of interest to the current study because it highlighted the experiences of both the power utility company and the customers with the prepayment metering system. Tewari and Tushaar's study also attempted to assess whether the project met the needs of stakeholders. However, Tewari and Tushaar's study did not focus on whether technical and project objectives were achieved. The study did not further examine the project management practice, leaving a gap which this study attempted to fill.

McKenzie (2012) conducted a study entitled "Pre-Payment Meters and Energy Efficiency in Indigenous Household" in Australia. In this study, he wanted to address issues concerning pre-payment meters, functionality and reliability. He also wanted to assess power card use, access and convenience, household arrangements for sharing the cost of electricity, household energy consumption, energy efficiency awareness and activities. McKenzie (2012) further wanted to assess Commonwealth government equity and hardship programmes, feedback options and tools for tracking household energy consumption as well as demographic details of participants.

Data collection for the study included a two staged approach; literature review of the relevant industry and academic sources, and interviews with indigenous people using pre-payment

meters in town camps. A total of 12 households were interviewed in town camps in Alice Spring. This represented a total of 25 respondents.

Semi-structured interview questions that focused on residents' lived experience of prepayment meters and associated issues were developed. McKenzie (2012) chose the semi-structured interviews in order to accommodate various cultural protocols and language differences. In addition, he used a questionnaire/discussion guide to elicit information on a range of issues surrounding household electricity consumption, conservation and pre-payment.

McKenzie (2012) discovered that most of the respondents felt satisfied with the pre-payment meters and power cards, and preferred them over alternative billing methods. On the other hand, the results indicated that there were some problems. These included; difficulties accessing power cards, high weekly costs, frequent disconnections and limited awareness of rebate programmes available as well as poor understanding of energy efficiency concepts or ability to make changes to manage household energy consumption.

The results further showed that all respondents reported that they had "self-disconnected" or run out of power at their homes in the last month at the time the study was conducted. The frequency of reported self-disconnection was high, with half of the respondents (50 percent) reported that the disconnection occurred one or more times per week and the other half (50 percent) reported that the disconnection occurred at least once per month. Finally, McKenzie (2012) discovered that, despite the high rate of self-disconnections, all the respondents clearly expressed satisfaction with the pre-payment meter method of paying for electricity. Moreover, those who had used other payment methods (conventional power bills) had also stated their preference for pre-payment meters. Reliability of the meters themselves was also high, with residents reporting no problems with the operation of the meters.

McKenzie (2012) concluded that almost all indigenous households in town camps and remote communities had pre-payment meters for their electricity use. He stated that since the pre-payment meters were only read by utilities once or twice a year, there was little flow of information on consumption patterns for residents. He further stated that there were many concerns raised over equity issues surrounding prepayment meter use. There were also very high rates of electricity disconnections in terms of both frequency and duration reported.

With the nature of pre-payment meters, there was little capacity to track these disconnections. Consequently, this was a problem that was yet to be addressed by government or utilities.

The weakness of the study was McKenzie (2012) did not indicate whether interviews and Focus Group Discussions were conducted with the same group (12 households) or a different one. Moreover, the validity and reliability of the conclusions drawn, later on the generalizations are highly questionable since non probability sampling method (convenient sampling) was used in the study. This is because this method of sampling is not free from personal bias and prejudice by the researcher.

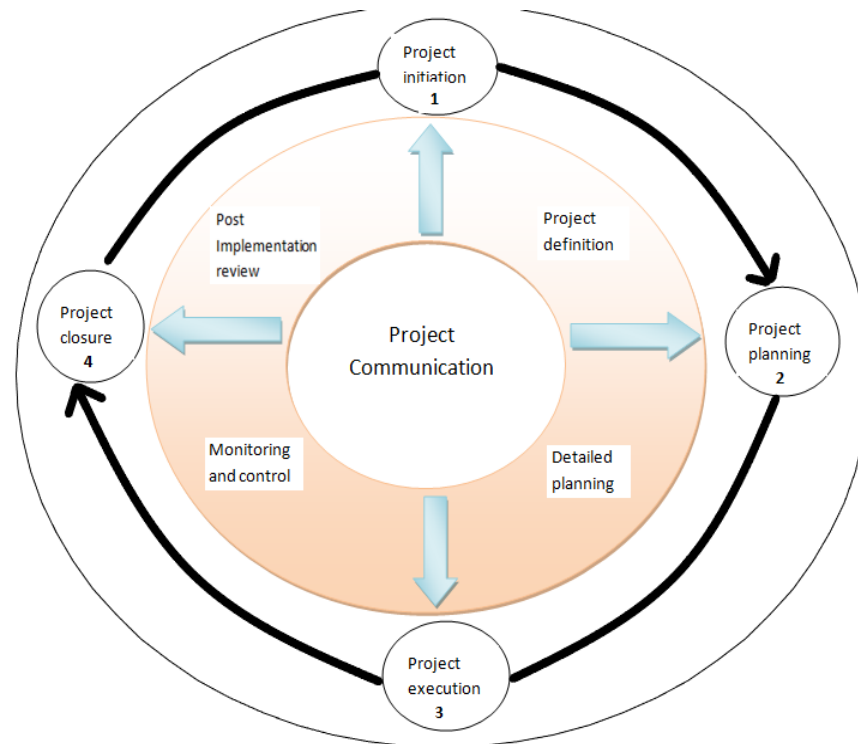
Mackenzie's study was of help to the current study since it addressed issues to do with prepaid meters, access and convenience, household energy consumption and sharing of the cost of electricity. However, Mackenzie's study did not examine the project management practice, leaving a gap which the current study attempted to fill.

In summary, international and local studies have been reviewed. These studies focused on prepaid electricity metering project and their benefits to utility companies and the customers. All the studies reviewed were focusing on the output of the respective projects and did not examine the project management practice, which was the focus of this study. There was, therefore, need to conduct a study to examine project management practice of prepaid electricity metering project.

2.3 Conceptual Framework

Based on the above theoretical and empirical literatures the below indicated conceptual framework was developed for the purpose of the study.

Figure 2.4 Conceptual framework



Adapted from source: Westland (2006)

Project cycle management is a methodology for managing projects; it is also defined as an approach in project management used to guide management activities and decision-making procedures during the life-cycle of a project. The Project Management Life cycle has four phases: Initiation, Planning, Execution and Closure. (Westland, 2006) as shown in Figure 2.4. All processes, tools & techniques in PCM should be recognized, defined and used in practiced, in order to meet not only key technical objectives (budget, time and quality) but also the needs of stakeholders. In each project life cycle, there are tasks that need to be completed. For the purpose of this paper the model of PCM described by Westland (2006) was used for further analysis

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter will present the methodological framework applied to solve the research problem and to answer the research questions. The chapter describes the chosen research approach, research design, population, the sample selection and the data collection methods

3.1 Research Approach

Research approaches are plans and procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation (Creswell, 2014). According to Mark, et al., (2009) there are two general ways of approaching a research problem, namely the deductive and inductive approaches. The deductive approach is based on the logical way of thinking and the conclusion drawn from the theory. Thus, the deductive approach means that the research starts from already existing theories and model, from which propositions are developed and subsequently tested through empirical studies. The inductive approach means the research starts from empirical studies and these studies are subsequently related to existing theories.

According to Creswell (2014) there are three research approaches: (a) qualitative, (b) quantitative, and (c) mixed methods. Unquestionably, the three approaches are not as discrete as they first appear. Qualitative and quantitative approaches should not be viewed as rigid, distinct categories, polar opposites, or dichotomies. Instead, they represent different ends on a continuum. A study tends to be more qualitative than quantitative or vice versa. Mixed methods research resides in the middle of this continuum because it incorporates elements of both qualitative and quantitative approaches (Creswell, 2014).

Based on the above description, the researcher used mixed research approaches. Additionally, the researcher used deductive approach, by referring different literatures, theories and models, which helped the researcher to develop conceptual framework and research questions. For the analysis of the practices of project management, the researcher used structured questioners and analyzed the data quantitatively. Additionally, Open-ended interview was used to collect qualitative data. Therefore, the researcher used both qualitative and quantitative data (mixed) research approach.

3.2 Research Design

The study adopted a descriptive survey design. Descriptive survey design is used to obtain information concerning the current status of the phenomena to describe “what exists” with respect to variables or conditions in a situation (Chandran, 2004). Descriptive survey design is appropriate when the researcher intends to describe a situation in terms of “what is” as opposed to analyzing why it is so.

The choice of the descriptive survey design was made based on the fact that in this study, the researcher was interested in the state of affairs already existing in the field, providing further insight into the research problem, by describing the variables of interest. No variable was manipulated. Descriptive research design enables collection of in-depth information about population being studied and describes its behavior, attitude, characteristics and values (Creswell, 2003).

3.3 Population

Population is described as a group of elements or cases, whether individuals, objects, or events, that conform to specific criteria and to which we intend to generalize the result of the research (McMillan and Schumacher, 2001). This research is a case study of Addis Ababa City. This was because EEU is the only organization carrying out prepaid energy metering projects in Ethiopia and the target population stated were directly involved and affected by the project. Thirty-four project offices in Addis Ababa city constituted the population of this study. They are:

East AA S.C No.1, 2, 3, 4, 5, 6, 7, 9, Bole Arbsa, Yeka Abado & Bole Lemi

North AA S.C No.2, 3, 4, 5, 6

West AA S.C No. 1, 2, 3, 4, 5, 6, 7, 8, 9

South AA S.C No. 1, 2, 3, 4, 5, 6, 7, 8, 9

3.4 Sampling

Sample is a portion of a population or universe. For this particular study, purposive sampling technique was used to select project engineers from each project offices. Responses were sought from 34 project engineers in all AA project offices and interview from EEU management. This is because they were better place to give relevant information.

3.5 Data Source and Types

Generally, there are two types of data, Qualitative and Quantitative. As discussed by Creswell (2014) mixed methods involve the collection and “mixing” or integration of both quantitative and qualitative data in a study.

Data can be gathered from both primary and secondary sources. According to Hollensen (2007) primary data can be defined as “information that is collected first-hand, generated by original research tailor-made to answer specific current research questions”. And secondary data can be defined as “information that has already been collected for other purposes and thus is readily available”.

There are several methods of collecting primary data, particularly in surveys and descriptive researches. Important ones are: observation, interview, questionnaires, depth interviews, and content analysis (Kothari, 2004). Secondary data include both quantitative and qualitative data. Secondary data are usually collected from journals, existing reports, books, and statistics by government agencies and authorities (Saunders, et al., 2009).

The study was conducted by collecting data from primary and secondary data sources. This was because of ease of interpretation of data and the need to address specific research issues in this case the project management practices.

The primary data collection tools for this study were questionnaire and interview. The predetermined questions were fielded to the project engineers regarding the practices of project management of prepaid energy metering project in their respective project offices. The questionnaire was used for data collection because, it offers considerable advantages in the administration: it presents an even stimulus potentially to large numbers of people simultaneously and provides the investigation with an easy accumulation of data. The questionnaire developed was e-mailed to the 34 project engineers to be filled and either picked from their respective offices or e-mailed back.

The secondary data for this particular study was collected from project management journals, books, research publications and company brusher. The secondary data helped the student researcher as specific reference and explore different construct, models and theories important to this study.

3.6 Data Collection Procedure

Generally, there are various procedures of collecting data. Survey is one of primary data collection system from a large number of respondents. As stated by Bhattacharjee (2012) survey involving the use of standardized questionnaires or interviews to collect data about people and their preferences, thoughts, and behaviors in a systematic manner.

The main instruments used consist of closed ended questionnaires and interviews. These different ways of gathering information can supplement each other and hence boost the validity and dependability of the data. In this study, the quantitative data was obtained through closed ended questionnaires and the qualitative data through interviews. The items of the questionnaire were mainly developed based on the research objectives and research questions.

3.7 Validity and Reliability

3.7.1 Validity

According to Creswell (2014) validity is one of the strengths of qualitative research and is based on determining whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account. Terms abound in the qualitative literatures that address validity, such as trustworthiness, authenticity, and credibility.

Validity is concerned with whether our research is believable and true and whether it is evaluating what it is supposed to evaluate. In this regard, Burns (1999), stresses that “validity is an essential criterion for evaluating the quality and acceptability of research.” Generally, researchers use different instruments to collect data. Therefore, the quality of these instruments is very critical because “the conclusions researchers draw is based on the information they obtain using these instruments” (Fraenkel & Wallen, 2003). Thus, it is imperative that the data and the instruments to be validated.

Content validity is related to a type of validity in which different elements, skills and behaviors are adequately and effectively measured. To this end, the research instruments and the data might be reviewed by the experts in the field of research. Based on the reviewer’s comments the unclear and obscure questions can be revised and the complex items reworded. Also, the ineffective and nonfunctioning questions can be discarded altogether.

Therefore, for the purpose of this research the researcher used different data collection techniques. In addition, the questionnaire and interview questions were derived from the literature review, and approved by university academicians to confirm validity.

3.7.2 Reliability

As stated by Mohamed (2013) one of the main requirements of any research process is the reliability of the data and findings. In the main, reliability deals with the consistency, dependability and replicability of “the results obtained from a piece of research”. Obtaining similar results in quantitative research is rather straightforward because our data are in numerical form. However, in qualitative approaches to research achieving the identical results are fairly demanding and difficult. It is because the data are in narrative form and subjective. To this end, Lincoln & Guba (1985) point out that instead of obtaining the same results, it is better to think about the dependability and consistency of the data. In this case, the purpose is not to attain the same results rather to agree that based on the data collection processes the findings and results are consistent and dependable.

Merriam (1998) believes that “the human instrument can become more reliable through training and practice.” In general, Lincoln and Guba (1985) and Merriam (1998) suggest that the dependability of the results can be ensured through the use of three techniques: the investigator’s position, triangulation and audit trial.

To make operationalize, the researcher was defined the variables into measurable factors, used both qualitative and quantitative data. Pilot test was done, if the questioners were administered in a real environment by respondents. For the purpose of this, 3 respondents were asked to complete the questionnaire to identify the problem with the questions clarity.

3.8 Data Analysis and Presentation

Data analysis was carried out by using the Statistical Package for Social Science (SPSS) version 20. Descriptive statistics such as frequency distribution is used to assess the demographic profile of the respondents to make the analysis more meaningful, clear and easily interpretable. Descriptive statistics allow the researchers to present the data acquired in a structured, accurate and summarized manner. The data collected from the field was sorted for completeness, checked for any errors and omissions, and summarized in tables. Also the

data obtained from the study were entered into the computer and statistically analyzed include descriptive statistics.

3.9 Ethical Consideration

As stated by Creswell (2014) in addition to conceptualizing the writing process for a proposal, researchers need to anticipate the ethical issues that may arise during their studies. Research involves collecting data from people, about people.

Writing about these anticipated ethical issues is required in making an argument for a study as well as being an important topic in the format for proposals. Researchers need to protect their research participants; develop a trust with them; promote the integrity of research; guard against misconduct and impropriety that might reflect on their organizations or institutions; and cope with new, challenging problems (Mark & Iain, 2006). Ethical questions are apparent today in such issues as personal disclosure, authenticity, and credibility of the research report; the role of researchers in cross-cultural contexts; and issues of personal privacy through forms of Internet data collection (Mark & Iain, 2006).

In this study, the researcher explained to the respondents the aim of the research and area in the introductory part of the questionnaire and interview. Furthermore, the researcher tried to avoid misleading statements in the questionnaire and interview. Lastly, the questionnaires and the interview were conducted only with voluntary respondents and inform the respondents not to mention their name on the questionnaire. In addition, all information and data from the company were disclosed to public.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

This chapter presents the data analysis and discussion of the research findings. The data analysis was made with the help of Statistical Package for Social Science (SPSS) version 20. The first part of the chapter discussed about the distributed and returned questionnaires. The second part is about the demographic profile of the study sample, responses received about project management practices for each phases of project life cycle management has been described using descriptive statistics.

Furthermore, descriptive statistics were used to analyze variables. Cronbach's alpha was used to test goodness and internal consistency of the measure. Before the data analysis, data cleaning and screening has been done. The analysis of the data collected from the sample population was screened for missing values. In addition, extreme values were checked. The minimum and maximum values were a five point Likert-scale questions found 1 up to 5 respectively. Only complete questionnaires were considered for the data analysis. For this particular study, all respondent filled and returned the questionnaires as shown in table 4.1.

Table 4.1 summarize about the distributed, returned and usable questioners

Table 4.1 Questionnaire Distribution and Response Rates

Method	Distributed (%)	Returned (%)	Response Rate (%)
Hand Delivered	34	34	100

Source: Survey findings (2018)

4.1 Reliability Analysis

The reliability of scale shows how free the data is from random error. Therefore, it is always advisable to select that scale that is reliable. One of the most commonly used scales of reliability is internal consistency. Internal consistency refers to “the degree to which the items that make up the scales are all measuring the same underlying attributes (i.e. the extent to which the items “hang together”) (Pallant, 2005). There are number of ways in which internal consistency can be measured, the most commonly used statistics is Cronbach's coefficient

alpha. Cronbach's alpha is a test reliability technique that requires only a single test administration to provide a unique estimate of the reliability for a given test (Joseph A. g. and Rosemary R. G. 2003). According to the author, cronbach's alpha is the average value of the reliability coefficients one would obtain for all possible combinations of items when split into two half-tests.

Cronbach's alphas were calculated to examine the reliability of each variable of the study. The variables in this study were four phases of the project life cycle management. According to Joseph A. g. and Rosemary R. G. (2003), cronbach's alpha reliability coefficient normally ranges between 0 and 1. However, there is actually no lower limit to the coefficient. The closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale.

More (Malery, 2003) provide rules of thumb. According to their rules; reliability coefficients should be at least '.70' and the higher the better. Furthermore, as suggested by the author, if scale item were to exhibit an item to total correlation of $< .5$ – unacceptable or less the item should not be included in further analysis. Reliability coefficient for items in each variable (Cronbach's alpha) is greater than .7 which showed higher reliability of the items used in measurement of the variables. Accordingly Cronbach's alpha for project management life cycle variable: Initiation, Planning, Execution & Closure phase is found to be more than 0.7 therefore it is statistically acceptable. The Cronbach's alpha value for all items suggested that the data collected through questionnaires is reliable and can be used for further statistical analysis.

Table 4.2 Reliability Statistics

	Cronbach's alpha coefficient	Number of Items
Project Initiation Phase	.760	9
Project Planning Phase	.862	13
Project Execution Phase	.783	11
Project Closure Phase	.929	3
Over all reliability	.935	36

Source: Survey findings (2018)

4.2 Demographic Information

The study sought to ascertain the background information of the respondents involved in the study. The background information points at the respondents' suitability in answering the questions.

Respondents Gender

The respondents were requested to indicate their gender. The findings are as presented in Table 4.3.

Table 4.3 Respondent Gender

Table 4.3 Respondent Gender				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid male	29	85.3	85.3	85.3
Valid female	5	14.7	14.7	100.0
Total	34	100.0	100.0	

Source: Survey findings (2018)

The table above shows that the survey includes a higher percentage of male participants (85.3%) than female participants (14.7%).

Respondent's age bracket

The respondents were requested to indicate their age bracket. The findings are as presented in Table 4.4

Table 4.4 Respondent Age

Respondent age				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Upto 30 yrs	9	26.5	26.5	26.5
Valid 31-40yrs	15	44.1	44.1	70.6
Valid 41-50 yrs	6	17.6	17.6	88.2
Valid above 50 yrs	4	11.8	11.8	100.0
Total	34	100.0	100.0	

Source: Survey findings (2018)

The findings indicate that, respondents (44.1%) were aged between 31-40 years, 26.5% were aged up to 30 years, and 17.6% were aged between 41-50 years, while 11.8% were aged above 50 years.

Respondent's education status

The respondents were requested to indicate their education status. The findings are as presented in Table 4.5

Table 4.5 Education status

Respondent Education status				
	Frequency	Percent	Valid Percent	Cumulative Percent
BSC/BA	31	91.2	91.2	91.2
Valid MSC/MA	3	8.8	8.8	100.0
Total	34	100.0	100.0	

Source: Survey findings (2018)

From the findings, majority of the respondents (91.2%) had BSC/BA, (8.8%) had MSc/MA. Thus majority of the respondents in the EEU are well trained and therefore there was high chances that they would offer reliable information.

Working Experience

In order to find out the period in which the respondents had worked for the company, the respondents were asked to indicate the duration in which they have been working for EEU. The findings are as presented in Table 4.6

Table 4.6 Work Experience

Respondent experience				
	Frequency	Percent	Valid Percent	Cumulative Percent
less than 5 yrs	4	11.8	11.8	11.8
5-10 yrs	6	17.6	17.6	29.4
Valid 11-15 yrs	16	47.1	47.1	76.5
above 15 yrs	8	23.5	23.5	100.0
Total	34	100.0	100.0	

Source: Survey findings (2018)

From the findings, majority of the respondents (47.1%) had a working experience of between 11-15 years, 23.5% had a working experience of 15 years and above, and 17.6% had a working experience of between 5-10 years while 11.8 % had a working experience of less than 5 years. Therefore the majority of the respondents had an extensive experience hence increasing the reliability of the information given.

4.3 Practices of Project Management

The study sought to assess the practices of project management in all project offices of the study. The responses were placed on the five Likert scale where 1 = strongly disagree 2=disagree 3=neutral 4=agree 5 =strongly agree. One statistical approach for determining equivalence between groups is to use simple analyses of means and standard deviations for the variables of interest for each group in the study (Marczyk, et al., 2005). The mean indicates to what extent the sample group averagely agrees or does not agree with the different statement. The lower the mean, the more the respondents disagree with the statement. The higher the mean, the more the respondents agree with the statement. On the other hand, standard deviation shows the variability of an observed response from a single sample. The mean values were presented in tables, together with standard deviation of values for each dimension. Mean values have been interpreted by adopting the criteria suggested by Landell (1977) & Mohd Najib (1994), for Likert type scale ranging from 1 to 5, the interpretation of mean values should be like: from 1.00 to 2.33 means Low; mean values from 2.34 to 3.64 means Moderate and from 3.68 to 5.00 means High.

4.3.1 Descriptive statistics for project initiation

The study sought to determine the extent to which project initiation was implemented in prepaid energy metering project. The respondents were asked to indicate the extent to which they agreed with statements in relation to this. The results are as presented in Table 4.7

Table 4.7 Descriptive Statistics for Project Initiation

No	Project Initiation Activities	Mean	Std. Deviation
1	Feasibility study was undertaken for the project	3.18	.999
2	Environmental impact assessment and Sustainability were studied	2.59	1.158
3	Project risks were studied	2.62	1.155
4	Operation and maintenance of the project were studied on short and long term	2.56	.991
5	All project requirements were Studied	3.09	1.026
6	"Project Charter" was prepared which describes scope, objectives, time, budget, and risks	3.09	.965
7	Project Team was appointed from the Beginning	2.44	1.078
8	In your opinion, were all necessary equipment, communication, infrastructure, documentation and tools were included in Project Office Environment? (project office set up)	2.32	0.912
9	The roles of each team member were identified by the project team	2.59	1.087
	Overall scale values	2.72	

The result of the survey indicates that the total score of Project initiation phase achieved a mean of (2.72) which indicates moderate level of initiation practice. This shows that the organization recognized and defined the activities of initiation phase. But this does not imply that the offices are practicing those activities. The results also indicate that there is a poor practice of project office setup. The information obtained from interview and document review also indicates that project charter was prepared, project team was appointed and that their roles are identified. However, formal procedure might not be followed as a standard for the project management. The response from the interview further explained that the importance of project management is not recognized in the office and lack in providing project management training for employees participating in the project activities. The information obtained from the interview also revealed that project offices were not equipped with the necessary equipment, infrastructure & tools. As a result, the project team couldn't do their tasks properly.

4.3.2 Descriptive statistics for project planning

The study sought to determine the extent to which project planning was implemented in prepaid energy metering project. The respondents were asked to indicate the extent to which they agreed with statements in relation to this. The responses were placed on the five Likert scale where 1 = strongly disagree 2=disagree 3=neutral 4=agree 5 =strongly agree. The results are as presented in Table 4.8.

Table 4.8 Descriptive Statistics for Project Planning

No	Project Planning Activities	Mean	Std. Deviation
1	WBS (work breakdown structure) was identified	3.00	.921
2	Expected duration (timeframe), resource (materials, people & equipment) requirement and costs for each activity were determined prior to project start	3.00	.853
3	Interrelationship between the project activities were clearly presented and defined	2.56	.991
4	Detailed project schedule was determined	2.68	.945
5	Prepared financial plan that indicates the required fund, source & the time the fund is required	2.91	1.055
6	Prepared change management plan	2.32	1.173
7	Quality targets were determined	1.76	.890
8	Quality plan was developed to monitor the quality of the outputs and to identify actions that will be used to achieve the required quality	1.91	.793
9	Procurement of goods & services needed for project were properly planned	2.94	.952
10	Risks were identified & developed mitigation strategy	1.88	.946
11	Listed the criteria to be met to gain customer acceptance	2.85	.892
12	Performed Project Communication requirement analysis & Preparing a plan/strategy to address identified communication needs	3.06	.952
13	Developed a system for collecting and distributing project information	3.09	1.083
	Overall scale values	2.61	

The result of the survey indicates that the overall score of the planning phase achieved a mean of (2.61) which indicates moderate level of planning practice. This shows that some of the projects planning activities were recognized and defined thought may not be used in practice. Creating WBS and estimating the required resource and duration for each activity are important tools for project planning. Both results revealed a mean of (3.0) which indicates a moderate level of practice.

Interview also indicates similar results. According to the interview response given by ICT Application and Business Retail Head, all activities were identified and resource requirements and duration were estimated for each activity during project planning phase. The approved plans were documented and used as a guide.

As shown in table 4.7, the mean values of risk, change and quality management plan indicate low level of practice. This shows that little attention is given to risk, change and quality planning. As a result, formal risk management plan was not instituted and rarely practiced.

The result also shows that absence of formal quality plan may result in loss of the project as a whole-and consequently, loss of business and reputation in the market.

The interview response also indicates similar results. According to ICT application & retail business experts, there is a recognizable problem of scope creep; the identification and use of risk management tools & techniques are not generally known, and there is poor practice of quality plan. This may be due to lack of awareness of the importance of quality management plan in EEU projects. In addition, the researcher identified no document with risk,& quality management plan.

4.3.3 Descriptive statistics for project execution

The study sought to determine the extent to which project implementation was executed in prepaid energy metering project. The respondents were asked to indicate the extent to which they agreed with statements in relation to this. The results are as presented in Table 4.9.

Table 4.9 Descriptive Statistics for Project Execution

No	Project Execution Activities	Mean	St. Deviation
1	Activities carried out by the project team were controlled and managed effectively	2.47	.992
2	Costs were managed so it does not exceed the allocated budget for the project	2.56	1.260
3	Managed time effectively	2.44	1.078
4	Bidding processes were managed effectively	3.26	.828
5	There were mechanisms used to monitor quality during the implementation (Quality Assurance)	2.12	1.122
6	Standards were set for the delivery of project outputs	1.91	1.083
7	Risks were managed effectively	2.03	1.058
8	Accurate & complete Progress reports were prepared and providing them to relevant stakeholders on time.	2.09	1.055
9	In your opinion, were changes that arise during the implementation of the project managed effectively and properly?	2.32	.912
10	The problems and issues that arise during project implementation were managed effectively	3.00	1.155
11	There was a clear communication channel between all the stakeholders	2.97	1.000
	Overall scale values	2.47	

The result of the survey indicates that overall score of execution phase achieved a mean of (2.47) which indicates moderate level of execution practice. This shows that there are some common, defined processes in the offices. As shown in table 4.8, the mean values of quality,

risk, change and acceptance management indicate low practice of quality, risk and acceptance management. This shows that quality, change and risk management usage in the implementation stage of the project were directly related to planning of quality, change and risk which implies that poor project planning leads to poor project implementation.

Acceptance management also indicates low level of practice. This shows that without a formal acceptance process in place, the stakeholders may not accept the final deliverables produced by the project, thereby questioning the project's overall success. Acceptance management is highly related to quality management, reviewing deliverable quality and measuring each deliverable produced against the acceptance criteria must be taken care of.

The result obtained from statement to check if accurate & complete Progress reports were prepared and providing them to relevant stakeholders on time scored a mean of (2.09) which indicates that there is low level of status reporting system practice. This shows that correct & timely report were not submitted to the relevant stakeholders.

The interview indicates similar result regarding the above mentioned practice. According to the experts, there is a recognizable problem of scope creep and these changes were not managed properly. As a result, most of the projects were not completed within specific cost & time limit. The experts added that there is poor practice of risk and quality management. Prepaid energy metering system depends on Ethio telecom network. When the network is disconnected, the system is unable to serve the customer and sell electric power. This and other risks are not managed properly. Moreover, Customers are still complaining about the quality of prepayment system and meters as a result its acceptance is still in question. According to retail business experts, there is absence of monitoring and evaluation department in EEU projects. As a result, Progress of project activities were not regularly monitored and reported. Most of the reports are incomplete and inaccurate. The reports are prepared just for the sake of presenting it to managements.

4.3.4 Descriptive statistics for Project Closure

The study sought to determine the extent to which project closure was executed in prepaid energy metering project. The respondents were asked to indicate the extent to which they agreed with statements in relation to this. The responses were placed on the five Likert scale where 1 = strongly disagree 2=disagree 3=neutral 4=agree 5 =strongly agree. The results are as presented in Table 4.10.

Table 4.10 Descriptive Statistics for Project Closure

No	Project Closure	Mean	St. Deviation
1	The project was evaluated after the closure	2.18	1.086
2	Lessons learned from the project were disseminated	2.09	1.055
3	All Documentation for the project were documented after the project finished	2.59	1.184
	Overall scale values	2.29	

The final step in the project cycle management is to review the project completion. As shown in the table 4.8, the result of the survey revealed that the total score of the project closure achieved a mean of (2.29) which indicates low level of closure practice. This shows that project closure was not instituted and rarely practiced. During the interview with the experts, it was identified that there was no formal practice of project closure. The experts further explained that the most of the projects were not evaluated after closing as a result lesson learned couldn't be used for future projects. They also added that absence of monitoring and evaluation department in EEU projects leads to lose an important and valuable worth of lesson learnt from accomplished projects.

The experts pointed out problems regarding project closure process. They said that there is low level of awareness about the importance of project closing process. EEU has repetitive prepaid energy metering projects. But lesson learned were not reused for future projects and thus were not able to capture & learn from their experience.

According to Aziz (2015) finding, failure to conduct through project closeout could potential put the organization from realizing the anticipated benefits from the deliverables of project; result in significant losses to the organization, and project management team's credibility.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary of Major Findings

This study aimed to assess the actual project management practices of prepaid energy metering project. Based on the survey result regarding the assessment of project management practices of project initiation, planning, execution and closure phase, the major findings are:

The total score of Project initiation phase achieved a mean of (2.72) which indicates a moderate level of initiation practice. The finding also indicates that there is poor practice of project office setup.

The overall score of the planning phase achieved a mean of (2.61) which indicates a moderate level of planning practice. However, the findings also revealed low practices of change, risk and quality management plan.

The result of the survey indicates that the overall score of execution phase achieved a mean of (2.47) which indicates a moderate level of execution practice. However, the findings also indicate low practices of acceptance, risk, change and quality management. Quality, change and risk management usage in the implementation stage of the project were directly related to quality, change and risk plan.

The total score of the project closure achieved a mean of (2.29) which indicates low level of closure practice. This shows that project closure was not instituted and rarely practiced. The finding also indicates the most of the projects were not evaluated after closing as a result lesson learned couldn't be used for future projects.

Therefore, the total score of the reality of project management practices achieved a mean of (2.52) which indicates a moderate level. This shows that there is a gap of inadequacy between the project management practices in prepaid energy metering project and the best practices. This is mainly due to the absence of clear framework for implementation of projects. It was clear from the results that project management did not follow an integrated system.

5.2 Conclusion

As discussed in detail in the literature part of this study, effective project management increases the chance of successfully completing projects within time, cost and quality constraints. Project management also helps to achieve other project constraints such as customer satisfaction, and providing the business value of the project. Based on the results of this study and according to the five-point scale, “Likert scale”, Project cycle management in this study achieved a moderate level. The findings strongly sustain that there is a need to reinforce and develop the project management practices of prepaid energy metering projects in EEU.

5.3 Recommendation

As the major objective of the study is to assess the project management practices of EEU prepaid energy metering projects, the following recommendations are forwarded based on the findings:

Project Identification should be in line with pre-drawn strategies to serve and support the objectives of general policies. After identification, project formulation should be studied carefully and feasibility studies should be conducted. Resources should be exploited in an economic manner to create sustainable projects. Short & long term Operation and Maintenance policies should be considered. Environmental impact assessment (EIA) should be conducted. Project requirements should be clear and documented from the beginning to ensure satisfaction of all related stakeholders. The project initiation process needs improvements regarding project office set up. The project office environment should include the necessary equipment, infrastructure & tools needed for the project team.

A project charter should be used as main practice as it clarifies the scope, objective, time, budget, and output of the project. It should be adopted and followed by the appointed project team. Defining scope of a project and managing the change that is always expected in managing the projects contribute a lot to the success of the project.

Precise project planning is a critical project success practice; planning and re-planning should be a way of life for project managers. Due to the dynamic nature of many projects, plans should be regularly reviewed in EEU prepaid energy metering projects.

The planning process needs improvements regarding separating project activities and routine works in creating complete project plan that incorporate the WBS, project schedule, financial plan, scope change management plan, risk management plan, quality management plan and other knowledge areas required for managing the project based on the scope and size of the project. Stick to the plan and considering only approved changes are also point of focus for improvement.

Change can occur to project scope, deliverables, timescales or resource. These changes must be formally requested, evaluated & approved prior to implementation. Project manager must manage this change within the project.

Prepaid project offices should give stronger focus on quality assurance management, risk management, scope change management as well as full attention to define clear, standard specifications. Risk management in a project is another element of project success. Risk management should begin during project planning to identify risks that can cause problems and to put “concrete actions” for treatment and prevention. Some risks can never be totally eliminated and they may change during a project, but ongoing well thought out risk assessment and risk mitigation strategies together with risk contingencies in the project budget are required to avoid unpleasant project surprises.

Meeting quality expectations of the stakeholders can be a challenging task. Quality plan should be documented to ensure that the quality expectations are clearly defined and can reasonably be achieved.

Monitoring and evaluation should be undertaken in every step of project implementation and not a once as it is common with many projects. This will help identify, loopholes and deviations from overall projects goals, and correct them in time so as to ensure successful projects. Prepaid project offices should have project monitoring & evaluation department so that project activities should be properly monitored and reported accurately. EEU should not only invest in technology, but also training of the project team on usage of the same technology. This will increase skills and their disposal and level of efficiency in increasing project performance.

EEU needs to sensitize its employees to understand the need for project initiation, planning, execution, and closure at all levels. The visible need of project management training that exists in the project offices need to be addressed to improve their project management

knowledge & practice capacity. The use of generic guides such as PMBOK in this regard may significantly help. Use of computing & software programs can also help manage the project activities effectively as well as increase monitoring and controlling quality processes. Recruiting professional project managers may also be one way of proving the practice of project management.

Project closing is also important component of project management. The project offices should plan for project closing that helps to know whether the project is completed, requirements are met, and business needs are fulfilled. Post evaluation should be applied, and lessons learned from project should be documented and disseminated to develop next projects.

5.4 Recommendations for Future Studies

While this study was able to provide additional insight into project management practices in EEU, other domains could be explored by further research works.

- This study focused only on one study sample. Future research could thus focus on other samples within the EEU. By doing so, a better understanding of the current situation can be achieved and other domains could be explored.
- Further studies could be done to develop a well-defined methodology of project management appropriate to different types of projects.
- It would be useful if a comparative study of project management practices in EEU is conducted with another advanced country in this domain.
- Further studies would be useful to study specific techniques and explore certain tools applied internationally in specific domains of project management

References

- Abbasi, G. Y.& Al-Mharmah, H. (2000).*Project management practice by the public sector in a developing country*.International Journal of Project Management, 18, 105109.
- Artto, K. and Kujala, J. (2008)*Project business as a research field*.International Journal of Managing Projects in Business, 1, 469-497.
- Artto, K., Kujala, J., Dietrich, P. and Martinsuo, M. (2008).*What is project strategy?*International Journal of Project Management, 26, 4-12.
- Bhattacharjee, A. (2012). *Social Science Research*.2nd ed. Zurich, Switherland: Creative Commons Attribution 3.0.
- Bradley, K. (2002).*Understanding PRINCE 2*. SPOCE Project Management Limited. Poole, Dorset.
- Butterick ,R. (2000). *The Interactive Project Workout*. 2nd ed, Pearson Education Limited, London (FT Prentice Hall), ISBN 0 273 64436 X, included Project Failure and Success Factors.
- Cameron, F. (2002).*The Dream Project*. MIS Australia, June 2002, included in the Project Management 1 Readings, Australian Computer Society.
- Casarin, A.A. &Nicollier, L. (2009).*Prepaid meters in electricity: A cost benefit analysis, Working Paper Series, IAE Business School, Austral University*.
- Cleland, D. I., & Ireland, L. R. (2002).*Project management: Strategic design and implementation*.4th ed. New York: McGraw-Hill.
- Cobb, A. T. (2012). *Leading Project Teams: The basics of Project Management and Team Leadership*. California: Sage Publications, Inc.
- Cooke-Davies, T. J. (2001).*Towards Improved Project Management Practice: Uncovering the evidence for effective practices through empirical research*.PhD Thesis, Leeds Metropolitan University, Leeds.
- Cooke-Davis, T. (2002).*The Real success factors in projects*. International Journal of Project Management, 20(3), 185-190.

Crawford, L., & Pollack, J. (2007). *How generic are project management knowledge and practice*. Project Management Journal.

Creswell, W. (2003). *Research Design: Qualitative, Quantitative and Mixed Approaches*. 2nd ed. Sage publication, California.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed method approach*. 4th ed. California: SAG Publication Ltd.

European Commission (May 1999), *Project Cycle Management- Training Handbook*: ITAD Ltd.

Estache, Antonio, Foster, Vivien, Wodon, Quentin. (2000). *Infrastructure Reform and the poor Learning from Latin America's Experience* LAC Regional Studies Program. WBIS Studies in Development

Freeman, M., & Beale, P. (1992). *Measuring project success*. Project Management Journal.

Greer, M. (1999). *14 Key Principles for PM Success*. Excerpt from Chapter 6, *Handbook of Human Performance Technology*, San Francisco.

Hartman, E. T. (2000). *Don't park your brain outside: A practical guide to improving shareholder value with SMART project management*. 1st, Upper Derby, PA: Project Management Institute.

Hollensen, S. (2007). *Global Marketing: A decision oriented approach*. 4th ed. s.l.: Prentice Hall.

Jugdev, K., & Muller, R. (2005). *A retrospective look at our evolving understanding of project success*. Project Management Journal, 36(4), 19-31.

Kanigel, R. (1997). *The One Best Way: Frederick Winslow Taylor and the Enigma of Efficiency*. London.

Kartam, N. A., Al-Daihani, T. G. and Al-Bahar, J. F. (2000). *Professional project management practices in Kuwait: issues, difficulties and recommendations*. International Journal of Project Management, 18, 281-296.

Kerzner, H. (2003). *Project management: A systems approach to planning, scheduling, and controlling*. 8th ed. Hoboken, NJ: John Wiley.

- Kerzner, H. (2009). *Project management: A systems approach to planning, scheduling, and controlling*. 10th ed., John Wiley & Sons, Inc., Hoboken, New Jersey, 2009.
- Kothari, C. (2004). *Research Methodology Methods and Techniques*. 2nd ed. New Delhi: New Age International Ltd.
- Lim, C. S., & Mohamed, M. Z. (1999). *Criteria of project success: An exploratory reexamination*. International Journal of Project Management, 17(4), 243-248.
- Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic Inquiry*. London: SAGE Publication.
- Lipovetsky, S., Tishler, A., Dvir, D. & Shenhar, A. (2002). *The relative importance of project success dimensions*. R&D Management, 27: 97–106.
- Marczyk, G., DeMatteo, D. & Festinger, D. (2005). *Essentials of Research Design and Methodology*. 1st ed. Hoboken New Jersey and Canada: John Wiley & Sons Inc.
- Maylor, H. (1999). *Project Management (2nd Ed.)*. London: Pearson Education Limited.
- Mark, I. & Iain, H. (2006). *Research Ethics for Social Scientists*. London: SAGE Publication Ltd.
- McKenzie, M. (2012). *Pre-Payment Meters and Energy Efficiency in Indigenous Household'' in Australia*. Bushlight, Centre for Appropriate Technology.
- MCMillan, J. H., & Schumacher, S. (2001). *Research in education: a conceptual introduction*. New York, Longman.
- Meredith Jack R. & Mantel Samwel J. (2010). *Project management a managerial approach*. 7th Ed. Asia, John Wiley & Sons, Inc.
- Milosevic, D. & Patanakul, P. (2005). *Standardized project management may increase development projects success*. International Journal of Project Management, 23, 181-192.
- Mohamed, Z. (2013). Mixed method research instruments, validity, Reliability and Reporting Findings. *Theory and Practice in Language Studies*, 3(2), pp. 254-265.
- Morgan, B. V. (1987). *Benefits of project management at the front end*. International Journal of Project Management, 5, 102-119.
- Morris, Peter W.G. (1994). *The Management of the Projects*. Thomas Telford, London.

Morris, Peter W.G. (2007). *The Wiley Guide to Project Organization and Project Management Competencies*.

Ohara, S. (2005). *Project and Program Management for Enterprise Innovation*. PMAJ.

PMI (1996). *A Guide to Project Management Body of Knowledge (PMBOK)*. 1st ed. PMI, Pennsylvania.

PMI. (2004). *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*. 4th ed. PMI, Pennsylvania.

RPRLGSP, May 2009: *MANUAL on PROJECT CYCLE MANAGEMENT: Guidelines on Identification, Design and Implementation of Successful Local Authority Projects*.

Saunders, M.N.K., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business Students*. 5th ed. s.l.: Pearson Education Limited.

Shenhar, A. (1996). *Project management theory: The road to better practice*. In: Project Management Institute 27th Annual symposium: Cited in Crawford, L., Pollack, J. and England, D. (2006) Uncovering the trends in project management journal emphases over the last 10 years. *International Journal of Project Management*, 24, 175-184.

Snyder, James R. (1987). *Modern Project Management: How Did We Get Here - Where Do We Go?*. *Project Management Journal*, Vol XVIII, No 1, March, pp 28-29.

Stretton, Alan. (1993). *A Short History of Modern Project Management*. *PM World Today* is a free monthly e Journal, October, 2007.

Stretton, Alan. (1994b). *A Short History of Modern Project Management*. Part Three, The Australian Project Manager, VOL 14.

Tewari, D. D & Shah, T. (2002). *An Assessment of South African Prepaid Electricity Experiment, Lessons learned, and their Policy Implications for Developing Countries*. South Africa.

Tewari, D.D. & Tushaar Shah. (2003). *An Assessment of South African prepaid electricity experiment, lessons learned, and their policy implications for developing countries*. *Energy Policy* 31:911-927.

Thomsett, R. (2002). *Project Pathology, Causes, patterns and symptoms of project failure*. <http://www.thomsett.com.au/main/articles/path/toc.htm>.

Van Der Merwe, A. P. (2002). *Project management and business development: integrating strategy, structure, processes and projects*. International Journal of Project Management, 20, 401-411.

Verzuh, E. (2008). *The Fast Forward MBA in Project Management* (3rd ed.). New Jersey: John Wiley & Sons, Inc.,

Waddams Price, C. and R. Hancock.(1998). *Distributional Effects of Liberalizing UK Residential Utility Markets* ' *Fiscal Studies*.

Westland, Jason (2006): The Project Management Life Cycle: a complete step-by-step methodology for initiating, planning, executing & closing a project successfully,

Winter, M., Smith, C., Cooke-Davies, T. and Cicmil, S. (2006a). *The importance of 'process' in Rethinking Project Management: The story of a UK Government-funded research network*. International Journal of Project Management, 24, 650-662.

Winter, M., Smith, C., Morris, P. and Cicmil, S. (2006b). *Directions for future research in project management: The main findings of a UK government-funded research network*. International Journal of Project Management, 24, 638-649.

Appendix A

QUESTIONNAIRE

A survey on assessing project management practices of prepaid energy metering project in Ethiopian Electric Utility: The case of Addis Ababa.

Dear respondents,

My name is Eden Tamiru, I wish to seek your assistance, as a participant, with this project work, which is being conducted as a partial fulfillment for my master's degree in project management at Addis Ababa university, school of commerce. This project work is undertaken as an attempt to investigate the project management practices of prepaid energy metering project in EEU: The case of Addis Ababa. Your participation in this survey is voluntary. The information you provide will be used only for the purpose of the study and will be kept strictly confidential. Please don't mention your name.

Contact address
Eden.tamiru@gmail.com

Thank you in advance for your unreserved cooperation.

SECTION ONE: *Questions related to the respondent's experience.*

1. Gender

Male []

Female []

2. Age

Up to 30 years []

Between 31 – 40 years []

Between 41 – 50 years []

Above 50 years []

2. Educational status

Diploma []

BSC/BA []

MSc/MA []

PHD []

Other (Specify).....

3. Number of service years (experience) at EEU

Less than 5 years []

Between 5 – 10 years []

Between 11 – 15 years []

Above 15 years []

SECTION TWO: *Issues Related with the study area*

The following statements relate to project management practices. Tick appropriately according to the level of agreement on the specified practices:

1 = strongly disagree 2=disagree 3=neutral 4=agree 5 =strongly agree

STATEMENT	Rating points				
Project Initiation Phase	1	2	3	4	5
Feasibility study was undertaken for the project					
Environmental impact assessment and Sustainability were studied					
Project risks were studied					
Operation and maintenance of the project were studied on short and long term					
All project requirement were Studied					
"Project Charter" was prepared which describes scope, objectives, time, budget, and risks					
Project Team was appointed from the Beginning					
In your opinion, were all necessary equipment, communication, infrastructure, documentation and tools were included in Project Office Environment? (project office set up)					
The roles of each team member were clearly defined and understood					
Project Planning Phase	1	2	3	4	5
WBS (work breakdown structure) was identified					
Expected duration (timeframe), resource (materials, people & equipment) requirement and costs for each activity were determined prior to project start					
Interrelationship between the project activities were clearly presented and defined					
Detailed project schedule was determined					
Prepared financial plan that indicates the required fund, source & the time the fund is required					
Prepared change management plan					
Quality targets were determined					
Quality plan was developed to monitor the quality of the outputs and to identify actions that will be used to achieve the required quality					
Procurement of goods & services needed for project were properly planned					
Risks were identified & developed mitigation strategy					
Listed the criteria to be met to gain customer acceptance					
Performed Project Communication requirement analysis & Preparing a plan/strategy to address identified communication needs					
Developed a system for collecting and distributing project information					
Project Execution Phase	1	2	3	4	5
Activities carried out by the project team were controlled and managed effectively					
Costs were managed so it does not exceed the allocated budget for the project					

Managed time effectively					
Bidding processes were managed effectively					
There were mechanisms used to monitor quality during the implementation (Quality Assurance)					
Standards were set for the delivery of project outputs					
Risks were managed effectively					
Accurate & complete Progress reports were prepared and providing them to relevant stakeholders on time.					
In your opinion, were changes that arise during the implementation of the project managed effectively and properly?					
The problems and issues that arise during project implementation were managed effectively					
There was a clear communication channel between all the stakeholders					
Project Closure	1	2	3	4	5
The project was evaluated after the closure					
Lessons learned from the project were Disseminated					
All Documentation for the project were documented after the project finished					

Adapted from Source: (Sajeda,2011, p.106)& (Abadir, 2011, p.220)

Appendix B

Interview questions for Ethiopian Electric Utility Management

Introduction and Purpose of Interview

My name is Eden Tamiru, I am a Master's student at Addis Ababa University School of Commerce, department of ProjectManagement. I am conducting a research study which is a part of my Master's thesis and on the process of collecting data for this research study purpose.

This project work is undertaken as an attempt to investigate project management practices of prepaid energy metering project in Ethiopian electric utility: the case of Addis Ababa.

I am looking for your kind participation in interview which will take 30 munities. Your participation in this interview is voluntary. The information you provide will be used only for the purpose of the study and will be kept strictly confidential.

Thank you in advance for your time and help with my research.

Sincerely yours,

General Interview Guiding Questions

Questions which willbe used to guide the semi-structured interviewonassessing the project management practices of prepaid energy metering project in EEU: the case of Addis Ababa.

- How does the overall project initiation practice looks like in prepaid energy metering project?
- How does the overall project planning practice looks like in prepaid energy metering project?
- How does the overall project execution practice looks like in prepaid energy metering project?
- How does the overall project closure practice looks like in prepaid energy metering project?

Appendix C

Project Initiation Phase

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Feasibility study was undertaken for the project	34	1	5	3.18	.999
Environmental impact assessment and Sustainability were studied	34	1	5	2.59	1.158
Project risks were studied	34	1	5	2.62	1.155
Operation and maintenance of the project were studied on short and long term	34	2	5	2.56	.991
All project requirement were Studied	34	2	5	3.09	1.026
"Project Charter" was prepared which describes scope, objectives, time, budget, and risks	34	2	5	3.09	.965
Project Team was appointed from the Beginning	34	2	5	2.44	1.078
In your opinion, were all necessary equipment, communication, infrastructure, documentation and tools were included in Project Office Environment? (project office set up)	34	1	5	2.32	0.912
The roles of each team member were clearly defined and understood	34	1	5	2.97	1.087
Valid N (listwise)	34				

Project Planning Phase

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
WBS (work breakdown structure) was identified	34	2	5	3.00	.921
Expected duration (timeframe), resource (materials, people & equipment) requirement and costs for each activity were determined prior to project start	34	2	5	3.00	.853
Interrelationship between the project activities were clearly presented and defined	34	1	5	2.56	.991
Detailed project schedule was determined	34	2	5	2.68	.945
Prepared financial plan that indicates the required fund, source & the time the fund is required	34	1	5	2.91	1.055
Prepared change management plan	34	1	5	2.32	1.173
Quality targets were determined	34	1	4	1.76	.890
Quality plan was developed to monitor the quality of the outputs and to identify actions that will be used to achieve the required quality	34	1	4	1.91	.793
Procurement of goods & services needed for project were properly planned	34	1	5	2.94	.952
Risks were identified & developed mitigation strategy	34	1	4	1.88	.946
Listed the criteria to be met to gain customer acceptance	34	2	5	2.85	.892
Performed Project Communication requirement analysis & Preparing a plan/strategy to address identified communication needs	34	1	5	3.06	.952
Developed a system for collecting and distributing project information	34	1	5	3.09	1.083
Valid N (listwise)	34				

Project Execution Phase

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Activities carried out by the project team were controlled and managed effectively	34	1	5	2.47	.992
Costs were managed so it does not exceed the allocated budget for the project	34	1	5	2.56	1.260
Managed time effectively	34	1	4	2.44	1.078
Bidding processes were managed effectively	34	2	5	3.26	.828
There were mechanisms used to monitor quality during the implementation (Quality Assurance)	34	1	5	2.12	1.122
Standards were set for the delivery of project outputs	34	1	5	1.91	1.083
Risks were managed effectively	34	1	5	2.03	1.058
Accurate & complete Progress reports were prepared and providing them to relevant stakeholders on time.	34	1	5	2.09	1.055
In your opinion, were changes that arise during the implementation of the project managed effectively and properly?	34	1	5	2.32	.912
The problems and issues that arise during project implementation were managed effectively	34	1	5	3.00	1.155
There was a clear communication channel between all the stakeholders	34	2	5	2.97	1.000
Valid N (listwise)	34				

Project Closure Phase

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
The project was evaluated after the closure to determine the level of achievement of the objectives of the project, its success and lessons learned	34	1	5	2.18	1.086
Lessons learned from the project were Disseminated	34	1	5	2.09	1.055
All Documentation for the project were documented after the project finished	34	1	5	2.59	1.184
Valid N (listwise)	34				