Addis Ababa University

College of Business and Economics

School of Commerce

GRADUATE PROGRAM

PROJECT MANAGEMENT MATURITY IN THE ETHIOPIA CONSTRUCTION SECTOR: THE CASE OF BAMACON ENGINEERING PLC

By: - Saron Mulugeta

Advisor: - Bahran Asrat (Dr.)

Addis Ababa, Ethiopia

July 2020

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE

PROJECT MANAGEMENT MATURITY IN THE ETHIOPIA CONSTRUCTION SECTOR: THE CASE OF BAMACON ENGINEERING PLC

By: -Saron Mulugeta

ID: - GSR/1804/11

Advisor: - Bahran Asrat (Dr.)

A Research Project Submitted to Addis Ababa University School of commerce in Partial Fulfillment of the Requirements for the Award of Master of Arts Degree in Project Management

Addis Ababa, Ethiopia
July 2020

Statement of Declaration

I, Saron Mulugeta declare that this project work on the topic entitled “Project Management Maturity in the Ethiopia Construction Sector: The Case of BAMACON Engineering PLC” in partial fulfillment of the requirement for the Degree of Master of Arts in Project Management is my original work prepared with the guidance and support of the research advisor Bahran Asrat (Dr.). All sources of materials used for the project work have been duly acknowledged. I further confirm that the study has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

Saron Mulugeta

Signature _____

Date _____

Addis Ababa, Ethiopia

Addis Ababa University

School of Graduate Studies

Statement of Certification

This is to certify that the project work prepared by Saron Mulugeta, entitled: “Project Management Maturity in the Ethiopia Construction Sector: The Case of BAMACON Engineering PLC” submitted in partial fulfillment of the requirements for the Degree of Master of Arts 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:

Examiner: _____ Signature: _____ Date _____

Examiner: _____ Signature: _____ Date _____

Advisor: _____ Signature: _____ Date _____

_____

Chair of Department or Graduate Program Coordinator

Abstract

This study is conducted to assess project management maturity levels of Bamacon Engineering PLC with specific objective of measuring and identifying actual practice of the company on managing projects. The scope of the study is limited to projects taking place in Bamacon Engineering PLC. The maturity assessment is based on a five level project management maturity model devised by PM Solutions. The study's research design is descriptive and the research approach is mixed (qualitative and quantitative).The sample size of the study is fifty-two respondents of the questionnaire and four project managers for the interview. The sampling technique used is non-probability purposive sampling. Hence, Survey questionnaire and interview is prepared based on reviewed literature to assess the project management maturity of Bamacon Engineering Plc. Primary and secondary method of data collection is used from respondents and detail literatures respectively. Then the data collected is analyzed using statistical software package (SPSS). Results indicate that the project management maturity level of the organization is found to be at level 3.59. This shows that the organization is at good performance level but needs improvement on each project management knowledge areas in order to level up the maturity level.

Keywords: Project management, Project management Knowledge areas, and project management maturity.

ACKNOWLEDGMENTS

First of all, I would like to thank God for everything and helping me in doing this project work until the end. My special thanks goes to my advisor Dr. Bahran Asrat for his valuable guidance and assistance throughout this research. I would like to thank employees of Bamacon Engineering PLC for their collaboration in responding to the questionnaires, interview questions and their inputs for the result of this project work. I also would like to thank my beloved families for their understanding and sacrifice during the whole journey of my education.

Table of Contents

List of Tables

List of figures

LIST OF ACRONYMS

CMM- *Capability Maturity Model*

CMMI- *Capability Maturity Model Integration*

GDP- *Gross Domestic Product*

HIMSS- *Health Information Technology Implementation*

ISO- *International Standards Organization*

IPMA - *International Project Management Association*

K-PMMM- *Project Management Process Maturity Model*

MINCE- *Maturity Increments IN Controlled Environments*

MoFED- *Ministry of Finance and Economic Development*

OGC- *Office of Government Commerce*

OPM3 - *Organizational Project Management Maturity Model*

P3M3- *Project, Program and Portfolio Management Maturity Model*

PfM3: *Portfolio Management*

PgM3*: Program Management*

PjM3: *Project Management (in Project, Program and Portfolio Management Maturity Model)*

PLC- *private Limited Company*

PM- *Project Management*

PM4DEV- *Project Management for Development Organizations*

PM3s- *project management maturity models*

PMBOK -*Project Management Body of Knowledge*

PMI *-Project Management Institute*

PMMM *-Project Management Maturity Model*

PMMMSM- *PM Solutions' Project Management Maturity Model*

SEI- *Systems Engineering Institute*

UCBP*-University Capacity Building Program*

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Project management is a basic field of study that helps organizations to understand the basic areas that needs focus for the success of projects. According to the Project Management Body of Knowledge (PMBoK), project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements (PMI, 2013). This application of knowledge requires the effective management of the project management processes.

Project management effectiveness is highly related to maturity. Mature organizational systems and processes assist the achievement of consistent project management excellence. The understanding of maturity, however, is often a subjective concept (Pretorius et al., 2012). Until just a few years ago, the concept of maturity was rarely used to describe the state of an organization's effectiveness at performing certain tasks. Then, this maturity concept was found being used increasingly to map out logical ways to improve an organization's services particularly across the software industry (Crawford, 2002). Researches indicate that organizations with higher project management (PM) maturity levels are expected to be successful in terms of project effectiveness and efficiency, and thus have a competitive advantage in the marketplace.

Construction organizations and project management are more related since they are project based. Projects in these organizations need more focus on project management maturity of the knowledge areas, which help organizations to be matured. (Kenny, 2007) mentions that construction sector role in economic development is undeniable. In view of its importance, governments made large investments all across the globe for many years. The industry provides high employment opportunity, probably next after agriculture (Pawar, Deshmukh, Chavan, 2016). In Ethiopia, construction is showing a sign of a highly accelerated expansion in recent years. The statistic shows the share of economic sectors in the gross domestic product (GDP) in Ethiopia from 2008 to 2018. The Studies by (Zewdu & Aregaw, 2015) indicated that the GDP contribution of the industry has been raised to 5.6%. The Central Statistics Agency of Ethiopia in 2009 predicted; in 2018 the share of the industry will contribute approximately 27.26 percent.

Despite the construction industry's significant contribution to the economy of the country Ethiopia and critical role it plays in this country development, the performance of the industry still remains generally low. In recent issue published by (Reporter magazine, 2016), interview made with Dr. Wubishet Jekale almost 60 % of the annual budget of Ethiopia is allocated for construction projects. Despite these huge sum amount of budget is allocated, the big picture of the construction sector shows how much the challenges and problems it faced are complex, like not meeting the planned schedule, the estimated budget and the planned quality. Due to this and other factors 79.06 percent of projects fail to meet their objective in Ethiopia (Lemma, 2014).

Therefore, the constructions growth in a country is very essential. To bring this growth the maturity level of the project management in construction sectors should be measured in order to see the strength and weakness. Maturity is not measured for the sake of a score, but to understand how to improve project management processes to better impact project outcomes. The connection between value delivered and process maturity is critical to organizations that rely on projects to achieve strategic goals (PM solution, 2014). According to the literatures observed, Construction companies like Bamacon Engineering plc in Ethiopia needs to assess the project management maturity level in order for the company to see its level of performance and to point out where improvement is needed.

1.2 Background of the Organization

Bamacon Engineering PLC is Established as a grade VII construction firm in 2001 using the name of the owner and general manager as Girma Gelaw Building Contractor, BamaCon Engineering registered with the ministry of infrastructure, has grown to be a very competitive Grade I Building Contractor with favorable prospects for a role of excellence in the construction industry and the company is an ISO certified. It has good experience of building construction work and it is working for better improvements. In fact, the company hasn't done a study on its project management maturity level therefore this study will help the company to identify its maturity level and helps to identify the improvement areas.

As per the experience of the company, Bamacon has twenty-six ongoing building projects in Addis Ababa, Ethiopia. These projects are located at Bole, Kazanchis, Olympia, Atlas, 6kilo and soon. It has around six departments. These are Finance, Engineering, Workshop, Operation, Store, Machinery and equipment. Under Engineering department there are

coordination and contract Administration departments. The number of teams they have for each projects depends on the size of the project. One project can have one project manager, one site engineer, one general Forman, one concrete Forman and one formwork Forman. Under these peoples the project can have a number of team members for each project. As the size of the project increase the number of team members also increase. The company has different machineries like excavator, loader, mixer and soon. The company provides cement for each site. The total overhead of the company is 10 million, 35% for each project.

The company's engineering department manages the case of contract related risks. At early stage the procurement is managed by listing out the necessary materials in order to proceed with the project. The case of stakeholder management there is a point person who can be the client in order to communicate on any issues related to the project.

The company has faced some time and cost overrun on six projects due to cash flow problem on the client side. Four of the projects were stopped but the two projects were managed by the 3rd party to continue making agreements. It has also faced problems on department coordination and lack of claim management office. Claim management in the case of finance and time it is now managed by the coordination department. The project management maturity level of the company is considered as low due to some reasons. Therefore, the company really needs to know its level of maturity in order to make some improvements for effectiveness of the company for its future.

Finally, the study assesses the maturity level of BAMACON Engineering PLC, see the gap and recommend areas where improvement is required. The Company starts the assessment with a baseline assessment of their current situation. The baseline assessment enables an organization to identify areas that need immediate actions and areas that will have an impact and provide greatest return on investment (Crawford 2011). This helps the organization prioritize its improvement actions and plan for continuous improvement. This study's intention is to support companies in implementing changes and making improvements in a structured way, by proposing an integrated framework, which comprises a project management maturity model.

1.3 Statement of the Problem

Project based organizations project management growth is continuous. Organizations need consistent assessment in order to get better performance in their projects. Several construction organizations are seeking their profitability and survival in enhancing the efficacy of their management practices to achieve the organizational objectives. Literatures stated that as per the need for organizations to evaluate their project management practices Project management maturity models have arisen to compare themselves with other organizations in their field in order to achieve excellence and ensure survival.

Looking at the common problems in project management Maturity in various parts of the world, A Global survey was done in 2004 on the state of project management of 38 countries including USA, Spain, Philippines, Japan, Italy, and Australia around the world. One of the key findings of the survey was the correlation between strong PM performance and maturity of PM practices in an organization. Generally, a higher maturity level was linked to sustainable project delivery. In 2004, the majority of organizations were operating projects within Level 1, 2, or 3. They continued the research in 2012, the survey showed a greater percentage of organizations at a higher level of PM maturity from previous surveys. Survey data indicated that organizations are seeking to standardize and enhance processes and tools, and thereby trying to achieve higher levels of PM maturity. However, the survey shows that more than half of the companies are not satisfied their current maturity level. It shows most organizations desire a higher maturity level, but require improvement in organizational structure, human resource management, and quality assurance (Global survey, 2012).

On the other hand, different researches on developing nations: The Ethiopian & East African Context was done. These researches show that most projects in both developed and developing countries are complex and operate in a dynamic environment. However, projects in developing countries are highly uncertain, and operate in a highly unstable, unpredictable and poorly resourced environment. This poses a challenge on project manager in developing countries, which is not seen by their counter parts in the developed nations. (Pawar, Deshmukh and Chavan,2016) stated the result of their research as construction PM maturity for the Grade-1 Contractors was found at low level and this shows how poor the PM practice in the industry overall is. According to (Moutawei, Mohamed, Ibrahim and Bakry, 2017) developing nations like the Egyptian construction industry faces most of the problems and challenges in the industry. These authors sited, considering the critical role the construction

industry plays in Egypt and other developing countries, and the poor level of performance of the industry in these countries, improving the overall performance of the construction industry ought to be a high priority action.

The level of Ethiopian construction project management practice in terms of adapting general project management procedures, project management functions, tools & techniques are unsatisfactory (Ayalew, Dakhli and Lafhaj, 2016). Researchers showed that significant numbers of projects in Ethiopia are under failed category due to ineffective project management processes like Planning, Time, Quality, Cost and Communication processes (Tesfaye, 2016). Therefore, investigating the relations between the extent of implementation of project management processes against that of project success or failure is mandatory in identifying and understanding which maturity level of project management are highly effective then it will give a lesson to be drawn by other construction companies.

Systematic and continuous development exertion needs understanding of exactly where the present status of the management practices is, where desired to go, and the gap between the two. Additionally, systematic and sustained enhancement endeavor demands identifying critical and priority areas, continually assessing results of improvement efforts and taking appropriate actions. This study aims to assess status of the project management practices and where desired to go and the gap between the two. It focuses on assessing the Bamacon Engineering PLC in Addis Ababa Ethiopia in what level of Maturity it exists in order to evaluate and improve their project management practices and capabilities and to provide efficacious guidance to other companies on understanding where project management is within it's company, where it needs to be and how the company is going to get there.

In view of the problems and challenges of project management maturity discussed here above, this study tries to address the following questions.

1.4 Research Questions

1. To what extent are the core (scope, time, cost and quality) project management knowledge areas applied in BAMACON Engineering PLC?
2. To what extent are the facilitating (integration, human resource, communication, risk, procurement and stakeholder) project management knowledge areas applied in the company?
3. What is the level of project management maturity of the company?

1.5 Research Objective

1.5.1 General objective

The main objective of this study is assessing the current project management maturity level of BAMACON Engineering PLC.

1.5.2 Specific objective

The specific objective of this study is:

- To assess the extent to which the company is applying the core project management knowledge areas.
- To assess the extent to which the company is applying the facilitating project management knowledge areas.

1.6 Significance of the Study

According to PMBOK guideline and empirical evidences, project performance increases with the better understanding of the project management knowledge areas. The level of awareness or understanding in project management knowledge areas is scaled as project management maturity level. From empirical reviews of prior researches there is strong relationship between project management maturity level and project performance. Maturity levels of project management are leveled by different models, which are called project management maturity level models. Hence, this study assesses and determines the maturity level of Bamacon Engineering PLC. It significantly contributes:

- To show the position of Bamacon Engineering PLC interims of its project management maturity level and give recommendation for further improvement in prioritizing and designing improvement action in construction companies.
- For other researchers to be as an engine to conduct research in the area and resolve project management related problems at project driven organizations in Ethiopia.
- The maturity assessment result of this research can be used as initial benchmark information in prioritizing and designing improvement action. Further the same result can also be used as a baseline to compare the success of or impact of future improvement effort.

1.7 Scope of the Study

The conceptual scope of the study is on the assessment of the project management maturity level and to establish the organization's progress in maturity level and give recommendations for future improvements. The Empirical scope of the study only focuses on the Grade-1 building construction company; specifically, it focuses on Bamacon Engineering PLC. The geographical location of the projects is at Addis Ababa, Ethiopia. The study is done for Academic purpose. The research design of the study is limited to Descriptive and the research approach uses both Qualitative and Quantitative research methodology. The study uses PM Solution model of project management maturity and the study structure is case study.

1.8 Limitation of the Study

The study could face a number of limitations listed below

- The research adopted only PM Solutions' Project Management Maturity Model even though there are so many models. The reason behind this is because this model is prepared along with project management body of knowledge areas.
- Project is one-time activity, complex, multi- dispensary and dynamic hence managing project needs in-depth and detail understanding of project activities hence it need to see all details related to the project management but short period of time limited researcher to be attached with only office level data (information) and has not cover all project management areas in detail. Hence the result could be too specific to project management maturity level to affect project success.

1.9 Organization of the Study

The study is organized into five sections. The first chapter introduces background of the study discussing about the project management maturity and background of the construction company, which is Bamacon Engineering PLC. The statement of the problem, the research questions, the general and specific objective of the study, significance, scope and potential limitation of the study is including. In the second chapter, different related literatures are presented to create an in depth understanding towards the subject under study. Under theoretical review meaning and nature of terms are discussed. Review of empirical study and the conceptual frame of the study are also included in this chapter. The third chapter is concerned with the study methodologies. It includes the research design, study variables, study area and target population, sampling techniques and sample size, data collection, data analysis, reliability and validity at the end research ethics is included in this chapter. The

fourth chapter discusses the results of the study and also interpretation and discussion of the results is given. And the fifth chapter gives the summary, conclusion and Recommendation. List of references and appendices are also attached at the end of the study.

Definition of key terms

Project management: According to **(**Hearkens, 2012) the project management is a process that calls for the creation of a small organizational structure (the project team), which is often an image of the larger organization. It is also defined as achieving a continuous stream of project objectives within time, within cost, at the desired performance/technology level, while utilizing the assigned resources effectively and efficiently, and having the results accepted by the customer and/or stakeholders (kerzner, 2017).

Project management Maturity: Maturity is the extent of assessing capability with regard to project management. It is a progressive development of enterprise-wide project management approach, methodology, strategy and decision making process (Tarne, 2007). The definition of organizational maturity refers to operations that are in perfect synergy to achieve strategic objectives (Silva, 2014). According to (Demir and Kocabas, 2010) Maturity models are considered to be tools that simulate specific aspects of capability and define the qualitative attributes that characterize competence at a particular level of performance.

Project management knowledge areas: Knowledge Area represents a complete set of concepts, terms, and activities that make up a professional field, project management field, or area of specialization and they are used on most projects most of the time (PMI, 2013). There are ten knowledge areas according to the PMBoK guide. According to literatures, Project management body of knowledge describes the overall knowledge with in the profession of project management and includes tools and techniques used to manage project management process and practices.

CHAPTER TWO: LITERATURE REVIEW

This chapter is composed of three sections, which are Theoretical review, Empirical review and conceptual framework. Under theoretical, definition of terms and related literatures are given and under the empirical, previous related literatures on project management and project management maturity are discussed. At the end the conceptual frame is given showing the relationship between project management maturity level and ten project management knowledge areas.

2.1 Theoretical Review

2.1.1Project Management

The first stage in developing an understanding about the study is defining project and project management. In this part, these terms of the study brief definitions are given in view of different literatures and they are discussed below.

A project: is a problem scheduled for solution (Joseph, 2012). It is also defined as a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specifications (Wysocki, 2014). It should have definite starting and ending points since it is a temporary activity, a budget, a clearly defined scope or magnitude of work to be done, and specific performance requirements that must be met. The PMI definition shows that a project is a temporary endeavor undertaken to produce a unique product, service, or result (PMI, 2013). (Merna and Al-Thani, 2008) also defined a project as a unique investment of resources to achieve specific objectives, such as the production of goods or services, in order to make a profit or to provide a service for a community. According to theses definitions a project can be defined as it is a set of multiple activities having only one goal and it is done only once delivering unique outcome. It is distinguished from regular work in that it's a one-time effort to change things in some way.

Project Management: the definition of project management can be seen in different ways through different literatures. A definition from the 1950's is that project management is the use of tools and techniques to direct the usage of different resources to accomplish a unique, complex and a one-time task within constraints of time, cost and quality (Lutful and Mia, 2015).In this literature Another definition was included from the (UK Association, 1995) of project management which states that project management is about planning, organizing,

monitoring and controlling all parts of a project and that all involved in the project are motivated to achieve the project goals safely and within the stated time, cost and performance. And the recent literatures gave definition of project management saying, it is the application of knowledge, skills, and tools necessary to achieve the project's requirements **(**Kerzner, 2017). And according to (pm4dev,2015) Project Management is also defined as a process of leading a team of capable people in planning and implementing a series of related activities that need to be accomplished on a specific date with a limited budget. Based of theses definitions a project management can be seen, as it is a process of implementing activities, which uses tools and techniques and leads a team for a project goal to be achieved effectively and efficiently. Because of its nature, coordinating all the activities requires a process approach. According to (PMI, 2013) project management is accomplished through the five process groups (initiating, planning, executing, monitoring and controlling, and closing).

2.1.2 Project Management Body of Knowledge (PMBoK)

The Project Management Institute's: A Guide to the Project Management Body of Knowledge (PMBOK Guide) is an excellent point of reference for starting an examination of project management capability. It is already an accepted standard, and there is a great deal of best practices information in existence around the knowledge areas outlined in the document. Project management body of knowledge describes that the overall knowledge with in the profession of project management and includes tools and techniques used to manage project management process and practices (PMI, 2013). According to (project management methodology guideline, 2010) these PMBoK enable the project manager to ensure all projects are conducted in most organized and efficient manner. The ten Knowledge Areas are discussed below.

1. **Project scope management**

According to the PM methodology guideline, Project scope management includes the processes required to ensure that the project includes all the work required and to complete the project successfully. Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project (PMI 2013). It takes a unique skill to obtain the true requirements from the project stakeholders who, in many cases, often are not sure what they want (HIMSS, 2011). Project Scope Management processes are given in the table 2.1 below.

No	Processes	Description
1	Plan Scope Management	The process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled.
2	Collect requirements	The process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives.
3	Define Scope	The process of developing a detailed description of the project and product.
4	Create WBS	The process of subdividing project deliverables and project work into smaller, more manageable components.
5	Validate Scope	The process of formalizing acceptance of the completed project deliverables.
6	Control Scope	The process of monitoring the status of the project and product scope and managing changes to the scope baseline.

Table 2.1: Project scope management processes (Source: PMI, 2013)

2. Project time management

According to (PMI, 2013) Project time management includes the processes required to manage the timely completion of the project. Project time management includes the processes required to manage the timely completion of the project. Plan schedule, define and sequence activity, resource and duration estimation, develop and control schedule are the processes required in project time management. Once a project schedule is set and communicated, it is often the most common measurement of project performance (HIMSS, 2011). Project Time Management processes include the following on Table 2.2.

No	Processes	Description
1	Plan Schedule Management	The process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.
2	Define Activities	The process of identifying and documenting the specific actions to be performed to produce the project deliverables.
3	Sequence Activities	The process of identifying and documenting relationships among the project activities.
4	Estimate Activity resources	The process of estimating the type and quantities of material, human resources, equipment, or supplies required performing each activity.
5	Estimate Activity durations	The process of estimating the number of work periods needed to complete individual activities with estimated resources.
6	Develop Schedule	The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.
7	Control Schedule	The process of monitoring the status of project activities to update project progress and manage changes to the schedule baseline to achieve the plan.

Table 2.2: Project Time Management processes (Source: PMI, 2013)

3. 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 (PMI, 2013). 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. The project manager takes appropriate corrective action to ensure that project performance matches the revised project plan (Watt, 2012). The Project Cost Management processes are given in Table 2.3.

No	Processes	Description
1	Plan cost Management	The process that establishes the policies, procedures, and documentation for planning, managing, expending, and controlling project costs.
2	Estimate costs	The process of developing an approximation of the monetary resources needed to complete project activities.
3	Determine Budget	The process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.
4	Control costs	The process of monitoring the status of the project to update the project costs and managing changes to the cost baseline.

Table 2.3: Project Cost Management processes (Source: PMI, 2013)

4. Project quality management

According to (HIMSS 2011) the primary purpose of quality management is to ensure that the final product meets the business need. Some measures of quality are measurable during the project, while others cannot be measured for months after the project ends. Quality measures and techniques are specific to the type of deliverables being produced by the project (PMI, 2013). This author states Project quality management includes the process and activities of the performing organization that determine quality polices, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken. The Project processes for Quality Management are discussed on Table 2.4.

No	Processes	Description
1	Plan Quality Management	The process of identifying quality requirements and/or standards for the project and its deliverables and documenting how the project will demonstrate compliance with quality requirements.
2	Perform Quality Assurance	The process of auditing the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used.
3	Control Quality	The process of monitoring and recording results of executing the quality activities to assess performance and recommend necessary changes.

Table 2.4: Project Quality Management processes (Source: PMI, 2013)

5. Project integration management

According to the PM methodology guideline Project integration management includes the processes required to ensure that various elements of the project are properly coordinated. As the term implies, every activity must be coordinated or integrated with every other one in order to achieve the desired project outcomes (Joseph, 2012). It 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 (PMI 2013).There are Project Integration Management processes and they are discussed below.

NO	Process	Description
1	Develop Project charter	The process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.

2	Develop project management plan	The process of defining, preparing, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan. The project's integrated baselines and subsidiary plans may be included within the project management plan.
3	Direct and Manage Project Work	The process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.
4	Monitor and control Project Work	The process of tracking, reviewing, and reporting project progress against the performance objectives defined in the project management plan.
5	Perform Integrated change control	The process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating their disposition.
6	Close Project or Phase	The processes of finalizing all activities across all of the Project Management Process Groups to formally complete the phase or project.

Table 2.5: Project Management Integration processes (Source: PMI, 2013)

6. Project human resource management

Human resource management in projects is a vital skill for all project managers. A team will often consist of people brought together for the first time, and it is the project manager's job to form them into a team that will work together to complete the project (HIMSS 2011). The project management team is a subset of the project team and is responsible for the project management and leadership activities such as initiating, planning, executing, monitoring, controlling, and closing the various project phases (PMI, 2013).The Project Human Resource Management processes are given on Table 2.6.

No	Processes	Description
1	Plan Human resource Management	The process of identifying and documenting project roles, responsibilities, required skills, reporting relationships, and creating a staffing management plan.
2	Acquire Project team	The process of confirming human resource availability and obtaining the team necessary to complete project activities.
3	Develop Project team	The process of improving competencies, team member interaction, and overall team environment to enhance project performance.
4	Manage Project team	The process of tracking team member performance, providing feedback, resolving issues, and managing changes to optimize project performance.

Table 2.6: Project Human Resource Management processes (Source: PMI, 2013)

7. Project communications management

Communication involves understanding the information received and being able to explain it to others (HIMSS 2011). Completing a complex project successfully requires teamwork, and teamwork requires good communication among team members (Watt, 2012). Effective communication creates a bridge between diverse stakeholders who may have different cultural and organizational backgrounds, different levels of expertise, and different perspectives and interests, which impact or have an influence upon the project execution or outcome (PMI, 2013).Project communications management includes the processes required to ensure timely and appropriate planning, collection, creation and distribution, storage, retrieval, management, control, monitoring and the ultimate disposition of project information. The Project Communications Management processes are discussed on Table 2.7.

No	Processes	Description
1	Plan communications Management	The process of developing an appropriate approach and plan for project communications based on stakeholder's information needs and requirements, and available organizational assets.
2	Manage communications	The process of creating, collecting, distributing, storing, retrieving and the ultimate disposition of project information in accordance with the communications management plan.
3	Control communications	The process of monitoring and controlling communications throughout the entire project life cycle to ensure the information needs of the project stakeholders is met.

Table 2.7: Project Communication Management processes (Source: PMI, 2013)

8. Project risk management

Risk management is the process of identifying, analyzing and responding to risks throughout the project. Early identification of risks is the responsibility of all project team members and is critical, as the earlier risks are identified the more time there is to perform risk analysis and plan the risk response (HIMSS, 2011). The objectives of project management are to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project (PMI, 2013). Project Risk Management involves procedures for risk identification, risk analysis, planning responses for identified risks and risk control (Maylor, 2010).The Project Risk Management processes are discussed on Table 2.8.

No	Processes	Description
1	Plan risk Management	The process of defining how to conduct risk management activities for a project.
2	Identify risks	The process of determining which risks may affect the project and documenting their characteristics.

3	Perform Qualitative Risk Analysis	The process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact.
4	Perform Quantitative Risk Analysis	The process of numerically analyzing the effect of identified risks on overall project objectives.
5	Plan risk responses	The process of developing options and actions to enhance opportunities and to reduce threats to project objectives.
6	Control risks	The process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project.

Table 2.8: Project Risk Management processes (Source: PMI, 2013)

9. Project procurement management

According to the PM methodology guideline Project procurement management includes the processes required to acquire the goods and services to attain project scope from outside the performing organization. It also includes the contract management and change control processes required to develop and administer contracts or purchase orders issued by authorized project team members (PMI, 2013).The Project Procurement Management processes are included on Table 2.9.

No	Processes	Description
1	Plan Procurement Management	The process of documenting project procurement decisions, specifying the approach, and identifying potential sellers.
2	Conduct Procurements	The process of obtaining seller responses, selecting a seller, and awarding a contract.
3	Control Procurements	The process of managing procurement relationships, monitoring contract performance, and

		making changes and corrections as appropriate.
4	Close Procurements	The process of completing each project procurement.

Table 2.9: Project Procurement Management processes (Source: PMI, 2013)

10. Project Stakeholder 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 (PMI, 2013).The Project Stakeholder Management processes are discussed on Table 2.10.

No	Processes	Description
1	Identify Stakeholders	The process of identifying the people, groups, or organizations that could impact or be impacted by a decision, activity, or outcome of the project; and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success.
2	Plan Stakeholder Management	The process of developing appropriate management strategies to effectively engage stakeholders throughout the project life cycle, based on the analysis of their needs, interests, and potential impact on project success.
3	Manage Stakeholder Engagement	The process of communicating and working with stakeholders to meet their needs/expectations, address issues as they occur, and foster appropriate stakeholder engagement in project activities throughout the project life cycle.

4	Control Stakeholder Engagement	The processes of monitoring overall project stakeholder relationships and adjusting strategies and plans for engaging stakeholders.

Table 2.10: Project Stakeholder Management processes (Source: PMI, 2013)

2.1.3 Project management maturity

According to (Jaroslaw, 2014) the concept of maturity refers to the comparative level of advancement that an organization has regarding any given activity or sets of activities. The term project management maturity signifies the radical approach to the development, methodology, tactics and making of decisions (Crawford, 2007). (Andersen & Jessen, 2003) refer to maturity as a state where an organization is in perfect condition to achieve its objectives. According to (Kerzner 2017), maturity in project management is the implementation of a standard methodology and accompanying processes such that there exist a high likelihood of repeated success. (Prado, 2011) also defined maturity in project management as the position in which the company finds itself regarding the project management processes. Based on this, maturity models seek to quantify the ability of a company to manage projects successfully. Maturity in organizational context is a state that creates effective condition for an organization to achieve its desired objectives (Mateen, 2015).

Therefore, Project management maturity is basic concept companies need to focus since it determines the company's success or failure based on the project management knowledge areas. Effective development of organizations abilities in managing projects is the basic aims of an organization. According to (Ferreira and Pereira, 2015) maturity models used in the diagnosis of Project Management culture in organizations are helpful to define a set of actions and measure to improve its performance as an organization. If Organizations have systems in place that show a mature project management environment based on a culture of continuous improvement will deliver successful projects (Crawford, 2011).

A project management maturity model determines project management maturity level of an organization. Beginning in the 1990's, various models were developed to evaluate the maturity of organizations in managing projects, almost all of them inspired by the maturity model in software development, Capability Maturity Model Integration (CMMI), created by Carnegie Mellon University in a partnership with the Systems Engineering Institute (SEI)

(Prado, 2011).Maturity models provide framework to organizations for improving their performance across different business areas (Brookes et al., 2014). Thus maturity, when applied to projects of organization, provides perfect condition to handle projects (Andersen & Jessen, 2003).

Different kinds of project management maturity models (PM3s) exist today, most of them inspired by the capability maturity model (CMM) developed in the beginning of the 90's, originally intended to measure capability in software development projects (Backlund, Chronéer and Sundqvis, 2013). These models are discussed below.

1. Organizational Project Management Maturity Model (OPM3)

The Organizational Project Management Maturity Model (OPM3) was created by the PMI between 1998 and 2003, (Zaguir, 2007). The Organizational Project Management Maturity Model (OPM3) is a framework that provides an organization-wide view of portfolio management, program management, and project management to support achieving best Practices within each of these domains (PMI, 2008). OPM3 was developed with the purpose of providing a way for organizations to understand project management and for measuring the maturity in contrast to a comprehensive and wide-ranging set of best practices in project management. OPM3 has defined five maturity levels for performing maturity assessment of Project, Program or Portfolio Management either collective or individual. The maturity levels are:

Level 1: None – no such practice exists

Level 2: Standardize – a standardized process of doing projects have been documented and communicated within organization. This practice is not used by all the projects but only few.

Level 3: Measure – Standardized process is used by all the projects within organization and processes are measured to evaluate effectiveness for organization.

Level 4: Control – measured process is corrected for poor application of the standardized practice. Upper and lower limits are established and process is analyzed.

Level 5: Improve – Continuous improvement of process becomes a practice for outcome of Best Practice standard.

2. Capability Maturity Model Integration (CMMI)

In 1987, Software Engineering Institute (SEI) of Carnegie Mellon University took the lead of proposing the Capability Maturity Model (CMM) from the standpoint of the software process capabilities (Lianying, Jing and Xinxing, 2011). According to (SEI, 1994) the model offers five level maturity levels for the assessment of contractors in order to help contractors continually improve its software process capability. The maturity levels are:

Level 1: Initial- Processes are usually ad hoc and chaotic; Success depends on the competence and heroics of the people in the organization

Level 2: Managed- Processes are planned and executed in accordance with policy, the process discipline reflected by maturity level.

Level 3: Defined- Processes are well characterized and understood, and are described in standards, procedures, tools and methods.

Level 4: Qualitatively Managed- The organization and projects establish quantitative objectives for quality and process performance and use them as criteria in managing processes.

Level 5: Optimizing- Organization continually improves its processes based on a quantitative understanding of the common causes of variation.

3. Kerzner Project Management Maturity Model (K-PMMM)

Kerzner put-forth his Project Management Maturity model in 2017 based on knowledge areas of PMBOK. K-PMMM accesses Project Management Maturity of organization using PMBOK guide and provide five levels of maturity.

Level 1 — Common language: In this level, the organization recognizes the importance of project management and the need for a good understanding of the basic knowledge on project management and the accompanying language/terminology.

Level 2 — Common processes: In this level, the organization recognizes that common processes need to be defined and developed such that successes on one project can be repeated on other projects. Also included in this level is the recognition of the application and support of the project management principles to other methodologies employed by the company.

Level 3 — Singular methodology: In this level, the organization recognizes the synergistic effect of combining all corporate methodologies into a singular methodology, the center of which is project management. The synergistic effects also make process control easier with a single methodology than with multiple methodologies.

Level 4 — Benchmarking: This level contains the recognition that process improvement is necessary to maintain a competitive advantage. Benchmarking must be performed on a continuous basis. The company must decide whom to benchmark and what to benchmark.

Level 5 — Continuous improvement: In this level, the organization evaluates the information obtained through benchmarking and must then decides whether or not this information will enhance the singular methodology.

4. Project, Program, Portfolio Management Maturity Model (P3M3)

Office of Government Commerce (OGC) first presented the Project, Program and Portfolio Management Maturity Model (P3M3) in 2006. P3M3 has presented three different sub-maturity models (OGC, 2011). These maturity models are: Portfolio Management (PfM3), Program Management (PgM3) and Project Management (PjM3). These three models can be used either separately or collectively to access relationship between organization's project, program and portfolio management maturity (OGC, 2011). P3M3 measures organization's performance for each of its sub-maturity model against following seven key areas.

- Organizational governance
- Management control
- Benefits management
- Risk management
- Stakeholder management
- Finance management
- Resource management

Each of seven key areas for sub models has five levels maturity levels. These levels as defined by OGC (2011) are:

Level 1 – awareness of process: Projects are recognized in organizations but structured approach does not exist for handling projects, programs and portfolios.

Level 2 – repeatable process: Basic standard for project management exist but not used consistently across organization.

Level 3 – defined process: Use of standards for projects is consistent across organization.

Level 4 – managed process: enables organization to measure and monitor projects performance.

Level 5 – optimized process: At this level of maturity, all the processes for handling projects, programs and portfolios are optimized and continuous improvement is evident in organization.

5. Maturity Increments in Controlled Environments (MINCE)

MINCE2 Foundation presented maturity Increments in Controlled Environments Model (MINCE) in 2007. The focus of MINCE maturity model is towards organization's ability to adapt to environmental and market changes.

The use of MINCE maturity model provides following insights in organization (Meisner, 2007):

- Maturity of organization
- Skill levels of organization's staff
- Effectiveness of organization's projects
- Ability to adapt to change
- How does organization benefit from past lessons?

According to MINCE Foundations (2007), each tower has five maturity levels as:

Level 1 – Activities

Level 2 – Processes

Level 3 – Systems

Level 4 - Supply Chain

Level 5 – Quality

6. Project Management Maturity Model (PMMM by PM Solutions)

PM Solutions' Project Management Maturity Model (PMMMSM) describes how organizations mature as they improve their project management processes. The model is based on the PMBOK guide's ten knowledge areas with five distinct levels of maturity. Each level represents a discrete organizational capability based on the organization's maturity in each of the knowledge area components listed. The five levels of maturity are 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 projects
- Management supports and encourages use
- Mix of intermediate and summary-level information
- Estimates and schedules based on expert knowledge and generic tools
- Project-centric focus

Level 3: Organizational Standards and Institutionalized Process

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

Level 4: Managed Process

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

Level 5: Optimizing Process

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

Summary of the project management maturity models and their levels are given in table 2.11.

Maturity levels	**Project Management Maturity models**					
	Organizational	**Capability Maturity Model Integration**	**Kerzner project management maturity model**	**Project, Program, Portfolio**	**Maturity Increments In Controlled Environments**	**PM Solutions**
Level-1	None	Initial	Common language	Awareness of process	Activities	Initial Process
Level-2	Standardize	Managed	Common processes	Repeatable process	Processes	Structured Process and Standards
Level-3	Measure	Defined	Singular methodology	Defined process	Systems	Organizational Standards and Institutionalized Process
Level-4	Control	Qualitatively Managed	Benchmarking	Managed process	Supply Chain	Managed Process
Level-5	Improve	Optimizing	Continuous improvement	Optimized process	Quality	Optimizing Process

Table 2.11 project management maturity models (source: literatures of PM maturity models)

2.2 Review of Empirical Studies

The study mainly reviewed articles and thesis's conducted under the area of assessing level of project management maturity of different countries at different years in order to give feedbacks on the study area.

Mateen (2015) conducted a research on Measuring Project Management Maturity - A framework for better and efficient Projects delivery. The research's objective was to perform an assessment on project management maturity of two departments in selected organization using four project management knowledge areas which were scope, time, cost and risk project management with specific objective of providing basis to understand how project management maturity model can be used to improve project management process and suggesting improvements based on measured OPM3 for better and efficient projects delivery. The result obtained was, the company has strong realization for standardized project management processes, a clear understanding of project management processes and a desire to improve processes was found among participants of the two departments, it was also observed that although standardization of project management procedures provide direction on how to deliver projects but it is not sufficient alone. The assessment also observed department one was more mature than department two regarding to assess knowledge areas. Some of the recommendation given by the researcher was, the company need to have clearly defined procedures to handle scope change during project execution, project time durations for each activity should be determined by project management team based on resources availability, Standards should be defined for project cost contingency reserves and existing risk management standards should be evaluated.

Kassu Girma (2015) also discussed in his study about assessment of project management maturity at landsvirkjun-power projects department division. The research aim in assessment of project maturity in Power Projects Department in ten project management body of knowledge using PM Solutions Project Management Maturity Model with the objective of providing a clear picture of current state, define future state, Identifies the gaps and provides a roadmap for organization change. Case study was used as research design and face-to-face interviews with five project managers were conducted in this assessment to gather data about the project management practices at Landsvirkjun-Power Projects Department. The key characteristics of the five level maturity models were used as criteria to evaluate each component of knowledge areas based on the qualitative data result obtained from conducted interviews and the data obtain through interview analyzed quantitatively using scoring mean.

According the assessment, the overall project management maturity at Power Projects Department found at maturity level 3. This indicates that most organizational standards and processes were achieved by most of project management knowledge areas and applied to all projects. However, in some cases, knowledge areas were not completely standardized and thus processes not applied properly and ineffectively. The assessment tool also identifies areas to be focused for improvement and recommended that formal training be provided based on project management knowledge areas including organizational standards and processes of project management for the project team and others.

Pawar, Deshmukh and Chavan (2016) set out to assess the maturity of PM in the construction industry of developing countries (India). The research proposed a PM maturity model to address the gaps and adapted it to the developing countries context. Maturity assessment of contractors in India was undertaken using the proposed maturity model and, low level of PM maturity; which indicated the informal practice of the fundamental processes was in existence. Further, the research found ISO certified contractors' have a higher project management maturity level than those who are not certified. Similarly, Capacity Building Program was found to positively impact on the degree of project management maturity, because contractors who participated have a greater maturity level than those who did not participate. Likewise, Road Contractors PM maturity is comparatively higher than Building contractors. Furthermore, the research found higher maturity level for cost, material, procurement, financial, time, and human resource management. Risk and safety management were found to be the least matured PM areas.

In 2017 Moutawei, Mohamed, Mohamed and Bakry conducted a research on Project Management Maturity for Construction Contractors in Egypt. In Egypt, there was a lack of documentation available on the current status, awareness and utilization of maturity models in the contracting organizations working in the construction sector and the research was made to fill this gap. In order to achieve the result, it was necessary to consult project management experts and professionals to get an understanding of how these organizations view maturity models and project management standards and to establish the most common business practices and so propose the basis of a maturity model for Egyptian construction contractors that best fit the current status. Based on the analysis of the survey conducted, it was concluded that project management tools and methodologies have not yet been utilized effectively in the Egyptian construction contracting organizations and that there is much

room for improvement regarding project management practices in these organizations in order for Egypt to develop the contracting construction sector as a pillar for the Egyptian economy.

Looking at the case of Ethiopia, it is a country with great opportunities for development in all areas of the society. Developing countries like Ethiopia spend substantial amount of their budgets in infrastructure development that involve significant construction works in projects such as construction of roads, buildings, water works, telecom civil works, etc. For example, the Ethiopian government has spent about 50% of its total budget in fiscal year 2007/2008 for capital projects out of which road construction accounts about 33 % (Ministry of Finance and Economic Development (MoFED), 2008). From project expenses in other sectors, the construction part accounts for the major part as most socio economic projects such as school and healthcare involve significant construction component. Even though significantly large amount of money is being poured in to infrastructure development, the infrastructure of the country is still considered to be very poor, even when seen by the standards of the Sub-Saharan countries. Nevertheless, the construction industry of the country looks unprepared for these huge volumes of works to come. Many studies in the area have indicated the need to improve the capacity of contractors in areas such as financial management, project estimating and costing, total quality management, change management, claim management, business planning, personnel and general management skill, etc which almost all can be included under the 10 PMI's knowledge areas of construction project management. This shows that improving the project management capacity of contractors can significantly improve the current status of the construction industry in the country. The need for the improvement and development initiative has already been acknowledged by the government of Ethiopian, and University Capacity Building Program (UCBP) has been initiated with the assistance of the German government to support the capacity of local contractors by providing managerial and entrepreneurial training and coaching that prepare contractors for ISO 9001certification. Contractors under the program were given training in areas such as modern contract and project management, modern financial and construction equipment management systems, general management and leadership, marketing, project and quality management.

2.3 Conceptual Framework of the study

Project management is becoming today's voice in many organizations. Project management disciplines thus have been developed to ensure success of a project and project efficiency and effectiveness. Many of the studies reviewed showed though, maturity models are not meant to provide a quick fix for projects in trouble they are guides to improve project management capability. Considering "The Project Management Body of Knowledge" (PMBOK Guide) being an excellent point of reference to measure project management capability, the researcher used a five-level maturity model adopted from Project Management Solutions which encompass 10 project management bodies of knowledge areas listed under PMBOK.

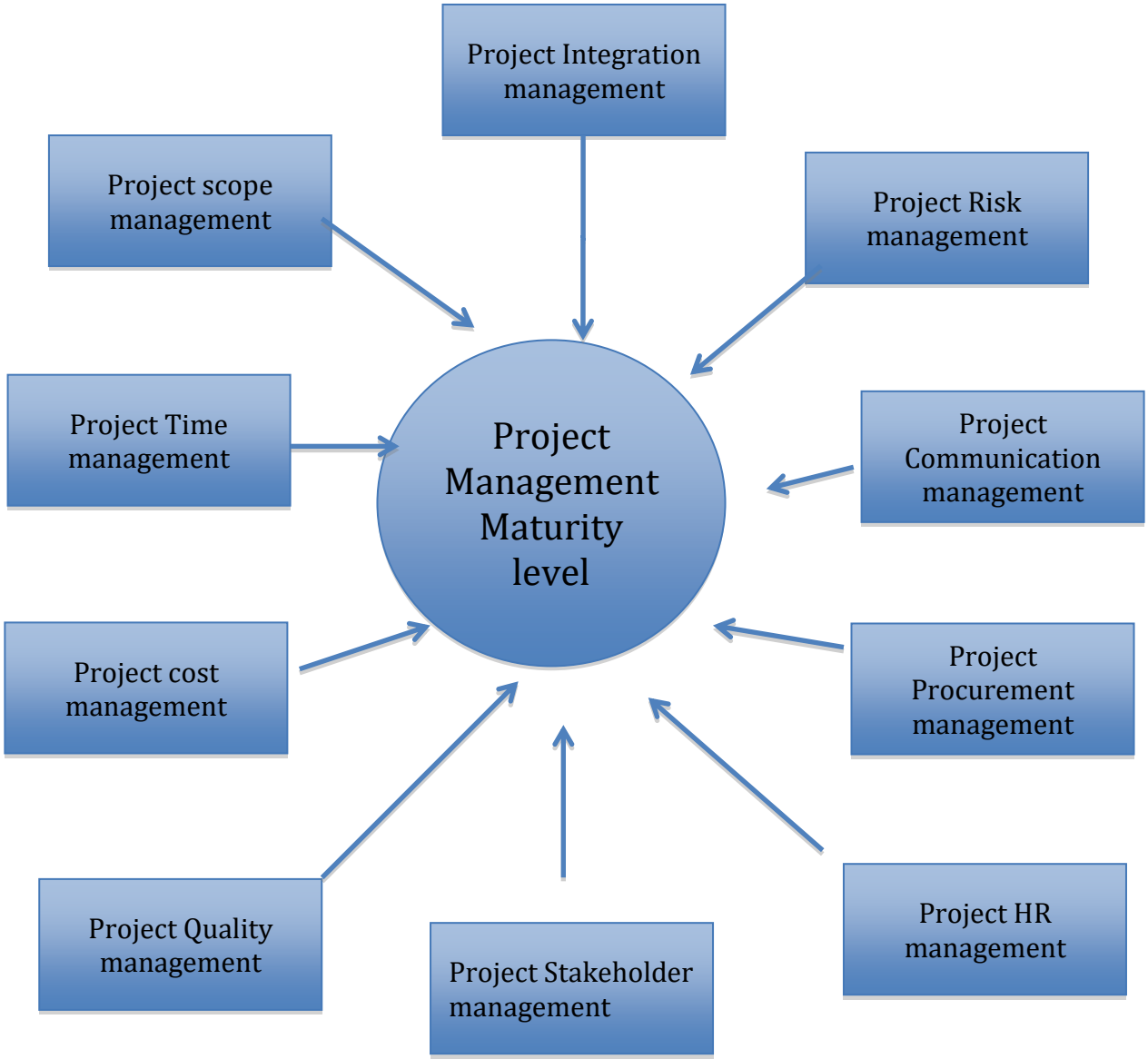

Figure 2.1: Conceptual framework (Source: PM solutions' Maturity Model)

CHAPTER THREE: RESEARCH METHODOLOGIES

3.1 Introduction

This study aims to reflect on the project management maturity level of the construction sector in Ethiopia by looking in depth in to Bamacon engineering PLC as a case unit. The methodology section provides an outline of the research methodology that is employed in the assessment of the Project Management Maturity level for the success of internal projects of Bamacon engineering plc in Ethiopia. This part describes the research design, description of study variables, description of study area and target population, sampling technique and sample size, data collection and method of data analysis. Validity, reliability and Ethical considerations are also described in this chapter.

3.2 Research design

The research design's purpose is descriptive. Descriptive research sets out to describe and to interpret what is. It looks at individuals, groups, institutions, methods and materials in order to describe, compare, contrast, classify, analyze and interpret the entities and the events that constitute the various fields of inquiry. The study has used descriptive type of design in order to get deep information about the project management maturity level in Ethiopia construction industry. The study structure is a case study since case studies can provide very engaging, rich explorations of a project or application as it develops in a real-world setting and they emphasize detailed contextual analysis of a limited number of conditions and their relationships, which is the project management maturity assessment of an organization.

The research timeline is cross sectional, since the study record information about the project management maturity level of the organization without manipulating the study environment. It allows the researchers to compare many different variables at the same time. And the research approach is mixed (qualitative and quantitative research) since it is done using the questionnaire survey, Interview and bases on theoretical consideration and existing knowledge. Qualitative research would give depth or quality to the research. This type of study aims at discovering the underlying motives and desires using in depth interviews for the purpose (Kothari, 2008). Since the research is engaged to assess the project management maturity level, it uses theoretical consideration and existing knowledge and it will be focusing on the quality of the future Ethiopian construction industry. On the other hand, quantitative research is the systematic empirical investigation of observable phenomena via statistical, mathematical or computational techniques, which is defined by the same author.

3.3 Description of study variables

The Dependent variable of the study is the project management maturity level. The study assesses the project management maturity level of BamaCon Engineering PLC based on the independent variables, which are the ten project management knowledge areas. As discussed in the conceptual framework, The Project Management Body of Knowledge (PMBOK Guide) is an excellent point of reference to measure project management capability. The ten project management knowledge areas are project Integration, scope, time, cost, quality, stakeholder, human resource, procurement, communication and risk management.

3.4 Description of study area and Target Population

The study is delimited to Building construction in Bamacon Engineering plc. The aim of this study is to perform maturity assessment based on the project management knowledge areas on project management practices of the selected company and provides improvement recommendations. The target population of the study is the project managers and senior Engineers in the company who are recently working on the ongoing projects of the company. This population is selected among the total population since they have longer experience on the company projects and concept on project management and project management maturity. One of Non-probability sampling techniques is used considering profession as basic criteria.

3.5 Sampling Technique/methods and sample Size

The total population of the study is all the employees in Bamacon Engineering PLC who are working in six departments of the company, which are the Finance, workshop, Engineering, operation, store, machinery and equipment in the company who is working on the building construction. The sample size of the study is the company's fifty two project managers and senior level Engineers who are working at 26 projects and head office, since this study is basically for project managers and senior level Engineers with efficient background in Project management to respond questions effectively and who are the responsible body for managing ten project management knowledge areas of the study and they also have deeper information than the ordinary project team members on the project management practice of the company. The sample selection approach for this study is non-probability purposive sampling. The reason behind for using non-probability purposive sampling is to select a sample who knows well about the project management practice of Bamacon Engineering PLC and to select a sample who will best able to answer the research question of this project works since every staffs don't have the same or equal information regarding the project

management practice of the company and the knowledge areas that is used in this project work as its discovered through the visit made on the company. Sample size determination process is the act of choosing the number of observations or replicates to include in a statistical sample. The sample size is determined based on the knowledge capacity of the respondents about the project management maturity of the organization.

3.6 Data Collection

The type of data of the study is qualitative. Qualitative research's process involves emerging questions and procedures, data typically collected in the participant's setting, data analysis inductively building from particulars to general themes, and the researcher making interpretations of the meaning of the data. The sources of data for the research are both primary and secondary data sources, which are used to collect all necessary information. Data collection methods & tools of the study are questionnaire and interview. They are used to collect relevant primary data for the study. The questionnaires and interview is administered to a sample of office and site project managers and also to senior engineers who are selected from the projects being undertaken currently by Bamacon Engineering plc. In addition, review of relevant theoretical documents is carried out as a secondary data source. The questionnaire covers the assessment of to what extent the core and facilitating project management knowledge areas are applied and asses the project management maturity level of the organization. The questionnaire is prepared in order to address the research variables and to achieve the general objective of the study, which is assessing the current project management maturity level of the organization and in order to meet the specific objectives, which are, used to assess to what extent the core and facilitating project management knowledge areas applied to the organization.

3.7 Data Analysis

In order to interpret the findings of the study descriptive statistic is employed in analyzing the study and the coded data was processed using statistical software package (SPSS). In the descriptive statistics the tools the study has used are mean and standard deviation. The data collected is coded and analyzed using graphs, tables and percentages to provide summaries of the respondents under study. Mean is used to identify the level of project management maturity and competitive positioning of the Bamacon Engineering plc.

The data from interview and secondary data sources are triangulated with the questionnaire-generated data to describe the process of comparing concurrently collected qualitative

findings. The questionnaires are generated based on the literatures review. The secondary data helps to interpret the findings of the questionnaires and the interview from the top project managers' support the data result from the questionnaire.

3.8 Reliability and Validity analysis

Creswell (2014) underlines the value of checking validity and reliability of data in attempting to acquire meaningful interpretations. A reliability analysis is conducted to establish both the consistency and stability of the research instrument. In this case, Cronbach's alpha is used to check the validity and reliability of data in this study. Cronbach's alpha is computed in terms of the average inter-correlations among the items measuring the concept. The closer the cronbach's alpha to 1: the higher internal consistency of the variables.

Variables	Cronbach's alpha value	No of items
Project management process Maturity	0.78	14
Project management tools and techniques	0.86	20
Organizational culture and human capacity	0.85	12
Project management maturity level of ten bodies of knowledge areas.	0.81	38

Table 3.1 Cronbach's values for variables (source: own survey 2020)

In table 3.1 above the cronbach's alpha of each variable is calculated using SPSS and the average of them taken to represent. Since all of the values are above the minimum threshold of 0.70, they suggest a relatively high internal consistency of the questions.

3.9 Research Ethics

Ethical issues involve with moral principle that governs or influence human behaviors. This research reflects the basic principles of research ethics that will be devoting the researcher and respecting the participant's opinion. The interview informs the participants about the objectives of the study. Then the data is collected using questionnaires with full consent of the participant. The statement is stated that clearly indicates these participants are volunteers who are willing to help the research to be conducted. And it is clear and transparent of their ideas.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter deals with the data analysis, presentation and interpretation of primary data, which was, collected from respondents through questioner on each contents of the study from fifty-two respondents and interview from six project managers of BAMACON Engineering PLC on their respective department. All of the questionnaires were fully completed which helps the study to be considered adequate for analysis and reporting.

The project management maturity of Bamacon Engineering PLC has been done based on the assessment on the ten-construction Project management body of knowledge areas covered by the study. These are Integration, Scope, Time, Cost, Quality, communication, Human resource, procurement, Risk and stakeholder management.

The study has used PM solutions' Maturity Model as it is represented in the conceptual model. The reason behind is the model developers have given a detailed description of the characteristics of the knowledge area at each maturity level. Mainstreaming each of PMBOK knowledge areas developed it.

4.2 Response rate and Demographic data

4.2.1 Response rate

A total of fifty-two questionnaire copies were administered and have an interview with four project managers. Response rate refers to the number of subjects sampled in a study who respond to the research instruments. All of the questionnaires were fully completed which helps the study to be considered adequate for analysis and reporting.

4.2.2 Demographic data

For the general questions regarding position/role, department, company experience and level of education are presented here under.

4.2.2.1Department and Current position of respondents

As described in the table 4.1 below all the respondents is from the engineering department of the company. From the total of 52 respondents given on figure 4.1, 19% are office project manager, 40 % are site project managers and 40% are engineers.

Department

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Engineering	52	100.0	100.0	100.0

Table 4.1Department of respondents (Source: own survey results, 2020)

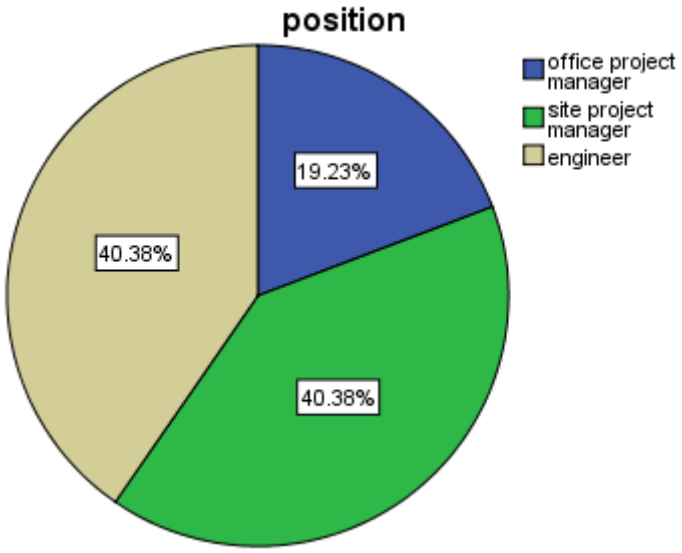

Figure 4.1 Current positions of respondents (Source: own survey results, 2020)

4.2.2.2 Education level and working experience of respondents

As shown in table 4.2 below, 100% of the respondents are from engineering department and table 4.3 shows the respondent's years of experience in the company. 50% of the respondents have a working experience of 1-5 years in the company.

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ba/BSc	52	100.0	100.0	100.0

Table 4.2 Level of Education (Source: own survey results, 2020)

Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 1	7	13.5	13.5	13.5
	1-5	26	50.0	50.0	63.5
	6-10	8	15.4	15.4	78.8
	11-15	7	13.5	13.5	92.3
	Above 15	4	7.7	7.7	100.0
	Total	52	100.0	100.0	

Table 4.3 Years of Experience (Source: own survey results, 2020)

4.3 Results and analysis of the study

In this part of the study the analyzed detail result of the questionnaire is given using SPSS software according to the research questions of the study. The outputs of the analysis are given below.

4.3.1 Project Management practice maturity level of the core Project management body of knowledge areas

The analysis of the project management maturity level of the organization is presented using tables. The average mean of project management body of knowledge areas is computed to know the project management maturity level of the organization.

The maturity level of each knowledge areas within the project department of the company estimated based on the mean value of each sub elements of the knowledge areas. On the questionnaire each respondent was asked to choose at which level the company stands in five maturity levels regard to sub elements of each project management knowledge areas. Then the mean of the five maturity levels scored by the respondents on each sub elements of knowledge areas is used to decide the maturity level of each knowledge areas, on the same time the mean of ten knowledge areas was used to define maturity levels of the company on project management as it shows below.

1. Project Scope Management maturity level

According to the data obtained from the mean value of each project scope management key practices on table 4.4, the maturity level of the importance of project scope management in their organization or project team is 3.4, the maturity level of the definition of project scope/ End to end definition of all works in projects is 3.28, the maturity level of quality of Work break down structure prepared in defining scope in their project is 3.75 and the maturity level

of the effort of Monitoring and controlling scope in their project is 3.65. Taking the total mean of each key practice gives us that the company's project scope management is at level 3.52.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
The importance of project scope management in your organization or project team.	11.5	7.7	21.2	48.1	11.5	3.40	1.15
Definition of project scope/ End to end definition of all works in projects	11.5	13.5	21.2	42.3	11.5	3.28	1.19
Quality of Work break down structure prepared in defining scope in your project	3.8	17.3	3.8	50.0	25.0	3.75	1.13
Effort of Monitoring and controlling scope in your project		17.3	23.1	36.5	23.1	3.65	1.02
Project Scope Management maturity level						**3.52**	**0.82**

Table 4.4: Project Scope Management maturity level (Source: own survey results, 2020)

The standard deviation of the variables of project scope management is given in table 4.4. The total standard deviation of scope management is 0.82. The lower value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean.

2. Project Time Management maturity level

The result of the project time management in the study is done based on each activity's maturity level of the company. As shown in table 4.5 maturity level of each activities given to get the maturity level of project time management. The company's project time management knowledge area maturity level is at 3.78.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Schedule or plan prepared for your project		9.6	25	26.9	38.5	3.94	1.01
Estimate of resource (Materials, people, equipment….) needed scheduled separately	3.8	7.7	30.8	34.6	23.1	3.65	1.04
WBS used when defining the schedule activities	5.8	17.3	9.6	40.4	26.9	3.65	1.21
Progress of project activities continuously monitored and controlled	7.7	7.7	11.5	34.6	38.5	3.88	1.23
Project Time Management maturity level						**3.78**	**0.71**

Table 4.5: Project Time Management maturity level (Source: own survey results, 2020)

The standard deviation for project time management is 0.71 as shown in table 4.5. The lower value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean.

3. Project Cost Management maturity level

The research finding indicates that project Cost management is considered to be more important than managing other knowledge areas. In addition, the maturity of Cost management practice is higher compared to others. Table 4.6 below shows the overall cost management practice maturity of the organization is 3.81. Since the maturity level result is higher, Project Cost management is the main focus of the company.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Estimate of detail cost for project	3.8	7.7	17.3	38.5	32.7	3.88	1.07
Estimate of detail cost of labor, material and machinery separately	3.8	11.5	25.0	32.7	26.9	3.67	1.11
Efficiency of projects meeting project cost		11.5	11.5	50.0	26.9	3.92	0.92
Effort of monitoring and controlling project cost	3.8	11.5	21.2	30.8	32.7	3.76	1.14
Project Cost Management maturity level						**3.81**	**0.93**

Table 4.6: Project Cost Management maturity level (Source: own survey results, 2020)

The standard deviation of the variables of project cost management is given in table 4.6. The total standard deviation of cost management is 0.93. The smaller value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean. This means that a small standard deviation shows that the values in a statistical data set are close to the mean of the data set.

4. Project Quality Management maturity level

According to table 4.7 below, the study result shows the quality management practice of the organization is found to be at level of 3.46. This shows that the company gives lesser attention to the project quality management than other knowledge areas like the project scope, integration, cost and time management.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Quality management policies, procedures and guide lines		17.3	32.7	26.9	23.1	3.55	1.03
Implementation of quality assurance		21.2	23.1	40.1	15.4	3.5	1.00
Project inspection and control of quality	3.8	9.6	42.3	32.7	11.5	3.38	0.95
Quality department or employees specializing in quality management	9.6	13.5	30.8	19.2	26.9	3.4	1.28
Project Quality Management Maturity Level						**3.46**	**0.83**

Table 4.7: Project Quality Management maturity level (Source: own survey results, 2020)

The standard deviation of the variables of project quality management ranging from 0.95 to 1.28 is given in table 4.7. The total standard deviation of quality management is 0.83. The smaller value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean. This means that a small standard deviation shows that the values in a statistical data set are close to the mean of the data set.

4.3.2 Project Management practice maturity level of the facilitating project management body of knowledge areas

1. Project Integration Management maturity level

Table 4.8 below shows the Project Integration management practice maturity level of the company responded by the project managers and senior engineers of the company. The overall integration management practice maturity is found to be 3.76. The maturity survey indicates that the integration management practice maturity is found to be at all processes, standards for all projects are repeatable and summary and detailed information, Estimates and schedules are based on industry standard.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Standard project management processes and methodologies		26.9	13.5	48.1	11.5	3.44	1.01
Develop Project management plan and change control work	11.5	3.8	17.3	55.8	11.5	3.51	1.12
Solid knowledge of project managers in project management		7.7	7.7	57.7	26.9	4.03	0.81
Support of Management in project management development		11.5		57.7	30.8	4.07	0.88
Project Integration Management maturity level						**3.76**	**0.74**

Table 4.8: Project Integration Management maturity level (Source: own survey results, 2020)

The standard deviation of the variables of project integration management ranging from 0.81 to 1.12 is given in table 4.8. The total standard deviation of integration management is 0.74. The lower value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean. This means that a small standard deviation shows that the values in a statistical data set are close to the mean of the data set.

2. Project Procurement Management maturity level

The overall procurement management practice maturity of the organization is found to be at 3.71. Table 4.9 below shows the frequency of respondents rating project procurement management maturity level for each practice.

The standard deviation of the variables of project procurement management ranging from 0.94 to 1.08 is given in table 4.9. The total standard deviation of procurement management is 0.90. The lower value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Planning for procurement of goods and services needed for your project	9.6	3.8	23.1	51.9	11.5	3.51	1.07
Standard procurement document for your project/organization like standard purchase order, subcontract/supplier agreement	7.7		13.5	61.5	17.3	3.81	0.99
Contract management/administration process	7.7		13.5	67.3	11.5	3.75	0.94
Status Claim management	3.8	13.5	9.6	50.0	23.1	3.75	1.08
Project Procurement Management Maturity Level						**3.71**	**0.90**

Table 4.9: Project Procurement Management maturity level (source: own survey results, 2020)

3. Project Communication Management maturity level

As shown in table 4.10 overall the communication management practice maturity of the organization is found to be somewhat at 3.68. Most of the respondents gave maturity level 4 for the communication management practices, which means that the company has a managed process in communication to some extent. The standard deviation of the variables of project communication management ranging from 1.00 to 1.21 is given in table 4.10. The total standard deviation of communication management is 1.02. The lower value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Plan/strategy prepared to address communication needs	7.7	13.5	17.3	38.5	23.1	3.55	1.21
System of collecting and distributing project information	7.7	7.7	32.7	25.0	26.9	3.55	1.19
Performance reports prepared and provided to relevant stake holders	3.8	7.7	26.9	42.3	19.2	3.65	1.00
Standard format for preparation of reports	3.8	7.7	11.5	40.4	36.5	3.98	1.07
Project Communication Management Maturity Level						**3.68**	**1.02**

Table 4.10: Project communication Management maturity level (Source: own survey, 2020)

4. Project Human Resource Management maturity level

The table 4.11 below shows that the company is at maturity level 3.38 in project human resource management knowledge area, which represents the company's organizational, standards are repeatable for all projects and Summary and detailed information, Estimates and schedules are based on Industry standard. The company is at maturity level 3.38 in project communication management knowledge area.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Planning for acquisition and management of human resource	5.8	13.5	34.6	28.8	17.3	3.38	1.10
Organizational structure of your project	5.8	21.2	13.5	42.3	17.3	3.44	1.17
Training/formal or informal/ for capacity building of project team members	13.5	13.5	25.0	38.5	9.6	3.17	1.2
Human resource cost and time formally tracked, monitored in your project	3.8	9.6	30.8	38.5	17.3	3.55	1.01
Project Human Resource Management Maturity Level						**3.38**	**0.89**

Table 4.11: Project Human Resource Management maturity level (Source: own survey results, 2020)

The standard deviation of the variables of project human resource management ranging from 1.01 to 1.2 is given in table 4.11. The total standard deviation of human resource management is 0.89. The lower value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean. This means that a small standard deviation shows that the values in a statistical data set are close to the mean of the data set.

5. Project Risk Management maturity level

Almost more than half the respondents rated each of the process in this knowledge is approximately at level 3.26 as depicted table 4.12 below. This shows that the average risk management maturity of this knowledge is found to be approximately at level 3. This is lowest matured project management knowledge area, which needs more focus for more improvement.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Identification and documentation of project risk	5.8	26.9	38.5	19.2	9.6	3	1.04
Risk analysis to determine their project impact	9.6	13.5	42.3	15.4	19.2	3.21	1.19
Detail risk response plan for identified and analyzed risks	3.8	13.5	36.5	42.3	3.8	3.28	0.89
Monitoring and controlling of project risk	7.7	3.8	28.8	44.2	15.4	3.55	1.05
Project Risk Management Maturity Level						**3.26**	**0.84**

Table 4.12: Project Risk Management maturity level (Source: own survey results, 2020)

The standard deviation of the variables of project risk management ranging from 0.89 to 1.19 is given in table 4.12. The total standard deviation of human resource management is 0.84. The lower value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean. This means that a small standard deviation shows that the values in a statistical data set are close to the mean of the data set.

6. Project Stakeholder Management maturity level

Table 4.14 below shows that the maturity level of project stakeholder management knowledge area is 3.29 level of maturity. This represents the company's organizational standards are repeatable for all projects and summary and detailed information, Estimates and schedules are based on Industry standard. The standard deviation of project stakeholder management of each variable ranges from 1.28 to 1.33 given on table 4.14 below. And the total standard deviation is 1.27. The lower value of the standard deviation shows that the values of the data set are spread over a relatively small range around the mean.

Project Management body of Knowledge area	Frequency (% of 52 Respondents)					Mean (maturity level)	Standard deviation
	1	2	3	4	5		
Assessment in stakeholders interest and influence	21.2	3.8	19.2	44.2	11.5	3.21	1.33
Develop stakeholders communication plan	19.2		15.4	53.8	11.5	3.38	1.28
Project Stakeholder Management Maturity Level						**3.29**	**1.27**

Table 4.14: Project Stakeholder Management maturity level (Source: own survey results, 2020)

According to the above data each project management knowledge areas maturity level is given. Based on this the project management maturity level of the organization i.e. the average mean of all knowledge areas covered under the study is at maturity level of 3.59. This means that the maturity level of the company is at level 3 but it is approaching to level 4 in which it has a managed process. This shows that the process in the company is integrated with corporate process and management uses data based on the organization to make decision. According to the mean result of the study of all variables are 3.5 and above. This means the respondents believe that there is good maturity level in the company in all dimensions of project management. This result can be realistic to some extent since the company is strongly working to improve its performance, as it is an ISO certified organization.

4.4 Interpretation and Discussion

4.4.1 Project Management practice maturity level of the core Project management body of knowledge areas

According to Kerzner (2017), Maturity in Project Management is specifically designed systems and processes, which are characterized by repetitiveness, increasing the probability of success. Maturity in organizational context is a state that creates effective condition for organization to achieve its desired objectives. Therefore, assessing maturity level of the company helps to know the level of the company and shows areas that need more improvement for efficient and effective performance of the company.

Project Scope Management maturity level

Project Scope Management is a set of processes required to ensure that the project includes all the work required, and only the work required, completing the project successfully (PMI, 2013).The result of the study shows that the maturity level of project scope management is at 3.5 approximating to level 4. This shows that management is regularly involved in input provision and decision-making, processes are typically automated and consistent use of tools and techniques for project management process, almost all projects use this process with minimal exception. Project management processes are typically automated, well established formal documentation at organizational level (i.e. for all projects) and lessons learned and previous project experiences are well organized and utilized for other projects. The company is in progress to be at level 4. This means that processes and standards are in progress to be integrated with corporate process and processes and standards to be documented to support using metrics to make project decision.

Project Time Management maturity level

A project time management knowledge area includes the processes required to manage the timely completion of the project. Once a project schedule is set and communicated, it is often the most common measurement of project performance (HIMSS, 2011). It includes key activities like Schedule or plan prepared for the project, Estimate of resource (Materials, people, equipment…) needed scheduled separately, WBS used when defining the schedule activities and Progress of project activities continuously monitored and controlled.

According to the result the company's project time management maturity level is at 3.78. This shows that the company's project time management is regularly involved in input provision and decision-making and processes are typically automated and consistent use of tools and techniques for project management process. Almost all projects use this process with minimal exception. Project management processes are typically automated and well established formal documentation at organizational level for all projects. This knowledge area maturity level is closer to level 4 to be in a managed process.

The four project managers (PM1, PM2, PM3 and PM4) result of each discussion is given. PM1's response on project time management says, "There is some weakness in schedule meeting due to late material supply and budget release". PM2's response says, "The time management in the company is good, there is no big time overrun problem". PM3's response also says "There is good time management but there are some time delays due to late concrete test result and supervision problem". PM4's response says, "There were four projects which were stopped due to sometime overrun problems due to the late budget release from the client". Generally, the interview result shows that there is some project time management problem. Time delays occur during construction due to delay of concrete test result, time delay during supervision, and material supply delays more in the case of concrete supply. Since the company has its own concrete production center, the company mostly focuses on the concrete market rather than the projects. The other cause of delay is due to delay late payments release from the clients. This holds the projects from progress. Therefore, some consideration on project time management needs to be taken.

Project Cost Management maturity level

According to (PMI, 2013) Project cost management includes the processes involved in estimating, budgeting and controlling costs so that the project can be completed within the approved budget. Project cost management includes the processes of: Estimate costs, Determine Budget and Control Cost.

According to the result of the study the overall cost management practice maturity of the organization is 3.81. This shows that company's cost management is regularly involved in input provision and decision-making, processes are typically automated and consistent use of tools and techniques for project management process and there is well-established formal documentation at organizational level.

This knowledge area of the company has more focus since the maturity level is higher. The company needs some work to make it at level 4 in which Processes and standards to be integrated with corporate processes, to mandates compliance and takes an organizational entity view and processes and standards to be documented to support using metrics to make project decision.

The four project managers (PM1, PM2, PM3 and PM4) result of each discussion is given. PM1's response on project cost management says "There is good project cost management in the organization but some time delay problems might also affect it since inflation occurs."PM2 and PM3's response says, "There is good project cost management in the organization." PM4 there is effective cost management but time overrun problems affect the cost too in some projects". In general, the interview data shows that there is good project cost management in the company since there is a managed system in the organization as it is supported by the questionnaire result.

Project Quality Management maturity level

Literatures show that Project Quality Management includes the processes and activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken. According to (HIMSS 2011) the primary purpose of quality management is to ensure that the final product meets the business need.

The result of the study shows the quality management practice of the organization is found to be at level of 3.46. This means company's project quality management maturity level is at level 3 in which quality management is regularly involved in input provision and decision making, processes are typically automated and consistent use of tools and techniques for project management process and Lessons learned and previous project experiences are well organized and utilized for other projects. This knowledge area has lesser maturity level than the above project management knowledge areas. It needs more focus in order to increase the maturity level of the company.

The four project managers (PM1, PM2, PM3 and PM4) result of each discussion is given. PM1's response on project quality management says, "There is ISO quality standard which is used to identify and measure project's quality but there needs to be some work on quality control." PM2's response says "The organization is an ISO certified and it is giving trainings

for employees in order to apply the quality standards." PM3's response says, "There are some quality problems like segregation that occur in projects."PM4's response says, "The organization has good quality concrete supply." In general, the interview data result shows the organization is an ISO certified. Since the company is an ISO certified there is a quality standard that needs to be fulfilled. And the company is giving trainings to the employees in order to fully apply ISO standards. Currently the system is not fully distributed in the organization. There are technical quality measures on projects, which are done by the consultant.

4.4.2 Project Management practice maturity level of the facilitating Project management body of knowledge areas

Project Integration Management maturity level

According to (Joseph, 2012) as the term integration implies, every activity must be coordinated or integrated with every other one in order to achieve the desired project outcomes. Project Integration management includes the processes and activities needed to identify, define, combine, unify and coordinate the various processes and project management activities within the project management process groups. In the project management context, integration includes characteristics of unification, consolidation, articulation and integrative actions that are crucial to project completion, successfully managing stakeholder expectations and meeting requirements. Project integration management entails making choices about resource allocation, making trade-offs among competing objectives and alternatives, and managing the interdependencies among the project management knowledge areas.

According to the result of the study the overall project integration management maturity is found to be 3.76 approximating to maturity level 4. This means that the Integration management could be considered to be at striving to achieve Process integrated with corporate process. The organization is in progress to perform Integration management formally in which Management uses data to make decisions; estimates and schedules based on organization.

Project Procurement Management maturity level

According to literatures Project procurement management includes the processes necessary to purchase or acquire products and services. Procurement management includes the contract

management issued by an outside organization (Buyer) or issued by the performing organization to an outside organization (sub contract management) and change control processes required to develop and administer contracts or purchase orders issued by authorized project team members.

The result of the study shows the project procurement maturity level is at 3.71. This means that the procurement management is regularly involved in input provision and decision-making, processes are typically automated and consistent use of tools and techniques for project management process and there is well-established formal documentation at organizational level. This knowledge area maturity level approaches to level 4. The company needs more work to upgrade its maturity level for better performance of the company.

The four project managers (PM1, PM2, PM3 and PM4) result of each discussion is given.PM1's response on project procurement management says that "There is good procurement management; it is managed by a crew at the head office." PM2's response says "The materials in the projects are supplied at the right time since there is no financial problem in the projects and the materials are requested before one month or two weeks.PM4's response says "Availability of materials is the main concern in the organization in order to avoid material supply delay." In general, the interview result shows that that there is a crew at the head office to manage the procurement in the organization. There is good project procurement management since materials are supplied for the projects at the right time after they are requested before one month or two weeks. The result of the questionnaire shows that the project procurement management maturity is at 3.71. This shows that there is medium level of maturity of the project procurement management in the organization.

Project Communication Management maturity level

Project Communications Management involves understanding the information received and being able to explain it to others (HIMSS 2011).It includes the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information. The result of the study shows the communication management practice maturity of the organization is found to be at 3.68. This means company's project communication management is regularly involved in input provision and decision making, processes are typically automated and consistent use of tools and techniques for project management process and there is well established formal documentation at

organizational level for all projects. This value shows the company's project communication management is in progress to be at level 4, which means the Processes and standards are to be integrated with corporate processes and processes and standards to be documented to support using metrics to make project decision.

The four project managers (PM1, PM2, PM3 and PM4) result of each discussion is given. PM1's response on project communication management says "The organization has good daily report in order to bring good communication about the project's progress." PM2' response says, "There is bother horizontal and vertical communication among the employees and the stakeholders." PM3' response says, "There is project managers meeting every week and every three weeks there is meeting among the client, contractor and the consultant." In general, the interview result shows that communication among the project managers is set to have meetings weekly and every three weeks there is meeting among the client, contractor and consultants. These meetings help the organization to follow up the projects progress and to have good relationship among them. The flow of communication goes from the head office then project managers then to the site engineers then to the gang leader at last to the daily labor of each project. The communication flow also goes the reverse from lower level to the higher level. According to the result of the questioner planning to address communication need and System of collecting and distributing project information needs more improvement for better performance.

Project Human Resource Management maturity level

According to literatures Project Human Resource Management includes the processes that organize, manage, and lead the project team. Project managers spend most of their time communicating with team members and other project stakeholders, whether they are internal (at all organizational levels) or external to the organization.

The overall result of the study shows the maturity level is 3.38 in project human resource management knowledge area. This shows the company's project human resource management is at lower level than the above knowledge areas. Literatures show that Human resource is the center of the projects performance. Focusing on this area helps the company to improve its performance and project management maturity level.

The four project managers (PM1, PM2, PM3 and PM4) result of each discussion is given.PM1's response on project human resource management says, "The human resource is managed by the head office in the organization. There is some problem of late salary

payment to the employees, luck of proper positioning of employees to the right work." PM2's response says, "The human resource management is centralized and managed by their crew. But there are some problems concerning not hearing the employee's comment, luck of overtime payments to the employees." PM3's response says, "The human resource is managed properly in a way that the shift employees where there is more work among the projects."PM4's response says, "The human resources are junior who are selected based on recommendation." In general, the interview results show that there is good human resource management. Human resource management is a centralized system, which is managed by the human resource management crew. According to the questionnaire and interview result, the organization needs improvements on giving capacity building trainings, on planning for acquisition and management of human resource. The organization structure and tracking the human resource cost and time needs to be monitored in a better way for improvements.

Project Risk Management maturity level

Project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, and monitoring and control of project risk. The objectives of risk management are to increase the probability and impact of positive events, and decrease the probability and impact of negative events in the project.

The result of the study shows the project management maturity level is at 3.26. This knowledge area's maturity level is the lowest among all. This shows that the company needs more focus on this knowledge area in order to improve projects performance and to increase level of maturity of the company.

The four project managers (PM1, PM2, PM3 and PM4) result of each discussion is given.PM1's response on project risk resource management says, "There is advance risk management plan. If risks occur in the projects the company focuses on them in order to solve the problem."PM3's response says, "There is risk insurance in the organization." PM3's response says, "The contract related risks are managed by the engineering department." In general, the interview data shows that the organization prepares risk management plan advance. When risks occur, the project managers focus on the areas where risks occur in order to solve the problem. The questionnaire result shows that the identification and documentation of project risk, doing the risk analysis for the projects needs improvement.

Project Stakeholder Management maturity level

According to (PMI, 2013) Project Stakeholder Management knowledge area 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 result of the study shows the project management maturity level is at 3.29. This knowledge area of the company is the second lowest maturity. The management is regularly involved in input provision and decision-making, processes are typically automated and there is consistent use of tools and techniques for project management process and well-established formal documentation at organizational level for all projects.

The four project managers (PM1, PM2, PM3 and PM4) result of each discussion is given.PM1's response on project risk resource management says, "The stakeholders are managed by their weekly communication about the projects and their interest."PM2's response shows that "In some projects stakeholder management is easy when the client and the consultant is the same."PM4's response shows that "There is a point person (the client) who is concerned on project stakeholder management of the organization." In general, the interview data shows that stakeholder are managed by having progress communication weekly in order to create transparency on the progress of the project and to create good relationship among the stakeholders. According to the result of the questionnaire assessment in stakeholder's interest and influence and also developing the stakeholder communication plan needs to be improved in order to increase the maturity level and for better performance.

4.4.3 Project management maturity level of the organization

According to the result and interpretation of the data obtained the project management maturity level of the organization is at medium level i.e. the average mean of all knowledge areas covered under the study is maturity level of 3.59. This means that the maturity level of the company is at level 3 but it is approaching to level 4 in which it has a managed process. This shows that the process in the company is integrated with corporate process and management uses data based on the organization to make decision.

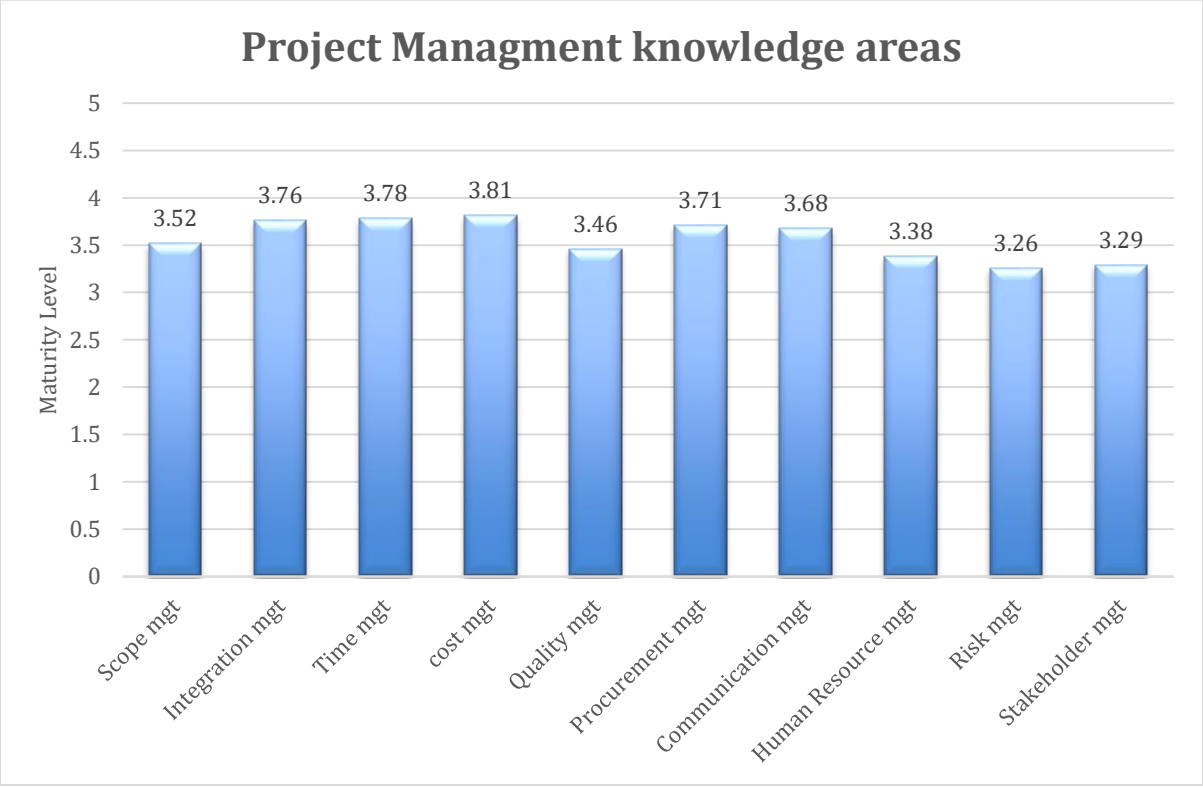

Figure 4.2: Summary of PMBOK'S Project Management Knowledge Areas Maturity level (Source: own survey results, 2020)

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summaries of the findings, conclusions derived from the analysis and the recommendations that are suggested to the company for effective project management practice.

5.2 Summary of Findings

Based on the analysis on the fourth chapter the following summary of findings was

The project management maturity level of the core and facilitating project management knowledge areas is between level 3 and level 4. And the final maturity level of the ten project management knowledge areas is at 3.59. Summary of the project management knowledge areas maturity level is given below.

Project management core knowledge areas

- Project scope management- 3.52
- Project time management-3.78
- Project cost management-3.81
- Project quality management-3.46

Project management facilitating knowledge areas

- Project integration management- 3.76
- Project procurement management- 3.71
- Project communication management- 3.68
- Project human resource management- 3.38
- Project risk management-3.26
- Project stakeholder management-3.29

Generally, the objective of this study was to assess the level of project management maturity of the organization based on the assessment on the project management knowledge areas maturity level. The sum of these assessments gives the general maturity level of the company. Assessing the project management maturity benefits the organization to improve its effectiveness in project delivery and it allows the organization to diagnosis the current position in the maturity level and identifies improvement areas. As a result, it provides a path

forward for the organization in improving project management practices and to establish well defined organizational standards for project management.

5.3 Conclusions

Conclusion of the study can be made based on the result, interpretation and discussion of the questionnaire and interview The study has been done in order to meet the basic objectives of the study, which are assessing the maturity level of the core and facilitating project management knowledge areas and determine the maturity level of the organization. According to the results and discussion of the study, the following conclusions have been made.

The respondents of the study were the fifty-two project managers and senior engineers from the engineering department of the organization currently working on 26 building projects.

The study's conclusion on the project management maturity level of the core and facilitating knowledge areas is at level 3 and approaching to level 4. These knowledge areas maturity level can conclude the maturity level of the organization study, which is level 3 going to level 4. Therefore, the organization's project management maturity level is found at level 3.

This study has assessed the project management maturity level of Bamacon Engineering PLC. The research has provided benchmark data on the current status of PM practice in the organization for use in continuous assessment of future improvement efforts. Project based organization should look forward for better project management knowledge areas as empirical studies since literatures shows that there is strong relation between Project management maturity level and meeting project goals. Therefore, the organization's maturity level is found in between level 3 and level 4.

5.4 Recommendations

5.4.1 Recommendation for action

According to different Literatures about higher level of project management maturity ensures effective projects delivery and it has a direct impact on project efficiency. Therefore, if the company gets a higher project management maturity levels, the company most likely will have higher project efficiency. According to the assessment made on Bamacon Engineering PLC it is operating at level 3 (organizational standards and institutionalized process) moving to Level 4 (managed process) project management maturity, hence to have a higher project management maturity level and higher project efficiency the following points recommended based on reviewed literatures and the result of the analysis.

In the core and facilitating project management knowledge areas maturity level all the knowledge areas are in between level 3 & level 4. The company needs to focus on the project scope, quality, human resource, risk and stakeholder management since these have lower maturity level than the others. This shows that the company needs to work on weaknesses of these knowledge areas in order to increase the maturity level of each and in general to increase the company's maturity level to be fully at maturity 4 (managed process) and to reach to level 5 (optimizing process).

5.4.2 Recommendation for further study

The study's main objective is to assess the maturity level of the company based on the assessment of the project management knowledge areas. According to different literatures organizations need to have more focus on the project management maturity level for better performance. Thus this research recommends the following for further research and investigation:

- Conducting in-depth research to determine in detail how the contractors so as to be able to prepare a detailed improvement framework possibly using case study approach to get a deeper insight are performing each of the construction PM knowledge area.
- Conduct further research to refine the models and the assessment questionnaire through active involvement of academicians and practitioners using focus group discussion, interview and further extensive literatures review.
- Conducting a research on the client's rather than the contractor might give another view of the project management maturity level.

References

Adrienne Watt. (2012). 'Project management'. The Saylor Foundation.

Andersen, E. and Jessen, S. A. (2003). 'Project maturity in organizations', International Journal of Project Management, 21(6), pp. 457–461.

Atkinson, R. (1999). "Project management: cost, time and quality, two best guesses and a phenomenon, it's time to accept other success criteria." International Journal of Project Management 17(6): 337-342.

Backlund, Fa,Chronéer, D.a & Sundqvist, E. (2013)'Project Management Maturity Models – A Critical Review A case study within Swedish engineering and construction organizations.', 27th IPMA World Congress.

Brookes, N. & Clark, R. (2009). Using Maturity Models to Improve Project Management Practice. POMS 20th Annual Conference, Orlando, Florida USA.

Brookes, N., Butler, M., Dey, P. and Clark, R. (2014). 'The use of maturity models in improving project management performance', International Journal of Managing Projects in Business, 7(2), pp. 231–246.

Carnegie Mellon University Software Engineering Institute (1994). The Capability Maturity Model Guidelines of improving the Software Process. Reading MA：Addition-Wesley,

C.R. Kothari (2008). Research Methodology, Methods and Techniques.

Crawford, J. (2006). 'The Project Management Maturity Model', Information Systems Management, 23(4), pp. 50-58.

Crawford, K. J. (2007). Describing Project Management Maturity. In: Project Management Maturity Model, 2nd Edition. Boca Raton: Taylor & Francis Group, pp. 1-3.

Crawford, L. (2011). Fitting projects management capability to strategy, 8th Annual Project Management Australia conference (PMOz): Project management at the speed of light, Sydney, Australia, 2-5August. Available from: http://epublications.bond.edu.au/sustainable_development/122

Creswell, J. W. (2014). Research design: Qualitative, Quantitative, and Mixed Methods Approaches Fourth ed. by SAGE Publications, Inc.

Ferreira, H. and Pereira, L. (2015). Maturity Evaluation in Project Management and Implementation of a PMO– Case Study. The International Journal of Business &Management, 3(11), pp. 338-347.

Gardiner, P. D. (2005). Project management: A strategic planning approach. Macmillan International Higher Education.

Harold Kerzner, Ph.d (2017). Project Management; A Systems Approach to Planning, Scheduling, and Controlling.

Joana Coelho Viana, Caroline Maria de Miranda Mota (2016). Enhancing Organizational Project Management Maturity: a framework based on the value focused thinking model.

JarrslawGorecki (2014). Problems associated with project Maturity in construction companies.

J. Kent Crawford (2002). Project Management Maturity Model, Providing a Proven Path to Project Management Excellence

Joseph Heagney (2012). Fundamentals of Project Management, Fourth Edition.

Mateen, M. (2015). Measuring Project Management Maturity - A framework for better and efficient Projects delivery. Göteborg: Chalmers University of Technology. MSc Dissertation.
Maylor, H. (2010).Project Management. 4th edition. Harlow: Pearson Education.

Merna, T., & Al-Thani, F. (2008). Corporate Risk Management (2nd ed.). England: John Wiley & Sons, Ltd.

Mr. BhaskarPawar, Prof.S.S.Deshmukh, Prof.Aradhana Chavan (2016). Project Management Maturity in the Construction Industry of Developing Countries. International Engineering Research Journal (IERJ) Volume 2 Issue 3 Page 1106-1109, 2016, ISSN 2395.
Naomi Brookes, Robin Clark.Using Maturity Models to Improve Project Management Practice.
Project Management Institute (2008). Organizational Project Management Maturity Model (OPM3), (Second Edition). Pennsylvania: PMI.
PMI (2013). Organizational Project Management Maturity Model (OPM3), Third Edition, Pennsylvania: Project Management Institute Inc.

Pretorius, S., Steyn, H. and Jordaan, J.C. (2012) Project management maturity and project management success in the engineering and construction industries in South Africa, South African Journal of Industrial Engineering, 23(3), 1-12. doi: https://doi.org/10.7166/23-3-507

Prado, D. Porque é importanteevoluiremGerenciamento de Projetos?Mundo PM: Curitiba, 2011, n 38, p. 37-40.

Project Management Methodology Guidelines (2010), "Project Management Methodology & Step-by-Step Guide to Managing Successful Projects", Arizona: City of Chan- dler.

Project Management Solutions (2012). What is project management maturity?

Robert K. Wysocki, (2014). Effective Project Management: Traditional, Agile, Extreme, 7th ed. John and Sons, Inc.

ShahidMahmood (2015). Capability Maturity Model Integration.Conference Paper.

Silva, D., Tereso, A., Fernandes, G. and Pinto, J.Â. (2014) OPM3 Portugal project: analysis of preliminary results, Procedia Technology, 16, 1027-1036. doi: https://doi.org/10.1016/j.protcy.2014.10.057

The Project Manager's Guide to Health Information Technology Implementation (HIMSS) (2011).Chicago pp 27–39.

The third global survey on current states of project management (2012). Insights and Trends current portfolio, Programme, and project Management.

Wysocki, R. K. (2004). Project Management Process Improvement. Norwood: Artech House, Inc.Zubrow, D. (2003). CMMI Appraisal Results SEPG 2003. Software Engineering Institute, Carnegie Mellon.

Zhang Lianying, He Jing and Zhang Xinxing (2011). The Project Management Maturity Model and Application, Based on PRINCE2. Elsevier Ltd. Selection and/or peer-review under responsibility of Harbin University of Science and Technology.

Zikmund, W.G., Babin, B.J., Carr, J.C. and Griffin, M. (2010). Business Research Methods. (Eighth Edition.Nashville:South-Western Pub.

Z. T. Zewdu and G. T. Aregaw (2015). "Causes of Contractor Cost Overrun in Construction Projects: The Case of Ethiopian Construction Sector," Int. J. Bus. Econ. Res., vol. 4, no. 4, pp. 180–191.

APPENDICES

ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND ECONOMICSSCHOOL OF COMMERCE

MASTERS OF ART IN PROJECT MANAGEMENT

Dear Participant:

My name is Saron Mulugeta. I am a student at Addis Ababa University in Project management department. As part of my MA in project management, I am conducting a research on project management maturity in the Ethiopian construction sector: Process and challenge: The case of Bamacon Engineering plc.

The research output will provide information about Project Management Maturity and Capability in all areas of project management knowledge areas: scope, time, cost, quality, risk, communication, procurement, etc. In addition, the result provides a framework for prioritization and development of project management improvement.

I kindly request you to participate in this study by patiently completing the questionnaires. And, I hereby assure you that all the information will remain confidential and do not include your name in the questionnaires.

Your precious time and effort in participating in this research will also contribute to the development and improvement of Project Management in your organization. Thus, please take few minutes of your precious time to complete the following questionnaires.

If you have any hesitation or question,

Email: saronmulugeta79@gmail.com

Tel: +251910-597446

Thank you for your interest in participating in the research and for your time and kind cooperation!

Saron Mulugeta

Addis Ababa, Ethiopia

Appendix A

Dear participant, this questionnaire booklet has five parts:

I. **Part one** – ask respondents about their General profile

II. **Part-Two**- ask respondents to level the project management process Maturity under the 5 levels of maturity

III. **Part-Three**- ask respondents on the project management tools and techniques of the company

IV. **Part-Four**- ask respondents on the Organization culture and human capacity of the company

V. **Part-Five-**ask respondents to level the 10 project management knowledge areas under the 5 levels of maturity.

Part one- General Information

1. Position/role in the company

1. Office Project manager ☐ 2. Site project manager ☐ 3.Engineer ☐

4. Project professional ☐ 5. Other……..

2. Department you are currently working in

1. Finance ☐ 2. Engineering ☐ 3. Operation ☐ 4. Coordination. ☐

5. Other……

3. Educational Level

1. High School completed ☐ 2. Diploma ☐ 3. BA/BSc ☐ 4. MA/MSc ☐
5. PhD ☐

4. Years of working experience in the company

1. Below 1 ☐ 2. 1-5 ☐ 3. 6-10 ☐ 4. 11-15 ☐ 5. Above 15 ☐

Part two– Project Management maturity level of Ten Project management body of knowledge areas.

These questions are designed to level the 10 project management knowledge areas under the 5 levels of maturity of the company. Please select the maturity level that best describes your company.

Level 1 - Initial Process-

- Ad hoc process without consistent and standardized procedures.

Level 2 - Structured Process and Standards

- Basic processes, not standard on all projects, used on large, highly visible projects
- Management supports and encourages use of processes; Estimates and schedules are based on expert knowledge and generic tools.

Level 3 - Organizational Standards and Institutionalized Process

- All processes, standards for all projects are repeatable
- Summary and detailed information, Estimates and schedules based on Industry standard.

Level 4 - Managed Process

- Process integrated with corporate process
- Management uses data to make decisions; estimates and schedules are normally based on organization.

Level 5 - Optimizing Process

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

No	Ten Project Management body of Knowledge areas Key Practice Characteristics.	PM Solutions Maturity levels					Remark
		1	2	3	4	5	
		Initial process	**Struct. Process**	**Org. Standard**	**Managed Process**	**Optim. Process**	
1	**Project Scope Management**						
1.1	The importance of project scope management in your organization or project team.						
1.2	Definition of project scope/ End to end definition of all works in projects						
1.3	Quality of Work break down structure prepared in defining scope in your project						
1.4	Effort of Monitoring and controlling scope in your project						
2	**Project Integration Management**						
2.1	Standard project management processes and methodologies						
2.2	Develop Project management plan and change control work						
2.3	Solid knowledge of project managers in project management						
2.4	Support of Management in project management development						
3	**Project Time Management**						
3.1	Schedule or plan prepared for your project						
3.2	Estimate of resource (Materials, people, equipment….) needed scheduled separately						
3.3	WBS used when defining the schedule activities						

3.4	Progress of project activities continuously monitored and controlled						
4	**Project Cost Management**						
4.1	Estimate of detail cost for project						
4.2	Estimate of detail cost of labor, material and machinery separately						
4.3	Efficiency of projects meeting project cost						
4.4	Effort of monitoring and controlling project cost						
5	**Project Quality Management**						
5.1	Quality management policies, procedures and guide lines						
5.2	Implementation of quality assurance						
5.3	Project inspection and control of quality						
5.4	Quality department or employees specializing in quality management						
6	**Project Procurement Management**						
6.1	Planning for procurement of goods and services needed for your project						
6.2	Standard procurement document for your project/organization like standard purchase order, subcontract/supplier agreement						
6.3	Contract management/administration process						
6.4	Status Claim management						
7	**Project Communication Management**						
7.1	Plan/strategy prepared to address communication needs						

7.2	System of collecting and distributing project information						
7.3	Performance reports prepared and provided to relevant stake holders						
7.4	Standard format for preparation of reports						
8	**Project Human Resource Management**						
8.1	Planning for acquisition and management of human resource						
8.2	Organizational structure of your project						
8.3	Training/formal or informal/ for capacity building of project team members						
8.4	Human resource cost and time formally tracked, monitored in your project						
9	**Project Risk Management**						
9.1	Identification and documentation of project risk						
9.2	Risk analysis to determine their project impact						
9.3	Detail risk response plan for identified and analyzed risks						
9.4	Monitoring and controlling of project risk						
10	**Stakeholder Management**						
10.1	Assessment in stakeholders interest and influence						
10.2	Develop stakeholder's communication plan						

Appendix B: Interview Questions

I appreciate for giving me your time to have this interview with me. I am Saron Mulugeta, MA graduate student in Project Management at AAU. The main purpose of this interview is to collect data for the research entitled "Project Management Maturity in the Ethiopia Construction: Process and Challenge: The case of BAMACON Engineering PLC." Therefore, I kindly request your cooperation and sincere response to the interview session.

1. Are there performance/quality standards used to identify and measure project's quality?

2. What are the real weaknesses affecting the project implementation in relation to the ten project management knowledge areas?

3. Do you have any recommendation to improve project performance of the company?

4. What recommendations do you have on the project management knowledge areas which are the project Integration, scope, time, cost, quality, risk, human resource, communication, procurement and stakeholder management?

Appendix C: Ten project management knowledge areas maturity level

Statistics

Total project scope management

N	Valid	52
	Missing	0
Mean		3.5240
Median		3.7500
Mode		4.00
Std. Deviation		.82732
Minimum		1.75
Maximum		5.00

Statistics

Total Integration management

N	Valid	52
	Missing	0
Mean		3.7692
Median		3.7500
Mode		3.75[a]
Std. Deviation		.74070
Minimum		2.00
Maximum		5.00

a. Multiple modes exist. The smallest value is shown

Statistics

Total time Management

N	Valid	52
	Missing	0
Mean		3.7837
Median		3.7500
Mode		3.25
Std. Deviation		.71577
Minimum		2.00
Maximum		5.00

Statistics

Total cost Management

N	Valid	52
	Missing	0
Mean		3.8125
Median		4.0000
Mode		4.00[a]
Std. Deviation		.93787
Minimum		1.50
Maximum		5.00

a. Multiple modes exist. The smallest value is shown

Statistics

Total quality Management

N	Valid	52
	Missing	0
Mean		3.4615
Median		3.5000
Mode		4.00
Std. Deviation		.83046
Minimum		1.75
Maximum		5.00

Statistics

Total procurement management

N	Valid	52
	Missing	0
Mean		3.7067
Median		4.0000
Mode		4.00
Std. Deviation		.90305
Minimum		1.25
Maximum		5.00

Statistics

Total communication Management

N	Valid	52
	Missing	0
Mean		3.6875
Median		4.0000
Mode		4.00
Std. Deviation		1.02765
Minimum		1.00
Maximum		5.00

Statistics

Total project Human resource

N	Valid	52
	Missing	0
Mean		3.3894
Median		3.5000
Mode		4.00
Std. Deviation		.89307
Minimum		1.50
Maximum		5.00

Statistics

Total Risk Management

N	Valid	52
	Missing	0
Mean		3.2644
Median		3.0000
Mode		3.00
Std. Deviation		.84223
Minimum		1.25
Maximum		5.00

Statistics

Total stakeholder Management

N	Valid	52
	Missing	0
Mean		3.2981
Median		4.0000
Mode		4.00
Std. Deviation		1.27671
Minimum		1.00
Maximum		5.00