Addis Ababa University

College of Business & Economics

School of Commerce

MA in Project Management (Extension Programme)

IRON TRAINGLE PROJECT MANAGEMENT PRACTICE AND CHALLENGES: IN CASE OF IT PROJECTS IN COMMERCIAL BANK OF ETHIOPIA.

By

Kelemie Tebkew Yirdaw

June, 2018

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Advisor: Fesseha Afework (PhD)

A Thesis submitted to Addis Ababa University School of Commerce Extension Program in partial fulfillment of the requirements for the Award of the Degree of Master of Arts in Project Management.

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June, 2018

Addis Ababa, Ethiopia

DECLARATION

I declared that "IRON TRAINGLE PROJECT MANAGEMENT PRACTICE AND CHALLENGES: IN CASE OF IT PROJECTS IN COMMERCIAL BANK OF ETHIOPIA" is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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Signature Date

LETTER OF CERTIFICATION

This is to certify that Kelemie Tebkew has carried out this research work on the topic entitled "IRON TRAINGLE PROJECT MANAGEMENT PRACTICE AND CHALLENGES: IN CASE OF IT PROJECTS IN COMMERCIAL BANK OF ETHIOPIA" under my supervision. This work is original in nature and suitable for submission in partial fulfilment of the requirement for the award of Master of Arts Degree in Project Management.

Advisor: Fesseha Afework (PhD) _____ _____

Signature Date

DEDICATION

This thesis is dedicated to my parents and families for the inspiration they gave me during my study.

ABSTRACT

The objective of this study was to assess the current Iron Triangle Project Management Practices and Challenges of Commercial Bank of Ethiopia (CBE) in relation to Information Technology Projects. In this work, attempts were done to examine and compare CBE's practice with the available Project Management Standards and best practices. In this descriptive survey, mixed research method was employed. Data collections were done using questionnaire survey, document analysis, and interviews. To analyze the data descriptive statistics using 5-point Likert SPSS tool was employed. Moreover, the findings were organized into four basic categories namely: General Project Management process Aspect, Project Scope Management, Project Time Management and Project Cost Management. Accordingly, the major findings are: (1) Lack of experienced Project Managers, (2) unable to use historical data and Work Breakdown Structure (WBS) as input in defining project schedule and estimating detail cost of labor, material, and equipment separately, (3) weak practice in application of computer software or tools in managing of scope, cost, and time, (4) there is a gap in time phased budget preparation, regular budget update, performing variance analysis, and forecasting budget, (5) did not prepare the detail WBS following project scope definition, (6) Historical data are not well organized and accessed to project managers. In addition, this research identified major challenges such as (1) unable to use computer applications and tools in managing Iron Triangle Elements, (2) IT Project Managers were unfamiliar with different PM Standards, (3) lack of Standardized Project Management Methodology, Templates and Procedures, (4) Absence of Project Management Training, and (5) Lack of Documenting Lessons learned. As a concluding remark, understanding and well managing of the Iron Triangle elements is crucial to project success. Moreover, understanding the nature of IT projects, applying pertinent methodology, Standards or Best Practices, and awareness of numerous and varied challenging issues surrounding the implementation process could contribute to the whole process of IT Projects Implementation.

Keywords: *Project, Iron Triangle Project Management, Challenges, Standards, Practices and IT Projects.*

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Last but not least, I would like to extend my thanks to all my families and friends for their support, encouragement and prayer not only during my thesis work but also all the way during my study. I would like to extend my special thanks to Aemero Haddis for his bigheartedness and support.

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CBE	Commercial Banking of Ethiopia
CBS	CORE Banking Solution
ERP	Enterprise Resource Planning
IS	Information Systems
IPMA	International Project Management Association
IT	Information Technology
OPM	Organizational Project Management
OPM3	Organizational Project Management Maturity Model
PM	Project Management
PCM	Project Cost Management
PSM	Project Scope Management
PTM	Project Time Management
PMI	Project Management Institute
PMBOK	Project Management Body Of knowledge
PMO	Program Management Office
SPSS	Statistical Package for the Social Sciences
WESP	World Economic Situation and Prospects

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Iron Triangle Project Management Knowledge Areas encompass the three main pillars (such as; Scope, Cost, and Time) of Project Management discipline (Project Management Institute [PMI], 2013). They are a separated knowledge areas which have their own process, inputs, outputs, different tools and techniques. Moreover, as published by Microsoft (n.d) the project triangle is also known as the "iron triangle" and, less poetically, the "triple constraints." Whatever you call it, it amounts to the same thing.

Furthermore, Iron Triangle components are also the bases for project definition. According to Turner (2009), project is defined as: "a project is an endeavour in which human, financial, and material resources are organized in a novel way to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives." Accordingly, in managing a project, you can't change a project's budget, schedule, or scope without affecting at least one of the other two parts. Thus, every project balances a "triangle" of time, money, and scope.

Consequently, Project success mainly characterized by the Iron Triangle components or knowledge areas. Thus, well managing of project scope, cost and time leads to project success. However, the empirical evidence indicates that many IT projects are failed because of poor management of project scope, cost and time as presented in (ENAS, 2017). A successful project must be on time, within budget, and deliver quality (features and functions) as promised. Anything less will be either a failed project or a challenged project. Moreover, Abadir (2011) said that "…many projects in developing countries encounter considerable time and cost overruns, fail to realize their intended benefit or even totally terminated and abandoned before or after their completion …" this is true regardless of the type of sectors or industries.

According to ENAS (2017), there is vast evidence that large IT projects indeed tend to fail. IT projects seem to fail in both private and public sectors. The reason why failure in

IT projects appears to be more remarkable due to management, organization, human and cultural issues –not technical problem (Francis & Rafi, 2002). In addition to this, Atif (2010) identified the different barriers in detail which hinder the project success in less developed countries.

Rely on these facts, understanding and well managing of the Iron Triangle components is essential to project success. These three components of Iron Triangle are the main parts of Project Management discipline (PMI, 2013). Thus, from Project Management definition perspective (PMI, 2013; Addis Ababa University, 2015) Project Management knowledge, skills, tools, techniques and best practices can be applied whenever managing Iron Triangle components in project activities to achieve project objectives on time, within cost, and to required quality standards.

On top of this, understanding the nature of IT projects which has some differences from the management of other projects, applying pertinent methodology or Standards/ Best practices, awareness of numerous and varied challenging issues surrounding the implementation process could contribute to the whole process of IT Projects development and Implementation (Cadle & Yeates, 2008 ; Mohamed, 2011).

Accordingly, Project Management is rapidly becoming a standard way of doing business in organizations and as stated in ESI International (2006) Projects are becoming the tools of implementing the business strategic plan of an organization. Moreover, Turner (2009) said that "project management is about converting vision into reality through project life cycle". The project life cycle is the process that takes us from vision to reality.

However, as stated by Kevin (2004) in practicing Project Management many organizations in economical developed countries are farther ahead in defining, following, and implementing the processes, inputs, outputs, tools, and techniques than others. On the other hand, according to Atif (2010) in economical developing countries the implementation of project management tools and techniques is still in its early phases of development.

In addition to this, (Atif, 2010; Abadir, 2011) mentioned that practicing Project Management similar to the case with other economical developing countries; the

Ethiopian financial sector shares many of the problems and challenges the sector is facing in other developing countries. Thus, the need for project management expertise in financial sector organizations has become fundamental in order to deal with the vast responsibility of managing a number of projects in modern Banking industry.

On top of this, modern Banking increasingly relies on the Internet and computer technologies to operate their businesses and market interactions and to increase efficiency and effectiveness in service delivery (Philippa, 2004). This is because banking business competition has motivated the advancement of services enabled by IT (Patrick, 2011).

Accordingly, as described by Mohammed and Karen (2009) even though Ethiopian IT capacities are still in a developmental phase and are immature in relation to leading western technologically developed countries, CBE is undertaking various projects to enhance its service delivery and equip its operations in state of the art technology. Therefore, the success of such projects becomes vital for the achievement of the Bank's vision. In line with this, the Bank has established a Program Management Office to oversee the successful undertaking of its projects.

Rely on these facts the researcher described the current practices and challenges of CBE's Iron Triangle of IT Project Management Process and forward conclusions and recommendations based on findings to enhance the maturity of PMOs.

1.2. Statement of the Problem

Information Systems or IT has become the heart of modern Banking in our world today. The Banking sector in Ethiopia is one of the rapidly growing sectors of the country's economy (kelemie, 2013). In addition, the Banking service has shifted from local branch Banks to national and global presence and anywhere-anytime Banking. The competition of Banking business has motivated the advancement of services provided by IT (Patrick, 2011).

The Ethiopian Banks (both public and private) have been implementing comprehensive Banking software known as CORE Banking Solution (CBS) in accordance with the guidelines of the National Bank of Ethiopia (NBE). CBS helps each Bank to acquire and implement state-of-the-art centralized Banking application software that provides the

needs of all branches of the Bank and its Head Quarter (kelemie, 2013). Following this CBS implementation, there are many IT projects such as; Datacenter, Disaster recovery, Enterprise Resource Planning, E-Payment …etc. have been implementing. These all are the indicators of the existences of IT Project Management practice in banking service. Inline with this by the preliminary study the researcher found that IT projects have a great contribution to the Bank's strategic objectives success. Source: CBE's Information Systems (IS) Strategic Roadmap and Bank's 4th quarter report of the year 2015/2016.

CBE is undertaking various additional IT projects to enhance its service delivery and equip its operations in state-of-the–art-technology progressively to achieve its vision of becoming a world class Bank. The success of such projects becomes vital for the achievement of the Bank's vision. But the question is how CBE handling iron triangle elements in managing those projects? globally, current literatures indicate that most of software (IT) project implementation problems are related to management, organization, human and cultural issues –not technical problem (Francis & Rafi, 2002). Moreover, It is also important to notice that a lack of awareness of numerous and varied challenging issues surrounding the implementation process could cause problems for the whole process of IT Projects Implementation Mohamed (2011).

Generally, managing project means managing Iron Triangle components (such as; Scope, Time, Cost). So, conducting a research on the Iron Triangle project management is Paramount.

Rely on these facts the researcher tried to conduct research on the current practices and challenges of CBE's Iron Triangle IT Project Management Process and forward conclusion and recommendations based on findings to enhance the maturity level of PMOs. Consequently, the study has the following research objectives and questions.

1.3. Research Questions

a. What are the Project Management Practices of CBE in general and Iron Triangle components in particular?
b. What are the major factors that impede the implementation of Standardized Iron Triangle PM Processes on IT Projects in CBE?

1.4. Objectives of the Study

1.4.1. General Objective

The general objective of the study is to describe the status of Iron Triangle Project Management Practices and identify major challenges that impede the implementation of standardized Iron Triangle PM Process in managing CBE's IT projects.

1.4.2. Specific Objectives

The following tasks were undertaken in this study.

a. To describe the general practices of CBE IT Project Management Process and to determine the application of Iron Triangle Project Management components being practiced by CBE.
b. To identify the major factors those impede the implementation of standardized Iron Triangle PM Processes in CBE.

1.5. Research Motivation

I decided to do this thesis research on such a broad topic (for a master's thesis) purposely and ambitiously. The two main reasons that drive me to do so are: Firstly, my interest to use the opportunity to help me realize my aspirations in my professional development goal. Being a junior and ambitious in the discipline , I was looking for a broad research topic that would enable me consolidate my PM knowledge and its practice in the context of CBE IT projects, so that it can help me in the future in research and consultancy services in the area. Secondly, my desire is to do something that can, somehow, initiate the research in the area of Iron Triangle Project Management.

1.6. Significance of the Study

The researcher believed that this study has the following significance for different parties. These are:

1. The assessment result of this research can be used as initial enhancement of PM practice or activities regarding the IT projects in CBE. Further, the same result can also be used as a baseline to compare the success of future improvement efforts.
2. The result of this study can serve as input for those who are responsible for managing IT projects in Banking industry in Ethiopia.

3. It enables all CBE IT Project Managers to have a common awareness.
4. The PM students could be able to get a better practice via a body of knowledge.
5. It may also serve as a starting point for practitioners and researchers who want to conduct more comprehensive research in this area from Ethiopian Banking sector perspective.

1.7. Delimitation of the Study/ Research Scope

The result of the research would be more comprehensive if it covers the entire Banks in Ethiopia and all PMI PMBOK knowledge areas. However, due to financial and time constraints, it is delimited to head quarter of CBE in Addis Ababa and Iron Triangle project management knowledge areas. The head quarter is a place where IT projects are performed; PMO, Project office, and team members are sited. These staffs can provide the necessary information about the study better than other staffs who work at branch level.

As a summary, the study is delimited to:

- The Iron Triangle PM Practices and challenges in CBE.
- Only client side Project Managers are considered in the research.
- The Project Office and PMO in CBE from office perspective.

1.8. Limitations of the Study

- I didn't find prior empirical research related to Iron Triangle PM Practice and challenges on IT projects from Ethiopian banks perspective.
- The other limitation was the thesis schedule or time period which was given by the school of commerce Office of Graduate Coordination. It was very short.

1.9. Terms and Definitions

For the purpose of this thesis, the following terms and definitions apply. The definitions of terms were taken from PMI PMBOK 5th edition guide book PMI (2013).

- ***Iron Triangle****:* The Iron Triangle or Project Triangle expresses the connected Triple Constraint of time, cost and quality or scope that must be managed in project delivery.
- ***Process***. A systematic series of activities directed towards causing an end result such that one or more inputs will be acted upon to create one or more outputs.

1.10. Organization of the Thesis

This study is organized in five chapters. These are:

- **Chapter One*:*** introduced mainly; what PM is and its role on IT projects from Banking industry perspective. And this chapter also presented the statement of the problem and the objective and questions of the study.
- **Chapter Two*:*** is the part where literature review on the following concepts were reviewed and presented for further description of the research area to understand this study clearly. The intended reviewing points are: Project, Management, Project Management, Iron Triangle , The Connections among Projects, Programs and portfolios, Organizational Project Management (OPM), Formation of International standards, and Associations related to Project Management, Development of International Standards / Frameworks, PMI standard- PMBOK, PM Process Groups, PM Processes, and Knowledge areas, PM Process Groups Interaction in Time, Project Management Process Mapping ,Project Management Office, Project Management vs. Operation Management, Project Management Importance and Applications, Project Management practices at different level: In Economical developed countries ,In Economical Developing Countries (In Ethiopia), and In Financial Sector of Ethiopia , Challenges of Project Management in Developing Countries , Information Systems (IS) Vs Information Technology (IT) ,IT Project management , Nature and Characteristics of IT Projects , and Types of IT Projects.
- **Chapter Three:** This chapter has presented research design and methodology which includes general insight on the existing research methods, what research method was employed in this thesis and why? Data collection techniques and data analysis methods were stated clearly.
- **Chapter four:** is a part where data was (collected through questionnaire, interview, and document) analyzed and presented. And the findings from the analysis were discussed, interpreted and summarization was made as related to the research problems statement.
- **Chapter five*:*** is the part where concluding remarks and recommendations were made. And also future possible study areas were also suggested.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

In this chapter, the researcher has tried to review the theoretical and empirical background of Iron Triangle Project Management and related concepts. Moreover, it gives highlight on the following points. Project Management Importance and Applications, Project Management Practices at different level, Challenges of IT Project Management in Developing Countries ,Empirical evidence on IT Projects Success and failed, IT Project management Nature and Characteristics, and Types of IT Projects.

This chapter begins with defining the concept of project and provides an overview of different perspective regarding it; subsequently, the review explores the concept of Iron Triangle Project Management and its role in managing IT project in Banking services.

2.1. THEORETICAL LITERATURE REVIEW

2.1.1. Project

Many authors and references have defined project in different ways emphasizing its different aspects. Thus, I have tried to mention some of their views in the following paragraphs and finally come up with one summarized definition of project for the purpose of this thesis work.

According to PMI (2013), project is defined as a project is a temporary endeavor undertaken to create a unique product, service, or result whereas Ngoc (2010) defined as a project is a problem scheduled for solution. On top of this, Turner (2009) defined as a project is an endeavor in which human, financial, and material resources are organized in a novel way to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives.

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 using different organization resources. Consequently, this study bases on the summarized definition of project. This research defines a project as: A temporary endeavor (that has definite beginning and end time) undertaken following specific cycle of Initiation, Definition, Planning, Execution and Close to create a unique product, service, or result through novel organization and coordination of human, material and financial resources to realize organization's strategic objectives (Abadir, 2011).

On top of this, one thing that should be noted is both operations and projects are stretched towards the realization of organization's strategic objectives. However, there is main difference of Operations and Projects; Operations are Ongoing, Repetitive, Produces the same thing where as Projects Defined beginning and ending, unique deliverable and Defined scope (Kevin el al., 2004).

In addition, a project has a defined scope which is constrained by limited resource, involves many people with different skill and, usually progressively elaborated throughout its life cycle. A project can involve a single individual or multiple individuals, a single organizational unit, or multiple organizational units from multiple organizations. As stated in PMI (2013) a project can create:

- A product that can be either a component of another item, an enhancement of an item, or an end item in itself,
- A service or a capability to perform a service,
- An improvement in the existing product or service lines, or
- A result, such as an outcome or document.

Accordingly, Projects have evidently become the core activity in most companies and organizations where they are investing significant amount of resources in different types of projects as building new services, process improvement, etc. (Mohamed, 2011).

Now, we have an idea of what a project is; let's return to our expert sources for the definitions of management and project management.

2.1.2. Management

According to Dr. Karam (n.d), although Management as a discipline is more than 80 years old, there is no common agreement among its experts and practitioners about its precise definition. Moreover, Management is a universal phenomenon. It is a very popular and widely used term. All organizations- business, political, cultural or social are involved in management because it is the management which helps and directs the various efforts towards a definite purpose.

On top of this, Henry (n.d) said that to manage is to forecast and plan, to organize, to compound, to co-ordinate and to control while Harold said that Management is the art of getting things done through and within formally organized group. In addition to this, William defined management as: Management is that function of an enterprise which concerns itself with direction and control of the various activities to attain business objectives. Moreover, Management is the organizational process that includes strategic planning, setting objectives, managing resources, deploying the human and financial assets needed to achieve objectives, and measuring results (Managementstudyguide.com, n. d).

Now, we have ideas of what a project and management is; let's return to our expert sources for the definitions of project management.

2.1.3. Project Management

According to Atif (2010), the foundation of the project management can be traced back to as early as civilization itself. But the modern Project Management has its roots in the Second World War and is developed in construction and defense industry during the industrial revolution. Project Management has progressed through several evolutionary stages and has become established as a well-known management method (Marc & Konrad, 2013). According to ESI International (2006), Project Management is rapidly becoming a standard way of doing business in organizations. Most recently, the demand for Project Management has increased as number of projects is increased dramatically in a broad range of industries Atif (2010) with different definitions.

The definition and characteristics of a project and management have been considered above. It is now possible to develop a definition for project management. One thing that should be noted is the given relative young age of project management as a discipline PMI (2013); it is not surprising to find that Project Management has numerous definitions. Virtually, all projects are planned and implemented in a certain social, economic and environmental context. These contextual variations can be additional reason of PM definition variations. Similar to the case for project, many and different definitions were given for Project Management. In this research only few definitions has been incorporated and then come up with one summarized base definition of PM for this research.

The definition of Project Management is, as defined by PMI (2013), the process of the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. Whereas Addis Ababa University (2015) defined as Project Management is the process of planning and executing a piece of work from inception to completion to achieve safe achievement of objectives on time, within cost limits and to the specified standards of quality. In other words, PM is the organizing, planning, directing, coordinating and controlling of all project resources from inception to completion to achieve project objectives on time, within cost, and to required quality standards.

On top of this, Chartered Institute of Building (2002) explained that Project Management is the professional discipline which separates the management function of a project from the design and execution functions. Management and design may still be combined on smaller projects and be performed by the leader of the design team. For larger or more complex projects the need for separate management has resulted in the evolution of Project Management. Finally, as stated in Kevin et al. (2004) Project Management is the planning, scheduling, and controlling of project activities to achieve project objectives. Moreover, Ngoc (2010) has tried to integrate the definition of PM to the five phases of PM. Project Management involves planning, scheduling and controlling all of the project activities to achieve its objectives. In other words, PM is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. PM is accomplished through the application and integration of the PM phases of initiating, planning, executing, monitoring, controlling and closing.

These definitions of PM, like the definitions of a project, highlight certain characteristics that are important to PM. The most important characteristic of Project Management is that it is oriented toward achieving results. The whole purpose of PM is to accomplish the business result that is desired. However, Project Management is not an end in itself; it is a process to achieve an end (Kevin et al., 2004).

Accordingly, this study bases on the summarized definition of PM as compiled by (Abadir, 2011). This research adapted and defines PM as: The application and integration of modern Management and PM knowledge, skills, tools and techniques to the overall planning, directing, coordinating, monitoring and control of all dimensions of a project from its inception to completion, and the motivation of all those involved to produce the product, service or result of the project on time, within authorized cost, and to the required quality and requirement, and to the satisfaction of participants.

2.1.4. Evolution of Project Management

According to Marc and Konrad (2013), PM is applied not only to the management of single projects but also to the coordination and management of entire project portfolios. In its early days the PM was solely concerned with the implementation of single project in that era. But, today many organizations have involved the concept of PM. This is mainly because of its systematic approach of managing the projects (PMI, 2013).

Similarly other prominent researchers like Atif (2010) have discussed the evolution of PM from managing a single project to multiple projects and then towards project as strategy and business. The Figure below may illustrate this evolution.

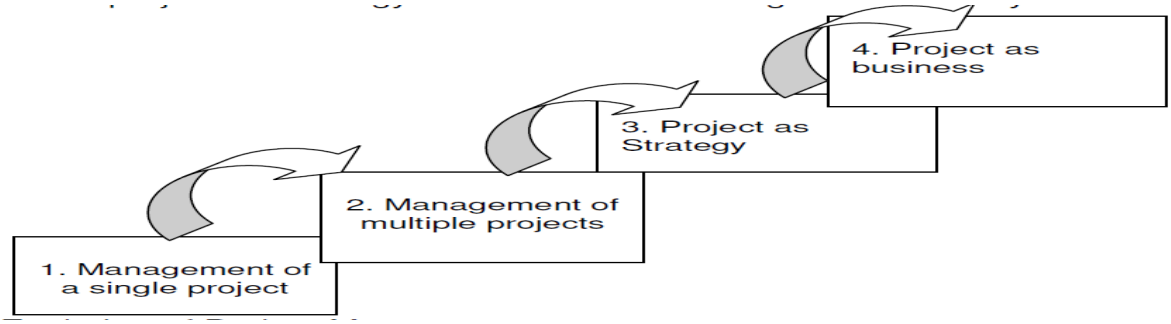

Figure 2-1.Evolution of Project Management. (Source: Atif, 2010)

2.1.5. The Relationship of Projects, Programs and Portfolios

As stated in PMI (2013) the relationship among Portfolios, Programs, and Projects is such that a portfolio refers to a collection of projects, programs, sub-portfolios, and operations managed as a group to achieve strategic objectives. Programs are grouped within a portfolio and are comprised of subprograms, projects, or other work that are managed in a coordinated fashion in support of the portfolio. Individual projects that are either within or outside of a program are still considered part of a portfolio. Although the projects or programs within the portfolio may not necessarily be interdependent or directly related, they are linked to the organization's strategic plan by means of the organization's portfolio.

Generally, Projects are temporary endeavors to build one or more deliverables whereas Programs are very large initiatives that are broken up into a set of smaller projects and then coordinated centrally. The projects in a program are related. However, Portfolios are collections of work - usually projects and/or programs and are a way to plan and manage the projects from an organization perspective. The projects may or may not be related.

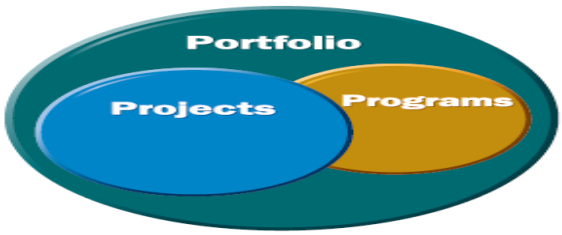

Figure 2-2. Projects & Programs and Organization's Portfolio. (Source: PMI OPM3, 2003)

2.1.6. Organizational Project Management (OPM)

The Organizational Project Management Maturity Model (OPM3) Knowledge Foundation Raju (2003) defines Organizational Project Management as the 'systematic management of projects, programs and portfolios in alignment with the achievement of strategic goals'. The concept of Organizational Project Management is new and is hardly found in literature and as a practice has just started to find acceptance. The essence of this concept is that the projects, programs and portfolios are related and their

interrelationships need to be considered in a holistic way in order to successfully meet organizational objectives.

This concept applies to all organizations big, small and in any industry or sector. An organization can consist of projects or programs or a combination of both. They are linked to strategy through portfolio management Raju (2003). Additionally, Organizational Project Management (OPM) is a strategy execution framework utilizing portfolio, program, and project management as well as organization-enabling practices to consistently and predictably deliver organization strategy producing better performance, better results, and a sustainable advantage (OPM3, 2008).

Figure 2-3. OPM processes depend on Project, Program and Portfolio Management (OPM3, 2003).

2.1.7. Formation of PM International Associations

By the end of the 1960s there was an increased understanding to recognize project management as a separate discipline (Atif, 2010). This recognition led to the creation of the two major professional bodies in the field of PM. These are:

- The International Project Management Association (IPMA) was founded in Europe in 1965. The vision behind the formation of IPMA was to promote project management and to lead the research in the development of the profession (Atif, 2010; IPMA, 2014).
- In 1969, the Project management Institute (PMI) in United States was formed to serve the interests of the project management industry. The premise of PMI is that the tools and techniques of project management are common and they can be used across different industries (Patrick, 2007; Atif, 2010).

2.1.7.1. Development of International Standards

The role of standards for PM profession has been an important issue for many years as cited in (Atif, 2010). A variety of benefits have been recognized from standardization. General benefits which apply to both technological and professional standardization include encouragement of technological innovation, guaranteeing marketplace, competition and convenience (JEDEC, 2016). In 1981, PMI Board of Directors approved to develop the procedures and concepts to support the profession of PM. This project proposal suggests three areas of focus such as standards, ethics, and accreditation (PMI, 1996). This initiative resulted in 1996 by the publication of: A Guide to the Project Management Body of Knowledge commonly referred to as a PMBOK (PMI, 1996). On the other hand the IPMA developed the ICB (IPMA Competency Baseline). Work on the ICB was initiated in 1993 and first version, in English, French and German, was presented in June 1998 (IPMA, 2000).

As stated in Atif (2010) some of the various standards that are related to PM are:

- Project Management Body of Knowledge (PMBOK) by PMI.
- Association for Project Management (APM) BOK by UK APM.
- Project IN Controlled Environments (PRINCE2) by Office of Government Commerce UK.
- Project and PM for Enterprise Innovation (P2M) by Engineering Advancement Association of Japan (ENAA).

In addition to this, the role of standards for PM profession has been an important issue for many years as cited in (Atif, 2010). A variety of benefits have been recognized from standardization. General benefits which apply to both technological and professional standardization include encouragement of technological innovation, guaranteeing marketplace, competition and convenience (JEDEC, 2016).

2.1.7.2. Project Management Institute Standard-PMBOK

The biggest contribution that the PMI made in its 40 years of history may be its development of the arguably most important project management standard—the PMBOK[R] Guide as stated in (Faisal, 2008). The PMBOK Guide is approved as an American National Standard by American National Standard Institute (ANSI) and is

recognized by the Institute of Electrical and Electronics Engineers (IEEE) as an IEEE standard (Atif, 2010).

On top of this, the PMI (2004) describes that much of the knowledge of tools and techniques for managing projects are unique to PM. However, understanding and applying the knowledge, skills, tools and techniques which are recognized as best practices are not sufficient alone for effective project management. As PMI emphasizes that in addition to the knowledge of tools and techniques, there are various other areas that are also vital in the application of PM (Atif, 2010). These are:

- Application Area Knowledge, standards and regulations.
- Understanding the project environment.
- General management knowledge and skills, and
- Interpersonal skills

The PMBOK guide divides the project into the five phases and describes it as a project management process groups. The process groups further divided into 47 processes as described somewhere in this document (PMI, 2013).

2.1.8. PM Processes, Process Groups and Knowledge Areas

2.1.8.1. Project Management Processes

As defined above PM is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. This application of knowledge requires the effective management of the PM processes (PMI, 2013). Since process is a set of interrelated actions and activities performed to create a pre-specified product, service, or result. Each process is characterized by its inputs, the tools and techniques that can be applied, and the resulting outputs (PMI, 2013).

Management of projects is accomplished through the use of the 47 PM processes as listed out in fifth edition of PMBOK Guide and incorporated in this document in Table 2-1 bellow. However, all the 47 PM processes are not meant to be performed uniformly in the management of all projects. The project manager and the project teams need to decide

which processes to employ, and the degree of rigor that will be applied to the execution of those processes (Abadir, 2011; PMI, 2013).

2.1.8.2. Project Management Process Groups

Project Management is accomplished through the appropriate application and integration of the 47 logically grouped PM processes, which are categorized into five Process Groups (PMI, 2013). These five Process Groups are:

- **Initiating Process Group**. Those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.
- **Planning Process Group**. Those processes required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project is undertaken to achieve.
- **Executing Process Group**. Those processes performed to complete the work defined in the project management plan to satisfy the project specifications.
- **Monitoring and Controlling Process Group**. Those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.
- **Closing Process Group**. Those processes performed to finalize all activities across all Process Groups to formally close the project or phase.

These PM process Groups has executed in a phased or cyclical manor.

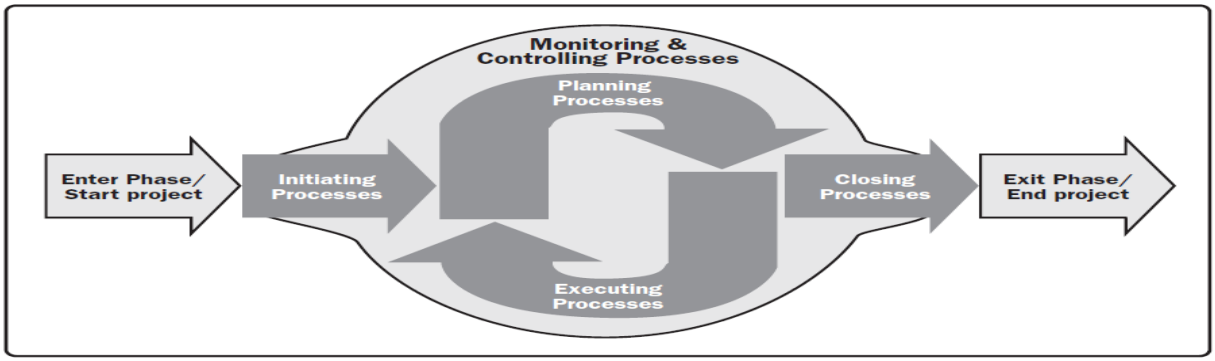

Figure 2-4. Project Management Process Groups Cycle (Source: PMI, 2013)

On top of this, as Turner (2009) said that at each stage of the project, it is necessary to follow a management process to deliver the work of that stage. Figure 2-5 below illustrates the management process being applied at each step of the project. This shows that project management is fractal management—each stage of the project is almost a mini-project in its own right—and so the management process is the life cycle being applied at lower levels (Turner, 2009).

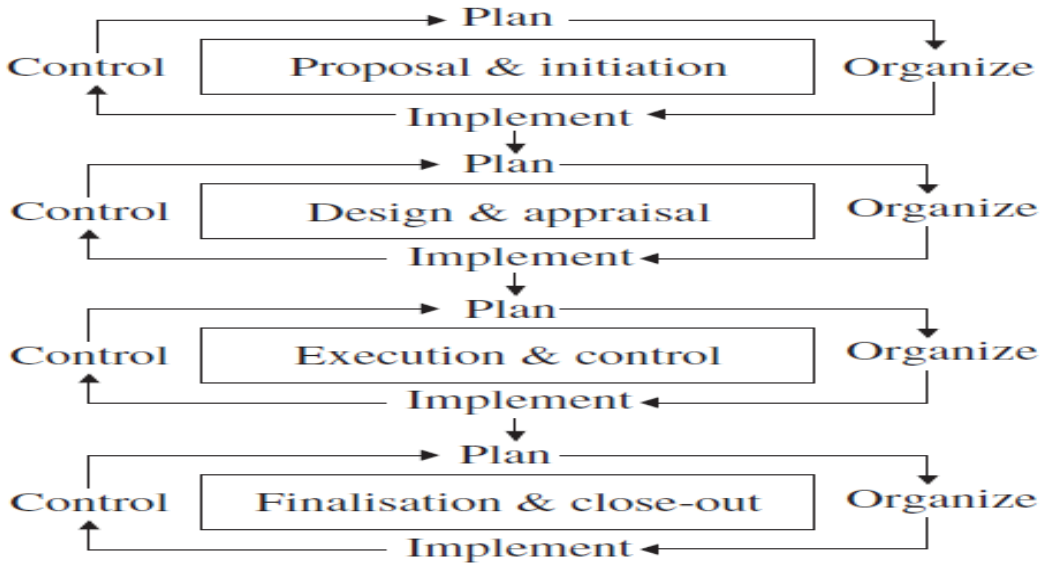

Figure 2-5 Project Management is fractal management. (Source: Turner, 2009).

2.1.8.3. PM Process Groups Interaction in a Project

Project Management process groups are linked by the outputs they produce. The Process Groups are seldom either discrete or one-time events; they are overlapping activities that occur throughout the project. Figure 2-6 bellow illustrates how the Process Groups interact and shows the level of overlap at various times. If the project is divided into phases, the Process Groups interact within each phase.

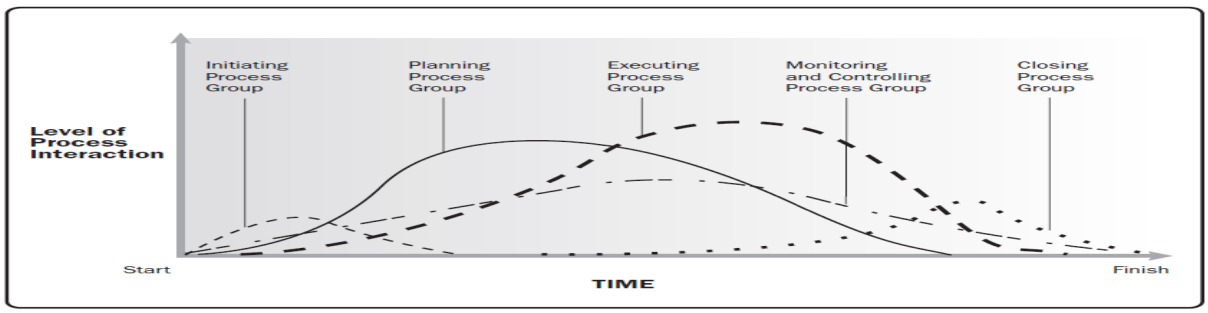

Figure 2-6. Process Group Interactions in a Project (Source: PMI, 2013)

2.1.8.4. Project Management Knowledge Areas

The 47 PM processes of PMBOK Guide are further grouped into ten separate Knowledge Areas (PMI, 2013). A Knowledge Area represents a complete set of concepts, terms, and activities that make up a professional field, project management field, or area of specialization. These ten Knowledge Areas are used on most projects most of the time. Project teams should utilize these ten Knowledge Areas and other Knowledge Areas, as appropriate, for their specific project. These Knowledge Areas are: Project Scope Management, Project Cost Management, Project Time Management, Project Quality Management, Project Integration Management, Project Human Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management and Project Stakeholder Management.

In addition to the above ten knowledge areas, there are other industry specific additional knowledge areas that the project manager should consider in managing projects. For example, the construction extension to PMBOK includes four additional knowledge areas such as financial, safety, environment and claim management (Chartered Institute of Building, 2002; Abadir, 2011).

2.1.8.5. Project Management Process Mapping

Project management process mapping will demonstrate the correlation and the workforces among five project management process groups and ten project management knowledge areas.

Table 2-1. Mapping of the PM Processes to Process Group and the Knowledge Areas (PMI, 2013)

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses		11.6 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

2.1.9. Project Management Office

A Project Management Office is a management structure that standardizes the project related governance processes and facilitates the sharing of resources, methodologies, tools, and techniques. The responsibilities of a PMO (may carry a variety of names) can range from providing Project Management Support functions to actually being responsible for the direct management of one or more projects (PMI, 2013).

In the last few years, PMOs have become a very popular cure for firms' PM ills. However, many firms decide to implement a PMO or Project Office without asking

several fundamental questions like what the PMO will do? The answer to that question further depends on other factors Kevin et al. (2004) such as:

- What type of organization does the firm has (i.e., functional, matrix, projected);
- At what level in the organization will the project office be located (i.e., strategic, tactical, operational);
- What level of PM maturity already exists within the organization?

Generally, the possible answer of the question, what is the role of the PMO? Will be either of the following; only provide administrative support to project operations, be a center of excellence for PM practitioners, be the managerial center to which project professionals report, or have complete responsibility for the planning and delivery of entire projects. All of these possibilities have a bearing on what a PMO will look like and how it will function.

According to Kevin et al. (2004), a common error that firms make is to confuse the opening of a PMO with the implementation of project management in their firm. The two may happen simultaneously, but they are not the same. Implementing PM at a firm means beginning to use a sound, repeatable project methodology at some level in the organization with the objective of growing the methodology's use throughout the firm over a period of time. Opening or creating a PMO means instituting an administrative, knowledge-based, tactical or strategic entity that will support project processes in a designated area and level of the firm.

2.1.10. Project Management vs. Operation Management

The fundamental difference between PM and Operation Management (OM) stem from the difference in the type of work they manage. PM deals with management of projects, which are temporary and unique PMI (2013) whereas OM deals with management of operations, which are ongoing and repetitive. Generally, project organization changes continually as the project progresses through its various phases and terminate when the mission is accomplished; whereas the ongoing organizations that manage operations sustain at least over a period of time and continue assuming a broader outlook.

Additionally, Organizations use projects to change operations, products, and services to meet business need, gain competitive advantage and respond to new markets (Abadir, 2011; Mohamed, 2011; PMI, 2013). Despite the existence of fundamental difference between PM and OM, both share many things in common. They share the same basic management philosophies (planning, organizing, and control); both make and implement decisions, allocate resources, manage organizational interfaces, and provide leadership for the people who are involved in performing the work. Generally, in addition to knowledge of PM, successful management of project demands knowledge of general management and working knowledge of application areas, for example for a IT project knowledge of IT (Abadir, 2011; PMI, 2013).

2.1.11. Project Management Importance and Applications

According to Atif (2010), most of the emergent industries since world-war II are project intensive. This widespread use of projects in organizations demanded an approach that can efficiently manage these temporary endeavors which are critical to the organizations strategic objectives. Generally, PM is used extensively in some form within many organizations. There has been no identified profession or industry where project management practices will not work (Abadir, 2011).

According to (Atif, 2010; Abebe, 2017), Project Management has led a number of organizations to be more effective and efficient in delivery of their products and services, to have more accurate budgeting and scheduling and improved productivity.

Application of Project Management – distinguishes what types of work should and should not be categorized as projects and includes the general flow of projects from idea into deployment. This step also defines and outlines project management process groups (IT Project Management Practices Guide, n. d).

Using PM generally helps to clarify goals and identify problem areas and risk; to isolates activities and easily monitor outcomes PMI (2013). Further, using PM enhances accountability as works can be isolated and responsibilities can be assigned. Moreover, it helps focus attention on few specific and important tasks.

Generally, According to Abadir (2011) and others, PM can best be applied when:

- Resources are to be shared among many units.
- Special attention or focus is to be given to important undertakings (example to focus attention on specific customers in specific market).
- Integration of systems and subsystems is sought within independent units.
- Dealing with ad hoc, complex, unfamiliar, unique, or rare; activities, problems and opportunities.
- Dealing with tasks that require pooling of many resources and capacities from diverse sources (example providing emergency response during disasters).
- It is desired to bring a wide range of experience and viewpoints into focus (example in research and product development or solving complex problems).
- Dealing with an undertaking that require massive input of capital, technology, skills, and resources.
- When there is a need to manage change.
- When it is desired to have unified management of a project-based contract in order to avoid the customer work with many different functional units.

2.1.12. Iron Triangle Project Management Knowledge Areas

According to PMI (2013), the Iron Triangle project management knowledge areas encompass the three main pillars (such as; Scope, Cost, and Time) of project management discipline. They are a separated knowledge areas which has their own process, inputs, outputs, different tools and techniques. As defined in PMI (2013) and well-illustrated in Microsoft (n.d) these three knowledge areas have been described as follows:

- **Project Scope Management** includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project.
- **Project Cost Management** includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget.
- **Project Time Management** includes the processes required to manage the timely completion of the project.

Moreover, Iron Triangle components are also the bases for project definition. According to Turner (2009) project is defined as: “a project is an endeavor in which human, financial, and material resources are organized in a novel way to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives.”

As published by Microsoft (n.d) the project triangle is also known as the “iron triangle” and, less poetically, the “triple constraints.” Whatever you call it, it amounts to the same thing. Moreover, you can’t change a project’s budget, schedule, or scope without affecting at least one of the other two parts. Thus, every project balances a “triangle” of time, money, and scope.

As a summary, the Project Triangle or Iron Triangle expresses the Triple Constraint of time, cost and quality or scope that must be managed in project delivery. Each constraint is connected and moving one point of the triangle will impact the other two points. The 'constraint' in the term triple constraint refers to the basic factors that need to be accounted for during planning and delivery of any project. These three factors are the well-known attributes of scope, schedule, and cost. Scope refers to the total amount of work involved in delivering the project, cost refers to the sum of all resources required to deliver that work, and schedule reflects the time estimated or allotted to the project's delivery. These three factors can, and should be, linked together (PMI, 2013).

Figure. 2-7. Iron Triangle or Project Triangle (Source: Microsoft, n.d)

Some examples of how one affect the other:

- To bring in the finish date (time), you could spend more in resources (money) to finish the work faster or a cut feature (scope) so there’s less work to do before the new deadline.

- To finish the project under budget (cost), you could get rid of overtime and finish the project later (time) or cut features (scope).
- To add features to a product (scope), you could extend the deadline to make time for the new work (time) or add people to get it done faster (cost). It is also possible to do both.

2.1.13. Challenges of PM in Economical Developing Countries

Large and medium-sized projects almost always present major problems for the economical developing countries. Abbasi and Al-Mharmah as cited in Atif (2010) argued that "existence of several social, cultural, political and financial problems leads to poor management performance in less developed countries. Therefore, the strategy for implementing project management in less developed countries must be consistent with the cultural and characteristics of the particular society and configuration of its economical, political and administrative systems".

As stated in Atif (2010) different barriers which hinder the project success in less developed countries are:

- lengthy approval procedures,
- existing administrative system,
- lack of ownership
- lack of authority,
- Poor estimation of activity cost,
- Poor Schedule preparation,
- Deficiencies in technical, financial management and entrepreneurial skills,
- Inadequate and inappropriate project organization structures, which lead to problems of authority, responsibility, communication and coordination, and
- Shortage of skilled manpower, especially at managerial levels.

All of these problems make the management of projects particularly difficult in the economical developing countries.

2.1.14. Information Systems Vs. Information Technology

The definition of both Information Systems (IS) and information technologies (IT) are closely related to each other. However, they are different in their functions. According to Artit (2012), IT relates to the products, methods, inventions, and standards that are used for the purpose of producing information. It can also be defined as "the preparation, collection, transport, retrieval, storage, access, presentation, and transformation of information in all its forms (voice, graphic, text, video, and image).

On the other hand, IS "consists of the IT infrastructure, application systems, and personnel who employ IT to deliver information and communications services for transaction processing/operations and administration/management of an organization" (Artit, 2012). Therefore, Information Systems is a set of components which interact to produce information, which includes hardware, software, data, procedures, and people. These components can be found in every Information System (Steven, 2008; Mohamed, 2011).

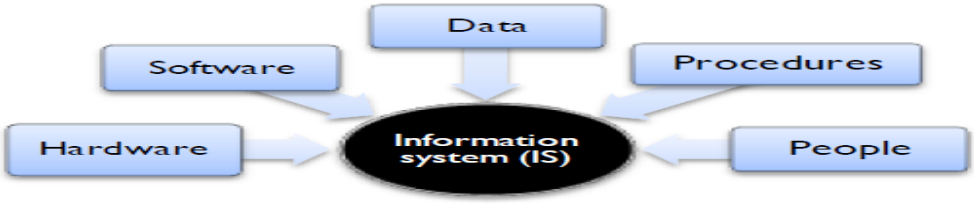

Figure 2-8. Five Components of an IS (Source: *Mohamed, 2011)*

As shown in Figure 2-8 above, Hardware refers to computers, storage disks, keyboards, and communication devices while software is relevant to word-processing programs. Data or information is included texts, words, sentences, and paragraphs in reports. Furthermore, procedures refer to the methods for using the program and involved activities. The last element is people. IS is not only computers, programs, and communication devices, but it also focuses on the assembly of hardware, software, data, procedures, and people; in other words, information system means a system of communication between people (Mohamed, 2011; Artit, 2012). Information movement can take place between humans, humans and machines, and/or between machines.

Generally, I can say that Information Technology is a subset of Information Systems. In other words, Information Systems is broader than Information Technology.

2.1.14.1. IT Project Management

Project Managers administer the development of IS and IT, which are critical to the survival of many firms. It is critical that IS development projects be effectively managed. Problems occur when project management does not recognize the risks of the project and then fails to achieve the goal of shepherding the project toward completion in an acceptable manner, either in terms of elapsed time, accumulated cost, and/or functionality. IS projects, like projects of any type, can easily become "a monster of missed schedules, blown budgets, and flawed products" (Brooks, 1987). The necessity of sound project management has been the subject of many studies (Huff & Prybutok, 2008).

An additional requirement for increasing the probability of IS development project success is having a project manager who knows how to manage the project.

2.1.14.2. Nature and Characteristics of IS/IT Projects

The management of IS /IT project has some differences from the management of other projects. The differences mainly stem from the nature and characteristics of IS/IT projects. So, the consideration of these differences is important for successful management of IS /IT projects. In general specking IT projects have the following characteristics as stated in (Cadle & Yeates, 2008) are:

- Are usually intellectual or skill intensive.
- Are usually undertaken inside; hence, variables such as weather and traffic are not suspected.
- Compared to most other industries, IT projects involve relatively highly professional.
- Are intangible in case of software system. It is usually quite hard for the users of a piece of software to express their wishes clearly and for the business analysts to capture them unambiguously. But infrastructure projects are tangible.

2.1.14.3. Types of IT Projects

In the field of information systems, there are a variety of types of projects which are undertaken. Although the general principles of project management are broadly common to all IS/IT projects, there are ways in which the different types of IS/IT project do differ from one another. Accordingly, based on Cadle and Yeates (2008) and the researcher's experiences the following nine broad types of IS/IT projects are identified. These are:

1. Software development projects
2. Package implementation projects
3. System enhancement projects
4. Consultancy and business analysis assignments
5. Systems migration projects
6. Infrastructure projects
7. Outsourcing (and in-sourcing) projects
8. Disaster recovery projects
9. Smaller IS projects

This classification may be modified to other classifications like 'internal' projects (done within an organization) or 'external' (carried out under contract). In addition, it is possible to categorize as: involving package implementation, original software development and putting in a new infrastructure, for example.

Although the general principles of managing any project are essentially the same, there are some differences in the dynamics of each type of IT/IS a project. Thus, the project manager needs to keep in mind that different types of project call for the deployment of different mixes of the project manager's skill-set.

Moreover, the management of IT project has some differences from the management of other projects. The differences mainly stem from the nature and characteristics of IT projects. So, the consideration of these differences is important for successful management of IT projects.

2.2. EMPIRICAL LITERATURE REVIEW

2.2.1. PM Practices at Different Level

The World Economic Situation and Prospects as stated in WESP (2014) classifies all countries of the world into one of three broad categories: developed economies, economies in transition and developing economies. On the other hand, Atif (2010) mentioned that the United Nations divides countries into two groups: developed and developing countries. Accordingly, for the purpose of this study I have considered the developed economies, and economies in transition classification as one category. Thus, I have employed the phrases; economical developed and economical developing countries throughout this document.

2.2.1.1. In Economical Developed Countries

According to Huff and Prybutok (2008) "Project Management has become a major component of productivity and innovation in our high-technology society", economical developed countries. PM makes a number of organizations to be more effective and efficient in delivery of their products and services in developed countries (Atif, 2010). It enables them to have more accurate budgeting, scheduling and improved productivity by large.

2.2.1.2. In Economical Developing Countries

According to Abbasi and Al-Mharmah (2000), in economical developing countries the implementation of PM tools and techniques is still in its early phases of development. PM is a relatively modern practice that attempts to achieve planned objectives within specific time and cost limits, through optimum use of resources and using an integrated planning and control system. The growth and acceptance of project management is continuing to increase as resources become scarce in economical developing countries (Atif, 2010; Abebe, 2017).

2.2.1.3. In Ethiopia

Ethiopia like other economical developing countries spend substantial amount of its budget in infrastructure development that involve significant construction works in

projects such as construction of roads, buildings, water works, telecom civil works, Hidassey Dam ,and sugar factories, etc. (Abadir, 2011). In addition to these, there is a remarkable investment on the IT projects in different sectors; particularly in the service industry like Banking. Some of the implemented projects in the Banking sector are: CORE Banking solution, Network & Data centere infrastructure, ERP, E-Banking, etc. (kelemie, 2013).

In connection with, the growth of IT sector in the Ethiopia has been limited because of different factors: low level of technology literacy, price for IT equipment, lack of sufficient infrastructural development, lack of trained man power, etc. However, despite all these constraints, the development can be seen in building ICT supported networks like the SchoolNet, WoredaNet, UniversityNet, AgriNet, and HealthNet though it is still the least developed (kelemie, 2013).

On top of this, Tomonari (2008) stated that even though e-government is at its emphatic stage in Ethiopia, there are different projects already implemented and some are underway. Among the already implemented projects are the WoredaNet, which interconnects more than 600 woredas all over the country. The services that are offered by this network are videoconferencing services, directory, and internet services. These all are the indicators of the existences of IT project management practice in Ethiopia. But the question is to what extent these projects used the PM best practices or standards?

2.2.2. In Financial Sector of Ethiopia

Financial sector has a great impact on the economy of all countries. Almost, it is very difficult to think of any development activity that does not involve Banks. Moreover, financial sector is one of the industries that provide the largest employment opportunities in Ethiopia. Like any economical developing country the Banks in Ethiopia play major role and contributes highly to the development of the economy of the country.

As stated in kelemie (2013) the result of IT projects has brought a paradigm shift in the functioning of Banks and delivery of banking services. The growth of the Internet, Mobile, ATMs and communication technology has added a different dimension to Banking industry. Today, some of the transactions (balance, found transfer etc…) can be done from the comforts of one's home without visiting a Bank's branch. This indicates

that technology is no longer an enabler, but a business driver. Additionally, the Ethiopian Banks (both public and private) have been implementing projects like comprehensive Banking software known as CORE Banking Solution (CBS) that provides the needs of all branches of the Bank and its Head Quarter centrally.

These all are the indicators of the existences of IT Projects Management practice in banking service. However, the question is that to what extent CBE is using Iron Triangle project management standards like PMI's PMBOK to manage projects in a better way? How CBE manage IT projects? What are the related challenges? These are the questions which were addressed in this research.

2.3. IT Project Status and Conceptual Framework

According to PMI (2013), the Iron Triangle PM Knowledge areas encompass the three main pillars (such as; Scope, Cost, and Time) of project management discipline. They are a separated knowledge areas which has their own process, inputs, outputs, different tools and techniques.

As ENAS (2017) explained, there is vast evidence that large IT projects indeed tend to fail. IT projects seem to fail in both private and public sectors. However, failure in IT projects appears to be more remarkable due to management, organization, human and cultural issues –not technical problem (Francis & Rafi, 2002). In addition to this, Atif (2010) identified the different barriers which hinder the project success in less developed countries are: lengthy approval procedures, existing administrative system, lack of ownership, lack of authority, and Poor estimation of activity cost, Deficiencies in technical, financial management and entrepreneurial skills, inadequate and inappropriate project organization structures, which lead to problems of authority, responsibility, communication and coordination, and Shortage of skilled manpower, especially at managerial levels. All of these problems make the management of projects particularly difficult in the economical developing countries.

Accordingly, Project success mainly characterized by the Iron Triangle knowledge areas. Therefore, well managing of project scope, cost and time leads to project success.

However, the following empirical evidence indicates that many IT projects are failed as categorized and presented in (ENAS, 2017).

- ***Successful project:*** These projects are completed on time and on budget, with all features and functions as initially specified. Only 16.2% of projects fell in this category.
- ***Challenged project:*** These projects are completed and operational but are over-budget, over the time estimate, and offer fewer features and functions than originally specified. 52.7% of all studied projects fell into the challenged category.
- ***Impaired/ Failed project:*** These projects are cancelled at some point during the development cycle. They are abandoned at some point and thus became total losses. 31.1% of all studied projects fell into this category.

Therefore, it should be noted that for the purposes of this study the above three empirical evidences or measures of project outcome was underlined. A successful project must be on time, on budget, and deliver quality (features and functions) as promised. Anything less will be either a failed project or a challenged project.

Rely on these facts, understanding and well managing of the Iron Triangle components is essential to project success. Because, these three components of Iron Triangle are the main pillars of project management discipline (PMI, 2013). Accordingly, from Project management definition perspective as defined in (PMI, 2013; Addis Ababa University, 2015), PM knowledge, skills, tools, techniques and best practices can be applied whenever managing these three components in project activities to achieve project objectives on time, within cost, and to required quality standards.

On top of this, understanding the nature of IT projects, applying pertinent methodology or Standards/ Best practices, and awareness of numerous and varied challenging issues surrounding the implementation process could contribute to the whole process of IT Projects development and Implementation (Cadle & Yeates, 2008; Mohamed, 2011).

Literature Review Findings and Conclusion

- Iron Triangle components encompass the three main pillars of project management discipline.
- Iron Triangle components are the bases for project definition.

- It is impossible to change a project's budget, schedule, or scope without affecting at least one of the other two parts. Thus, every project balances a "triangle" of time, money, and scope.
- The majority of IT project failure appears to be more remarkable due to management, organization, human and cultural issues –not technical problem.
- Understanding nature of projects and employing pertinent methodology or standards has a great contribution to project success.
- Project success from project management perspective means well managing of Iron Triangle knowledge areas; delivering project on time, on budget, and with quality (features and functions) as promised.

As a concluding remark, understanding and well managing of the Iron Triangle components is essential to project success. Moreover, understanding the nature of IT projects, applying pertinent methodology or Standards/ Best practices, and awareness of numerous and varied challenging issues surrounding the implementation process could contribute to the whole process of IT Projects Implementation- project success.

Rely on these facts the researcher described the current practices and challenges of CBE's IT Iron Triangle PM Process and forward Conclusions and possible recommendations based on findings to enhance the maturity of PMOs. Thus, the study has the following research conceptual framework.

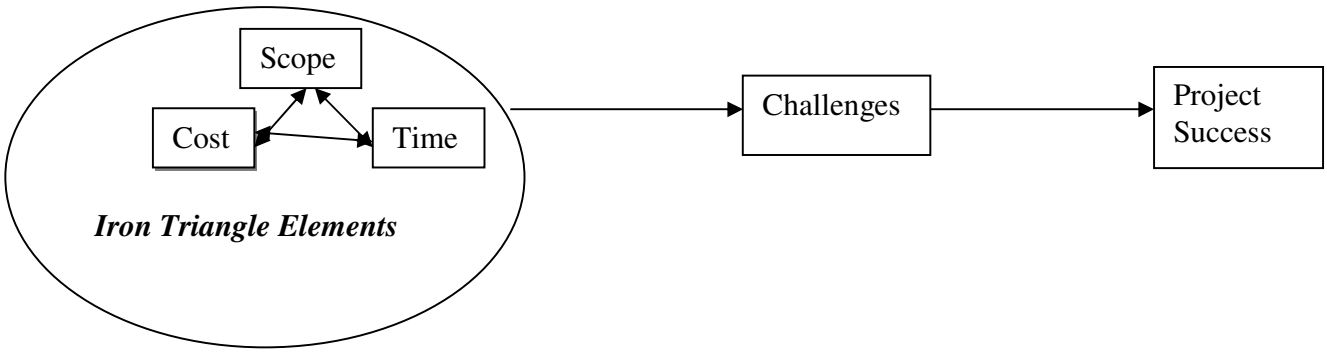

Figure 2-9. Conceptual Frame work of the study (Source: Own)

CHAPTER THREE

RESEARCH METHODOLOGY AND DESIGN

This chapter presented what research design and method were employed to address the formulated research objectives. Thus, the following points were addressed: What research approach was employed? What research method was used and why? How the respondents for the study were selected and why? What data collection techniques were employed? And how data was analyzed?

The chapter starts with the discussion on research approach. Subsequently, the argument was made about the selection of an appropriate methodology for this research. The next section of the chapter described the research design for the research which is followed by the discussion on the data collection and analysis techniques. The last section of the chapter discussed about the research validity, reliability and ethical standards of this particular study.

3.1. Research Approach of the Study

In research there are two types of research approaches namely; deduction and induction. In this study, the researcher did not formulate any hypothesis or 'theory' from the beginning, but instead have formulated some research questions which are anchored on the statement of the problem, and research objective. To address these questions, the quantitative and qualitative data were collected, coded, analyzed, interpreted and presented. Therefore, for this study, the inductive approach with Mixed research method was applied (Mohamed, 2011; SAUNDERS et al., 2012).

3.2. Research Method of the Study

As explained in Atif (2010) methodology is the combination of techniques used to enquire into a specific situation; whereas methods are the individual techniques for data collection, analysis etc. Moreover, Mohamed (2011) mentioned that the choice of research methods manipulates the way in which the researcher collects data. Thus, this part focuses on the method that has been applied in this research.

Thus, this study employed the mixed research method to compliment and get detail information via triangulation (Dean et al., 2008; Mohamed, 2011). The strategy of inquiry for this approach is concurrent procedures (Anene & Annette, 2007). Moreover, the choice of method is based on the purpose/ nature of the study which is descriptive survey (Kumar, 2011).

Therefore, this study employed the mixed research method as a research choice and descriptive survey as a research strategy. These methods were selected for this particular study because it is found an appropriate technique for collecting vast information and opinion from respondents in addition to its lower cost, time and convenience to include large sample size (Abadir, 2011).

3.3. Research Design of the Study

There are many definitions of research design for example, it can be defined as "The research design constitutes the blueprint for the collection, measurement, and analysis of data" and "research design is the plan and structure of investigation so conceived as to obtain answers to research questions" (Mohamed, 2011).

Therefore, the research design adopted for this study is a descriptive survey which is used as a road map for achieving the research objectives of the study. This design is appropriate because of the nature of the study and the research questionnaire was designed in such a way that they addressed key issues on status of Iron Triangle Project Management Practices and major challenges that impede the implementation of standardized Iron Triangle PM Process in managing CBE's IT projects.

The detail discussion about the research design was presented below. Figure 3-1 below is illustrating the research design to carry out this research project. Thus, the overall thesis structure is governed by the following main research design components and steps as shown below.

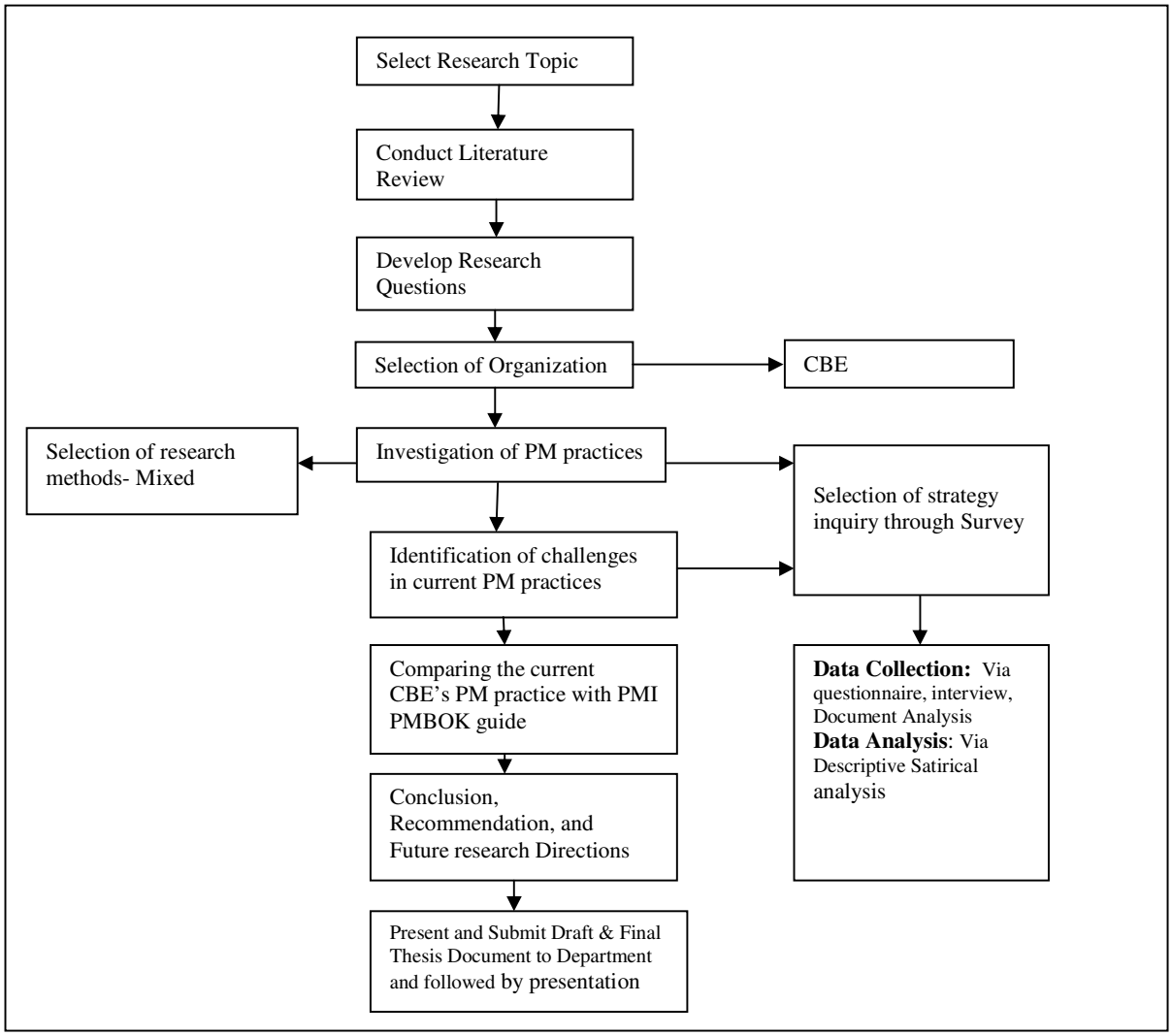

Figure 3-1. Depicts the research design and steps. (Source: Own)

a. Literature Review: This research started with a literature review focusing on key concepts and empirical evidences on the areas of PM.
b. Assessing the Current PM Practice and Challenges: A descriptive survey with a mixed research methods were applied to assess the current PM practice, and problems that impede the implementation of standardized Iron Triangle PM knowledge areas in CBE.
c. Presenting, Discussing and interpreting the findings were made.
d. Finally, forwarding future research areas, Conclusion and Recommendations were made.

3.3.1. Steps that were taken during this Study

1. Conducting a literature review to capture PM related concepts and empirical evidence.
2. Assessing the current Iron Triangle PM Practice and challenges.
3. Collected data was analyzed.
4. The findings resulting from the data analysis (#3) was discussed with respect to the research questions.
5. These findings (#4) were interpreted within the context of the research objective.
6. The thesis concluded with a summary of the findings, Conclusion, recommendations and Future research areas.

3.3.2. Source of Data

In this study, two sources of data were employed. The primary data sources used in this study were IT Project Managers and Program Management Office Director, who have decision power related to IT projects and they have more exposure to PM practices than other staffs of the Bank in relation to IT projects. In addition to this, secondary sources of data such as; Project Charter, PM plan, and change management, Project Performance Report, Contract Document and best practice documents related to PM were checked.

3.3.3. Population

The population of the study was all IT Project Managers (ten in number) and Director of Program Management Office of CBE. Generally, from site perspective, IT Project Offices and Program Management Office were selected as the unit of analysis.

3.3.4. Census

This study employed Purposive sampling technique for interview since the interviewees were selected based on their specialized insight or special perspective, experience, characteristic, or condition when there is something the researcher wishes to get and understand (Yegidis & Weinbach, 1996). For questionnaires census was employed since all IT Project Managers were taken as respondents.

3.3.5. Instruments of Data Collection

Generally, three types of instruments namely: Questionnaire, Document Analysis and Interview were used for the data collection. The primary data was collected through questionnaire and interview.

3.3.5.1. Questionnaire

A questionnaire was designed based on Iron Triangle PM Processes which includes the three main PMBOK knowledge areas such as; Project Scope, Cost and Time Management and General PM Process Aspects. The questions are open and closed on practices and challenges of Iron Triangle PM related to the above four categories. The questionnaires were prepared and distributed to IT Project Managers of CBE. Thus, the questionnaire contains 41 questions in five categories. The first section was related to respondent information. The second section dealt with General PM Aspect. The third section dealt with Project Scope Management. The fourth section is about the Project Cost Management. And the fifth section dealt with the Project Time Management aspect of IT Project Management. See the ***Appendix B.***

The Questionnaires were adapted from Reference Maturity Assessment Survey Questionnaire Abadir (2011) which was applied to any organization - small or big, profit or non- profit in any industry or part of the world (Raju, 2003). In addition, the questionnaire has been developed in line with the PMI's PMBOK Guide which is a well-accepted standard in Project Management.

3.3.5.2. Interview

It is important to interview right people who have rich knowledge about the studied phenomenon; otherwise there is a risk that the interviews will not fulfill the purpose of the thesis. The choice of respondents for this thesis was selected from the people who were involved in managing and implementing of the IT project. Being part of the implementation process, the researcher believed that, they would be able to give details of the information which would be relevant for this study. The selection of the respondents in this research was made based on their roles, expertise, and experience involved in IT project implementation process in order to achieve the purpose of the study.

Informal information about interviewees' experience and knowledge was collected by the researcher prior to conduct an interview. They possess the experience and perspective in project management that this research wishes to understand. Given the PM experience and background of potential interviewees, purposive sampling method seems the most logical choice for interview.

The main purpose of this interview session is to supplement and increase the validity of the information obtained through the questionnaire. Thus, the objective of Iron Triangle PM Development and implementation practice and challenges of the study were addressed.

The appointment was given to interviewees two days before their scheduled interview date. The average time for the interviews was 55 min. All interviews were conducted face-to-face, in person, at the interviewees' site of business. The interview questions were attached. See ***appendix A.***

3.3.5.3. Document Analysis

Document analysis was made as believed necessary. These were: PM related books, journal articles, conference proceedings, and relevant Iron Triangle PM related internet sources were reviewed to know the subject area in depth, and assess other countries experiences in relation to IT projects PM process. In addition, CBE's Program Management Office documents such as; Project Charter, PM Plan, and Project Change Management documents, Project Performance Reports, and Project Closure documents, PM Policy and Procedure documents were checked.

3.4. Pilot Study

In order to assess the relevance of the instruments designed to collect data for the study, the pilot study was conducted. The aim was to find out and avoid ambiguity, omissions and misunderstanding of each item. Using the relevant comments from results of the pilot study and suggestions of the advisor, corrections were made. Some of the comments were: changing the **Yes** and **No** questions to the 5 point likret, and splitting some questions.

3.5. Procedures

The data-gathering tool used in the study was drafted on the basis of the reviewed literature and the intended data to be collected. The set of questionnaires were distributed to the respondents. The data collection process was administrated by the researcher.

All interviews were done by the researcher. Data collections through interview were conducted by speaking to the interviewees face to face. Before conducting the interview, the researcher tried to create conducive atmosphere and explain the purpose of the interview to them. As a result, necessary information was collected, organized and processed separately for interpreting and summarizing purpose to produce the findings.

3.6. Method of Data Analysis

The analysis of data is the process where one is trying to gather and present the data in such way so it has a good structure and becomes easy to understand (Artit, 2012). In addition, data analysis is a process of bringing order, structure and meaning to the mass of collected data. The goal with the analysis is to be able to come up with valid conclusions based on the empirical data.

The analysis was anchored to the statement of the problem, research objective and research questions. Thus, the quantitative and qualitative data was collected, coded, analyzed, interpreted and presented. The data from the closed ended questions were coded and entered to SPSS version 20.00 for analysis and summarize the data descriptively using tables, percentages and frequency. While the open ended questions of the questionnaire and interview were categorized by the researcher's hand in a generalizable format.

Finally, all the aggregated data were further discussed and then findings were presented to the reader in a readable format. After which conclusion was made and recommendations were delivered.

3.7. The Trustworthiness of the Study

Validity and reliability are two major components to measure the quality or trustworthiness of the study. Ensuring validity and reliability of the data obtained in survey is critical as most of the time compared with other data gathering method such as interview and case study approach (Abadir, 2011; Artit, 2012).

3.7.1. Validity

Validity is concerned with the question of whether the researcher is studying the phenomenon he/she purports to be studying (Artit, 2012).

In this research the validity was assured by:

- Performing content validity and using standard questions for a questionnaire.
- Conducting pilot study and got inputs from advisor as well as the respondents.
- Making discussion on summary under each interview question was made for corrections and adding more information which was missing.
- The interviewees were required to support their response by providing documents.
- Further, to control the impact of respondent bias, the researcher delivered the questionnaires in person to the IT Project Managers by explained the importance of accurate data for the research and also to the studied organization.

3.7.2. Reliability

Reliability is concerned with the question of whether the researcher is obtaining data on which she/he can rely. It is concerned with the findings of the research; if they can be repeated and found the same result then it is considered to be reliable (Artit, 2012).

Thus, in this research the reliability was assured by:

- Collecting the data from different sources i.e. IT Project Office and PMO.
- The triangular / mixed research method.
- 5-point Likert Cronbach-Alpha test

The reliability of the 5-point Likert scale questionnaire items was checked by the Cronbach-Alpha test using SPSS software. The questionnaire items were categorized as General PM Process Aspect, Project Scope Management, Project Time Management and Project Cost Management. Reliability test was conducted for each of these categories and the Cronbach Alpha test scored approximately at **0.74, 0.86, 0.93** and **0.86** respectively.

Therefore, the score supports the presence of good internal consistency among the items and promised the reliability and acceptability of the study items.

A researcher has devised 41 questions questionnaire to measure how IT Project Managers handle Iron Triangle PM Practice and challenges. Each question was a 5-point Likert item from "strongly disagree" to "strongly agree".

3.8. Ethics

Ethics are norms or standards of behavior that guide moral choices about our behavior and our relationship with others. The goal of ethics in research is to ensure that no one is harmed or suffers adverse consequences from research activities (Atif, 2010). As a researcher the obligation is not only professionally but in particular ethically to make value judgment and use discretion in resolving the ethical issues.

Therefore, for the purpose of this research the ethical standard of doing the research was strictly followed: It is assured to all the respondents who were take part in the research that there privacy is kept intact at all times during and after the research. The researcher was also ensuring the consent of the participant. Moreover, before the data collection phase a formal cooperation letter was submitted to the PMO to carry out the data collection phase. See ***appendix C.***

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1. Introduction

This chapter presents the result of the data obtained from the respondents using descriptive survey. To analyze the collected data SPSS Statistics version 20.00 was used. The findings were organized in to five basic categories namely; Respondents' characteristics, General PM Process Aspect, Project Scope Management, Project Time Management and Project Cost Management. In this section, the findings of the study and discussion were presented under each question whereas an implication was stated at the end of each category.

4.2. General Information

Historically, Commercial Bank of Ethiopia (CBE) dates back to the establishment of the State Bank of Ethiopia in 1942. CBE was legally established as a share company in 1963. In 1974, CBE merged with the privately owned Addis Ababa Bank. Then after, in 2016 CBE merged with Construction and Business Bank (CBB). Since then, it has been playing significant roles in the development of the country. Currently, CBE has more than 1,200 branches and 2 abroad branches in South Sudan and Djibouti. Moreover, it has a total of more than 35 thousands of employees.

The aim of the study was to assess the practices of Iron Triangle IT Project Management Practices and Challenges. Questionnaires and interview questions were used as instrument to carry out the study in addition to document analysis. Questionnaire findings provided insight into how Iron Triangle components have been managed in the Bank, CBE. And findings from Interview clarified the general process of PM in addition to supplement the questionnaires. Consequently, the research findings were organized based on the four major categories.

Currently, the Bank is undertaking various IT projects. These projects would help to provide quality customer service, create better intra process integration and facilitate the Bank become cost efficient. Thus, On top of the Bank's day-to-day operational activities, the Bank focuses on executing the following major strategic initiatives/projects that are designed to help the Bank achieve its targeted performance. The PMO currently oversee various IT Projects. Some of the projects were: Enterprise Resource Planning (ERP), Customer Relationship Management System (CRMS), Anti Money Laundering (AML), Learning Management System (LMS) Project, Electronic Document & Record Mgt. (EDRMS), Information Technology Infrastructure Library (ITIL) Framework, Upgrading Core banking Software, NG Screener upgrade, T24 implementation for subsidiary Banks, Risk management systems, implementation information security systems, and Upgrading Card Banking Systems etc...

4.3. Respondent Information

CBE's IT Project Offices and Program Management Office were taken as unit of analysis. Thus, from these units/ offices data were collected. A total of twelve (12) respondents were participated in this study, ten of them for questionnaires and two staffs for interviews. In terms of job title and positions; Program Management Office Director and his assistant, and IT project managers of the Bank who have engaged in managerial positions and decision making on IT projects. Most of those participants have more than ten years of experience of IT related working experiences and managing different IT projects.

Respondents' characteristics category includes their working experience, PM related education or training and level of education in PM. The response of the respondents and the implications are illustrated hereunder.

Table 4-1. Respondents' Characteristics

Relevant IT related working experience (Years):

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3-5 Yrs	1	10.0	10.0	10.0
	5-10 Yrs	1	10.0	10.0	20.0
	>10 Yrs	8	80.0	80.0	100.0
	Total	10	100.0	100.0	

Have you received any Project Management related education or training?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	6	60.0	60.0	60.0
	Yes	4	40.0	40.0	100.0
	Total	10	100.0	100.0	

If yes; what was the highest level of training you received?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	6	60.0	60.0	60.0
	Certificate	1	10.0	10.0	70.0
	Short-term training	1	10.0	10.0	80.0
	as a course in a related program of study	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Source: Own survey, 2018

The respondents were asked their relevant IT related working experience (in Years); 80% of IT project managers have an experience of >10 years while 10% have an experience of 5-10 years and 10% have an experience of 3-5 years. In relation to PM related education or training status; 40% of the respondents have received PM related education or training and 60% did not get any PM training. In terms of PM educational or training level, 10% of the respondents have received certificate in PM while 10% have attending Short-term training and 20% of them have taken as a course in a related program of study.

Project Management (PM) is a discipline that has been identified by many authors as having the potential to effectively delivering organizational changes (PMI, 2013). This change comes through effective management of projects which aligns to organizational strategic objectives. For this reason project managers must have PM knowledge and skills. However, six out of ten, IT Project Managers didn't aware of PM process knowledge and skills.

Implication

In general specking most of IT Project Managers have relevant IT related working experience. However, only four of them attended Project Management related education or training at different educational level. Form these facts it is possible to say that most of IT projects might not be managed well. Since Project Managers didn't aware of PM processes, knowledge and skills.

4.4. Questionnaire

The questionnaire was given to two of IT Project Managers in the Bank as a means of testing whether the questions were easily understood or not. Based on the response of these two respondents and incorporating the comments of the adviser, the questionnaires were distributed to all IT project managers. And then the researcher collected the filled questionnaires. The questionnaire is attached as an ***appendix B***.

Cooperation letter which was written by Addis Ababa University, School of Commerce and introductory statement about privacy of respondents were documents which are attached to survey questionnaires in order to raise the motivation of the respondents and to create comfort zone. This was used as a guarantee that the information provided is to be used only for the stated purpose. The accepted cooperation letter is attached as an ***appendix C.***

The survey was carried out from April 20 - 25, 2018. The survey was done in person to increase the response rate and also succeed in the study even though it was time taking to get responses from some respondents.

4.4.1. Response

Questionnaires were collected from all ten respondents. Therefore, the response rate is calculated 100% using:

$$\frac{\textit{Number of completed questionnaire}}{\textit{Number of questionnaire distributed}} = \frac{10}{10} = 1.0 \times 100 = 100\%$$

This shows that the response rate is 100% and it could be considered very much valid for proceeding to analysis of data.

4.4.2. Questionnaires and Interviews Data Analysis

In this section, the results from data analysis were presented to address the components of Iron Triangle Project Management. The data analysis result was depicted using tables in percentage and frequency which referred to the number of respondents. As indicated in 4.5.1 (response) above, the result of the analysis was based on the responses obtained from ten respondents. The analysis of qualitative data was done by researcher's impression and integrated with questionnaires data analysis result under each item or group of items.

4.4.2.1. General Project Management Aspect

IT Project Managers were asked about CBE's Management Support and General Project Management Process in relation to IT Project implementation. The result was summarized as shown in table 4-2 below.

Table 4-2. General Project Management Process Aspect -Respondents' Summary

Is the need and benefit of Project Management recognized by your organization's management?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	6	60.0	60.0	60.0
	A	3	30.0	30.0	90.0
	N	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Does your organization's management provide support for Project Management development?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	5	50.0	50.0	50.0
	A	4	40.0	40.0	90.0
	D	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Does your organization have a central Program Management office that provides project management support for the projects of the organization?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	7	70.0	70.0	70.0
	A	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Does your organization have standard Project Management processes and methodologies?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	3	30.0	30.0	50.0
	N	3	30.0	30.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Does your organization provide Project Management training for its Project Management team?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A	5	50.0	50.0	50.0
	N	2	20.0	20.0	70.0
	D	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Are Project Management processes, methodologies and procedures applied formally in managing projects in your organization?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A	3	30.0	30.0	30.0
	N	1	10.0	10.0	40.0
	D	6	60.0	60.0	100.0
	Total	10	100.0	100.0	

Source: Own survey, 2018

As shown in table 4-2, depending on the above illustrated tables 60% of the respondents were strongly agreed on the need and benefit of PM is recognized by CBE's management while 30% of them were agreed and 10% of them were neutral on the question. In connection with the management support for PM development; 10% of them were disagreed while 50% of the respondents were strongly agreed and 40% of them were agreed on the support provided by CBE's management. Moreover, 70% of the respondents were strongly agreed on having a central Program Management Office that provides PM support for the projects of the organization and 30% of them were agreed on the question.

As indicated in PMI (2013), PM need and benefit recognition by organization's management has a great contribution for project success. Establishing Program Management Office is one of the great aspects/parts of management support. Thus, in this case, it is possible to say that CBE's management is well aware of PM development.

Only 20% of the respondents were strongly agreed on having standard PM processes and methodologies while 30% agreed on the question. And 30% of them were neutral and 20% of them were disagreed on the same issue. In relation to PM training; 50% of the respondents were agreed on the organization is providing PM training for its PM team. And 20% of them were neutral and 30% of them were disagreed on the issue. In relation to a formal use of PM processes, methodologies and procedures in managing projects of the Bank; 30%, 10%, and 60% of the respondents were agreed, neutral, and disagreed respectively on the issue.

As indicated in PMI (2013), applying a standardized PM processes, methodologies and procedures has a great contribution to project success. Successful projects maintain the Iron Triangle of Project Management. The Iron Triangle is an equilateral triangle, where each side is of the same length. One side represents the project scope, second side represents the project budget, and the third side represents the project schedule. When one of these sides isn't in balance with the others, the project is not doing well. This means that the PM is complicated. However, a trained project manager makes it easy; whiles untrained project manager is the cause of waste time, lose money, cause frustration, and create all sorts of problems if they lack good PM skills. So, project managers must be well trained, and exhibit PM knowledge and skills. However, from the fact that many of the respondents were weak in usage of formal and standardized PM processes, methodologies and procedures in managing projects. The reason for this is the organization did not providing PM training for many (6 out of 10) of the Project Managers. This figure was supported by interview which was conducted with the PMO Director and his assistant it was found that many of them didn't get PM training.

Implication

From the discussion, in general, it is understood that there is almost enough CBE's management support and awareness about PM benefits and needs. However, there is a gap in using standardized and/or formal PM processes, methodologies and procedures in managing IT projects in the Bank.

4.4.2.2. Project Scope Management

This section included items to examine the Project Scope Management practice of the Bank. As indicated in the literature there are six major processes that make scope management in projects effective (PMI, 2013). These processes and the underline activities should be performed in advance so that the project will proceed smoothly.

Table 4-3. Project Scope Management Respondents' Summary

Is there awareness about the need or importance of PSM in your organization?s and Project Management team?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	4	40.0	40.0	40.0
	A	3	30.0	30.0	70.0
	N	2	20.0	20.0	90.0
	D	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Is there any formal effort of managing project scope in your organization/project?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	3	30.0	30.0	30.0
	A	3	30.0	30.0	60.0
	N	3	30.0	30.0	90.0
	D	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Are Computer applications or tools used in scope management process?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	3	30.0	30.0	40.0
	N	4	40.0	40.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Is the project's scope defined?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	4	40.0	40.0	40.0
	A	5	50.0	50.0	90.0
	N	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Is work Breakdown structure (WBS) prepared in defining scope in your project?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	5	50.0	50.0	70.0
	N	2	20.0	20.0	90.0
	D	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Is there any effort of monitoring and controlling scope in your project?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	6	60.0	60.0	80.0
	N	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Are work results reviewed or inspected to ensure or verify that all scope of the work is complete?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	8	80.0	80.0	90.0
	N	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Source: Own survey, 2018

As shown in table 4-3, Based on the above illustrated tables, 40% of the respondents were strongly agreed, 30% of them were agreed, 20% were neutral, and 10% were disagreed on the issue of awareness about the need and importance of PSM by the organization and PM team. They were also asked whether there is a formal effort of managing project scope; and 30% of the respondents were strongly agreed, 30% of them were agreed, 30% of them were neutral, and 10% of them were disagreed on this issue. On top of this, respondents were asked whether there is a computer application or tools used in their PSM process. And 10% of the respondents were strongly agreed, 30% of them were agreed, 40% of them were neutral, and 20% were disagreed. Moreover, they were asked whether project scope is defined in managing projects; 40%, 50%, and 10% of the respondents were strongly agreed, agreed, and neutral respectively.

As indicated by PMI (2013), awareness on the need and importance of PSM by stakeholders particularly; the organization leader and PM team is very crucial since they are the decision makers on project time and cost. However, three of the IT project Managers did not feel the situation just like others. Moreover, formal effort of managing project scope such as; defining scope, plan scope management, and preparing WBS is crucial to a project's success since it is the prerequisites of the next project processes such as cost estimation and determining the duration of each activity and finally, developing schedule. To do this computer applications or tools are very assisting technologies in scope management. However, in this case six of the respondents did not utilize the tools.

The next item is whether Work Breakdown Structure (WBS) was prepared in defining project scope; 20% of them were strongly agreed, 50% of them were agreed, 20% of them were neutral, and 10% of them were disagreed. On top of this, they were asked whether there is an effort on monitoring and controlling scope of projects. As a result, 20% of them were strongly agreed, 60% of them were agreed, and 20% of them were neutral. Final they were asked whether there is work results reviewed or inspected to ensure or verify that all scope of the work was completed. Accordingly, 10%, 80% and 10% of the respondents were strongly agreed, agreed, and neutral respectively.

As indicated by PMI (2013), Work Breakdown Structure (WBS) helps to identify the required resources in quantity and type for each activity. It is also the inputs for each

activity cost estimation process and activity duration determination. Therefore, it should be prepared following scope definition. However, three of the respondents did not practice it. This indicates that they determine the project duration and budget by pre-assumption not in logical and planed manner. In addition, six of the respondents did not use computer application or tools. This limitation was assured when the interview was conducted with the PMO director and his assistant.

Implication

From the discussion, in general speaking, there is a good understanding on the importance and need of Project Scope Management and formal efforts have made to define and manage Project Scope. Moreover, there is a good experience in monitoring and controlling of project scope and work results are reviewed or inspected at delivery. However, there is gap in computer application or tools usage in managing Project Scope and WBS preparation following project scope definition.

4.4.2.3. Project Time Management

This section included items to examine the Project Time Management practice of the Bank. As indicated in the literature there are seven major processes that make time management in projects effective (PMI, 2013). These processes and the underline activities should be performed in advance so that the project will proceed smoothly.

Table 4-4. Project Time Management Respondents' Summary

Is there awareness about the importance of PTM in your organization's and project management team?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	4	40.0	40.0	60.0
	N	2	20.0	20.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Is there any formal effort of managing time in your project?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	3	30.0	30.0	30.0
	A	3	30.0	30.0	60.0
	N	3	30.0	30.0	90.0
	D	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Is a schedule (plan) prepared for the project?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	5	50.0	50.0	50.0
	A	4	40.0	40.0	90.0
	N	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Is the schedule base lined? (Start and finish date are fixed and approved)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	3	30.0	30.0	30.0
	A	5	50.0	50.0	80.0
	N	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Are Network scheduling method (such as CPM, or PERT) used?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	2	20.0	20.0	30.0
	N	2	20.0	20.0	50.0
	D	5	50.0	50.0	100.0
	Total	10	100.0	100.0	

Are computer applications or tools used for scheduling?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	4	40.0	40.0	50.0
	N	3	30.0	30.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Is WBS used as input when defining the schedule activities?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	3	30.0	30.0	40.0
	N	5	50.0	50.0	90.0
	D	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Are relationships among activities identified and the activities sequenced?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	7	70.0	70.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Is estimate of resources (materials, people, equipment ...) needed prepared?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	5	50.0	50.0	70.0
	D	2	20.0	20.0	90.0
	SD	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Is activity duration estimate prepared?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	5	50.0	50.0	60.0
	N	2	20.0	20.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Are the company's historical data (previous related project) used in estimating activity duration?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	A	3	30.0	30.0	30.0
	N	4	40.0	40.0	70.0
	D	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Is the project schedule updated?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	3	30.0	30.0	30.0
	A	5	50.0	50.0	80.0
	N	1	10.0	10.0	90.0
	D	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Source: Own survey, 2018

As shown in table 4-4 on the above table, 20% of the respondents were strongly agreed, 40% of them were agreed, 20% of them were neutral, and 20% of them were disagreed for the question that whether there is awareness on the need or importance of Project Time Management (PTM) by the organization and PM team. In addition to this, they were asked whether there is a formal effort of managing project time; then 30%, 30%, 30%, and 10% of respondents were strongly agreed, agreed, neutral, and disagreed respectively on this issue.

As indicated in PMI (2013), Time Management is essentially the ability to organize and plan the time spent on activities in a day. The result of good time management is increased effectiveness. A lack of effective time management can have a negative impact on a project in the long run. Time is one of the three triple constraints and any deviation from the schedule has an effect on the cost and scope of a project. In most cases time really is money. Ineffective time management can also increase stress and frustration in the project manager and the team members. Therefore, a formal effort of managing project time such as; Plan Schedule Management, Define Activities, Sequence Activities, Estimate Activity Resources, Estimate Activity duration, and Control Schedule are a very fundamental issue. However, in this case 40% of the respondents were doubted and disagreed on whether organization and PM team have awareness about the need or importance of PTM and applying formal effort in managing project time.

When respondents were asked if they prepared a schedule (plan) for the project; 50% of the respondents were strongly agreed, 40% of them were agreed, and 10% of them were neutral. In addition, they were asked whether there is schedule baseline (which is a fixed and approved Start and finish date) in PM process; then 30% of the respondents were strongly agreed, 50% of them were agreed, and 20% of them were neutral. Moreover, they were asked whether they used network scheduling method (such as CPM, or PERT); 10% of the respondents were strongly agreed, 20% of them were agreed, and 20% of them were neutral and 50% of them were disagreed. On top of to this, 10% of the respondents were strongly agreed, 40% of them were agreed, 30% of them were neutral and 20% of them were disagreed on the use of computer applications or tools for scheduling.

As stated in PMI (2013), the PM contains the schedule baseline, which is the original approved project schedule, used as a reference to compare with the actual results to determine if a change, corrective action, or preventive action is necessary. Once the schedule has been created it becomes schedule baseline. A schedule baseline will normally include the expected time scale for delivery of the final project outcomes, plus related information such as estimated costs and estimated use of resources. It is important to form the baseline schedule as accurately as possible so that it is a reliable comparative measure.

Network scheduling method and computer applications or tools are the main project management assisting technologies that help to visualize and speed up the schedule activities and assign resources for scheduling project. However, in this case, respondents' Network scheduling method and computer applications or tools usage related to PM was poor. Moreover, I found that there was an understanding gap among the respondents since 90% of them were agreed that project scheduled was prepared. But from the interview and document analysis it was found that only high label plan was prepared not a detail schedule.

When the respondents asked whether WBS used as input when defining the schedule activities, 10% of the respondents were strongly agreed, 30% of them were agreed, 50% of them were neutral and 10% of them were disagreed. They also asked whether there are relationships among activities identified and the activities sequenced were made in their PM process; consequently, 10% of the respondents were strongly agreed, 70% of them were agreed, 20% of them were neutral. In addition, they were asked that whether there is estimate of resources (materials, people, equipment …) needed with respect to the availability of time. As a result 20% of the respondents were strongly agreed, 50% of them were agreed, 20% of them were neutral and 10% of them were disagreed.

Moreover, 10% of the respondents were strongly agreed, 50% of them were agreed, 20% of them were neutral and 20% of them were disagreed when they asked whether there was a preparation of estimate activity duration. On top of this, they were also asked that they used company's historical data (previous related project) in estimating activity duration, and then 30% of the respondents were strongly agreed, 40% of them were

neutral and 30% of them were disagreed. Finally, regarding the availability of updated project schedule, they responded that 30%, 50%, 10%, and 10% of the respondents were strongly agreed, agreed, neutral, and disagreed respectively.

As per the literature which indicated in PMI (2013), WBS is the input for estimating activity duration since WBS describes the required resources in quantity, type and time required for each activity. And it also helps in developing an overall schedule for the project. Prior to this, identification and definition of each project activity is crucial to a projects success as it helps to determine the duration of each activity. Once identified and defined, relationship and dependency should be determined and adequate resources should be assigned based on the needs of each activity. And then project schedule will be updated on demand. This is one of the processes that should be performed by the project team and the manager. However, in this case, use of WBS and historical data as input was weak in estimating activity duration.

In the interview conducted with the PMO Director it found that the project team did not prepare the detail WBS. Moreover, historical data are not well organized and accessed to project managers. Thus, it's not a surprise if many of them are neutral and disagreed about the issue.

Implication

As we can see from the above table under Project Time Management category, in general specking, CBE has a better awareness about the need and importance of PTM. In addition, there is a trend of fixing and approving schedule baseline, and updating schedule on demand. On the other hand, although applying formal effort in managing project time, such as activity sequencing, estimating activity duration and schedule preparation showed a good figure, beyond 50%. However, there is a gap in using Historical data and WBS as input in defining schedule activities and employing network scheduling methods for estimating activity duration. These make the overall schedule unsound.

4.4.2.4. Project Cost management

This section comprises the items used to assess the Project Cost Management practice of the Bank.

Table 4-5.Project Cost Management Respondents' Summary

Is there awareness about the importance of (PCM) in your organization's and project management team?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	3	30.0	30.0	30.0
	A	4	40.0	40.0	70.0
	N	1	10.0	10.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Is there any formal effort of managing cost in your project?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	4	40.0	40.0	60.0
	N	2	20.0	20.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Is estimate of the project cost prepared?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	3	30.0	30.0	30.0
	A	4	40.0	40.0	70.0
	N	1	10.0	10.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Does the estimate detail cost of labor, material, and machinery separately?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	2	20.0	20.0	30.0
	N	2	20.0	20.0	50.0
	D	5	50.0	50.0	100.0
	Total	10	100.0	100.0	

Is WBS used in preparing the estimate?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	3	30.0	30.0	40.0
	N	4	40.0	40.0	80.0
	D	2	20.0	20.0	100.0
	Total	10	100.0	100.0	

Is cost-estimating software used in preparing the estimate or managing cost?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	4	40.0	40.0	40.0
	D	5	50.0	50.0	90.0
	SD	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Is a budget prepared for the project?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	8	80.0	80.0	100.0
	Total	10	100.0	100.0	

Is the budget time phased? (Does the budget indicate the amount on schedule)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	N	2	20.0	20.0	20.0
	D	5	50.0	50.0	70.0
	SD	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Is the budget base lined? (the budget allocated to work packages)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	5	50.0	50.0	70.0
	N	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Is the budget updated regularly?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	4	40.0	40.0	50.0
	N	2	20.0	20.0	70.0
	D	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Is there any effort to monitor and control the project cost?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	2	20.0	20.0	20.0
	A	6	60.0	60.0	80.0
	N	1	10.0	10.0	90.0
	D	1	10.0	10.0	100.0
	Total	10	100.0	100.0	

Is variance analysis (difference of budgeted and actual cost) performed?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	2	20.0	20.0	30.0
	N	4	40.0	40.0	70.0
	D	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Are Budget forecasts (cost to completion,) prepared and updated?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	1	10.0	10.0	10.0
	A	3	30.0	30.0	40.0
	N	3	30.0	30.0	70.0
	D	3	30.0	30.0	100.0
	Total	10	100.0	100.0	

Source: Own survey, 2018

As shown in table 4-5 above, relying on the first question which deals about the level of awareness about the need or importance of Project Cost Management by the organization and PM team, 30% of the respondents were strongly agreed, 40% of them were agreed,

10% of them were neutral, and 20% of them disagreed. In addition, they were asked whether there is a formal effort of managing project Cost; 20%, 40%, 20%, and 20% of the respondents were strongly agreed, agreed, neutral, and disagreed respectively.

As indicated in PMI (2013), Project Cost Management (PCM) is a method that uses technology to measure cost through the full life cycle of projects. PCM encompasses several specific processes of PM which includes Plan Cost Management, Estimate Costs, Determine Budget, and Control Costs. Thus, a formal effort of managing project cost (these processes) is very crucial for the success of projects. Therefore, the organization and PM team are highly expected in recognizing of the effort and importance of PCM since the main goal is to complete a project within an approved budget. However, in this case the result is not satisfactory.

The next items they were asked is that whether they prepared and estimated project cost. As a result, 30% of the respondents were strongly agreed, 40% of them were agreed, 10% of them were neutral, and 20% of them were disagreed. In addition, regarding the issue of estimating detail cost of labor, material, and equipment separately, 10% of the respondents were strongly agreed, 20% of them were agreed, 20% of them were neutral, and 50% of them were disagreed. They also asked that the use of WBS as input in preparing cost estimation, and then 10% of the respondents were strongly agreed, 30%of them were agreed, 40% of them were neutral, and 20% of them were disagreed.

As indicated in PMI (2013), it's impossible to underestimate the importance of cost estimation when it comes to successfully completing a project. Moreover, estimating detail cost of labor, material, and equipment separately and sum-up to reach at a project level budget. This helps to have a clear and an approximation accurate forecast of how much a project will cost. Cost estimating input includes formed deliverable oriented work packages (usually in the form of a well-defined Work Breakdown Structure), historical data, and duration of activities, resources and unit rates of resources. However, there is weak practice in estimating detail cost of labor, material, and equipment separately and use of WBS as input in preparing cost estimation. This implies that preparing and estimating project cost was a mere approximation and presumption rather

than based on logic and planning. Findings that I found out form the interview and document analysis strengthen this idea.

The next items they asked is that whether they used cost-estimating software in preparing and estimating project cost and 40% of the respondents were neutral, 50% of them were disagreed, and 10% of them were strongly disagreed. They were also asked that whether they prepared a budget for the project; and then 20% of them were strongly agreed and 80% agreed. With respect to the time phased budget preparation (Does the budget indicate the amount on schedule), they responded that, 20% of them were neutral, 50% of them were disagreed and 30% of them were strongly disagreed. In addition, regarding on the budget baseline (The budget allocated to work packages), 20% of the respondents were strongly agreed, 50% of them were agreed, and 30% of them were neutral. And then about the regular budget update; 10% of the respondents were strongly agreed, 40% of them were agreed, 20% of them were neutral, and 30% of them were disagreed.

According to PMI (2013), cost estimating software is so important in cost estimation process. It producing fast and competitive estimates to wins bid faster. It is known that a project budget is an essential component of project planning. However, the time phased budget provides more benefits than most of us realize. Of course, it is the cost baseline for the project and allows tracking and reporting of actual results for the project. It also provides additional value: it is the basis for calculating Earned Value Management (EVM) metrics which provide the project performance status for cost and schedule and reveals funding requirements and projected cash flow for the project. However, there is a weak practice in use of cost-estimating software for preparing and estimating project cost, and time phased budget preparation. Findings that I found out form the interview supporting this idea.

For the last table questions, they were asked whether there is any effort to monitor and control the project cost and 20% of the respondents were strongly agreed, 60% of them were agreed, 10% of them were neutral, and 10% of them were disagreed. Moreover, they also asked whether they performing variance analysis in monitoring project. Consequently, 10% of the respondents were strongly agreed, 20% of them were agreed, 40% of them were neutral and 30% disagreed. Finally, for the question of the Budget forecasts (cost to completion), preparation and update in managing project, 10%, 30% ,

30% , and 30% of the respondents were strongly agreed, agreed, neutral, and disagreed respectively.

As indicated in PMI (2013), the Monitoring and Controlling process oversees all the tasks and metrics necessary to ensure that the approved and authorized project is within scope, on time, and on budget so that the project proceeds with minimal risk. This process involves comparing actual performance with planned performance and taking corrective action to yield the desired outcome when significant differences exist. Monitoring and Controlling process is continuously performed throughout the life of the project. For this task different tools can be used such as; Gant chart, S- curve, Earned Value Management (EVM). However, findings show that there is gap in project monitoring using these tools for variance analysis and Budget forecasts. In addition, the interview conducted with the PMO Director it found that the project managers did not employ those tools.

Implication

As we can see from the above table under Project Cost Management category, in general specking, CBE is somehow good at awareness about the importance and formal effort in PCM, in estimating of project cost, budget preparation, fixing baseline budget, project cost monitoring and controlling. However, there is a gap in use of WBS in separate resource detail cost estimation, application of cost estimation software, time phased budget preparation, regular budget update, performing variance analysis, and forecasting budget.

4.4.2.5. Comments from Questionnaire's Respondent

Comments were obtained through open paragraph question at the end of the questionnaires are listed below. They are provided by three IT Project Managers in CBE.

- Giving PM training for Project Managers has a great contribution for project success.
- The PM process varies for each individuals project, some of them were managed well and the other not. Therefore, applying uniform PM practices across all projects is very important.
- The Iron Triangle Project Management process must be balanced.

- Usually project cost was determined by lower price purchasing made. Other intended costs were managed with much flexibility and getting top management approval on demand.

4.5. Document Analysis Result

The researcher has tried to check the availability of the following documents and intended to perform high level review. These are: Project Charter, Statement Of Work (SOW), PM plan, WBS, Project Schedule, Time Phased Budget, and Project Closure Review Documents, Change Management Procedure, Policy and Procedure, Project Performance Report, and Contract Documents of a project.

Finally, the following gaps were found out from the checklist based Document Analysis as shown below:

- The following documents were not found: WBS, Time Phased Budget, and Project Closure Review Documents.
- PMO does not have Policy and Procedure documents which guide IT projects.
- Project Schedule document did not reflect activity resources and time phased budget as stated in PMBOK standard.

4.6. Major Challenges

From the interviewees and indirect checking via questionnaires, different major challenges that impede the implementation of standardized Iron Triangle PM Processes in CBE IT Projects were identified as shown below:

- Lack of standardized Iron Triangle Project Management Process.
- Lack of experienced Project Managers or domain expert (experts in different standards).
- Lack of formal PM Methodology which is known by all Project Managers.
- Lack of Standardized Project Management Tools and Templates practice in managing Iron Triangle Elements.
- Lack of PMO Policy and Procedure documents which guide IT projects.
- Lack of Project Management Training.
- Absence of documenting Lessons learned and Best practices.

CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCULUSION AND RECOMMENDATION

In this research study, the researcher set the objective of assessing the Iron Triangle PM Practices and Challenges in implementing of IT Projects in Commercial Bank of Ethiopia. This final chapter highlights the conclusion and recommendations that have been provided as per the findings of the study to improve the Iron Triangle PM Practices and to overcome the identified challenges in CBE.

5.1. Summary of Major Findings

The researcher has tried to combine or synthesize all findings from the questionnaires, Interviews and Document Analysis and come up with the major findings as summarized below:

1. IT Project Managers (8 out of 10) did not receive PM related training. Form this fact it is possible to say that IT projects may not be managed well.
2. Lack of experienced Project Managers or domain expert (experts in different PM standards).
3. Lack of standardized and/or formal PM Process, Methodology, Templates and Procedures in managing IT Projects in the Bank.
4. There is weak practice in use of computer applications or tools in managing Project Scope, Time and Cost.
5. There is a gap in use of historical data and WBS as input in defining schedule and using network scheduling methods for estimating activity duration. These make the overall schedule unsound.
6. From the interview and document analysis it was found that only high label plan was prepared not a detail schedule that shows resources and time phased budget.
7. There is weak practice in using WBS as input in estimating detail cost of labor, material, and equipment separately, application of cost estimation software, time phased budget preparation, regular budget update, performing variance analysis, and forecasting budget.

8. From the interview and document analysis it found that CBE's project team did not prepare WBS following project scope definition.
9. Historical data were not well organized and accessed to Project Managers.
10. Absence of documenting Lessons learned and Best Practices.

5.2. Conclusion

In today's technological and business environment, Iron Triangle PM is a very important part of PM process in implementing of IT projects. In addition, as mentioned in the literature review Project success is mainly characterized by the Iron Triangle elements or knowledge areas such as; Scope, Time and Cost. Thus, based on the findings and data analysis of the research, the following conclusions were drawn on the Iron Triangle PM Practice and Challenges.

When comparing CBE's Iron Triangle PM Practice with the available PM Standards or Best Practices, it was found that Project Scope Management, Project Time Management and Project Cost Management were at infant stage or under standard. Generally, CBE's Iron Triangle PM Practice is characterized by no established practices or standards or formal and uniform Methodology; but basic and non-standard processes were practiced on IT Projects. This signals a need for improvement in PM Practices.

In addition, in this research major challenges were identified. These are: Unable to use computer applications or tools in managing Iron Triangle elements; Unfamiliarity with different PM Standards; Lack of formal PM Methodology, Templates and Procedures; Absence of PM Training; Lack of Documenting Lessons learned. These all mentioned problems are internal factors of the organization and they can be managed.

As a concluding remark, understanding and managing of the Iron Triangle elements is crucial to project success. Moreover, understanding the nature of IT projects, applying formal Methodology, Standards or Best Practices, and awareness of numerous and varied challenging issues surrounding the implementation process could contribute to the whole process of IT Projects Development and Implementation.

5.3. Recommendations

To enhance the PM Practices and overcome the identified Challenges and bring effectiveness of Iron Triangle PM on IT projects; the researcher recommends the following.

5.3.1. For The Bank's PMO

- Use of computerized tools like PM Software when making cost estimation, schedule preparation and ongoing management.
- The PMO should also work on developing standardized templates and pertinent PM Methodology and Procedures to create a common language among the project team members.
- Use of PMBOK guideline tools and techniques for Project planning, executing and control is advisable for effective management of Iron Triangle elements.
- PM training should be provided to the Project Managers before being assigned to projects to build core PM skills. This will reduce misunderstandings and misconceptions which in turn help them make decisions quickly and deliver the project on time, within budget and deliver deliverables as promised. Hence the PMO must make sure to incorporate training as part of the plan.
- Even though projects vary in terms of nature, cost, and timeline; lessons learned from one project can be incorporated to other project to make decision making easier and to avoid similar error. Therefore, the PMO should work on regularly documenting lessons learned and make accessible for eligible staffs.

5.3.2. For Practitioners

- It can be used as initial enhancement of Iron Triangle PM Practice and used as a baseline to compare the success of future improvement efforts in CBE.
- It enables all CBE's IT Project Managers to have a common awareness.
- The PM students could be able to get a better practice via a body of knowledge.
- It may also serve as a starting point for practitioners and researchers who want to conduct more comprehensive research in this area from Ethiopian Banking sector perspective.

5.3.3. Areas for Further Research

Some aspects of PM that are beyond the scope of this thesis research are recommended for future research. Undertaking this research has opened many venues for further research initiatives which are presented below:

- Conducting a research on the remaining PMI PMBOK knowledge areas practices to have an overall picture of the PM practices in CBE.
- Enhancing the same research by considering all Banks in Ethiopia.
- Researchers can also study on all private and public organizations to understand the status of IT PM practice and challenges at national level.

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APPENDICES

Appendix-A: Interview Questions

Addis Ababa University

College of Business & Economics

School of Commerce

MA in Project Management (Extension Programme)

Topic of study:

"Iron Triangle Project Management Practice and Challenges: In case of IT Projects in Commercial Bank of Ethiopia"

Part I: Interview plan

Interviewee Title: _____

Location: _____ Appointment date: _____

Start Time: _____ End Time: _____

Agenda: **Approximate time**: **55** mins

- Overview……..5 mins
- Project Management Process-General aspects……..….10 mins
- What PM practices are employed in CBE?.....…….....15 mins
- About related challenges ……..……..….10 mins
- Extent of PMBOK's Iron Triangle Practices in CBE……..10 mins
- Summery and closing ……...5 mins

Part II. Respondent Information

- Job Title of the Interviewee:----------
- Position of the Interviewee:----------Email-------- (Optional)
- Relevant IT related working experience (Years):----------
- Have you received any Project Management related education or training?------

<u>Part III</u>. Interview Questions

a. What are the Project Management Practices of CBE in general?
b. What are the major Challenges that impede the implementation of Standardized Iron Triangle PM Processes on IT Projects in CBE?
c. How CBE practice the PMBOK's Iron Triangle Knowledge Areas?

Note: A Project Management Process-General aspect has two parts:

Part 1: *CBE's Management Support for Project Management Development*

- Is the need and benefit of Project Management recognized by CBE's Management?
- Does CBE establish central Program Management Office?
- Have Standard Project Management Process and Methodologies?
- Do Project Managers have a solid knowledge base on PM and getting PM training?

Part 2: *Project Management Process*

- Is a comprehensive planning done to perform the Scope, time and cost Management process?
- Is there a policy or direction or guideline that requires or recommends planning and performing Scope, time, and cost Management process?
- Is there a monitoring and controlling process for project Scope, time, and cost Management?
- Is there a clear and updated documentation process for Scope, time and cost?
- Is there a documenting lessons learned and best practices trend?

Appendix-B: Questionnaire

Addis Ababa University

College of Business & Economics

School of Commerce

MA in Project Management (Extension Programme)

Topic of study:
"Iron Triangle Project Management Practice and Challenges: In case of IT Projects in Commercial Bank of Ethiopia"

Dear Respondent:

The main purpose of this questionnaire is to assess the CBE's Project Management Practices and Challenges that hindered in implementing of standardized Iron Triangle Project Management processes. It is a part of partial fulfillment of MA in Addis Ababa University under School of Commerce. Your responses shall **NOT** be used for other purpose other than the intended aim of the research. Your kindly response is very important for the success of the study and your response is highly appreciated.

I thank you very much in advance for your cooperation!!!

In case, if you need any clarification about this research questionnaire please contact me:

Name: Kelemie Tebkew
E-mail: kelemiet@Yahoo.com
Mob #: +251 911 948958

Appendix-B: Questionnaire for IT Project Managers

Part I. Respondent Information

Direction: Please put a "✓"sign in the square bracket for each item.

1. Relevant IT related working experience (Years): [ ] 1-3 Yrs [ ] 3-5 Yrs [ ] 5-10 Yrs [ ] >10Yrs
2. Have you received any Project Management related education or training? [ ] Yes [ ] No
3. If yes**;** what was the highest level of training you received? [ ] PhD [ ] Masters Level [ ] Bachelors [ ] Certificate [ ] Short-term training [ ] as a course in a related program of study

Direction: Please use a tick (✓) mark to answer the following statements as SA= (Strongly Agree), A= (Agree), N= (Neutral), D= (Disagree) and SD= (Strongly Disagree) to rate the factors.

S.No.	Items	SA	A	N	D	SD
	Part II. Project Management Process-General aspect					
1	Is the need and benefit of Project Management recognized by your organization's management?					
2	Does your organization's management provide support for Project Management development?					
3	Does your organization have a central Program Management office that provides project management support for the projects of the organization?					
4	Does your organization have standard Project Management processes and methodologies?					
5	Does your organization provide Project Management training for its Project Management team?					
6	Are Project Management processes, methodologies and procedures applied formally in managing projects in your organization?					
	Part III. Iron Triangle PM knowledge Areas **A. Project Scope Management (PSM)**					
1	Is there awareness about the need or importance of PSM in your organization's and Project Management team?					
2	Is there any formal effort of managing project scope in your organization/project?					
3	Are Computer applications or tools used in scope management process?					
4	Is the project's scope defined?					
5	Is work Breakdown structure (WBS) prepared in defining scope in your project?					
6	Is there any effort of monitoring and controlling scope in your project?					
7	Are work results reviewed or inspected to ensure or verify that all scope of the work is complete?					

	B. Project Time Management (PTM)					
1	Is there awareness about the importance of PTM in your organization's and project management team?					
2	Is there any formal effort of managing time in your project?					
3	Is a schedule (plan) prepared for the project?					
4	Is the schedule base lined? (Start and finish date are fixed and approved)					
5	Are Network scheduling method (such as CPM, or PERT) used?					
6	Are computer applications or tools used for scheduling?					
7	Is WBS used as input when defining the schedule activities?					
8	Are relationships among activities identified and the activities sequenced?					
9	Is estimate of resources (materials, people, equipment …) needed prepared?					
10	Is activity duration estimate prepared?					
11	Are the company's historical data (previous related project) used in estimating activity duration?					
12	Is the project schedule updated?					
	C. Project Cost Management (PCM)					
1	Is there awareness about the importance of (PCM) in your organization's and project management team?					
2	Is there any formal effort of managing cost in your project?					
3	Is estimate of the project cost prepared?					
4	Does the estimate detail cost of labor, material, and machinery separately?					
5	Is WBS used in preparing the estimate?					
6	Is cost-estimating software used in preparing the estimate or managing cost?					
7	Is a budget prepared for the project?					
8	Is the budget time phased? (Does the budget indicate the amount on schedule)					
9	Is the budget base lined? (the budget allocated to work packages)					
10	Is the budget updated regularly?					
11	Is there any effort to monitor and control the project cost?					
12	Is variance analysis (difference of budgeted and actual cost) performed?					
13	Are Budget forecasts (cost to completion,) prepared and updated?					

Last comments, suggestions regarding the Iron Triangle PM process, please state here: ----------

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Appendix-C: Accepted Cooperation Letter

10 MAY 2018

ስልክ Tel { ማዘሪያ PBX 011 551 80 20-23; BAIS ትምህርት BAIS dept. 011 515 75 79 } ፋክስ FAX 251-1-51-57-86

ቁጥር Our Ref. BAIS/H/035/2008

ቀን Date March 14, 2018

ፖ.ሣ.ቁ P.O.BOX 3131

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ADDIS ABABA, ETHIOPIA

To Whom It May Concern

The Addis Ababa University School of Commerce currently runs Five Masters level Programs and one Doctoral Program: Human Resource Management (MA), Project Management(MA), Business Leadership(MA), Marketing Management(MA), Supply Chain and Logistics Management(MA), in addition to this, the School is also preparing itself to launch some more expedient programs very soon.

As an immediate and direct stakeholder to this socioeconomically pragmatic move, we would like you to cooperate with us by way of assisting our students to conduct academic researches and case analyses in your organization. As such, we kindly request your esteemed organization to provide student **Kelemie Tebkew Yirdaw** ID.No. **GSE/0075/08** with information pertaining to **Iron Triangle Project Management Practices and challenges: In case of IT projects in Commercial Bank of Ethiopia.** A copy of the paper produced may be provided to you if so demanded.

Thanking you sincerely,

Dr. Tilahun Muluneh
Head, Department of BAIS

Accepted
09/05/2018
Daniel Hailu