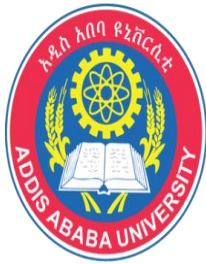


ASSESSMENT OF PROJECT MANAGEMENT MATURITY AT THE MINISTRY OF URBAN DEVELOPMENT AND CONSTRUCTION –THE CASE OF THE FEDERAL GOVERNMENT BUILDINGS CONSTRUCTION PROJECT OFFICE

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School of Commerce

Presented in Partial Fulfillment of the Requirements for Master's of Arts Degree
in Project Management

Advisor: Solomon Markos (PhD)

Addis Ababa, Ethiopia

July, 2019

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July, 2019

Addis Ababa, Ethiopia

DECLARATION

I, the undersigned, hereby declare that the work contained in this project paper is my own original work and that I have not previously in its entirety or in part submitted at any university for a degree.

Signature: -----

Date: -----

ENDORSMENT

This is to certify that this project work, "Assessment of project management maturity at the Ministry of Urban Development and Construction - the case of the Federal Government Buildings Construction Project Office" undertaken by Roza Yerukneh Alemu for the Partial fulfillment of the award of Master's degree in Project Management at Addis Ababa University, School of Commerce, is an original work and not submitted earlier for any degree either at this University or any other University and it has been submitted for examination with my approval as a university advisor.

Solomon Markos (PhD)

Signature _____

Date _____

Addis Ababa University

College of Business and Economics School of Commerce

This is to Certify that the project work prepared by Roza Yerukneh Alemu, entitled: "Assessment of project management maturity at the Ministry of Urban Development and Construction - the case of the Federal Government Buildings Construction Project Office" submitted in partial fulfillment of the requirements for the Degree of Master of Art in Project Management complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the Examining Committee:

External Examiner: ----- Signature: ----- Date: -----

Internal Examiner: ----- Signature: ----- Date: -----

Advisor: ----- Signature: ----- Date: -----

ABSTRACT

The research was carried out to determine the project management maturity level of the Federal Government Buildings Construction Project Office and identify its weakness and strengths. Primary data were collected using survey questionnaire and unstructured interviews with the selected members of the project office. The PM Solutions' project management maturity model is used to level the maturity of the project management of the office. Based on the findings, the Project Office's project management maturity level is identified to be level 2 which indicate that the basic project management processes and documentation exist in the project office, but they are not considered as an organizational standard. There are basic metrics to track project cost, schedule, and technical performance. The office lacks project management professionals and training opportunities are limited. Management supports the implementation of project management, but there is neither consistent understanding, involvement, nor the organizational mandate to comply for all projects. With this consideration, it is recommended that the project office needs to make more efforts to enhance its maturity level by establishing tailorable organizational standards and institutionalized processes for all project management processes. The project office needs to be equipped with project management professionals and consistent trainings in project management knowledge areas and their application must be provided to project team members. Continuous improvement based on lesson learned needs to be encouraged. In addition, improving management oversight, integrating project management processes, ensuring the establishment of effective risk management standards and project quality assurance mechanisms, and implementing all-inclusive monitoring and evaluation system are necessary.

Key words: Project Management Maturity Level, Ministry of Urban Development and Construction, the Federal Government Buildings Construction Project

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List Abbreviations

FGBC	Federal Government Buildings Construction
CMM	Capability Maturity Model
PERT	Program Evaluation and Review Technique
PM	Project Management
PMBOK® Guide	A Guide to Project Management Body of Knowledge
PMI	Project Management Institute
POO	Project Oriented Organization
SEI	Software Engineering Institute
WBS	Work Breakdown Structure

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Tighter budgets, shorter timelines, scarcity of resources and rapidly changing technology demand better project management functions in order to deliver results by tying project results to business goals. Responses to the impact of changes in a project environment require flexibility and necessary adjustment of project management plans. Many believe that a strong project management practice enables the meeting of organizational objectives through projects.

An Economist Intelligence Unit's 2009 survey report shows that 80% of global executives believed having project management as a core competency helped them remain competitive during a recession. In addition, the Unit's 2010 survey indicates that 90% of global senior executives ranked project management methods as either critical or somewhat important to their ability to deliver successful projects.

Furthermore, a survey by Gryger, Saar and Schaar (2010) found that nearly 60% of senior executives said building a strong project management discipline is among their top-three priorities for their companies as they look to the future, and implementing project management across the organization helps create a strategic value chain that gives companies an edge on their competitors, particularly in high-risk sectors and markets.

On the other side, the nature of the project itself and the environment in which the project is executed makes its management very complex. Accordingly, the project environment is affected by several forces originating from the project itself, the stakeholders of the project, the sector or industry relevant to the project's deliverables as well as local and international economics, politics and other social pressures (Rwelamila, 2007).

In order to win over the challenging forces and achieve success in projects, an organization need to look for best practices and focus on well-suited outputs based on the requirements. The projects also need to be able to create, maintain and disseminate knowledge and experiences as well as to establish an organizational culture that supports creativity and knowledge sharing through clear communication channels.

As it is indicated earlier, the growth and acceptance of project management are continuing to increase as resources become scarce in less developed countries. However, in these countries, the implementation of project management tools and techniques is still in its early phases of development. Rondinelli (1976) indicates ineffective project planning and preparation, faulty appraisal and selection processes, defective project design, problems in start-up and activation, inadequate project execution, operation and supervision, inadequate or ineffective external coordination of project activities and deficiencies in diffusion and evaluation of project results and follow-up action are some of the major factors project delay or failure in developing countries.

Project management capability of project driven organization is measured using project management maturity levels. The Project management maturity level is determined using project management knowledge areas and project management process groups (PMBOK® Guide, 2013). Different project management maturity models are developed to measure project management maturity of organizations. The PM Solutions' project management maturity model is the one that is adopted and used to measure project management maturity level of the Federal Government Buildings Construction Project Office of the Ministry of Urban Development and Construction of Ethiopia. The purpose of the assessment is to measure the maturity of project management practices at the project office and take lessons for future improvement.

1.2 Problem Statement

Studies in developed countries assure that there is positive relationship between project management maturity levels and project success (Nieto-Rodriguez and Evrard, Sonnekus and Labuschagne, 2004). A survey conducted in Ghana by Ofori and Deffor (2013), and in Kenya by Ouko (2016) asserted that project management maturity in the public sector in general and the construction industry in particular is at low level in most of the project management knowledge areas.

In spite of the observable challenges in terms of quality and timely delivery of public projects, especially in the construction sector, there are a very few attempts done to identify the all-inclusive image of a project management maturity level in Ethiopia. While a Survey conducted by Yimam in 2011 revealed that both the construction project management process and practices maturity of the Grade-1 contractors in Ethiopia is at low level, Ararso (2017) claimed that, except project risk management, most of the project management knowledge areas are applied to all projects in the Ethiopian Road Authority.

Based on the Federal Negarit Gazete Proclamation No. 691/2010, the Ministry of Urban Development and Construction of the Federal DEMocratic Republic of Ethiopia has the mandate of “providing necessary support in the preparation of designs and contract documents for, and in the supervision of construction of buildings financed by the Federal Government.” Accordingly, the Federal Government Buildings Construction Project Office, under the ministry, has been given a mission to construct and deliver the Federal Government buildings by applying up-to-date construction technologies and implementing the project management principles.

The preliminary information obtained from the report of the Project office’s Business process reengineering study conducted in 2015, some end users and the researcher’s own observation as

a member of a government institution which uses the service of the project office indicates that the Ministry as a whole and the project office in particular has limitations in delivering quality buildings that satisfy client requirements and meet deadlines. The failure in application of up-to-date construction technologies and standards, limitations in project management, contract administration, and inconsistency in monitoring and control mechanisms have been stated as the root causes.

As any responsible citizen, the researcher has a strong belief that the existing issues related to the quality, cost and timely delivery of the Federal government buildings construction projects needs to be addressed from various perspectives. In light of this, the research was conducted to identify the current project management maturity level of the Federal Government Buildings Construction Project Office, identify the project management weakness and strength, and then provide recommendation for improvement based on the findings.

1.3 Research questions

Based on the stated problem, the research has attempted to get a response for the following questions: -

- What is the current project management maturity level of the Ministry of Urban Development and Construction, the Federal Government Building construction projects?
- What are the strengths and weaknesses in project management of the Ministry of Urban Development and Construction, the Federal Government Building Construction Projects?

1.4 Research Objectives

To address the above list of research questions, the researcher set general and specific objectives.

1.4.1 General Objective

The main objective of this research is to assess the current project management maturity level of the Ministry of Urban Development and Construction, the Federal Government Buildings Construction Project office.

1.4.2 Specific objectives

The research is designed to:

- ✓ To determine project management maturity level of the Ministry of Urban Development and Construction, the Federal Government Building Construction Project office.
- ✓ Identify weakness and strength of project management of the Project office and give recommendations for future improvement.
- ✓ Provide benchmark data on the current status of PM practice in the project office for the future improvement efforts.

1.5 Significance of the study

As this assessment is based on a framework that has been independently developed over many years by industry experts and practicing project managers, it offers a more independent, objective assessment of the project office's project management capabilities, motivates the organization to reach a better state by identifying the gaps and presenting a roadmap for organizational change, and provides inputs for further research on project management maturity as well as interdependency among project management knowledge areas. The study also provides insight about the importance of incorporating project management maturity issue in government sectors development plans especially in project oriented institutions.

1.6 Scope of the study

Among the project offices in the Ministry of Urban Development and Construction, the research entirely focuses on the case of the Federal Government Building Construction Project Office. The office was chosen as it is fully involved in managing projects and project deliverables yet having significant gaps in doing so. The completed and ongoing construction projects are part of the study. The determination of the maturity level of the Project office is entirely based on the application of the ten project knowledge areas referring to the 6th edition of PMBOK® Guide.

1.7 Limitation of the Study

The research could have some limitations listed below:

- The project office undertakes projects either by its own force or by subcontracting certain or entire activities for completing a project; yet, the study did not include the views of the contractors.
- Project management at a professional level in Ethiopia is recent a phenomenon and the number of project management graduates may be very limited. As a result, the staffs at the Ministry of Urban Development and Construction, the Federal Government Building Construction Project Office might have a lower level of theoretical project management knowledge and discipline to easily understand and respond to the questionnaires.
- Intentional or accidental response bias by research participants.

1.8. Definition of Terms

Project

“It is a temporary endeavor undertaken to create a unique product or service. Temporary means that the project has a definite ending point, and unique means that the product or service differs in some distinguishing way from all similar products or services” (PMBOK® Guide, 1996, p.4).

Project management

Project management deals with tracking process execution including developing workable schedule, financial reporting model for the project, tracking of efforts against plan, managing costs against budget, status reporting and so on. It involves clearly defined boundaries, input and output with activities ordered in precedence of time and space. There must be a recipient of the result of the project being managed, that is, the customer and the project must have defined values being added (Passenheim, 2009).

Project management maturity

It refers to the progressive development of an enterprise-wide project management approach, methodology, strategy, and decision-making process (PMBOK® Guide, 2013)

Project management maturity level

It is a well-defined evolutionary plateau toward achieving a mature project management process. Each maturity level provides a layer in the foundation for continuous process improvement. The five-step maturity levels range from basic to sophisticated practices. (Rezvani, 2011).

Project management maturity models

They are frameworks that can be used to assess the progressive improvement in project management systems and processes, and to provide an improvement path (Pennypacker 2001)

Project Management Body of Knowledge (PMBoK)

It describes the overall knowledge within the profession of project management and includes tools and techniques used to manage the project management process and practices. There are ten knowledge areas (PMBOK® Guide, 2017).

1.9 Organization of the Study

The paper has five chapters. The first chapter contains an introduction of the study, consisting of the background of the study, problem statement, research questions, objectives, significance, scope and limitations of the study as well as definition of major terms.

The second chapter focuses on review of related literature in which earlier studies in the area are highlighted and presented. Theoretical and empirical review of existing literature and conceptual framework of the study are discussed in detail. The third chapter presents the research methodology. In this chapter research approach and design, population and sampling, instrument of data collection, methods of data analysis, tools to ensure reliability and validity, and ethical research considerations are offered.

The fourth chapter is dedicated to data presentation, analysis and discussion in which the collected primary and secondary data are analyzed and organized in a manner that meets the objectives of the study. The last chapter deals with a summary of the research findings, the conclusions as well as recommendations of the study based on the findings.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This part includes three sections. The first the section, theoretical literature review and the second section, the empirical literature review presents the major writings on the relationship between project management maturity level and project performance. The third section demonstrates the conceptual framework that was adopted to identify the project management maturity level of the Ministry of Urban Development and Construction in the case of the Federal Government Buildings Construction Project Office.

2.1 Theoretical Literature Review

Project is a strategic way to create value and benefits in organizations and project management enables organizations execute projects effectively and efficiently and meet business objectives, satisfy stakeholders' expectations by increasing the chances of success, responding to risks in a timely manner and managing scope, quality, schedule, costs and resource constraints. on the contrary, poorly managed projects or the absence project management may result in missed deadlines, cost overruns, poor quality, rework, uncontrollable expansion of projects, and loss of reputation for the organization, unsatisfied stakeholders and failure in achieving the objectives for which the project has undertaken. (PMBOK® Guide, 2017, p. 10).

Different authors have offered different opinions as to how and when modern project management started. While an article by Seymour, T. and Hussein, S. (2014, 233) on the history of project management indicates that “project management has been practiced for as long as humanity inhabited earth”, Snyder (1987), claims that modern project management era only started in 1958 with the development of the Program Evaluation Review Technique (PERT) and the Critical Path Method (CPM).

Kwak, Y. H. (2003) also asserts that the origins of modern project management started between the 1900s and 1950s, with the invention of Gantt charts and the commencement of core project management tools such as PERT, CPM and Work Breakdown Structure (WBS). According to his study, the institutionalization process of project management started with the establishments the International Project Management Association (IPMA) and the Project Management Institute (PMI) between 1958 and 1979, the development of project management software technology and the Theory of Constraints (TOC) from 1980 to 1994 as well as the creation of the Critical Chain Project Management (CCPM) and the starting of the Agile Manifesto. He also noted that the ranking of project management as the third most valued skill by employers, behind only leadership, negotiation skills and business analysis since 1995s worth notice.

There have been debates on whether the maturity of project management by itself can lead to project success. Some authors like Mullaly & Thomas (2010), Labuschagne, Marnewick and Jakovljevic (2008) and Nicholas and Steyn (2008) claims that there are no statistically significant correlations exist to prove the causal effect between project management maturity and performance and a higher level of project management maturity does not necessarily guarantee project success.

However, many scholars have asserted that project management has significant contribution to the success of project objectives. Andersen and Jessen (2002) indicate that as maturity implies a situation where an organization has standards and procedures in place that would assist it in reaching its objectives; a project-oriented organization is mature when it is able to deal perfectly with its projects. Kerzner (2003) also states that maturity in project management is the implementation of a standard methodology and accompanying processes which creates a high likelihood of repeated success.

Nieto-Rodriguez and Evrard (2004) stresses that a higher level of organizational maturity enhances project performance. Cooke-Davies and Arzymanow (2003) also state that higher maturity levels are expected to be successful in terms of project effectiveness and efficiency and also have a competitive advantage in the marketplace. Jung and Wang (2006) as well indicate improved PM maturity facilitates continuous improvements within PM, which is essential for the success of international organizations.

Hence, measuring project management maturity level of an organization has many advantages. A PM maturity assessment helps in pointing out a logical path for progressive development, setting direction, prioritizing actions, and beginning cultural change rather than primarily identifying the current level at which an organization is performing (Crawford, 2006). It also benefits the purpose of comparing project capability between organizations or between a specific organization and industry norms to benchmark their maturity relative to others (Mittermaier and Steyn, 2009, Grant and Pennypacker, 2006).

The project management maturity level is determined by the extent of the implementation of project management knowledge areas. The maturity level is determined by applying project management models. The project management maturity models are designed to provide a framework that an organization needs to develop its capabilities, in order to deliver projects successfully in the long term (Jugdev and Thomas, 2002). According to Carvalho, Laurindo and Pessôa (2003), maturity models systematize project methods, tool packages and methodologies; propose a continuous improvement to manage a change between an organization's initial and desired states.

The models assume that organizations' knowledge and experience can be translated into procedures, roadmaps, routines and databases, which leads to the configuration of a “collective

brain” (Gareis and Huemann, 2000, p. 5). Most of these frameworks have been developed in the beginning of 2000 (Mullaly, 2006).

Grant and Pennypacker (2006) have estimated that there are more than 30 models available in the market. Most of them have been proposed by consulting companies (Foti, 2002) and many of the models have similarities in stage of each level but used for different purposes. The Capability Maturity Model (CMM), the Project Management Process Maturity Model, the Project Management Maturity Model, the Organizational Project Management Maturity Model, the PM Competence Model and PM Solutions Project Management Maturity Model are some of the prominent models being applied to measure project management maturity levels of organizations. This study has used the PM Solutions Project Management Maturity Model. Summary information about some of the models and the details of the PM Solutions Project Management Maturity Model are presented as follows.

Kerzner’s Project Management Maturity Model (PMMM)

The Kerzner's maturity model defines the five levels using project management processes for continuous improvement. (Kerzner, 2001). The five levels are:

- ✓ **Level 1 – Common Language;** - The organization recognizes the importance of project management and the need for a good understanding of the basic knowledge on project management.
- ✓ **Level 2 – Common Processes;** -At this level, the organization recognizes that common processes need to be defined and developed so that project success can be repeated.
- ✓ **Level 3 – Singular Methodology;** - The organization defines a single methodology for project management in order to take advantage of the associated synergistic effect.

- ✓ **Level 4 – Benchmarking;** - the organization recognizes that process improvement is necessary to maintain competitive advantage.
- ✓ **Level 5 – Continuous Improvement;** - At this level, the organization evaluates the information obtained through benchmarking and decides how to improve its processes.

When this model is used to assess the PM maturity level of an organization, multiple choice questions are used where the respondents select the answer that most closely describe the current PM situation in their organizations.

Project Management Process Maturity (PM)² model

Project Management Process Maturity (PM)² model allows the collection and comparison of the project management process information for a number of organizations (Ibbs & Kwak, 1998).

The model's five levels of maturity process are described as follows (Kwak, 1997):

- ✓ **Level 1 – Ad-hoc Stage;** - Organizations at level 1 do not use formal procedures for executing a project. Project activities are poorly defined and cost estimates are inferior.
- ✓ **Level 2 – Planned Stage;** - At the planned stage, informal and incomplete procedures manage a project. The organization has strength in doing similar and repeatable work.
- ✓ **Level 3 – Managed Stage;** - Most of the project management problems are identified and informally documented. PM data for project planning and management are collected across the organization.
- ✓ **Level 4 – Integrated Stage;** - At the integrated stage, an organization can manage, integrate, and control multiple projects efficiently. The PM process data are standardized, collected, and stored.

- ✓ **Level 5 – Sustained Stage;** - At this stage, PM processes are continuously improved. PM data are collected and rigorously analyzed to improve processes. Innovative ideas are strongly pursued.

The final aim of this model is the determination of success drivers that are critical for the success of a project and the measurement of the magnitude of the return on investment that an organization draws from the improvement of its project management process maturity (Ibbs & Kwak, 2000).

SEI's Capability Maturity Model (CMM)

It is a framework that shows the key elements of an effective software development process (Paulk et al., 1993). The CMM defines the five levels of the maturity process, these are very similar to those of the (PM)2 model. The levels are defined as follows: -

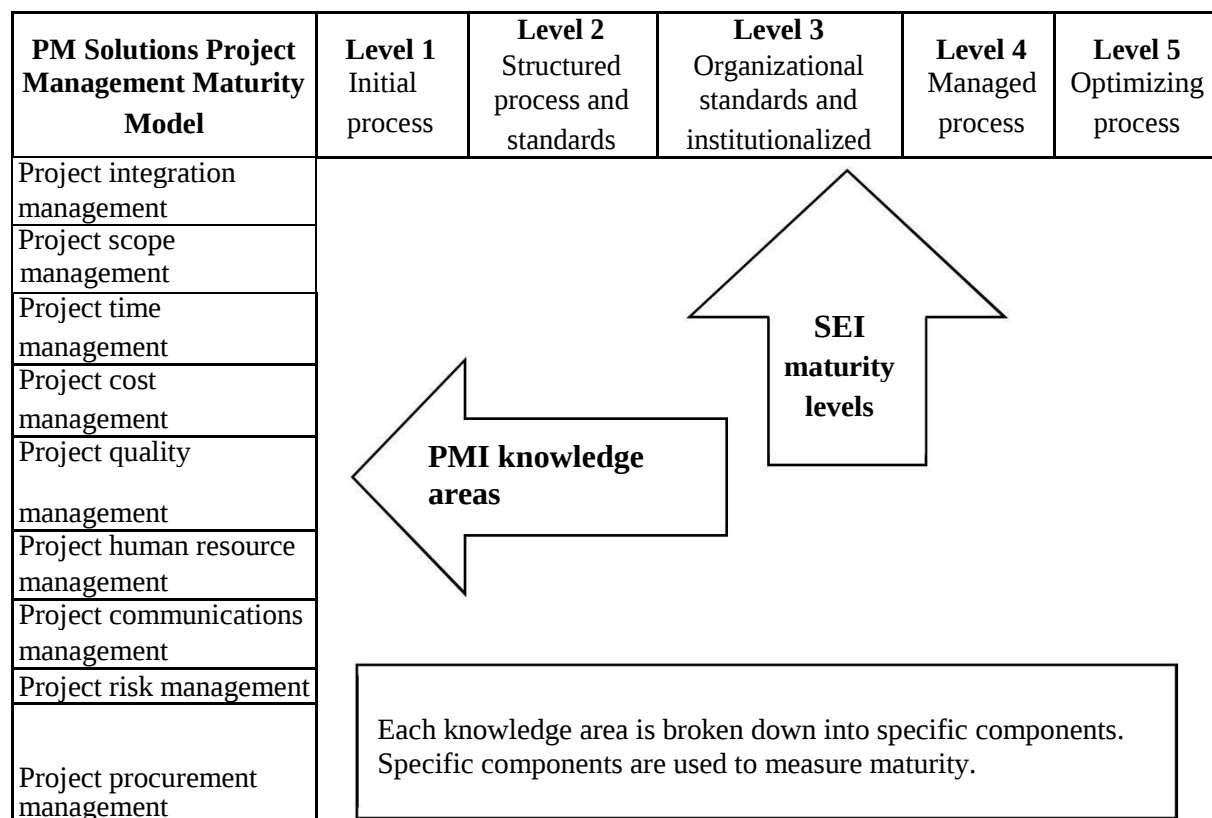
- ✓ **Level 1 – Initial Level;** -The organization does not provide a stable environment for software development. Project success depends on having good software managers or teams.
- ✓ **Level 2 – Repeatable Level;** - The organization establishes basic guidelines for managing the software project and its various procedures.
- ✓ **Level 3 – Defined Level;** -The organization has a formally documented standard process for developing and maintaining software engineering and management.
- ✓ **Level 4 – Managed Level;** - The organization sets quantitative goals for both software products and processes. It has a predictable process.
- ✓ **Level 5 – Optimizing Level;** -The entire organization is focused on continuous process improvement. Software processes are evaluated to prevent known types of defects from recurring and lessons learned are spread to other projects.

The CMM questionnaire provides the respondent with four options throughout: ‘yes’, ‘no’, ‘does not apply’, and ‘don’t know’, contrary to the (PM)2 questionnaire that is asking the respondent to select the situation description that is the closest to what can be found in his organization. The type of questions in the CMM questionnaire, allow more distinct answers with less space for interpretation. Consequently, less the support is required for the respondents.

The PM Solutions Project Management Maturity Model

The PM Solutions Project Management Maturity Model is based on a two-dimensional framework as it is indicated on Figure 2-1. Both dimensions are based on accepted industry standards. This model has received widespread acceptance as a standard for process modeling and assessment of organizational maturity in several process areas (Crawford 2002).

Figure 2-1: PM Solutions project management maturity model



Source: (Crawford, 2002)

The first dimension reflects the level of maturity. It is based on the structure of the Software Engineering Institute's Capability Maturity Model. There are five levels of maturity included in the PM Solutions Project Management Maturity Model. Crawford (2002) summarizes the five levels that represent a discrete organizational capability based on the summary-level characteristics described below.

✓ **Level 1 Initial Process**

- Ad hoc processes
- Management awareness

✓ **Level 2 Structured Process and Standards**

- Basic processes; not standard on all projects; used on large, highly visible project
- Management supports and encourages use
- Mix of intermediate and summary-level information
- Estimates, schedules based on expert knowledge and generic tools
- Mostly a project-centric focus

✓ **Level 3 Organizational Standards and Institutionalized Process**

- All processes, standard for all projects, repeatable
- Management has institutionalized processes
- Summary and detailed information
- Baseline and informal collection of actuals
- Estimates, schedules may be based on industry standards and organizational specifics
- More of an organizational focus
- Informal analysis of project performance

✓ **Level 4 Managed process**

- Processes integrated with corporate processes
- Management mandates compliance
- Management takes an organizational entity view
- Solid analysis of project performance
- Estimates, schedules are normally based on organization specifics
- Management uses data to make decisions specifics

✓ **Level 5 Optimizing Process**

- Processes to measure project effectiveness and efficiency
- Processes in place to improve project performance
- Management focuses on continuous improvement

The second dimension of the PM Solutions Project Management Maturity Model adopts the structure of PMI's nine knowledge areas (PMBOK® Guide, 1996). Each of the nine knowledge areas are further decomposed into 42 key components that provide for a more rigorous and specific determination of project management maturity. The nine project management knowledge areas are described as below.

I. Project integration management

Project integration management includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the project management process groups. It includes making choices about resource allocation, balancing competing demands, examining any alternative approaches through creation and the use of appropriate knowledge, tailoring the processes to meet the project objectives and

managing the interdependencies among the project management knowledge areas (PMBOK® Guide, 2017).

II. Project scope management

Scope means what is needed to be done and scope management is the managing of what needs to be done (Wysocki, 2009). Project scope management includes all those practices that are necessary to ensure that the project is restructured to only the required necessary work in order to achieve a necessary product, service or result.

III. Project time management

It provides a comprehensive plan that shows how and when the project deliverables defined in the project scope is expected to be attained, and services as a tool for communication, managing stakeholder's expectations, and as a basis for performance reporting. Commonly, project Time Management (PTM) includes planning and controlling processes that are acclaimed for complying with requirements related to project time. (Solís-Carcaño, Corona-Suárez, and García-Ibarra, 2015).

IV. Project cost management

Project cost management includes the processes involved in planning, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget. It is primarily concerned with the cost of the resources needed to complete activities. It considers the effect of project decisions on the subsequent recurring cost of using, maintaining, and supporting the product, service or result of the project. (PMBOK® Guide, 2017, p).

V. Project quality management

International Organization for Standardization (ISO) (1994) states quality as "the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs." In this regard, the main purpose of project quality management is to ensure the project will meet or exceed stakeholder's needs and expectations. Its central focus is meeting or exceeding stakeholder's expectations and conforming to the project design and specifications.

VI. Project resource management

Project resource management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project. These processes help to ensure that the right resources will be available to the project manager and project team at the right time and place. It concerned with the management of both team or personnel resources and physical resources. While the project team consists of individuals with assigned roles and responsibilities who work collectively to achieve a shared project team, physical resources include equipment, materials, facilities and infrastructure. The team resource management is mainly concerned with acquiring, managing, motivating and empowering the project team, and physical resource management is concentrated in allocating and using the physical resources needed for successful completion of the project in efficient and effective way (PMBOK® Guide, 2017).

VII. Project communications management

Project Communication is the exchange of project-specific information with the emphasis on creating understanding between the sender and the receiver (Project Communication Handbook, 2007). It has the purpose of ensuring the delivery of the information needs of stakeholders

through appropriate planning, collection, distribution, storage, retrieval, management, control, monitoring and the ultimate disposition of project information.

VIII. Project risk management

The Association for Project Management (2006) defines project risk as an uncertain event or condition that, if it occurs, has a positive or negative effect on project objectives. On the other hand, while Kerzner (2010) describes risk management as a practice of and the act of dealing with risk, which includes risk planning, risk identification and analysis, implementing risk management strategies and risk control and monitoring, Williams (1995), states project risk management as proactive planning for projects as a way to anticipate and mitigate serious issues that adversely affect the project during and at some point in the future.

IX. Project procurement management

Guth (2007) defined project procurement management as a coordinated effort with outside suppliers to acquire goods and services for projects. It includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team. It consists the management and control processes required to develop and administer procurement agreements.

Based on the PM Solutions Project Management Maturity Model, the maturity level for the specific knowledge area and the achievement of a given maturity level by an organization is cumulative. That is, for each succeeding PMM level, the assumption is that all criteria for the preceding levels of that component are being fulfilled. The maturity level in each knowledge area will be determined after completing the assessment of the knowledge area's components. For that purpose, the assessments of the knowledge area components will be reviewed and the lowest maturity in that knowledge area will be picked as the knowledge area's level of maturity.

Likewise, to determine the overall organizational maturity level, the maturity assessment of each of the nine knowledge areas will be reviewed and the lowest level that is assessed will be the organizational maturity level (Crawford, 2002, pp. 201-202).

2.2 Empirical Literature Review

PM Solutions conducted a study on the maturity of project management practices in 293 organizations around the world, including North America, Europe, Middle East and Africa, Asia and Pacific as well as Central and South America from 2001 to 2014. Its 2014 research report confirms that when organizations improve their project management maturity, they experience corresponding gains in project management performance, more importantly, they show improved organizational performance. The organizations identified as high performing in this study were much more mature in their project management practices than low performers (average level of maturity 3.4 vs. 1.7) and show substantially greater value in a variety of project management performance measures that matter most to executives, including the percentage of cost savings per project (26% vs. 6%), failed projects, (10% vs. 38%), projects delivered under budget (32% vs. 7%), projects delivered ahead of schedule (24% vs. 7%), productivity (34% vs. 8%), time to market (36% vs. 5%), customer satisfaction (40% vs. 19%), and alignment with business objectives (51% vs. 25%).

The report also indicates high performers have shown \$125K cost savings per project vs. \$8K for low performers. In addition, the report states that organizations increasing the level of their project management maturity, has shown a significant percentage of improvement in projects aligned with business objectives (37%), decrease in failed projects (29%), customer satisfaction (26%), projects delivered under budget (23%), and productivity (21%).

On the other hand, PricewaterhouseCoopers conducted study in 2004 on project management maturity involving 200 organizations from 30 different countries across the globe and concluded that there is a positive correlation between maturity level and project performance, i.e., a higher project management maturity level will in most cases deliver superior performance in terms of the project delivery and business benefits. The report also set the current overall maturity level as 2.5 denoting that the current state of project management in organizations is at the level of informal processes and it has not yet institutionalized which is a reason for why so many projects are unsuccessful today. The research also indicated most organizations want to reach a higher maturity level as more than half of the companies (60%) are not satisfied with their current maturity level and wish to achieve a higher maturity level. In addition, the 2007 and 2012 surveys' report by the company indicates that a project management methodology increases the likelihood of higher-performing projects, the PM is critical to business performance and organizational success, and PM enables business growth and higher maturity yielded higher performance within the five key performance indicators such as delivering projects on time, within budget, to scope, to quality standards, and with the intended business benefits.

In a cross-sector study in the USA, Yazici (2009) concluded that organizational performance is associated with PM maturity, but also that the latter influences organizational performance when combined with organizational culture. Besner and Hobbs (2012, 2013) supported this finding and suggested that there are different relationships among maturity, competency and project success. Labuschagne et al. (2008) found in their study of project management maturity in ICT organizations in South Africa that the highest number of organizations perceived themselves to be at level 3, with the second most placing themselves at level 2. Cooke-Davies and Arzymanow (2003) also researched the variation between different industries and found that the

petrochemical and defense industries were the most developed, and Most organizations were perceived to be at maturity levels 1 to 3, which supports the findings of Spundak and Striga (2010) and of Grant and pennypacker (2006).

The study by Yimam (2011) also assessed project management maturity in the construction industry of developing countries by taking Ethiopian contractors as a case. The study surveyed a total of 40 contractors of which 32 of them were local and 8 of them were international contractors. According to the researcher the construction PM process maturity and practices maturity of the contractors found to be at low level at average maturity of 1.30. The research also showed that much of the project management knowledge areas are implemented informally.

In general, the theoretical and empirical reviews reflect that though there have been debates on the extent of the role of project management maturity for organizational project management effectiveness and efficiency, many have agreed that matured project management process and practice has significant contribution to the success of project objectives and assessment of PM maturity helps in identifying the current level of performance and setting direction for improvement.

2.3. Conceptual Framework

The study has used the PM Solutions project management maturity model with some modification on the knowledge areas and their specific components based on the latest PMBoK published by Project Management Institute (PMI).

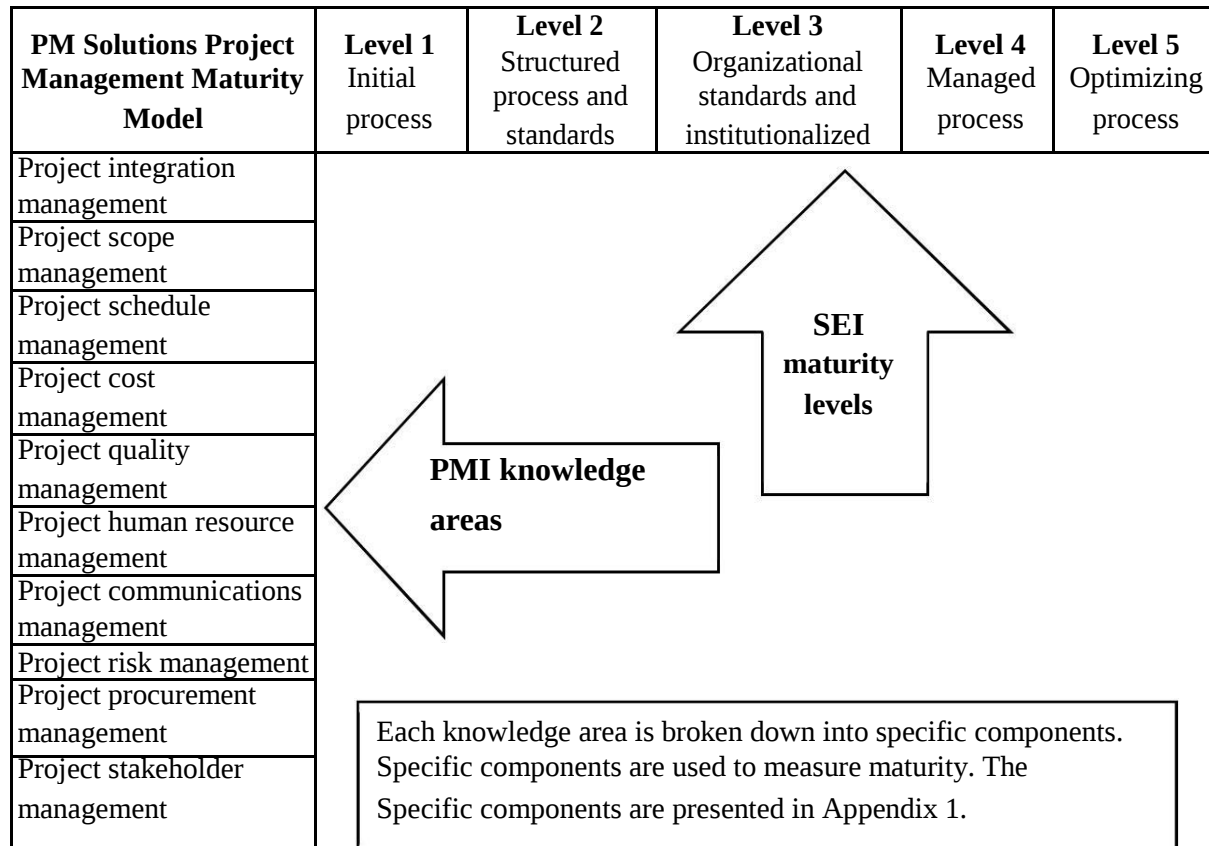
The 6th edition (2017) has presented the tenth project management knowledge area which is Project stakeholder's management. Project stakeholder management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop

appropriate management strategies for effectively engaging stakeholders in project decisions and execution. The process supports the work of the project team to analyze stakeholder expectations, assesses the degree to which they impact and are impacted by the project positively or negatively, and develop strategies to effectively engage stakeholders in support of project decisions and planning and execution of the work of the project. The key to effective stakeholder engagement is to focus on continuous communication with stakeholders, including team members, to understand their needs and expectations, address issues as they occur, manage conflicting interests and foster appropriate stakeholder engagement in project decisions and activities.

Based on the assessment results, recommendations are provided. Figure 2-2 shows the modified version for this specific study and appendix 1 demonstrates the components of the ten knowledge areas. As the figure shows the frame work has two dimensions. The first dimension reflects the level of maturity. It is based on the structure of the Software Engineering Institute's Capability Maturity Model. Crawford's (2002) summary- level characteristics of the five levels of maturity have been used to assess the distinct organizational capability of the project office.

The second dimension represents the project management knowledge areas. This dimension adopts the structure of PMI's ten knowledge areas (PMBOK® Guide, 2017). Each of the ten knowledge areas are further decomposed into 49 key components that provide for a more detail analysis and specific determination of project management maturity.

Figure 2-2 Conceptual model for the Research



Source (own, modified from Crawford, 2002)

Based on the PM Solutions Project Management Maturity Model, the maturity level for the specific knowledge area and the achievement of a given maturity level by an organization is cumulative. Accordingly, the assessments of a knowledge area's components were distinguished and the lowest maturity in that knowledge area has been picked as the knowledge area's level of maturity. Similarly, to determine the overall organizational maturity level, the maturity assessment of each of the ten knowledge areas was conducted and the lowest level has become the project office's maturity level.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter outlines the research approach and design used by the study, highlighting the population and sampling technique, data collection techniques and data analysis instruments to answer to the research questions.

3.1 Research Approach and Design

3.1.1 Research Approach

A mixed approach was applied for this research to accommodate data from different perspectives and conduct triangulated analysis. A survey questionnaire and unstructured interview were used to collect qualitative data from primary sources in the project office. Existing documents in the office were also used to gather additional qualitative secondary data. The quantitative data analysis techniques were applied to analyze the data collected and reach conclusions.

3.1.2 Research design

As the study is conducted to identify the level of project management maturity of the project office, the design that is used for this research is descriptive. The maturity assessment is done by reviewing existing documents, using a survey questionnaire adapted from the concept of the Ten Project Management Body of Knowledge Areas by Project management Institute (2017) as well as conducting unstructured interviews. Subsequently, the maturity level of each project management knowledge areas of the project office is determined using the five levels of the PM solutions project management maturity model.

3.2 Research Population and Sampling

As it is indicated in the background section of this paper, the project office has two divisions which are construction division and support division. Given the capability required to understand the project management concepts, the study targets the construction division and its 26 professional project team members including the general manager of the project office. Different sampling techniques were used for the survey questionnaire and the unstructured interview. Census survey was applied for the survey questionnaire to include all the 26 members of the construction division of the project office due to their limited number and in order to get a response from different perspectives while purposive sampling was used for the interview. One senior manager, one project team leader and one project team member were selected for the interview based their experience.

3.3 Data Collection

A Survey technique and unstructured interview were used to collect the primary data. The study utilized both primary and secondary data sources. The primary qualitative data were collected using closed ended questionnaires and open-ended interview topics. The relevant qualitative secondary data were acquired from existing documents in the project office. For the questionnaire, at least five scaled questions were prepared for each of ten project management knowledge areas to measure the maturity level for each component, the PM knowledge areas and cumulative maturity level for each knowledge area and the project office.

The questionnaire has comprised of two parts. The first part has collected information on the profile of the respondents, whilst the second part has gathered information on the maturity levels of the project office. Questionnaires were personally distributed and collected. When the need arose, the researcher did provide explanation on each leveling criterion for the respondents. The

unstructured interview focused on the ten project management knowledge areas, but gave special attention to the three areas where PM Solutions project management model has found significant influence on the adoption of project management practices. They are project office, management oversight, and professional development which are part of project integration management, project quality management as well as project resource management knowledge areas respectively (Crawford, 2002).

3.4 Data Analysis

The project maturity level of the Federal Government Buildings Construction Project office of the Ministry of Urban Development and Construction of the Federal Democratic Republic of Ethiopia has been determined using the PM Solutions Project maturity model with some modification on the knowledge areas and their specific components based on the latest PMBoK published by Project Management Institute (PMI) in 2017. Appendices 1 and 2 show the modified versions for this specific study.

The rationality behind using this model has been its capability to ensure an organization's firm understanding of its strengths and areas of improvement as well as a sound and structured way to develop an action for development.

Data collected has been analyzed using a qualitative approach by comparing the finding with theoretical and empirical findings from literature and quantitative approach by using descriptive statistical tools such as mean and percentages. The data have been coded and analyzed utilizing graphs, tables and percentages to provide summaries of the respondents under study. Mean was used to compute the average value of a single component of a knowledge area by the respondents.

3.5 Scale Reliability and Validity

Given the limitation of the study time, which was about months, the researcher had found it difficult to apply the standard data reliability and validity tools exhaustively. However, the researcher has used test-retest method using the questionnaire as well as unstructured interviews with key respondents like the head of the project office to ensure the reliability of the data collection tools.

In addition, Cornbach's alpha reliability test was conducted to measure internal consistency of items by using SPSS (Statistical Package for the Social Sciences). As a result, the test determined that the Cornbach's alpha for this research is 0.88 which suggests a relatively high internal consistency.

Content validity and construct validity methods were applied to ensure the validity of the data collected. Accordingly, a data from the unstructured interview and relevant secondary sources were used to triangulate the responses from the questionnaire. Internationally accepted theories and models such as PM solutions PM maturity model and project management knowledge areas by Project Management Institute (PMI) were also used.

3.6 Ethical Considerations

The researcher has given due attention and committed to ethical issues which need to be considered in a scientific research. Standard instruments for data collection were used to minimize the researcher's bias. Closed ended questions were used in the questionnaire in order to avoid leading questions. All the materials and literatures referred, consulted and/or quoted have been properly acknowledged.

The respondents were provided with full information about the purpose of the study to get their consent to reply. The respondents have also been assured of the confidentiality of their views as well as the presentation of the study results as aggregate and without any adjustment or bias. In addition, all the secondary data sources have been used with full consent of the Ministry and the project office's officials.

CHAPTER FOUR

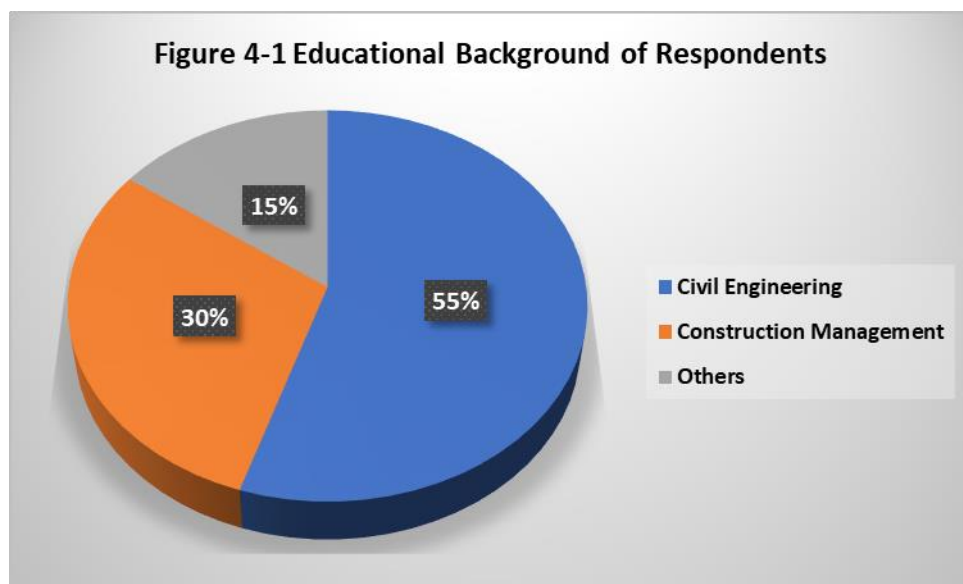
RESULTS AND DISCUSSIONS

4.1 Introduction

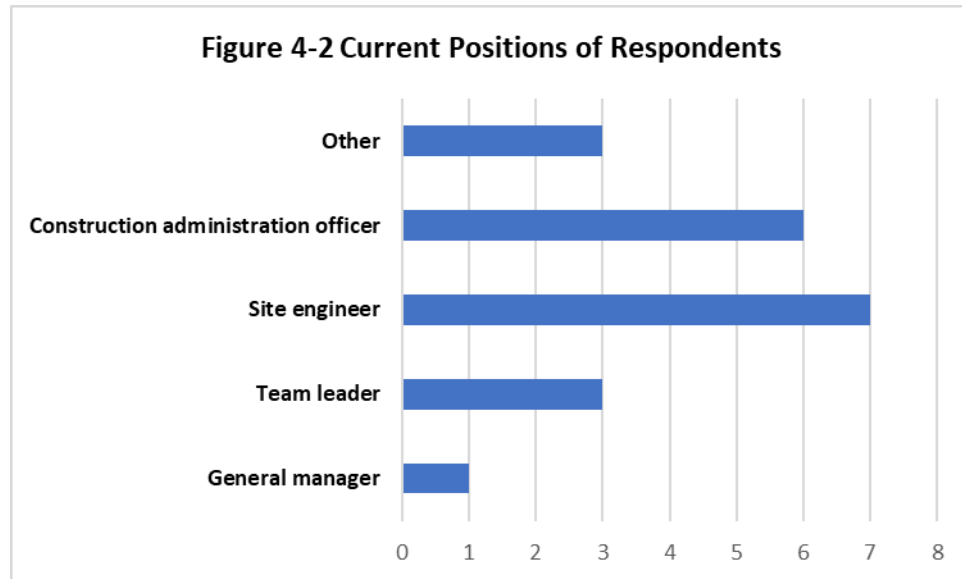
In this section, data collected by survey questionnaire and the unstructured interview are presented, described and corresponding analysis is carried out. In view of this, the average project management maturity level for the ten project management knowledge areas' specific components were computed based on the responses of the research participants. Subsequently, a cumulative maturity level for each knowledge area and overall maturity level of the project office are determined, and then corresponding discussion on the project management weaknesses and strengths are identified.

4.2 Response Rate and Demographic Data

Among the 26 research participants, 20 (77%) has given a response to the questionnaire. As the pie chart below shows, the majorities, 55% of the respondents are civil engineering graduates and 30% are construction management graduates while 15% of respondents did not mention their field of study.



In addition, around 80% of the respondents had taken training on project management. The result of the study also demonstrates that about 25% of the respondents have more than 6 years of work experience. As it is described in the figure 4-2, from the total of 20 respondents, 1 is general manager, 3 are team leaders, 7 are site engineers, 6 are construction administrations officers and 3 did not mention their current position.



4.3 Findings on the project management maturity level

The research questions of this study focus on the current perceived level of the project maturity level of the Federal Government Buildings Construction Project office and its strengths and weaknesses in the project management application. As it is indicated in the research methodology section, the PM Solutions project management maturity model determines the maturity level for each knowledge area and the project management maturity level of an organization using the cumulative method. (Crawford, 2002, pp. 201-202). Accordingly, the description of the maturity level for each project management maturity area, the Project office's overall maturity level as well as the strengths and weakness at each level are presented as follows based on the analysis of the data collected.

4.3.1 Maturity Level of Each Project Management Knowledge Area

4.3.1.1 Project Integration Management

Table 4-1 Project integration management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
1	Project integration management							
1.1	Develop Project Charter	8	4	4	4		20	2.2
1.2	Develop Project Management plan	8	12				20	2.2
1.3	Direct and Manage Project work	8	4	8			20	2
1.4	Manage Project Knowledge	8	8	4			20	1.8
1.5	Monitor and Control Project work	4	4	12			20	2.4
1.6	Perform integrated change control	4	8	8			20	2.2
1.7	Close project or phase	8	8		4		20	2
	Cumulative level	1.8 → 2						

Source: Own survey (2019)

Table above depicts that there are seven parameters for measuring and leveling project integration management maturity. The result of the study shows that the project integration management maturity level of the project office is level 2 which indicates the existence of structured processes and standards. There are basic, documented processes in place for developing project plans and integrating, analyzing, and developing the reports on work results. Summary-level information is consolidated into reports. The focus is on summary status and performance reporting for the triple constraint items such as scope, time and cost. Although the processes are in place, they are not considered an organizational standard. Management supports the efforts and is involved with large, highly visible projects.

4.3.1.2 Project Scope Management

Table 4-2 Project Scope Management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
2	Project Scope Management							
2.1	Plan scope management		12	8			20	2.4
2.2	Collect requirements		8	4	8		20	3
2.3	Define Scope		12		8		20	2.8
2.4	Create Work Breakdown Structure		8	8	4		20	2.8
2.5	Validate scope		12	4	4		20	2.6
2.6	Control scope		12	4	4		20	2.6
	Cumulative level	2.4 → 2						

Source: Own survey (2019)

The Project scope management process has six components listed on the above table. The cumulative maturity level of all the components is 2.4 which can be categorized as level 2. This shows that there is a basic project management scope process in place. There is a process to involve management in the project scope management process, but not all management is participating in this process. Many of the projects in the organization are utilizing the standard project management process to identify and manage project scope. Organizational management is involved in project management processes in the larger, more visible projects, but there may not be consistent management involvement across all projects, or an organizational mandate to utilize the basic project management processes on all projects.

4.3.1.3 Project Schedule Management

Table 4.3 Project Schedule Management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
3	Project Schedule Management							
3.1	Plan Schedule Management		8		12		20	3.2
3.2	Define Activities		4	4	12		20	3.4
3.3	Sequence Activities		4	4	12			3.4
3.4	Estimate Activity durations		8	4	8		20	3
3.5	Develop Schedule		8	-	12		20	3.2
3.6	Control Schedule		8	4	8		20	3
	Cumulative level	3						

Source: Own survey (2019)

The cumulative maturity level of project schedule management of the FGBC Project office is level 3. All processes are in place and documented. The processes are considered an organizational standard and are being utilized by nearly all projects. The activity definition process is expanded to include activity templates. Activity sequencing is expanded to include external dependencies and activity network templates. The schedule control process is expanded to include schedule performance analysis. The schedule integration process is developed and implemented with program schedules. Metrics are collected and analyzed in areas such as the number of project activities, type of external dependencies, duration standards, capability factors, resource dedication factors, and schedule performance and efficiency. Management fully supports the schedule management processes and has institutionalized the procedures and standards. Processes and standards are integrated with other corporate processes and systems. Integration includes organization- wide integration of

projects with key dependencies established and monitored. In addition, the schedule development, schedule baseline, and cost control processes are integrated with the project office, financial, strategic planning systems, and risk management process. There is a mandate to comply with the organizational project management processes and procedures. Management takes an organizational view of projects.

4.3.1.4 Project Cost Management

Table 4.4 Project Cost Management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
4	Project Cost Management							
4.1	Plan cost Management	4	8	4	4		20	2.4
4.2	Estimate costs		4	8	8		20	2.6
4.3	Determine Budget		12		8		20	2.8
4.4	Control costs		16		4		20	2.4
	Cumulative level	2.4 → 2						

Source: Own survey (2019)

Table above describes components of project cost management and their corresponding project management maturity level at the FGBC Project office. The result reveals that the FGBC Project office project cost management has a cumulative maturity value of 2.4 which is categorized as project management maturity level 2. This indicates that there are documented processes in place for identifying generic key resources (labor categories, hours, equipment, and material), generating and documenting project cost estimates, publishing and distributing reports, and monitoring basic cost metrics. Although the processes are in place, they are not considered an organizational standard. Management engagement focuses on large, highly visible projects. A basic cost-estimating template exists. Metrics exist for basic cost information (planned budget, percent complete) although they may be collected and correlated manually. Additional processes

are likely to exist for resource cost planning, historical cost database development, earned value techniques, cost reporting, and cost performance analysis. Summary and detailed information are developed and collected. Project management processes are considered standard practice for large, visible projects. All documented processes are repeatable.

4.3.1.5 Project Quality Management

Table 4.5 Project Quality Management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
5	Project Quality Management							
5.1	Plan Quality Management		8	4	8		20	3
5.2	Manage Quality		8	4	8		20	3
5.3	Control Quality		4	8	8		20	3.2
	Cumulative level	3						

Source: Own survey (2019)

All the activities attached to project quality management of the FGBC Project office are labeled to similar value of maturity level. The finding of the research reveals that the FGBC Project office project quality management maturity level has the value 3 which shows that the quality process is well documented and is an organizational standard; most of the projects follow this standard. Management signs off on the quality plan and final testing for all projects and often participates in quality reviews. Quality has a program focus-that is, how well does the product perform within the context of all other products/systems in the immediate domain of the product? Management supports the development of a quality department and has identified one or two people whose focus is organizational project quality standards and assurance.

4.3.1.6 Project Resource Management

Table 4.6 Project Resource Management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
6	Project Resource Management							
6.1	Plan Resource Management	4	4	8	4		20	2.6
6.2	Estimate Activity Resources	4		12	4		20	2.8
6.3	Acquire Resources		8	8	4		20	2.8
6.4	Develop Team	4	4	12			20	2.4
6.5	Manage Team	4	4	12			20	2.4
6.6	Control Resources		12	8			20	2.4
	Cumulative level	2.4 → 2						

Source: Own survey (2019)

The cumulative value of the 6 specific components of project resource management knowledge area is 2.4. Hence, the FGBC Project office is at level 2 which implies that there is a documented, repeatable process in place that defines how to define, acquire, and manage the resources in the form of suggested inputs, tools and techniques, and outcomes. Formal teams are established on large projects that are held accountable to follow the human resource management process. Management expects the project manager to have a project management resource plan in place for large projects. Project team evaluations are conducted, and project managers are expected to provide line management with a performance report for the individuals at the end of the project. Processes are readily available and integrated with other project planning elements.

4.3.1.7 Project Communications Management

Table 4.7 Project Communications Management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
7	Project Communications Management							
7.1	Plan communications Management		16		4		20	2.4
7.2	Manage communications	4	8	4	4		20	2.4
7.3	Control communications	4	12		4		20	2.2
	Cumulative level	2.2 → 2						

Source: Own survey (2019)

The computed cumulative maturity level of project communication management is valued 2.2 and the value is categorized under project management maturity level 2 which shows the establishment of a basic communications management process in the project office. Stakeholder communication needs and project constraints and assumptions are identified, project status and progress reporting are distributed on a regular basis, and there is a notification of phase and complete project close up. Large, highly visible projects are encouraged to follow the process and there is documentation supporting how the process should work. Management understands the need for regular communication of project activities in order to have the needed information to make good decisions and supports the collection of project status. The focus for communications is on summary status and progress reporting for the triple constraint items (scope- schedule-cost). Projects are launched through project requests from a client. At this level the following activities (including components below) are required for large and highly visible projects and encouraged for other projects: Applying the detailed communications management

process, including analyzing the communications requirements and technology parameters
Identifying the communication vehicles used to exchange information
Baselining the project triple-constraint parameters.

Formal acceptance from the customer is obtained for project deliverables. The communications management process is fully documented, and the process is repeatable. Communications templates exist and are readily accessible and integrated with other project planning elements. Management values the output of communications management and requires utilization of project management tools and techniques to communicate project outcomes and the triple constraint parameters.

4.3.1.8 Project Risk Management

Table 4.8 Project Risk Management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
8	Project Risk Management							
8.1	Plan Risk Management	8	8	4			20	1.8
8.2	Identify Risks	8	8	4			20	1.8
8.3	Perform Qualitative Risk Analysis	8	4	8			20	2
8.4	Perform Quantitative Risk Analysis	8	8	4			20	1.8
8.5	Plan Risk Responses	8	8	4			20	1.8
8.6	Implement Risk Responses	8	4	8			20	2
8.7	Monitor Risks	8	4	8			20	2
	Cumulative level	1.8 → 2						

Source: Own survey (2019)

Project risk management knowledge area covers the 7 factors listed in the table above. The result of the study shows that the cumulative computed value of the project risk management

maturity level is 1.8 which is classified under project management maturity level 2. At this level, risk management processes are developed and documented for identifying, quantifying, developing a risk response, and reporting risks. Project team members generally understand macro- and some detail-level risks, and most projects are expected to determine strategies for dealing with the risks. Teams use a structured approach to quantify the impact of the risks to rank their importance. Risk lists are compiled to track and monitor progress. The risk management processes are considered standard practice for large, visible projects, and recommended for all other projects. All documented processes are repeatable. Management supports risk management, but they are only consistently involved in large, visible projects and involved in other projects if the risk critical and is of great magnitude. Risks are examined and controlled on a project-by-project basis.

4.3.1.9 Project Procurement Management

Table 4.9 Project Procurement Management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
9	Project Procurement Management							
9.1	Plan Procurement Management		8	4	8		20	3
9.2	Conduct Procurements		8	4	8		20	3
9.3	Control Procurements		12	4	4		20	2.6
	Cumulative level	2.6 → 2						

Source: Own survey (2019)

The project procurement maturity level of the FGBC Project office is computed to a cumulative value of 2.29 and the value is categorized under project management maturity level 2. At this level, there is a basic process documented for procurement of goods and services from outside the organization, but this process is not a standard practice. Its use on large or highly visible

projects is encouraged. The procurement organization drives the process with some input from the project team, organizational management, and the client. The process for procurement is considered standard practice for large, highly visible projects, and all other projects are encouraged to use it. The process is specific and documented. Organizational management is more involved, with input from the client department. The process involves the project team and capitalizes upon its technical knowledge. Contracts are managed at an appropriate level of detail with regular periodic reporting.

4.3.1.10. Project stakeholder management

Table 4.10 Project stakeholder management

Knowledge area		Number of respondents					Total number of respondents	Average maturity level
		Level 1	Level 2	Level 3	Level 4	Level 5		
10	Project Stakeholder Management							
10.1	Identify Stakeholders		8	8	4		20	2.8
10.2	Plan Stakeholder Engagement		8	12			20	2.6
10.3	Manage Stakeholder Engagement		12	8			20	2.4
10.4	Monitor Stakeholder Engagement		12	8			20	2.4
	Cumulative level	2.4→2						

Source: Own survey (2019)

Project stakeholder management includes the processes required to identify stakeholders, plan, manage and monitor their engagements. As it can be seen from the above table, project stakeholder management knowledge area of the FGBC Project office is at a maturity level of 2 which shows that there is a process of identifying stakeholders and analyzing their expectations. But the identification of stakeholders is not accompanied with a formal stakeholder

management plan and a strategy to engage stakeholders and manage their expectations. The overall process, however, is not guided by a predefined methodology for all projects.

4.3.2 The overall project management maturity level of the Ministry of Urban Development and Construction, the Federal Government Buildings Construction Project Office

The table below describes maturity levels of the ten project management knowledge areas and the current cumulative project maturity level of the FGBC Project office.

Table 4-11 The overall project management maturity level of the project office

Project Management Knowledge area	Maturity levels					Cumulative
	Level 1	Level 2	Level 3	Level 4	Level 5	
	Initial process	Structures process and standards	Organizational standards and institutionalized	Managed process	Optimizing Process	
Project integration management		√				
Project Scope Management		√				
Project Schedule Management			√			
Project Cost Management		√				
Project Quality Management			√			
Project Resource Management		√				
Project Communications Management		√				
Project Risk Management		√				
Project Procurement Management		√				
Project Stakeholder Management		√				
Cumulative						2

The project management maturity level of the project office is level 2 which indicates the existence of basic structured processes and standards. The level falls in the range of maturity level set by PricewaterhouseCoopers (2004), Cooke-Davies and Arzymanow (2003), Spundak and Striga (2010), and Grant and pennypacker (2006). It also conforms to the findings of Yimam (2011) on process maturity and practice maturity of grade 1 contractors in Ethiopia,

Ouko (2016) on project management maturity of construction projects in Kenya as well as Ofori and Deffor (2013) on project management maturity in Ghana.

The findings show that there are many project management processes exist in the project office, but they are not considered an organizational standard. Documentation exists on these basic processes. Management supports the implementation of project management, but there is neither consistent understanding, involvement, nor the organizational mandate to comply for all projects. Functional management is involved in the project management of larger, more visible projects, and these are typically executed in a systematic fashion. There are basic metrics to track project cost, schedule, and technical performance, although data may be collected and correlated manually. Information available for managing the project has often a mix between summary-level data and detail-level data.

From the lists of knowledge areas, project schedule management and project quality management are relatively at higher position which is level 3 while project integration management and project risk management are quite at lower position compared with other knowledge areas.

During the unstructured interviews, the participants admitted that there is a noticeable delay in delivering project outputs and there are complaints from clients regarding project quality. But the interviewees attach these problems with the absence of raw materials with standard quality, their unpredictable price in local market as well as the complexity of the procurement process from international market. However, this scenario can also relate to the project office's limited engagement in risk identification, response and monitoring. If risks are not identified early on, it is difficult to put the right assumption based on which a specific project operates. As Jekale (2004), and Cusworth and Franks (1993) indicate, projects in developing countries are highly

influenced by their external environment because of the turbulence, rapid changes and highly constrained project managers to deal with the changes. Hence, limitations in risk assessment and prediction affects the achievement of project goals within the planned time and cost, because in many cases unforeseen events lead to additional cost and time as well as compromization of quality.

Furthermore, as PMBOK® Guide (2017, p. 69) indicates, “project integration management includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the project management process groups.” The result of this study shows that the project office’s low maturity level in this knowledge area affects the process of making choices about resource allocation, balancing competing demands, examining any alternative approaches through creation and the use of appropriate knowledge, tailoring the processes to meet the project objectives and managing the interdependencies among the project management knowledge areas.

Besides the information obtained about the status of the application of the ten project management knowledge areas, the unstructured interview indicates that structurally the project office has been independently operating and ensuring multi-project capabilities such as interproject dependencies. It also has full authority manage its resources. However, the office has no project management graduates in order to apply basic project management concepts. In addition, although most of the respondents replied that they have been provided trainings in project management, the unstructured interview has revealed that the trainings lack consistency and sustainability which affects its effectiveness. Voropajev (1998) claims that lack of institutional capacity and trained personnel among the main reasons why projects fail in developing countries. Therefore, the project office needs to acquire human resource with the skill

and knowledge of project management, expand continuous staff training and development programs in project management, develop and implement methodologies and standards relating to project management, as well as to facilitate project management maturity improvement initiatives by being the focal point for consistent application of the processes and the methodologies.

The other fundamental point the interview focused on is management oversight. As Nguyen (2007) states, lack of robust management support mainly contributes to the failure in the application of project management knowledge and technologies in developing countries. Both the findings from the questionnaire and the unstructured interview indicates that the management of the Ministry and the Project office have been providing support for the implementation of project management principles, but there is neither consistent understanding, involvement, nor the organizational mandate to comply in all projects. Therefore, the involvement of key leaders in the project office's functions is very important.

In general, the findings of this study demonstrate that the project office has pure project management structure. This shows that the project office has full command over its project with its own functional departments. The advantage of this structure is the strong footing it provides for timely management of stakeholders' requirements, to avoid potential conflicts related to resource allocation with other project offices in the Ministry. The project office's direct responsibility and accountability to the higher management of the Ministry also cuts the hierarchy and fasten decision making which has a great impact on the timely delivery of project outputs. As Crawford (2002) noted, meeting stakeholder expectations means establishing a project office at the correct level in an organization.

The Ministry's executive's commitment to equip the project office with independent authority for operation of projects is plausible. However, the critical project delay and quality problems with give insight that there are problems in consistency of follow up during every project life cycle to ensure the progress of projects towards their objectives.

The unstructured interview also reveals that after stakeholders presented their initial requirements, there are limited actions taken by the project office to conduct additional detailed studies to identify the feasibility of the project given the time, cost and quality requirements. There is a limited engagement of stakeholders as well in detail planning and throughout the project cycle which shows there is a gap in ensuring their satisfaction in fixed intervals during the project execution.

Furthermore, the assessment made on the composition of the project team members shows that while the project office has adequate senior and junior staffs with knowledge, skill and experience required in the construction industry, there is no single person with the professional background of project management. This shows that there is a lack of project management theoretical knowledge to understand what kind of processes and practices are necessary for successful execution of projects besides the expertise on a functional part of project deliverables. The research as well indicates that professional development trainings in the field for existing project team members lacks consistency. The participants of the study specifically indicate that short and long term trainings are required in order for them to apply up-to-date project management theories and practices in the office.

By and large, given the independent structure of the project office and its full authority over its resources, full commitment of the project team, and the existing opportunities for timely decision making and better engagement with stakeholders, it can be concluded that the absence of

theoretical knowledge about project management and the limited opportunities for professional development in the field are the main reasons for the project office's low project management maturity level.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter contains three sections. They are summary of major findings, conclusion and recommendations.

5.2 Summary of major findings

The study reveals that the project management maturity of the Ministry of Urban Development and Construction, the Federal Government Buildings Construction Project office is currently at level 2 which implies that the project office has structured processes and standards which adheres to some basic project management practices, but often only at an individual project level. Mostly, project management operation in the project office is reactive in nature and success has likely relied on key individuals or specific management support rather than an adoption of broad standards throughout the organization.

Project management underlying disciplines are not also well understood or consistently followed, and project success is largely unpredictable, and cost and schedule problems are the norm in the project office. The office also lacks skilled human power that is specialized in the field of project management, which affects the establishment of well-defined project management procedures that can be used as standards of operations. Management oversight is basically limited to large and highly visible projects.

Among the ten project management knowledge areas, project integration management and project risk management are the least matured in the project office, which indicates the limitations in integrating the project management systems and inadequate engagement in risk

management which can affect the achievement of project goals within the planned time, cost and quality.

The project scope management, project cost management, project resource management, project communication management and project procurement management are at maturity level 2 which shows the existence of basic processes to set and manage project scope, estimate and monitor project cost, identify key resources and prepare a plan, communicate management process focusing on triple constraint items of scope, schedule and cost, as well as to conduct procurement of goods and services from outside.

The findings of this study specifically demonstrate that the project office has an organizational structure that supports full authority over the operation and facilitate the decision making process which has a great impact on the timely delivery of project outputs. However, the absence of team members with professional backgrounds in project management and the limited initiatives for sustained professional development in the field show that there is a lack of project management theoretical knowledge about the detail processes and practices for successful implementation of project objectives.

5.3 Conclusions

The theoretical and empirical literature reviews of this research assert that project management maturity level and project success are strongly positively related. The project management maturity level is determined by conducting an appropriate assessment using project management maturity models including the PM Solutions Project Management Maturity Model, which is used for this specific research.

These models help organizations determine their current project management maturity level, based on the known level, identify their strengths and weaknesses, and provide a road map for strategic improvement.

Accordingly, this study assessed the project management maturity level of the Ministry of Urban Development and Construction, the Federal Government Buildings Construction Project office in terms of the application of the project management ten knowledge areas. Based on the analysis of the findings, the following conclusion was reached.

The projects management practices and processes of the Ministry of Urban Development and Construction, the Federal Government Buildings Construction Project office is currently at level 2 which implies that at an individual project level, the project office has structured processes and standards which direct some basic project management practices.

Overall project management operation is reactive in nature and success has mostly depend on key individuals or specific management support rather than an adoption of broad standards throughout the organization. Project management underlying disciplines are not also well understood or consistently followed, and project success is largely unpredictable, and cost and schedule problems are the norm.

Similarly, the findings of the study indicate that the project office's project integration management and project risk management maturity are relatively at lower levels, which reveals the existence of the highest possibility for cost and time overrun, and the failure to achieve project objectives. Unanticipated events have an impact on the level of the attainment of project objectives and goals if proper identification and detail analysis of risk is not conducted and prevention and management mechanisms are not set in advance. The lower maturity level in project integration management also presents challenges in fair resource allocation, balancing

competing demands, exploring options through creativity and the application of existing knowledge, adapting the organizational processes and standards to meet specific project objectives, and managing the interdependencies among the project management knowledge areas.

The findings of the study also demonstrate that there are basic, documented processes in place for other knowledge areas such as project scope management, project cost management, project resource management and project communication management. However, the processes are not considered as organizational standards as the focus is on large, highly visible projects. Performance evaluation and reporting is limited to the scope, time and cost constraint. Organizational management is largely involved in project management processes in the larger, more visible projects, but there may not be consistent management involvement across all projects, and the process for procurement is considered standard practice for large projects, and all other projects are encouraged to use it.

In general, the absence project management professionals, and the lack of up-to-date and sustainable training mechanisms in place in the project office shows the existence of issues related to the proper understanding of the project management underlying disciplines which affects the predictability of project success.

5.4 Recommendations

Though there have been debates on whether the maturity of project management by itself can lead to project success, many of the theories and empirical evidences revealed that there is a positive relationship between project management maturity level and project success. Given that maturity implies a situation where an organization has standards and procedures in place that would assist it in reaching its objectives, there is no doubt that mature project management with

a standard methodology and accompanying processes increases the chance of success while poor project management may result time and cost overruns, poor quality and failure in achieving the objectives of a project.

As a 2014 case study conducted by PM Solutions Inc. indicates, when organizations improve their project management maturity, they experience a significant percentage of improvement in aligning projects with business objectives, reducing the number of failed projects, increasing customer satisfaction, delivering projects under budget and increasing productivity.

With this consideration, the research methodology developed for this study is expected to assess the project management maturity level of the Ministry of Urban Development and Construction, the Federal Government Buildings Construction Project office, identify strengths and weaknesses and provide recommendations for improvement.

Accordingly, the result of the study has determined that the project management maturity of the project office is level 2 which implies that there is no uniformity in the project management process in the project office. Project integration management and project risk management knowledge areas, which require in depth assessment and have significant impact on the achievement of project objectives, are at the lowest maturity level when compared with other project management knowledge areas. These shows the existence high likelihood for cost and time overrun because of unforeseen events. The absence of project management graduates, the limited training opportunities in project management for existing project team members, the lack of standardized and comprehensive project performance monitoring and evaluation systems as well as limitations of management oversight are some of the project management weaknesses identified.

Hence, in order to change the scenario and establish a strong organizational culture that can effectively and efficiently deliver project objectives, the project office needs to put an effort to increase its current maturity level, which is level 2 to level 3 and more. For this purpose, the office needs first to establish a project team whose members is adequately equipped with theoretical and practical knowledge of project management besides the detail technical and functional knowledge and skills of each project's deliverables. Therefore, hiring new project management graduate staff and putting in place effective professional development strategies are mandatory.

Subsequently, it is essential to establish organizational standards and institutionalized process for all project management processes. Customizing tools are required in order to apply them to a specific project. Considering stakeholders' engagement as integral part of the project management, setting standard engagement mechanisms for all projects is important.

Management oversight also needs to be improved at the Ministry and at the project office. Management needs to understand its role in project management and in integrating project management processes, standards, and supporting systems with other corporate processes and systems. Management is required to regularly involve in input and approval of key decisions and in key project issues. It is also expected to support initiatives for continuous improvement of project management activities.

Formal documentation also must exist for all processes and standards which facilitates easy reference as well as a collection and distribution of lessons learned. Lessons learned needs to be regularly examined, documented and used to improve project management processes and standards.

Effective project management requires consideration of past project performance and what is expected in the future. Efficiency and effectiveness metrics, baseline estimates, and earned value and impact analysis on other projects need to be applied to make decisions regarding a specific project. Integrating project information system with other corporate systems is also necessary to optimize the decisions.

There are interdependencies between the ten project management knowledge areas. Reaching a specific maturity level requires the cumulative effort in the application of all knowledge areas. The study reveals that the project office has a better maturity level for project schedule management and project quality management while project integration management and project risk management are quite in a lower position. Hence, it is recommended to maintain a close relationship of levels across the various knowledge areas for better results.

5.5 Suggestions for further study

The analysis of data collected using survey questionnaire and unstructured interview as well as information from secondary sources shows that the project office has observable limitations in delivering project outputs that satisfy the time, cost and quality requirements. More studies are recommended on the implication of project delay on the quality and cost of project deliverables by the office.

Using the findings of this study as a benchmark, further research is also recommended for the other project offices in the Ministry in order to determine its overall project management maturity.

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Appendices

Appendix 1

The modified components to measure maturity

Knowledge area	Maturity levels				
	Level 1	Level 2	Level 3	Level 4	Level 5
Project integration management					
Develop Project Charter					
Develop Project Management plan					
Direct and Manage Project work					
Manage Project Knowledge					
Monitor and Control Project work					
Perform integrated change control					
Close project or phase					
Project Scope Management					
Plan scope management					
Collect requirements					
Define Scope					
Create Work Breakdown Structure					
Validate scope					
Control scope					
Project Schedule Management					
Plan Schedule Management					
Define Activities					
Sequence Activities					
Estimate Activity durations					
Develop Schedule					
Control Schedule					
Project Cost Management					
Plan cost Management					
Estimate costs					
Determine Budget					
Control costs					
Project Quality Management					
Plan Quality Management					
Manage Quality					
Control Quality					
Project Resource Management					
Plan Resource Management					
Estimate Activity Resources					
Acquire Resources					
Develop Team					
Manage Team					

Control Resources					
Project Communications Management					
Plan communications Management					
Manage communications					
Control communications					
Project Risk Management					
Plan Risk Management					
Identify Risks					
Perform Qualitative Risk Analysis					
Perform Quantitative Risk Analysis					
Plan Risk Responses					
Implement Risk Responses					
Monitor Risks					
Project Procurement Management					
Plan Procurement Management					
Conduct Procurements					
Control Procurements					
Project Stakeholder Management					
Identify Stakeholders					
Plan Stakeholder Engagement					
Manage Stakeholder Engagement					
Monitor Stakeholder Engagement					

Appendix 2

Addis Ababa University School of Commerce **Graduate studies, Project Management (MA) Program**

This questionnaire is set out with the aim of gathering necessary information to assess the project maturity level of the Ministry of Urban Development and Construction, the Federal Government Buildings Construction Project Office. The main objective of this assessment is to determine the project management maturity level of the Project Office and provide recommendations for further improvement. The attainment of this objective extensively depends on your genuine cooperation in filling the questionnaire. You are not expected to write your name on this paper and the information you provide will be used only for academic purpose that will be kept confidential.

This questionnaire has two parts. The first part is allotted to the demographics of the respondents in terms of educational background and work experience. The second part comprises leveling questions for the project management knowledge areas based on reference points provided.

Part A. Demographics

Put [√] mark under leveling for each of the questionnaire

1. Educational background

B.A. degree ----- MA or above ----- Field of Study -----

2. Work experience at the project office

Less than 5 years ----- 6 – 10 years ----- More than 10 years -----

3. What is your current position at the project office? -----

4. Have you ever attended a Project Management course or training?

Yes ----- No

Part B. Project management maturity leveling

Please level each of the issues raised under the table below based on the characteristics of the levels listed as follows:

Level 1 Initial Process

- *Ad hoc processes*
- *Management awareness*

Level 2 Structured Process and Standards

- *Basic processes; not standard on all projects; used on large, highly visible project*
- *Management supports and encourages use*
- *Mix of intermediate and summary-level information*
- *Estimates, schedules based on expert knowledge and generic tools*
- *Mostly a project-centric focus*

Level 3 Organizational Standards and Institutionalized Process

- *All processes, standard for all projects, repeatable*
- *Management has institutionalized processes*
- *Summary and detailed information*
- *Baseline and informal collection of actuals*
- *Estimates, schedules may be based on industry standards and organizational specifics*
- *More of an organizational focus*
- *Informal analysis of project performance*

Level 4 Managed process

- *Processes integrated with corporate processes*
- *Management mandates compliance*
- *Management takes an organizational entity view*
- *Solid analysis of project performance*
- *Estimates, schedules are normally based on organization specifics*
- *Management uses data to make decisions specifics*

Level 5 Optimizing Process

- *Processes to measure project effectiveness and efficiency*
- *Processes in place to improve project performance*
- *Management focuses on continuous improvement*

Put [√] mark under leveling for each of the questionnaire

Knowledge area	Maturity levels				
	Level 1	Level 2	Level 3	Level 4	Level 5
Project integration management					
Develop Project Charter					
Develop Project Management plan					
Direct and Manage Project work					
Manage Project Knowledge					
Monitor and Control Project work					
Perform integrated change control					
Close project or phase					
Project Scope Management					
Plan scope management					
Collect requirements					
Define Scope					
Create Work Breakdown Structure					
Validate scope					
Control scope					
Project Schedule Management					
Plan Schedule Management					
Define Activities					
Sequence Activities					
Estimate Activity durations					
Develop Schedule					
Control Schedule					
Project Cost Management					
Plan cost Management					
Estimate costs					
Determine Budget					
Control costs					
Project Quality Management					
Plan Quality Management					
Manage Quality					
Control Quality					
Project Resource Management					
Plan Resource Management					
Estimate Activity Resources					
Acquire Resources					

Knowledge area	Maturity levels				
	Level 1	Level 2	Level 3	Level 4	Level 5
Develop Team					
Manage Team					
Control Resources					
Project Communications Management					
Plan communications Management					
Manage communications					
Control communications					
Project Risk Management					
Plan Risk Management					
Identify Risks					
Perform Qualitative Risk Analysis					
Perform Quantitative Risk Analysis					
Plan Risk Responses					
Implement Risk Responses					
Monitor Risks					
Project Procurement Management					
Plan Procurement Management					
Conduct Procurements					
Control Procurements					
Project Stakeholder Management					
Identify Stakeholders					
Plan Stakeholder Engagement					
Manage Stakeholder Engagement					
Monitor Stakeholder Engagement					