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ASSESSMENTS OF CONSTRUCTION PROJECT MANAGERS’ COMPETENCE AND ITS IMPACT ON PROJECT SUCCESS. THE CASE OF BAHIR DAR CITY PUBLIC BUILDING CONSTRUCTION PROJECTS

By
Chekol Menberu Teshome

Bahir Dar, Ethiopia
February, 2020
ASSESSMENTS OF CONSTRUCTION PROJECT MANAGERS’ COMPETENCE AND ITS IMPACT ON PROJECT SUCCESS. THE CASE OF BAHIR DAR CITY PUBLIC BUILDING CONSTRUCTION PROJECTS

Chekol Menberu Teshome

A Thesis Submitted to Bahir Dar University Institute of Technology in Partial Fulfillment of the Requirement for the Degree of Master of Science in Civil Engineering (Construction Technology And Management)

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Bahir Dar, Ethiopia
February, 2020
DECLARATION

I, the undersigned, declare that the thesis comprises my own work. I have dually acknowledged and refereed all materials used in this work. I understand that non-adherence to the principles of academic honesty and integrity, misrepresentation/ fabrication of any idea/ data/ fact/ source will constitute sufficient ground for disciplinary action by the University and can also evoke penal action from the sources which have not been properly cited or acknowledged.

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Date of submission: 03/03/2020
Place: Bahir Dar

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Lastly, I would like to express my gratitude to my family for their immense love, encouragement, and support they gave me during the whole period of the study.

Dedicated to My Family

Chekol Menberu

February, 2020
ABSTRACT

Most building construction projects in Ethiopia have a problem to complete with the scheduled time frame, estimated budget, expected quality, etc. Those problems are a combination of technical and human skill factors. Thus, the purpose of this research is to assess the competence of construction project managers and its impacts on project success in the case of Bahir Dar city public building construction projects. The study covers only Grade -1 general and building contractors. Purposive sampling technique was used to select the research population. Both primary and secondary data are collected to achieve the intended research objectives. Questionnaires and semi-structured interviews were employed as instruments of data collection. The respondents were project managers, site engineers, office engineers and site supervisors. Questionnaires were distributed to project sites for 57 participants. Furthermore, 9 semi-structured interviews were conducted with project managers and project coordinators. The data were analyzed using SPSS 20 and MS-Excel 16. The findings of this study revealed that: in hard competence, like time management, financial management, cost management and quality management, project managers have high level of competence. Whereas, in integration management, scope management, procurement management, PM software competence, risk management, safety management and environmental management, project managers have a medium level of competence. The findings of this study also revealed that: in soft competence, like communication, organizing, team working, positive work attitude and conflict management, the project managers have high level of competence. While, in leadership, flexibility & alertness, problem-solving, human resource management and creativity & innovation, project managers have a medium level of competence. The top five project success criteria that were impacted by the competence of project managers were found to be project cost, project time, technical specifications and functional requirements, clients’ satisfaction and stakeholders’ relationship. The study results also shows that project managers’ competencies have high level of impact on project success. This research also has a proposed conceptual framework for project managers’ competencies development.

Keywords: Building Construction Projects; Project Managers; Competencies; Hard Competence; Soft Competence; Project Success
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<td>AIPM</td>
<td>Australian Institute of Project Management</td>
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<td>APM</td>
<td>Association of Project Management</td>
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<td>HRM</td>
<td>Human Resource Management</td>
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<td>IPMA</td>
<td>International Project Management Association</td>
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<td>ISO</td>
<td>International Standard of Organization</td>
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<td>KPIs</td>
<td>Key Performance Indicators</td>
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<td>MS Project</td>
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<td>PM</td>
<td>Project Manager</td>
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<td>PMBOK</td>
<td>Project Management Body of Knowledge</td>
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<td>PMCD</td>
<td>Project Management Competence Development</td>
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<td>PMCDF</td>
<td>Project Management Competency Development Framework</td>
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<td>PMI</td>
<td>Project Management Institution</td>
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<td>PMP</td>
<td>Project Management Professionals</td>
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<td>SPSS</td>
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CHAPTER ONE

1. INTRODUCTION

1.1. Background

The construction industry plays a significant role in the economy of developing countries like Ethiopia, next to agriculture, it provides the largest employment opportunities (Jekale, 2004). Despite the construction industry’s significant contribution to the economy and the critical role it plays, the development and the performance of the industry still remains generally low. Construction project's purpose is to timely complete within the scheduled time, cost, quality. Thus, project management methods have been developed to ensure the achievement of these aims (Raija, Tromstedta and Harri, 2006). However, many projects in developing countries encounter considerable time and cost overruns, fail to realize their intended benefit or even totally terminated and abandoned before or after their completion. According to Yimam (2011), the main reason for project failure in developing countries is not only the absence of general resources or financial resources but the lack of project management capability.

Regarding construction project management in Ethiopia, studies have indicated the need to improve the capacity of contractors in project management knowledge areas of construction project management (Yimam, 2011; Karlsson, 2011). Lack of awareness on the benefit and application of project management combined with the presence of few trained project managers (Yimam, 2011). Research work by Long (2000) have indicated that poor managerial capability of contractors is one of the critical problems of the construction industry in developing countries. Thus, improving the managerial capability of contractors need to be one of the priority considerations for improvement of capability of contractors in developing countries. Dlungwana and Rwelamila (2004) have also strongly emphasized the importance of improving the management skills of contractors. As most of the works of contractors is managed as a project, improving the contractors project management capability can significantly contribute to the overall improvement of contractors’ capability to deliver successful projects.
In the construction sector, the project leader may be the project manager or project coordinator based on the level of responsibility given to him/her by the client (Odusami, 2002). Project managers’ knowledge, skills and personal attributes are clearly a vital factor in the delivery of successful projects (Crawford, 2000). This involves project managers possessing a variety of skills relating to the standard objectives of project completion within a set specification, under time, cost and quality constraints. Projects may fail due to external factors that are beyond the control of the project manager. However, the competence of the project manager constitutes a critical parameter among the many variables that directly affect the outcome of project (Intan, Mohamad, Nadira and Siti, 2015). Therefore, assessing the project managers’ competence is one of the critical role to evaluate factors that contribute to projects failure or success.

The continuous improvement effort of project managers’ competence requires knowledge of where the current status is, where is the required status, and the gap between the two (Yimam, 2011). So far, little or no research has been done in Ethiopia on the assessments of competence of construction project managers. Thus, this research is undertaken to assess the competence of construction project managers and investigate the impact of construction project managers’ competence on project success in Bahir Dar city public building construction projects. Furthermore, a framework for the development of project managers’ competence is proposed.

1.2. Statement of the Problem

A number of factors have been identified for the poor performance of projects in developing countries. One of those factors is the low institutional and human capacity (Jekale, 2004). In the Ethiopian construction industry, a big part of the labor and managers have insufficient knowledge and skills within the construction area which often causes delays and low performing quality (Karlsson, 2011). Jekale (2004), also revealed that in his finding, there is not enough construction and management capacity in Ethiopia. The practitioners (in Ethiopia) are less experienced in project management.

The project manager is one of the major stakeholders in a construction project and his/her competence is a critical factor influencing project planning, scheduling, and
communication (Forcada, 2008). According to PMI (2013) and Abebe (2017), from many factors contribute to project success, the most important is the effectiveness of project manager.

Although many researches have been conducted on the subject of project managers’ competence as well as management practices of construction projects in different parts of the world, in Ethiopia, it is difficult to find detailed literature on this regard. As a result, research works in such a field is difficult (Jekale, 2004). However, the researcher was interested to fill this gap and try to contribute something useful in this field. Most building construction projects in Ethiopia have a problem to complete with the scheduled time frame, estimated budget, expected quality, etc. Those problems are a combination of technical and human skill factors. Thus, this research will assess the competence of construction project managers and investigate its impact on project success.

### 1.3. Research Questions

This study addresses the following research questions:

- ✔️ What are the competencies of construction project managers?
- ✔️ What are the main competency gaps of project managers in Bahir Dar city public building construction projects?
- ✔️ What are the impacts of construction project managers’ competencies on project success in Bahir Dar city public building construction projects?
- ✔️ What are the level of impact construction project managers’ competencies have on project success in Bahir Dar city public building construction projects?
- ✔️ What are the methods for the development of construction project managers’ competence?
1.4. Objectives of the Study

1.4.1. General Objective

The objective of the study is to assess the competence of construction project managers and its impact on project success in the case of Bahir Dar city public building construction projects.

1.4.2. Specific Objectives

✓ To assess the competence of construction project managers in Bahir Dar city public building construction projects.
✓ To investigate the impact of construction project managers’ competencies on project success in Bahir Dar city public building construction projects.
✓ To identify the level of impact the construction project managers’ competencies have on project success in Bahir Dar city public building construction projects.
✓ To propose a conceptual framework for the development of project managers’ competence.

1.5. Scope of the Study

The scope of this research is to assess Grade-1 general and building contractor’s project manager competence and its impacts on project success in Bahir Dar city public building construction projects. The study covers only Grade-1 contractors project managers in Bahir Dar city public building construction projects. This is due to the fact that all public building construction projects in Bahir Dar city are undertaken by only Grade-1 contractors. Thus, the research result should be taken only as indicative of the project managers of Grade-1 contractors. The result can be applicable to get information about the current status of project managers’ competencies and its impact on project success.

1.6. Limitation of the Study

✓ Project managers were very hard to reach as they were busy most of their times and the questionnaire is handed to project managers to do a self-assessment and hence there might be some bias in the responses. On the other hand, project participants
(site supervisors, office and site engineers) sometimes seemed to be hesitant to honestly evaluate their managers. However, some efforts have been taken to check such impact, such as a reliability test has been conducted.

- Data access limitations: this refers to the fact that data gathering through the questionnaires is controlled to the period of these questionnaires, which may limit the quality and quantity of the data collected, and the lack of similar studies.

1.7. Significance of the Study

This research aims to assess project managers’ competence and its impact on project success in Bahir Dar city public building construction projects. Thus, the research is expected to provide benchmark data on the current status of project managers in the construction industry for continuous assessment of future improvement efforts. Moreover, the study has a proposed framework that could be used for improvements of project managers’ competencies. Furthermore, assessing project managers’ competence to find their skill gaps can provide insight on how and where an individual can improve their project management knowledge and skills.

1.8. Thesis Layout

This thesis has five chapters. The first chapter is the introduction; which presents the background, problem statement, research question, objective of the study, the scope of the study, limitations of the study and significance of the study. The second chapter is a literature review; which presents literature from journals, books, internet searches, which is relevant to the research topics. The third chapter is research design and methodology; which discussed the research methodology followed in order to achieve the objectives of the study. The fourth chapter is analysis and discussions; in this part, the results of the data obtained from the questionnaire survey and interview were presented and discussed accordingly. The fifth chapter is conclusions and recommendations; it presents general conclusions and recommendations of this study, along with an implication of its major findings.
CHAPTER TWO

2. LITERATURE REVIEW

2.1. Introduction

This chapter reviews literature that is related to the subject matter of the study. Under this chapter, project management and competence, construction project management, importance of project management competence, project managers’ competence, role and responsibility of project manager, impacts of project managers’ competence on project success, and project management framework and standards, methods for assessments of project management competence, methods, and process for developments of project managers’ competence are discussed and presented in detail.

2.2. Project Management and Competence

2.2.1. Definitions of Competence

Competency is a cluster of related knowledge, attitudes, skills, and other personal characteristics that can affect a major part of ones’ job (i.e., one or more key roles or responsibilities), correlates with performance on the job, can be measured against well-accepted standards, can be improved via training and development and can be broken down into dimensions of competence (Likamaa, 2015). Likamaa (2015) also points out that competency reveals what a person is cable of doing and why they act in a certain way, as competencies are needed to use the knowledge and to make things happen. Therefore, competencies can predict behavior in a wide variety of situations and job tasks. Competencies inform the behavior of an individual as they include intent, which relates to motives, traits, self-concept, social roles, and knowledge.

According to Vichita, Thai-ngam, and Jintawee (2007), competency is an individual characteristic that can be measured or counted reliably and that can be shown to differ significantly between superior and average performers, or between effective and ineffective performers. Competency can be described as a set of behavior patterns that an incumbent needs to bring to a position in order to perform its tasks and functions in the...
delivery of desired results or outcomes. Major components of competencies include abilities, attitudes, behavior, knowledge, personality, and skills (PMI, 2007).

2.2.2. Definitions of Project

A project is a sequence of unique, complex, and connected activities having one goal or purpose and that must be completed by a specific time, within budget, and according to specification (Raija et al., 2006). PMI (2007) and Crawford (2000) define, project is a temporary endeavor (that has definite beginning and end time) undertaken following specific cycle of Initiation, Definition, Planning, Execution and Close to create a unique product, service, or result through novel organization and coordination of human, material and financial resources.

A project can be considered to be any series of activities and tasks that have a specific objective to be completed within certain specifications, have defined start and end dates, have funding limits (if applicable), consume human and non-human resources (i.e. money, people, equipment), are multifunctional (i.e. cut across several functional lines) (Grzesik & Piwowar-Sulej, 2018).

2.2.3. Definitions of Project Management

Project management is the application and integration of modern management and project management knowledge, skills, tools and techniques to the overall planning, directing, coordinating, monitoring and control of all dimensions of a project from its inception to completion, and the motivation of all those involved to produce the product, service or result of the project on time, within authorized cost, and to the required quality and requirement, and to the satisfaction of participants (Crawford, 2000; PMI, 2013; Chartered Institute of Building, 2002).

Walker (2008) explained that project management is the process of planning and executing a piece of work from inception to complete to objectives on time, within cost limits and to the specified standards of quality. It organizes, plan, direct, co-coordinate and control all project resources from inception to completion.
Project management has emerged because of the characteristics of our contemporary society demand the development of new methods of management. Effective project management provides an organization with powerful tools that improve its ability to plan to implement and to control its activities as well as the way in which it utilizes its people and resources (Mandson & Selnes, 2015).

2.2.4. Construction Project Management

Management of construction projects is similar to management of other kinds of projects in many respects, it has also some peculiarities that differentiate it from managing other kinds of projects such as software development. For example, unlike the management of many other projects, the project managers in the construction project are often changed from one phase to another or some may specialize in only one phase of the construction project (PMI, 2013).

PMI has published a supplemental guide for managing construction project (the construction extension - a guide to the project management body of knowledge-3rd edition). In this guide, four additional knowledge areas of project safety management, project environmental management, project financial management, and project claim management are included (PMI, 2013).

The management of construction projects has some differences from the management of other projects. The differences mainly stem from the nature and characteristics of construction projects. The consideration of these differences is important for the successful management of construction projects. Generally, construction projects:

- Are usually capital intensive, complex; and require significant management skills, involvement, and coordination of a wide range of experts in the various field (Chartered Institute of Building, 2002)
- Must address the geography and conditions of the project site and the relation of the project to the environment (PMI, 2007).
- Are subject to a variety of laws and regulations that aim to ensure public safety and minimize environmental impacts (Burger, 2013).
Compared to most other industries, construction projects involve relatively intensive labor use and consume large amount of materials and physical tools. (Jekale, 2004).

2.2.5. Project Management Competence

According to Gabriela (2008), project management competencies in the construction industry include general and management skills, over and above the technical skills of traditional engineering areas. A project manager who is well educated in the fundamental principles of engineering design and management can usefully apply such principles once he or she has acquired a basic understanding of a new application area.

Project management competence consists of understanding the project management knowledge areas, leadership skills, and business environment. Leadership skills include understanding the project management process, self-management, leading people: direction, motivating and inspiring, communicating, negotiating, problem-solving, and influencing the organization. Business environment understanding means an understanding of global markets, internationalization, regulation and laws, technology and applications; also in cultural, political, economic and ethical context (Raija et al., 2006).

2.2.6. Importance of project management competence

In an attempt to convert the organizations’ vision into reality and reach the desired future state, project-based management is implemented as a process to improve performance and successfully solve problems (Turner, 2012).

A field that is indistinguishably associated to change, complexity, high risks, and fast-paced projects, project management is also considered an approach to solving corporate problems through special management techniques that drive better control and use of existing resources (Grzesik & Piwowar-Sulej, 2018).

Karlsson (2011) shows that project management can be broken down into a number of components, including planning, organizing, implementing and controlling. Planning is required so that what needs to be done can be identified, in order for it to be organized to identify how it will be done. These plans must then be implemented and continuously
controlled to ensure that the project stays on track with regard to the specification, quality, time scales, and planned resources. To manage all these components, different competencies or skills are required of the project manager and the project team.

Project management is being viewed as the new form of general management which enables organizations to integrate, plan, and control schedule-intensive and one-of-a-kind endeavors in order to improve overall organizational performance (Pant & Baroudi, 2008). The attractiveness of project management lies in its ability to guarantee control, particularly of work of irregular nature, which is generally associated with an unpredictable level of change in the business environment, through the appropriate use of knowledge and techniques. Success, in this case, is primarily defined by the ability to ensure that the objective of the endeavor is completed (Ashleigh, 2012).

2.3. Project managers

2.3.1. Definition of Project Manager

The project manager is a direct representative of the organization and is responsible for the overall success of the project. The project manager holds the single point of integrative responsibility necessary to ensure that everything on the project is managed effectively to ensure successful project delivery (APM, 2015). According to the definition of PMI (2013), a project manager is a person assigned by the performing organization to lead the team that is responsible for achieving the project objectives.

2.3.2. Role and Responsibility of Project Managers

In the construction industry, the responsibility of the project manager is to see to the delivery of the physical infrastructure that the client has specified within the budget, time, quality and safety requirements. Project managers lead the rest of the team; they make key decisions; they are involved in the day-to-day activities; they set the tone for the whole project. In other words, they are the cornerstones of the project (Gabriela, 2008). According to Bothma (2012), the project manager is the point of contact between the client and the contractor and is therefore responsible for the relationship between the client and the construction company. This relationship is very important for the completion of the current
project, but also for the possibility of receiving future work from the same client. Bothma (2012), also revealed that the project manager is responsible for communication and coordination of stakeholders, such as the owner and supervisory agencies, and needs to lead the project team and promote sincere cooperation among members. In other word, the project manager is the focal communication point with internal and external environments, as well as the single point of responsibility for the project. Therefore, the project manager should possess the following abilities: the unbiased fairness of a judge, the skills of a diplomat, the authority of a general, and the understanding of a parent (Valencia, 2007).

Gabriela (2008), points out several project managers tasks and responsibilities, such as: get all players on the project team, manage task interfaces, assure clear identification of task completion, assure communication of task completion, manage responsibility interfaces, question blurry responsibilities, clarify delegation levels, balance the needs of project, client, organization, identify stakeholders and their definition of project success, balance project objectives with other objectives, act as a catalyst, and when necessary, a devil’s advocate, promote effective communication and wide participation in decision making, manage conflicts.

According to Zulch (2016), a project manager is required to fulfill a number of roles, many of which are performed simultaneously. The roles include understanding the environment, planning activities, scheduling tasks, managing budgets, selecting and appointing the project team, leading, controlling and motivating the project team, communicating with the project team and stakeholders, making decisions, solving problems, negotiating, and persuading.

Project objectives, schedules, budgets, evaluating alternatives, evaluating risks and how to deal with them, leading to successful completion are the responsibility of the project manager. Therefore, the project manager is to be a leader when he controls the activities, pursue the plan of work, make true decisions without conflicts of management (Mandson & Selnes, 2015). Egan (2012), believed that project managers’ main role is in making acquisitions required for the construction of the project, including consistent refining the project scope, identification of items that have delivery dates which impact the schedule, procurement, and purchasing of materials.
Project managers have the responsibility to satisfy the needs: task needs, team needs, and individual needs. As project management is a critical strategic discipline, the project manager becomes the link between the strategy and the team. Projects are essential to the growth and survival of organizations. Projects create value in the form of improved business processes, are indispensable in the development of new products and services, and make it easier for companies to respond to changes in the environment, competition, and the marketplace (PMI, 2013).

2.3.3. Competence of Project Managers

Construction projects are one of the most difficult areas to apply project management techniques, due to the typical nature of construction projects, which normally involve risks or uncertainty, and suspense, which compound to present the ultimate test to the project manager in charge of the project. Project managers in the construction industry, therefore, need to combine their technical knowledge with effective teamwork and communication skills into areas of expertise known as core competencies (Dainty A., Cheng M., and Moore D., 2003).

Project management competency development framework (PMCDF) maintains three dimensions of project managers’ competence, namely knowledge, performance, and personal competencies. Knowledge competencies refer to the project managers’ knowledge, as well as personal understanding of project management (what the project manager knows about project management). Performance competencies refer to the project managers’ ability to successfully complete a project and project activities (what the project manager is able to do or accomplish while applying project management knowledge). Personal competencies refer to the project managers’ core personality competence (how the project manager behaves when performing the project or activity) (Burger, 2013).

Competencies can be divided into different categories. The most common division of competencies are hard and soft. Hard competencies (referred to as technical, professional, practical, functional) and soft competencies (interpersonal, behavioral, social). Hard competencies refer to skills in using the tools typical for a specific profession. They are needed to solve technical problems, to make decisions in specialized areas and also to train
others. In turn, soft competencies are based on the ability to cooperate with other people, to understand their needs and aspirations and to motivate them (Grzesik & Piwowar-Sulej, 2018).

2.3.3.1. **Hard Competence**

The construction extinction project management body of knowledge (PMBOK) identifies the hard skill competencies of effective project managers, which includes project scope management, time management, cost management, risk management, procurement management, quality management, financial management, environmental management, safety management, and integration management. And also project management related software (Sumner & Powell, 2013).

**(1) Project Integration Management**

This category is involving the integration of a wide number of techniques. It ranges from developing projects chartered to project closure. Project integration management ensures the understanding of overall project management as a big picture. Project integration management is a process and activity that integrates the various elements of project management, which are identified, defined, combined, unified, and coordinated within the project management process group (PMI, 2013).

Project integration management characterized by comfortable running the project; track record of successful projects; solid project methods; project management skills; monitoring project progress and other performance indicators; coordination of project interfaces and ensuring the delivery of projects. The lack of a clear project meaning and plan is basic neglect of conscientiousness on the project managers’ part, typically, the foremost damage of the project (Umer Asgher, Ehsan K., Waheed M., Nawa E., Mirza S., Sarwar Z., 2010).

**(2) Project Scope Management**

PMI (2013), defines the project scope management as the methods required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. The category of scope management included all the sentences that specifically mentioned scope management, required planning competence, talked about
defining or understanding requirements and the ones that mentioned changes. The reason for including changes into scope management was because a project manager needs to control the changes in order to manage the scope of the project. It is project scope management competence that allows the project manager to control what is and what isn’t part of the project, which is also why requirement definition was included under this heading. Project scope management can comprise phrases like the project manager will plan; project scope definitions; tracking changes; definition of the project; identification of ongoing changes within existing projects and works with internal and external stakeholders to develop a clear understanding of the requirements (Miranda & Ghimire, 2007).

The importance of a well-formulated scope of work has been shown several times in many projects. It is not unusual that a project is rushed into a start without the proper planning and preparation. This often leads to problems for both suppliers and customers as extra costs and delays are likely to occur. A clear project scope facilitates the project organization to realize the actual magnitude of the work and creates an understanding of the achievements that are required in the project (Karlsson, 2011).

(3) Project Time Management

Sentences that mentioned time, tracking milestones, prioritize and creating as well as monitoring schedules all were coded under this classification. The phrases dealt as project time management incorporates key work packages to be delivered on time; prepare project schedule; monitor the projects’ progress in terms of planned versus actual schedule; outstanding time management skills; Monitoring of project milestones and delivers the project within the agreed time (Miranda & Ghimire, 2007).

A failure to recognize and describe all actions required for the project, also under evaluation of these actions, can make it extremely complicated to meet up project deliverables on time. Delays may cause growing sponsor trouble which may outcome in project termination (Umer et al., 2010).
(4) Project Cost Management

Project cost management includes ensures adherence to budget; tracking project costs; earned value; estimates; proven track record delivering projects within budget and able to effectively manage, allocate and coordinate resources (Miranda & Ghimire, 2007).

According to PMI (2013), project cost management includes the processes of cost estimating, cost budgeting and cost control. The main objective of cost management is to complete the project within the approved budget.

The project budget is very important and influences all areas in both the planning and execution of a project. It is important to keep track of total costs as well as costs for different work packages in a project. A professionally developed budget does not only control the project costs but also creates good conditions for the development of well-functioning cash flow in the project. The consequence of insufficient cash flow in a project is often connected to large extra costs and delays as there is a high risk for a temporary stop of the whole project (Karlsson, 2011).

(5) Project Quality Management

Phrases that dealt as project quality management includes high-quality results; commitment to continuous improvement; quality plan; be fully aware of the company quality policy and comply with the quality procedures and instructions; be able to effectively manage to a high standard of quality; your task is to ensure the solution works for end-users (Miranda & Ghimire, 2007).

The project team must identify which quality standards are relevant to the project in order to perform quality control. The identified standards should be considered the baseline in the development of a quality plan. It is important that the quality plan not only consists of required levels of quality in different activities but also methods to achieve the requested quality (Karlsson, 2011).
(6) Project Risk Management

Risk management includes risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, and risk monitoring and control. The main objectives of project risk management are to increase the probability and impact of events that are positive to the project and decrease the probability and impact of events that are negative to the project (PMI, 2013). By implementing proper risk management techniques, can project managers save the project from uncertainty, and by maintaining effective communication in different stages of the project with the stakeholders, clients, contractor and the employees’ conflicts can be mitigated and the project can turn into being rigid and stable (Mandson & Selnes, 2015).

(7) Project Procurement Management

This category included all words that related to obtaining quotes, bids or offers from suppliers, developing resource requirements and managing contracts from suppliers. Everything that was related to what would be procured and when fell under this category. Project procurement management includes phrases like develop project resource requirements; obtaining quotes from suppliers; develop and manage vendor contracts/agreements; including procurement, RFP and contract management; responsible for advising on the validity of the quotation document information and evaluate, test, specify and procure novel process technologies (Miranda & Ghimire, 2007).

The planning of procurement management should be carried out early in the project and focus on the analysis of which products or services that need to be purchased. After the initial planning, a procurement plan should be developed that includes all major procurements that are needed in the project. A procurement plan is an important tool for efficient procurements throughout the project. It should be developed based on the projects’ WBS and time schedule in order to include all procurements and to be timely integrated into the project (Karlsson, 2011).

Poor management of the procurement process can run off a project short of resources at critical stages. Some deliverables can entail particular third-party tooling with lengthy lead
times which, if not appropriately considered for, may have terrible consequences for the project (Umer et al., 2010).

(8) PM Software Competence

Project managers require relevant experience or knowledge of the technology involved in the project to be successful. This author refers to technical skills to the following: special knowledge in the use of tools and techniques, project knowledge, understanding methods, processes, and procedures, the technology required, and skills in the use of the computer (El-Sabaa, 2001).

(9) Project Safety Management

Safety management includes the processes required to assure that the construction project is executed with appropriate care to prevent accidents that cause or have the potential to cause personal injury or property damage. Safety planning for a construction project involves a job site analysis of the hazards inherent in the work and making decisions as to the measures to be taken to deal effectively with them. Execution of the project safety plan involves the application and implementation of the safe construction practices on-site in accordance with the requirements of the plan (PMI, 2007).

The study about safety and health management, dealt with reducing the number of accidents, no increase in the cost of insurance and compliance with the regulations. This competency was important for people working in places that were more prone to accidents. Some methods to reduce the number of accidents included training activities, supervision and innovative use of technology (Chandra, 2017).

(10) Project Environmental Management

Project environmental management includes the processes required to ensure that the impact of the project execution to the surrounding environment will remain within the limits stated in legal permits. It is related to identifying the environmental characteristics surrounding the construction site and the potential impacts the construction may bring to the environment; planning the approach towards avoiding environmental impacts and
achieving environmental conservation (and improvement if possible); auditing the plan and controlling the results, and inspecting environmental conditions. Environmental planning identifying what are the characteristics of the environment surrounding the construction site and which environmental standards are relevant to the project, and determining what impact the project will bring to the environment and how to satisfy the identified environmental standards (PMI, 2007).

(11) Project Financial Management

Financial management includes the processes to acquire and manage the financial resources for the project and is more concerned with revenue source and analyzing/updating net cash flows for the construction project. Financial planning identifying key financial issues to be addressed and assigning project roles, responsibilities and reporting relationships. Financial management is distinctly different from cost management which relates more to managing the day-to-day costs of the project for labor and materials. In this section, the discussion is limited to financing the cost of construction of the project itself, although long-term financing may include both construction and operation, for example in the case of design-build-operate projects (PMI, 2007).

2.3.3.2. Soft Competence

Numerous soft skills have been found to positively impact the effectiveness of a project manager. According to the authors, Sumner and Powell (2013); Miranda & Ghimire (2007); Pant & Baroudi (2008); Stephen Ogunlana, Zafaar Siddiqui, Silas Yisa, Paul Olomolaiye (2002), Zulch (2016); Burger (2013), the desired sets of soft competencies include; communication, leadership, problem-solving, team building and working with others, organizing, flexibility and alertness, creativity and innovation, human resource management, negotiation and conflict management, and positive work attitude.

(1) Communication

Communication refers to exchange information in any form such as oral, written, symbolic, etc. (Gabriela, 2008). Project communication management is an activity that involves the collection, distribution, storage, retrieval and disposition of the information in the project.
Since the project involves a number of internal as well as external stakeholders, project managers’ effective communication plays a vital role in the maintenance of stakeholders’ relations. The four components of the project communication management process are communication planning, information distribution, performance reporting and managing stakeholders. A communication skill comprises sets of ability to communicate effectively across all levels of organization, including executive management; excellent speaking and writing skills; ability to write reports, business correspondence, and procedure manuals; fluent with multiple languages particularly helpful; maintain a good professional relationship with the client, acting as first point of contact for any issue or query and keeping senior stakeholders in the picture with presentations on how the projects are tracking (PMI, 2013).

Communication plays important role in understanding the vision and mission of the project and also understand the reasons for changing the project strategy and more precisely avoiding misunderstandings among project managers, team members and the project sponsor (Umer et al., 2010).

(2) Leadership

The sentences that were dealt under leadership included things such as mobilization, influencing people, acting strategically, direction (roadmaps), coaching and mentoring. It helps a project manager to lead people and the organization as a whole to achieve project objectives (APM, 2015).

Leadership terms such as shaping goals, obtaining resources, building roles and structures, establishing good communications, seeing the whole picture and moving things forward to a successful conclusion. These skills are different than the ones provided to project managers through training, which mainly have a technical nature. This competency is critical to a successful PM (Mandson & Selnès, 2015). One of the most important project managers’ competencies is the leadership skill and the ability to influence practices creating conditions for a learning organization (Raija et al., 2006).
(3) **Problem-Solving**

Problem-solving comprises phrases like make decisions on problem resolutions; possess excellent analytical skills; must be able to solve practical problems and deal with variables in situations where only limited standardization exists; selecting and implementing application solutions; trouble-shooting mentality and proactively identify potential problems. Problem identification, decision making, and analytical skills were also included under problem-solving (Miranda & Ghimire, 2007).

(4) **Team Work**

Team working is when people work collaboratively towards a common goal as distinct from other ways that individuals can work within a group. Every project involves a number of people from various backgrounds and cultures to perform various project-related tasks. This situation requires managerial competence of working along with groups of people, coordinating and facilitating them to get the job done effectively. Consensus, team building, delegation, the ability to encourage maximum inputs from team members, involving the right people, gaining powerful allies, and the use of networking to gain information are consolidated under this heading (APM, 2015).

Interactional skills and connecting and making personal bonds with the team members are absolutely in the highest interest of every person in the team for feeling appreciation and importance to the project work, while the team members can take more care of the technical competence in the team. This can help in achieving a more effective, efficient and successful project execution and project control (Mandson & Selnes, 2015).

(5) **Organizing**

Organizing refers to the arrangement of people, material and support resources to meet the organizational objectives successfully (Mandson & Selnes, 2015). Organizing will have a more general meaning that involves the competence of arranging, preparing and attaining orderly and systemized structure in the results of the tasks performed (Oxford English Dictionary, 2007).
(6) Flexibility & Alertness

Flexibility and alertness are related to competence in coping with situations. As the project operates in a dynamic environment, flexibility is one of the essential competencies of the project manager (Miranda & Ghimire, 2007). Similarly, alertness refers to the competence that facilitates managers to see quickly, understand and act in a particular situation in projects (Oxford English Dictionary, 2007).

Project managers need flexibility and good leadership and management skills to cope with unpredictable events and make results in confusion, which on the other hand acts as the source of innovativeness (Raija et al., 2006).

(7) Creativity & Innovation

This category included both the competence to act creatively and innovatively as the competence to foster such behavior within the participants of the project. play an important role in managing projects successfully as they help project managers come up with new solutions to the problems. Both creativity and innovation are related to ‘out of box thinking’ or the ability to tackle problems from a different angle. Innovation refers to the new ideas, process or product offering that could be either in the form of product innovation or process innovation. There are some other terms that also represent creativity and innovation such as inventiveness, open-mindedness, innovation, and change and acting as a change agent (Crawford, 2000).

(8) Human Resource Management (HRM)

This competence is related to dealing with people in the project. A project manager requires this competence in order to effectively acquire, manage and motivate people to perform effectively. Even though HRM is a broad topic covering a wide variety of competencies such as communication, team working, conflict and negotiation, etc. (PMI, 2013), this research treats each of these factors as individual competence to fit within the framework of soft competences.
In the early phases of a project, it is necessary for the project manager to plan how the project team should be organized and determine what roles are required. Each role in the project team should be assigned with areas of responsibility, authority, and required competence. It is important that a role with a defined area of responsibility also has the authority to make decisions within that area. Responsibility without authority makes it very hard for middle management to influence the work, which most likely will affect the project negatively (Walker, 2008).

Poor team planning and development, including understaffing, vague responsibilities and instability, lead to a lack of staff motivation and direction, causing slow down progress (Umer et al., 2010).

(9) Conflict Management

Conflict management is the process of identifying and addressing differences that if unmanaged would affect project objectives. As a number of stakeholders are involved in projects this requires project managers to have performed effective conflict management through negotiating. Negotiation is related to seeking a consensus, resolving differences and aligning views, it has to do with getting people to agree and to accept and agree upon terms and conditions of a certain situation (APM, 2015).

(10) Positive Work Attitude

Positive work attitude refers to a feeling or opinion about something or someone. It could be negative, positive or neutral. Having a positive attitude is one of the essential competencies of project managers APM, (2015), relates a positive attitude as behavioral characteristics as a function of values, beliefs, and identity. For the purpose of this research, it also includes a commitment to success, high self-esteem, and enthusiasm, trustworthiness, fairness, a can-do attitude, acting assertively, behaving ethically, coping with authority and managing self.
Table 2.1: Hard and soft competencies from literature.

<table>
<thead>
<tr>
<th>Types of competence</th>
<th>References used</th>
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<tbody>
<tr>
<td>Hard competence</td>
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<tr>
<td>Project integration management</td>
<td>(PMI, 2013)</td>
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<tr>
<td>Project scope management</td>
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<td>Project time management</td>
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<td>Project cost management</td>
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<td>Project environmental management</td>
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<td>Project financial management</td>
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<td>Pm software competence</td>
<td>(El-Sabaa, 2001)</td>
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<tr>
<td>Soft competence</td>
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<tr>
<td>Communication</td>
<td>(Gabriela, 2008; PMI, 2007; Umer et al., 2010)</td>
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<tr>
<td>Leadership</td>
<td>(Raija et al., 2006)</td>
</tr>
<tr>
<td>Problem-Solving</td>
<td>(Miranda &amp; Ghimire, 2007)</td>
</tr>
<tr>
<td>Team Working</td>
<td>(Mandson &amp; Selnes, 2015; APM, 2015)</td>
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<tr>
<td>Organizing</td>
<td>(Mandson &amp; Selnes, 2015; Oxford English Dictionary, 2007)</td>
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<tr>
<td>Flexibility &amp; Alertness</td>
<td>(Mandson &amp; Selnes, 2015; Oxford English Dictionary, 2007)</td>
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<tr>
<td>Creativity &amp; Innovation</td>
<td>(Crawford, 2000)</td>
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<td>Human Resource Management</td>
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<tr>
<td>Conflict Management</td>
<td>(APM, 2015)</td>
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<tr>
<td>Positive Work Attitude</td>
<td>(APM, 2015)</td>
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2.4. Project success and impacts by project managers’ competence

2.4.1. Project Success and its Criteria

Due to the increased complexity of project and project management, project success also became a complex phenomenon, which may be considered both from an input- and output-oriented perspective. The output-oriented perspective evaluates project success by means of success criteria (Silvius and Schipper, 2014). While the input-oriented perspective analyzes the factors contributing to project success by means of critical success factors (Gabriela, 2008). The understanding of project success has developed during the last few decades considerably, and this process in accordance with the understanding of the concept.
of project and project management. In the beginning, papers on project success were focusing on the classical project triangle (time, cost, quality). Later, this was enhanced by considering stakeholder satisfaction and the strategic aspect of the client. This development requires the consideration of the interrelationships among the components of the project success: the success criteria and the critical success factors (Muller and Turner, 2007).

According to the Texas University, there are six success criteria used to measure success include budget performance, schedule performance, client satisfaction, functionality, contractor satisfaction, project manager/team satisfaction (Likamaa, 2015). Likamaa (2015), identified six measures for the performance of solving technical and social skills: budget performance, schedule performance, quality performance, owner satisfaction, profitability, public satisfaction.

Key Performance Indicators (KPIs) in the UK construction industry, to measure project performance is based on 10 identified parameters. These consist of project performance indicators; construction cost, construction time, cost predictability (design and construction), time predictability (design and construction), defects, client satisfaction with the product and client satisfaction with the service; and three company performance indicators namely; safety, profitability, and productivity (Storm, 2013).

2.4.2. Impacts of Project Managers’ Competence on Project Success

There are several variables that affect project success. Variables exogenous to a project refer to its inherent nature. Variables exogenous to the project team are those usually stated by the project sponsor early in the life of the project. Endogenous variables are those that can be modified by the project manager and team. As an endogenous variable the skills and experience of a project manager, which are demonstrated through leadership, commercial and technical abilities can have a large impact on the team performance and hence, on the overall project success (Belassi and Tukel, 1996).

According to the study by Valencia (2007), the project manager is the bonding medium holding the project together. Therefore, the appointed project manager directly influences the success or failure of the project. Chandra (2017), revealed that a project manager, who has strong leadership skills, could monitor, control, and manage project performance with
high quality. A frequent cause of problems in projects is the lack of or poor leadership on the part of the project manager which compromises the success of the project. It also appears to be that conscientious and openness, as aspects of the personality as well as a strong personal motivation of project managers influence the success of the project (Zimmerer & Yasin, 1998).

The poorest of effective leadership of the project manager will cause wasted time, unnecessary costs, and increases in errors in the construction process or completed construction (Intan et al., 2015). Competencies of the project manager in construction are responsible for the overall success of delivering the owners’ physical development within the constraints of cost, schedule, quality and safety requirements. A competent project manager is vital to project success (Khamaksorn, 2016).

If the project managers are competent in communication skills, collaboration skills, and team cohesiveness skills, it will enhance project success in terms of schedule, cost and quality performance, as well as stakeholder satisfaction (Ballesteros and Chavarria, 2015). The influence of the project manager on the sustainability aspects of his/her project at hand is substantial, regardless of whether he/she actually bears responsibility for these aspects. A project manager has “a lot of” influence on the application of sustainability principles in or to the project. The project manager has a central position in the project and that provides the opportunity to influence many aspects of the project. This influence is not limited to the process of executing the project but, by the ‘power of agenda’, extends to the deliverable and objectives of the project. The ‘power of agenda that the project manager has, provides him/her with the opportunity to discuss sustainability aspects, concerns or issues with the project sponsor, within the project team or with other stakeholders (Silvius and Schipper, 2014).

A research done by Crawford (2000) demonstrated that the competence of a project manager clearly contributes to project success. A competent project manager, as opposed to an incompetent one, has a higher chance of completing the project successfully. However, project management competence is the only aspect contributing to project performance.
2.5. Project Management Framework and Standards

The International standardization of organization (ISO) defines a standard as a document established by consensus and approved by a recognized body that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context. Standards may be regarded as socio-economic constructs reflecting a balance of perspective between stakeholders (Sumner & Powell, 2013).

As project management develops and becomes recognized, there are a number of institutions and associations established to promote education, professional authorization and the compilation of project management body of knowledge as standards. These standards form the basis of training and the certification of project managers. Below is a list of the common project management body of knowledge developed by institutions (Sumner & Powell, 2013):

- PMI - Project Management Institute
- IPMA - International Project Management Association
- APM - Association of Project Management
- AIPM - Australian Institute of Project Management

A. Project Management Institute (PMI)

Considered to be the largest PM association in the world in charge of pushing the profession through its global ideals, certifications and credentials, collaborative chapters and virtual communities, and academic research. It is founded in 1969. PMI supports and encourages all project professionals to pursue a new balance of global and local best practices, relationship building and sharing a resource as well as continuous improvement of skills and aptitudes so as to be a priority for project managers who wish to shine in the discipline (PMI, 2013).

B. International Project Management Association (IPMA)

The international project management association (IPMA) is a non-profit international group integrated by members who operate in over 60 countries across Europe, Africa, Asia,
and America. Each national association runs in its own language, and according to its specific culture and national standards (Ahmad, 2017). IPMA represents members on a global level, and plays a leading role in the development and promotion of the PM profession, providing standards and guidelines as the discipline evolves (IPMA, 2015).

In the late 1990s, IPMA developed IPMA competence baseline version 2.0. In order to improve this standard, IPMA undertook a revision project and based on the suggestions and directions from 40 association members, IPMA competence baseline 3.0 was published. IPMA competence baseline 3.0 defines a common framework for the certification purpose. 50 members of IPMA worldwide can use the IPMA competence baseline as a basis and add their own specific competencies and provide a national competence baseline. However, this national standard should be validated by IPMA (IPMA, 2015).

Within the international project management association (IPMA) baseline 3.0, competency is defined within the perimeter of technical, behavioral and contextual competencies, and based on these three, 46 competency elements are defined. They are 20 technical competency elements, 15 behavioral competency elements, and 11 contextual competency elements. Technical competencies dealing with project deliverables. Behavioral competencies deal with the personal relationships among all parties involved in a project, and contextual competencies deal with the interrelation of the project team within the context of a project. Each competency element, requirements of knowledge and experience in different IPMA levels are described. Besides this, there is also a section called “main relation” that describes the relation of each competency element with other competence elements (Omidvar, G., Samad, Z., & Zafarghandi, S., 2011).

C. Association of Project Management (APM)

This standard is linked to IPMA competence baseline and also the association of project management (APM) body of knowledge, and is designed to assess knowledge and experience of candidates who want to attain a global recognized certification. For the development of the standard, worldwide competency frameworks are studied and project management practitioners’ knowledge and experience inside the UK industry has been used (Omidvar et al., 2011). In this standard, competence elements are defined within three
domains: technical competencies, behavioral competencies, and contextual competencies. Technical competencies contain 30 functional project management competency elements. Behavioral competencies contain personal project management competence elements, which cover attitudes and skills. Behavioral competencies have nine competency elements. Contextual competencies describe the interrelationship between the organization and project manager, and they include eight competency elements (APM, 2015).

D. Australian Institute of Project Management (AIPM)

The Australian institute of project management (AIPM) which acts as the main project management body in Australia developed the national competency standards for project management in 1996, and based on registered project managers’ program it awarded certificates in three levels of the project director, project manager and project practitioner. In order to upgrade this standard and based on requirements of professionalism in the project management, AIPM developed the AIPM professional competency standards for project management in 2008. The knowledge and skills required in the Australian institute of project management (AIPM) standard are driven from the project management body of knowledge standard (PMBOK). Thus for this standard, the areas of project management are defined according to scope, time, cost, quality, human resource, communication, risk, procurement, and integration management (Omidvar et al., 2011).

2.6. Methods for assessments of project management competence

Traditionally, the performance measurement of project managers has been conceptualized mainly on the premises that are system and processes that deliver projects. However, the traditional metrics of deliverables on time, on budget and according to customer specification were not enough to measure competency and discussions have indicated that there need to be a way to measure management competency when hiring a project manager (Rayford, 2013).

Recently, measuring competencies involves project management knowledge tests, 360-degree feedback by peers and assessment centers. Further, education, examination, portfolios, self-assessments, interviews, outcomes, and peer review are some of the methods for competency assessment (Rayford, 2013). Assessment of knowledge and
experience required a mix of methods, including the training portfolio, written exam, 360-degree feedback, workshop, project report, reference and the interview itself (IPMA, 2006)

The performance of a project manager can be assessed in different ways; individual self-assessment, through organization-wide assessment, certification-level assessment. The assessor may be the manager themselves, peer, or an external assessor/consultant. The project manager will gather evidence to be used in the assessment against the project management competence development (PMCD) framework performance criteria. The organization may also prescribe qualitative, quantitative, and interpretive methods to be used and how evidence is collected and assessed (PMI, 2007).

The demonstrable performance of a project manager can be calculated in the view from the respective team members and also in the evaluation of the project outcome and success (Mandson & Selnes, 2015).

2.7. Project Managers’ Competence Development

2.7.1. Project Managers’ Competence Development Process

As shown in Figure (2.1), First, the competence of the project manager is assessed using the PMCD framework as the baseline competencies. The PMCD framework is designed to apply generically to most project managers, regardless of the project’s nature, type, size, or complexity. Secondly, a competence development plan is prepared in light of the assessment results (PMI, 2007).

The process is not intended to be a one-time assessment to identify or certify competent project managers but it is intended to be used on an ongoing basis. The competence development process may be performed periodically to assess and improve project management competence. The competence development process allows development activities and the methods of assessment to be adapted to develop training or performance assessment requirements. The entry and exit points of this process will depend on the objectives of the project manager or organization the project manager is working for (PMI, 2007).
2.7.2. Project Managers’ Competence Development Methods

Project management development can be seen in three different ways: planned development, self-guided development, and innate development. Whereas planned and self-guided development suggests the independent efforts and approaches taken by the organization or the project manager respectively, innate development refers to the autonomous development of project managers. The standard practice of planned development includes formal project management training programs that follow a framework of desired competencies, as well as commonly accepted standards or guidelines to successfully deal with the functional requirements of a project. Self-guided development involves the project managers’ self-motivation and guidance through their progress towards success. Their own experience and the challenges faced determine the learning path to be followed (Storm, 2013).

A. Training

Professional competency is “attained by a combination of knowledge acquired during training, and skills developed through experience and the application of the acquired knowledge” (Crawford, 2000). In relation to the means through which project management development can be undertaken, there is training and education (Ashleigh, 2012, p. 154).
On the other hand, training provides a source of information and guidance concerning the different sets of skills and knowledge that one needs to be successful in the organization for their present and future development (Ballesteros and Chavarria, 2015). On the other hand, project management in terms of formal education can lead to the increase of skills and the obtainment of well-recognized credentials (Walker, 2008, p. 318). Training of project managers should rely on the development of technical, management and leadership competencies (Muller and Turner, 2007, p. 446). Moreover, Ashleigh (2012, p. 159) propose that those involved in project management education emphasize human and conceptual skills in order to successfully prepare project managers through learning that resides on transferable skills and the available technology.

The development of both technical and human skills could bring the current project a healthier improvement and progress, the techniques help out to identify project managers’ strengths and weaknesses this also be of assistance to bring the best in them. The training aids the manager deliver fundamental principles of the organization, and standards sustain an organizational culture and deliver superior service for the public (Abebe, 2017).

Training and professional development programs have a positive impact on improving competencies. A training program designed to develop skills such as scope management, resource management, cost management, and risk management, had a measurable positive impact on behavior and actions. Professional development programs can also improve behavioral competencies. Behavioral competencies, including leadership, motivation, self-control, openness, negotiation, and results orientation changed after a program designed to develop these competencies (Sumner & Powell, 2013).

**B. Learning in Adults**

The context that needs to be considered in learning in adults is not limited to the context of the workplace, but also the context of where the learners fit into society. If something is explained in terms of something that learners have never experienced in their working or private life, the likelihood of their understanding of the issue is very low. Learning in adults involves not only the mind and memory function but the whole body, emotions, and spirit of the learner (PMI, 2007).
Another view on adult learning is that of lifelong learning. Lifelong learning is based on the principle that adults continue to learn throughout their lifetime and thereby continuously develop their knowledge and skills. This continued development of skills and knowledge is not something that can be learned in a prescribed period, for example, going on a one-week or two-month course. This approach ultimately requires people to develop an open state of mind where they are open to any new ideas, have the motivation to challenge old or previous ways of thinking and realize that they do not always have to overthink a problem where there might be a simple answer. This process forces the person to continuously learn new things, from time to time relearn things that were already known and at some points in life, unlearn things that were previously relevant, but might not be so any longer (Mahsa Taghi, Reza Dehghan, Janaka Ruwanpura, and George Jergeas, 2016).

C. Workplace Learning

Learning that takes place in the workplace can be divided into learning by gaining experience from physically doing a task, or from the training provided by the employer. It should be noted that in most cases, the employer only provides training that the company thinks are relevant to its operations. Hence, because the employer controls the time and resources spent on this, the employee has little control over this learning (Mahsa et al., 2016).

A project manager can gain experience on ‘live’ projects to build confidence, gradually advancing the complexity and breadth of experience. This may mean assigning a project manager to a small or less complex project until he or she demonstrates comprehension of project management competence. This should not amount to allowing a project manager to fail, but should, nevertheless provide an opportunity for the project manager to learn. This arrangement should be structured and supportive (PMI, 2007).

D. Learning by Experience

Learning by experience can also be described as informal learning. This refers to learning that is not structured or has not officially been planned, and that people predominately do on their own. This can be through normal physical working experience or through the way that individuals live their normal lives (Karlsson, 2011).
Another topic that falls into learning by experience is problem-based learning. The idea in problem-based learning is that once confronted with a problem, a person can break down the problem, and by then looking at the parts of the problem the person can use prior knowledge of similar or related problems to solve this problem. This works well in a working or group environment where the collective knowledge of the group can contribute significantly towards solving the problem. The individual has a responsibility to keep up with the technological and innovation advances in the industry to ensure that he or she has sufficient expertise to advance his or her career. Keeping up with these changes and advances in technology and social changes allows a person to continue to improve his or her skills-base and also improve productivity and efficiency in the workplace, something that will assist the person in career development and promotions to new job positions (Gabriela, 2008).

E. Mentoring

A mentor can be assigned to a project manager as a “go to” person when the project manager needs assistance or would like to discuss project management issues. The mentor may or may not be the project manager’s own line manager. The project manager can discuss issues or concerns with the mentor; seeking mentor advice on how to handle or address issues the project manager is experiencing. Mentoring works best where the project manager wants to address the development needs. Mentoring is usually driven by the project manager and is usually a long-term activity (PMI, 2007).

Mentoring can also be used as a company strategy to advance the career development of employees at a higher pace than by simply letting them gain experience under normal working conditions. By improving job satisfaction, a company can ultimately improve the productivity of its employees, yielding better returns for the company (Ballesteros and Chavarria, 2015). Companies also need to look at mentorship as not just being a kind of short-term role modeling. They need to focus on the longer-term and must ultimately be able to use this strategy in succession planning, where a mentee can take over the function of the mentor when the mentor steps down or retires (Gabriela, 2008).
2.8. Summary of Literature Review

Project managers’ competence is a key factor influencing the final outcome of projects (Stephen et al., 2002). Detailed literature on the management practices of construction projects in Ethiopia is difficult to find (Jekale, 2004). Despite this, this research has tried to summarize existing literature in different parts of the world in the area. Therefore, based on previous research studies and literature review, the most important project managers’ hard competencies will be studied based on (PMI, 2007; El-Sabaa, 2001; Mandson & Selnes, 2015; Sumner & Powell, 2013; PMI, 2013; Karlsson, 2011; Chandra, 2017; Miranda & Ghimire, 2007; Umer et al., 2010): project integration management, project scope management, project time management, project cost management, project quality management, project risk management, project procurement management, PM software competence, project safety management, project environmental management, and project financial management. The most important project managers’ soft competencies based on (APM, 2015; Gabriela, 2008; Crawford, 2000; Mandson & Selnes, 2015; PMI, 2013; Oxford English Dictionary, 2007; Walker, 2008; Miranda & Ghimire, 2007; Raija et al., 2006; Umer et al., 2010): are communication, leadership, problem-solving, team working, organizing, flexibility & alertness, creativity & innovation, human resource management (HRM), conflict management and positive work attitude.

Furthermore, based on previous research studies and literature stated above, the project success criteria that may be impacted by project managers’ competence will be studied based on (Belassi and Tukel, 1996; Chandra, 2017; Zimmerer & Yasin, 1998; Valencia, 2007; Khamakson, 2016; Ballesteros and Chavarria, 2015; Silvius and Schipper, 2014; Intan et al., 2015). This include sustainability and reliability, clients’ satisfaction, project time, stakeholders’ relationship, project cost, technical specifications & functional requirements, end-user satisfaction, health, safety & environment (HSE), supplier satisfaction, and team satisfaction.
CHAPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Introduction

Research is a process of collecting, analyzing and interpreting data to provide the solution for questions or problems. With this regard research, design and methodology is, therefore, a means to tie up all the research processes jointly and guides the researcher to achieve the objectives of the study. Research methodology refers to the overall approach taken, the theoretical basis from which the researcher derives his/her thought (Kumar, 2010).

Therefore, for this study, the research design and methodology followed to achieve the ultimate goal of the research which is specified at the beginning will be discussed. In addition, data collection methods, sampling technique, sample size and method of data analysis are presented.

3.2. Study Approach and Design

Kothari (2004), identified that there are two basic approaches to the research; quantitative approach and the qualitative approach. Quantitative research involves the generating of numerical data or data that can be transformed into useable statistics in order to explain, predict, and control phenomena of interest. This approach attempts to maximize objectivity, reliability, and generalize the ability of findings and is normally interested in prediction. The qualitative approach involves the collection of extensive narrative data in order to gain insights into the phenomena of interest. This research used both qualitative and quantitative approaches to realize the competence of construction project managers and its impacts on project success in the public building construction projects of Bahir Dar city.
3.3. Sources of Data

Two types of data have been used in the study: primary and secondary. Secondary data has been collected from previous literature such as books, journals, thesis, dissertations, and annual reports. While primary data has been collected via questionnaire and interview.

3.4. Data Collection Methods

3.4.1. Questionnaire

To achieve the purpose of this study, a questionnaire has been used as the main tool to collect data, tailored for this study. The questionnaire was constructed based on the literature review and has been developed through experts’ judgment. Then, the questionnaire was validated through expert judgment. The respondents of the questionnaire were all professionals like project managers, site supervisors, site engineers and office engineers in Bahir Dar city, who were involved in the sites of public buildings constructed in the city and available during the survey (June 22-September 30, 2019).

The questionnaire is composed of three parts: first, general information part; which includes (education, position and working experience). Second, independent variables (project managers’ competencies); which include two sub-variables (hard competence and soft competence with their respective variables) and variables were measured by a five-point Likert-type scale to tap into the respondents’ perceptions. Third dependent variable (project success criteria). All variables were measured by a five-point Likert-type scale to tap into the respondents’ perceptions, ranging from value 1 to value 5, used throughout the questionnaire. Where 1=Very low, 3=Medium, 2=Low, 4=High, 5=Very high. As shown in Table (3.1), questionnaires were distributed to 65 respondents by hand. Out of the targeted 65 respondents, 57 responded, giving a response rate of 87.7%. 16 questionnaires were filled by project managers, 19 were filled by site engineers, 17 were filled by site supervisors and 5 were filled by office engineers.
Table 3.1: Questionnaire distribution and response rate

<table>
<thead>
<tr>
<th>Professionals</th>
<th>Number of Distributed questionnaire</th>
<th>Number of Returned questionnaire</th>
<th>Percentage of response rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project managers</td>
<td>20</td>
<td>16</td>
<td>80</td>
</tr>
<tr>
<td>Site engineers</td>
<td>19</td>
<td>19</td>
<td>100</td>
</tr>
<tr>
<td>Office engineers</td>
<td>6</td>
<td>5</td>
<td>83.33</td>
</tr>
<tr>
<td>Supervisors</td>
<td>19</td>
<td>17</td>
<td>89.47</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>57</td>
<td>87.7</td>
</tr>
</tbody>
</table>

3.4.2. Interview

According to Karlsson (2011), interview is one of the primary data collection methods which is a flexible and adaptive way of investigating underlying motives of a subject in a way that self-administered questionnaires cannot. The interview undertaken for this thesis was based on a semi-structured interview, here the interviewer and interviewee engage in formal interviews. Semi-structured interviews incorporate a list of questions and topics that need to be covered during the conversation in order to gather relevant information. The assessment was conducted face-to-face with the selected nine (9) project managers and project coordinators. They were selected by purposive sampling technique.

3.5. Research Population and Sample

3.5.1. Population

According to Kumar (2010), a research population can be defined collection of individuals or objects that have a common, binding characteristic or traits. In addition, the population is defined as all elements (individuals, objects and events) that meet the sample criteria for inclusion in a study. In this study, the concept of the research population was understood as the set of entities from which the research samples are drawn. Therefore, the selection of an appropriate research population controls unnecessary variation and helps to define the limits for generalizing the study findings.

In this research, it is decided to study the whole population, i.e. 25 public building construction projects in Bahir Dar city. Four of those projects were inactive and did not have the personnel needed to fill out the questionnaire, one site refused to participate in the research due to either privacy issues, or the fact that there has been a great workload.
Therefore, this leaves 20 public building construction projects as the population for this research.

3.5.2. Sampling Technique

Sampling is the process of selecting a sample from the study population to become the basis for estimating or predicting the prevalence of an unknown piece of information, situation or outcome regarding the population (Kumar, 2010). A sample is a part of the total population that represents this population meaning, sampling allows a representative section of a population to be studied and the results extrapolated back to the population as a whole (Kothari, 2004).

In this research, purposive sampling technique was used to select building construction projects in Bahir Dar City, based on research scope and purpose. This research has surveyed entire population, i.e. 20 active public building construction projects in Bahir Dar city and therefore, the sample size for the study is equal to the population size. The sampling unit for this study is the Grade-1 contractors’ project manager.

3.6. Method of Data Analysis

In this study, descriptive statistics (mean, frequency and percentage) were used to analyze the quantitative data found from the questionnaire. Statistical package for social sciences (SPSS) version 20 software and excel 2016 were used to assist in analyzing the quantitative data. The five-point Likert's scale (1, 2, 3, 4, and 5) is used to calculate the mean score which helps to assess the competence of construction project managers and to assess competence level of impact on project success in building construction site and to investigate the impacts of construction project managers’ competence on project success criteria.

For the inferential statistics of this study, the average mean scores of the respondents were interpreted based on the following criteria: \[
\frac{5 \text{ (high range)} - 1 \text{ (low range)}}{3} = 1.33 \text{ (interval)} \quad (Ahmad, 2017)
\]

- Low degree: between 1 and 2.33 (1 + 1.33= 2.33).
✓ Medium degree: lies between 2.34 and 3.66 (2.33 + 1.33 = 2.34 - 3.66).
✓ High degree: lies between 3.67 up to 5.

The agreements of respondents’ result have been statically tested by Spearman’s correlation coefficient. Spearman’s correlation is a non-parametric statistic test used to find the relationships between the sets of data in the research study. Before carrying out further analysis the validity and reliability of the data have been checked as follows:

3.6.1. Validity

According to Zikmund (2003), validity is the ability of scale or measuring instrument to measure what it is intended to measure. On the other hand, according to Creswell (2012), validity is determining whether the findings are accurate from the standpoint of the researcher, participants, and readers. In doing so, internal and external validity have been performed in this research.

3.6.1.1. Internal validity

Different procedures have been taken to guarantee the internal validity of this research. First, the literature review was used to assure content validity. Second, expert judgment was used to confirm face validity. Finally, Pearson principal component factor analysis was used to confirm the construct validity of the variables. If Pearson principal component factor value is more than 40% for all variables, then validity is assumed (Zikmund, 2003). Therefore, Table (3.2) shows that the loading of variables within their groups is more than 40%, this indicated that it is possible to assume validity for the collected data of questionnaire survey.
Table 3. 2: Pearson Principal Component Factor Analysis for Variables

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Hard competence</th>
<th>Soft competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The competence of construction project managers in Bahir Dar city</td>
<td>89.3%</td>
<td>89.8%</td>
</tr>
<tr>
<td>2</td>
<td>The impact of construction project managers’ competence on project success in Bahir Dar city</td>
<td>59.4%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The level of impact the construction project managers’ competence dimensions have on project success in Bahir Dar city</td>
<td>0.543</td>
<td>0.912</td>
</tr>
</tbody>
</table>

3.6.1.2. External validity

This study assured the external validity by construction experts, through the judgement of the distributed study results. Construction experts were project managers, coordinators, and supervisors. Most of them were agreed on study results regarding project managers’ competence and its impact on project success. Despite, construction experts mentioned factors that hinder project managers to implement their competencies in their given projects. Eventually, they point out some common factors that hinder implementation of project managers competencies. Some of these factor were:

- Resource supply problem on the side of contractors.
- Lack of communication skill, weak contractual administration system, delay in decision making and to provide feedback, and design problem, on the sides of the consultants.
- Client bureaucracy, payment delay, and lack of client organization commitments to provide immediate feedback, on the sides of the clients.

In addition, according to construction experts, unstability of market condition, political issues, lack of professional ethics of employees, abilities of workers, were also factors that hinder project managers to implement their competence.
3.6.2. Reliability

Reliability is the degree to which measures are free from errors and therefore yield consistent results. Cronbach’s alpha is a coefficient that is used to measure reliability or internal consistency of items; it indicates how closely the items are related to each other, and how free they are from bias. If Cronbach’s alpha value is more than 60% for all variables, then reliability is assumed (Zikmund, 2003). Table (3.3) shows that Cronbach’s Alpha coefficients for all variables are more than 60%, therefore for this research reliability is assumed.

Table 3. 3: Cronbach’s Alpha coefficient for variables

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>N of items</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The competence of construction project managers in Bahir Dar city</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hard competence</td>
<td>11</td>
<td>0.927</td>
</tr>
<tr>
<td></td>
<td>Soft competence</td>
<td>10</td>
<td>0.959</td>
</tr>
<tr>
<td>2</td>
<td>The impact of construction project managers’ competence on project success in Bahir Dar city</td>
<td>10</td>
<td>0.879</td>
</tr>
<tr>
<td>3</td>
<td>The level of impact the construction project managers’ competence dimensions have on project success in Bahir Dar city</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hard competence</td>
<td>11</td>
<td>0.795</td>
</tr>
<tr>
<td></td>
<td>Soft competence</td>
<td>10</td>
<td>0.963</td>
</tr>
</tbody>
</table>

3.7. Research Methodology Flow Chart

The schematic flow chart in Figure (3.1) shows the methodology followed in this research work. The research design was formulated after problem identification through preliminary review of literature. Then data and information sources were determined based on the formulated research design. The research instruments were decided on the basis of the data and information sources. After an in-depth review of literature, questionnaire and interview survey were prepared and then data were collected through the prepared questionnaire and interview. The data were then analyzed for cross-checking the reliability and validity of the information obtained through the overall research work and then followed by data analysis and discussions in order to draw conclusions and to forward recommendations based on the findings of the study.
Figure 3.1: Flow chart of research methodology
CHAPTER FOUR

4. DATA ANALYSIS AND DISCUSSIONS

4.1. Introduction

In this chapter, the results of the field survey are analyzed and discussed. The general information of the study population is discussed and illustrated. The competence of construction project managers, the impact of project managers’ competence on project success and project managers’ competence components level of impact on project success are analyzed and discussed. Also, this chapter proposed a framework for the improvements of project managers’ competence. Descriptive statistics and inferential statistics methods were used to analyze the data. Spearman non-parametric correlation analysis was used to determine the agreement between the respondents.

4.2. General Information of the Respondents

This section discusses and analyzes the first part of the questionnaire which consists of the general information on respondents.

4.2.1. Education Level

This question refers to educational qualifications of construction project managers, site supervisors, site engineers, and office engineers. It includes five classifications which are less than high school, high school, diploma, first degree, and masters and above. As indicated in Table (4.1), most of the project managers were holding the first degree 12 (75%), and then master and above 3 (18.75%) and finally diploma 1 (6.25%).

Education level complements the experience of project management practitioners in the workplace (Mahsa et al., 2016). Site supervisors, site engineers, and office engineers were asked about the education level on which to understand the evaluations of the project manager's competence were based on the relevant education level or not. Assessing the education level is important to show the respondents’ ability in understanding research questionnaire terms (variables).
As clearly shown in Table (4.1), within the respondents of the site & office engineers, most of them were holding the first degree 20 (83.33%) and then master and above 4 (16.66%). Within the respondents of site supervisors, most of them were holding the first degree 12 (70.59%), and master and above 4 (23.53%) and diploma 1 (5.88%).

As a summary, almost all site engineers, site supervisors, and office engineers were holding the first degree and above first degree, this revealed that all respondents are capable of evaluating project managers’ competence. It can also revealed that the respondent can have the ability to understanding research questionnaire terms (variables).

Table 4.1: Education levels of the respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Respondents</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project managers</td>
<td>Site and Office engineers</td>
<td>site supervisors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Less than high school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>High school</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diploma</td>
<td>1</td>
<td>6.25</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>First degree</td>
<td>12</td>
<td>75</td>
<td>20</td>
<td>83.33</td>
<td>12</td>
</tr>
<tr>
<td>Masters and above</td>
<td>3</td>
<td>18.75</td>
<td>4</td>
<td>16.66</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>100</td>
<td>24</td>
<td>100</td>
<td>17</td>
</tr>
</tbody>
</table>

4.2.2. Working Experience in the Construction Industry

The working years of experience are divided into four categories include less than 5 years of experience, 5 to 9 years of experience, 10 - 15 years and more than 15 years of experience. As indicated in Table (4.2), 43.75% of the project managers have 10 -15 years of experience, 37.5% of them have 5 – 9 years of experience, 12.5% of them have less than 5 years of experience and 6.25% of the project managers have more than 15 years of experience in the construction industry. Therefore, the result has shown that the majority experience of project managers lay between 5 years and 15 years, which accounts 81.25%.

Work experience has a significant contribution to the development of skills and know-how for the project management team. Regarding the relevant working experience of a project manager, in some studies, at least six years in a more junior position is mandatory. In other studies, the prior experience is closer to ten years in more junior positions to engage in a
project manager position. Hence, there is no crosscut experience to the project manager. But, it is better to have more than 5 years’ experience to engage in a project manager position in addition to other selection criteria (Mahsa et al., 2016).

Site supervisors, site engineers, and office engineers were asked about the duration of the project on which they have worked with the project manager to understand whether their evaluations were based on short experiences or long periods of work.

As shown in Table (4.2), the majority of the site & office engineers’ experiences were less than 5 years of experience 13(54.16%), then those within 5–9 years of experience were 8(33.33%), followed by 10 years – 15 years of experience 2 (8.33%) and finally 1(4.16%) have more than 15 years of experience. The experiences of site supervisors were 10(58.82%) have 5 years – 9 years and 5(29.41%) have 10 years – 15 years and finally 2(11.76%) have more than 15 years of experience.

As a summary of the above results, the cumulative experience of site engineers, site supervisors, and office engineers were within the range of 5–9 years, this revealed that all respondents have relevant work experience for evaluating project managers’ competence and its impact on project success in Bahir Dar city public building construction projects.

Table 4. 2: Frequency and percentages working experience of respondents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Project managers</th>
<th></th>
<th>site and office engineers</th>
<th></th>
<th>site supervisors</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
<td>%</td>
</tr>
<tr>
<td>Less than 5 years</td>
<td>2</td>
<td>12.5</td>
<td>13</td>
<td>54.16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5 year – 9 years</td>
<td>6</td>
<td>37.5</td>
<td>8</td>
<td>33.33</td>
<td>10</td>
<td>58.82</td>
</tr>
<tr>
<td>10 years – 15 years</td>
<td>7</td>
<td>43.75</td>
<td>2</td>
<td>8.33</td>
<td>5</td>
<td>29.41</td>
</tr>
<tr>
<td>More than 15 years</td>
<td>1</td>
<td>6.25</td>
<td>1</td>
<td>4.16</td>
<td>2</td>
<td>11.76</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>100</td>
<td>24</td>
<td>100</td>
<td>17</td>
<td>100</td>
</tr>
</tbody>
</table>

4.2.3. Working Experience as a Project Manager

The last part of the demographics section asked project managers about their overall experience as a project manager to understand the level of their experience as a project manager position. As it is indicated in Figure (4.1), 50% of the respondents have less than 5 years of experience and the rest 50% of the respondents have 5 – 9 years of experience.
as a project manager. Therefore, the project managers have adequate experience on project management practice in Bahir Dar city public building projects.

![Working experience as a project manager](image)

**Figure 4.1:** Percentages of working experience as a project manager
4.3. Analysis and discussion on the competence of construction project managers

The first specific objective of this research was to assess the competence of construction project managers.

4.3.1. Project Managers’ Hard Competence

Table 4.3: Mean scores of the project managers’ hard competence.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean scores</th>
<th>Average mean scores</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard competence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project time management</td>
<td>4.25</td>
<td>4</td>
<td>3.6471</td>
</tr>
<tr>
<td>Project Financial Management</td>
<td>3.9375</td>
<td>4.0833</td>
<td>3.7647</td>
</tr>
<tr>
<td>Project cost management</td>
<td>4</td>
<td>3.7083</td>
<td>3.7647</td>
</tr>
<tr>
<td>Project quality management</td>
<td>4</td>
<td>3.875</td>
<td>3.5294</td>
</tr>
<tr>
<td>Project integration management</td>
<td>3.8125</td>
<td>3.5417</td>
<td>3.5294</td>
</tr>
<tr>
<td>Project scope management</td>
<td>3.6875</td>
<td>3.625</td>
<td>3.2941</td>
</tr>
<tr>
<td>Project procurement management</td>
<td>3.875</td>
<td>3.4583</td>
<td>3.2941</td>
</tr>
<tr>
<td>PM software competence</td>
<td>3.4375</td>
<td>3.2917</td>
<td>3.2353</td>
</tr>
<tr>
<td>Project risk management</td>
<td>3.3125</td>
<td>3.4583</td>
<td>3</td>
</tr>
<tr>
<td>Project Safety Management</td>
<td>3.5625</td>
<td>3.125</td>
<td>3</td>
</tr>
<tr>
<td>Project Environmental Management</td>
<td>3.3125</td>
<td>3.2083</td>
<td>2.5294</td>
</tr>
</tbody>
</table>

(1) Project Time Management

Project time management includes prepare project schedule; monitor the projects’ progress in terms of planned versus actual schedule; outstanding time management skills; monitoring of project milestones and delivers the project within the agreed time (Miranda & Ghimire, 2007). Umer et al. (2010), also realized that a failure to recognize and describe all actions required for the project, also under evaluation of these actions, can make it extremely complicated to meet up project deliverables on time. Delays may cause growing sponsor trouble which may outcome in project termination. But this study has assessed the Bahir Dar city public building construction project managers’ competence on; ability to prepare project schedule; ability to monitor the projects’ progress in terms of planned versus actual schedule; ability to monitor project milestones and deliver the project within the agreed time. Hence, as clearly indicated in Table (4.3), the average mean score of
respondents for project time management is 3.9649, which is between 3.67 and 5. Therefore, this average mean score result indicated that the project managers have a high level of status on project time management competence in Bahir Dar city public building construction projects.

(2) Project Financial Management

On this heading, this study has assessed the project managers’ competence on; ability to identify key financial issues to be addressed; the ability to acquire and manage the financial resources for the project concerned with revenue source and analyzing/updating net cash flows; able to manage the day-to-day costs of the project resources in Bahir Dar city public building construction projects. According to PMI (2007), project financial management is concerned about identifying key financial issues to be addressed and assigning project roles, responsibilities and reporting relationships. Financial Management is distinctly different from cost management which relates more to managing the day-to-day costs of the project for labor and materials.

Based on a questionnaire survey, as shown in Table (4.3), the average mean score of respondents is 3.9474, which is within the range of 3.67 and 5. Therefore, the assessment result indicated that the construction project managers of Bahir Dar city public building construction projects have a high level of status on project financial management competence.

(3) Project Cost Management

On this competence component, the researcher has assessed the competence of construction project managers on the ability to determine resources needed to perform project activities, ability to develop project budget based on resources needed, and ability to control the project budget throughout the project life cycle in Bahir Dar city public building construction projects. But according to PMI (2013), project cost management includes the processes of cost estimating, cost budgeting and cost control. Karlsson (2011), also reveal that it is important to keep track of total costs as well as costs for different work packages in a project. A professionally developed budget does not only control the project costs but also creates good conditions for the development of well-functioning cash flow
in the project. So, assessing project cost management competence is important for identifying skill gaps of the project managers.

Based on a questionnaire survey, as indicated in Table (4.3), the average mean score of respondents’ for project cost management is 3.807, which is within the range of 3.67 and 5. Hence, this indicated that the Bahir Dar city public building project managers have a high level of competence on project cost management

(4) Project Quality Management

Project quality management includes high-quality results; commitment to continuous improvement; quality plan; be fully aware of the company quality policy and comply with the quality procedures and instructions; be able to effectively manage to a high standard of quality; to ensure the solution works for end-users (Miranda & Ghimire, 2007). In this regard, the researcher has been concerned on the assessments of the Bahir Dar city public building construction project managers’ competence regarding the ability to identify relevant quality standards, to determine methods to meet the standards and to control results to monitor compliance and eliminate unsatisfactory performance. Therefore, as it is clearly indicated in Table (4.3), the average mean score of respondents for project quality management is 3.807, which is between, 3.67 and 5. Hence, the average mean score result indicated that the project managers have a high level of competence

(5) Project Integration Management

On this heading, the researcher has assessed the Bahir Dar city public building construction project managers’ competence on; ability to prioritize tasks based on project objectives; ability to identify, define, combine and integrate project management activities and processes; like initiation, planning, execution, monitoring and controlling and closing. According to Umer et al. (2010), it is characterized by comfortable running the project; track record of successful projects; solid project methods; project management skills; monitoring project progress and other performance indicators; coordination of project interfaces and ensuring the delivery of projects.

Based on the questionnaire survey, as indicated in Table (4.3), the average mean score of respondents on project integration management competence is 3.614, which is between
2.34 and 3.66. Hence, the project managers have a medium level of status on project integration management competence in Bahir Dar city public building construction projects.

(6) Project Scope Management

On this competence component, this study has assessed the Bahir Dar city public building construction project managers’ competence regarding ability to determine and control what needs to be and not to be included in a project; ability to frequently monitor the scope of the project to identify changes and to validate the scope of the project at the beginning of the project; ability to make sure that the project delivers on the scope that has accepted and to make sure the project stays within scope. According to Miranda & Ghimire (2007), the scope management competence included all the sentences that specifically mentioned scope management, required planning competence, talked about defining or understanding requirements and the ones that mentioned changes. Project scope management competence allows the project manager to control what is and what isn’t part of the project.

As clearly shown in Table (4.3), based on the questionnaire survey, the average mean score of the respondents for project scope management is 3.5439, which is between 2.34 and 3.66. Therefore, the average mean score result indicated that Bahir Dar city public building construction project managers have a medium level of status on project scope management.

(7) Project Procurement Management

For this study, the researcher has assessed the project managers’ ability to manage the process of attaining goods, services, or results from outside the project team in order to complete the required work in Bahir Dar city public building construction projects. As shown in Table (4.3), the average mean score of respondents for project procurement management competence is 3.5263, which ranges between 2.34 and 3.66, indicated that the project managers have a medium level of competence in Bahir Dar city public building construction projects.

According to Miranda & Ghimire (2007), project procurement management includes develop project resource requirements; obtaining quotes from suppliers; develop and manage vendor contracts/agreements; including Procurement, RFP and contract
management; responsible for advising on the validity of the quotation document information and evaluate, test, specify and procure novel process technologies. Umer et al. (2010), poor management of the procurement process can run off a project short of resources at decisive stages. Therefore, project procurement management is an essential competence component for project success.

(8) PM Software Competence

This study has assessed the PM software competence of the Bahir Dar city public building construction project managers, which includes, know and able to apply PM-related software such as; MS Project, Primavera and other. According to El-Sabaa (2001), project managers require relevant experience or knowledge of the technology involved in the project to be successful. This author refers to technical skills to the following: special knowledge in the use of tools and techniques, project knowledge, understanding methods, processes, and procedures, the technology required, and skills in the use of the computer. Based on a questionnaire survey, as indicated in Table (4.3), the average mean score of respondents for PM software competence is 3.3158, which is between 2.34 and 3.66. Hence, the result indicated that the project managers have a medium level of status on PM software competence in Bahir Dar city public building construction projects

(9) Project Risk Management

According to PMI (2013), risk management includes risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning and risk monitoring and control. In this regard, this study has assessed the Bahir Dar city public building construction project managers’ competence on; the ability to manage the risks of the project and the ability to provide risk management planning, ability to identify risks, ability to implement risk planning and risk monitoring. As shown in Table (4.3), the average mean score of respondents’ project risk management is 3.2807, which is between 2.34 and 3.66. Hence, this result indicated that the project managers have a medium level of competence on project risk management in Bahir Dar city public building construction projects.
(10) Project Safety Management

On this regard, this study has been concerned on the assessments of the project managers’ competence on; the ability to analyze the hazards inherent in the work and ability to take the measurement; ability to apply and implement the safe construction practices on-site in accordance with the requirements of the plan in Bahir Dar city public building construction projects. As shown in Table (4.3), the total mean score of respondents for project safety management competence is 3.2105, which is within the range of 2.34 and 3.66. Therefore, this average mean score result indicated that project managers have a medium level of competence.

According to Chandra (2017), the study of safety and health management, dealt with reducing the number of accidents, no increase in the cost of insurance and compliance with the regulations. This competency was important for people working in places that were more prone to accidents. Some methods to reduce the number of accidents included training activities, supervision and innovative use of technology.

(11) Project Environmental Management

On this heading, the researcher has assessed the Bahir Dar city public building construction project managers’ competence regarding the ability to determine impacts the project will bring to the environment and the ability to satisfy the identified environmental standards. As indicated in Table (4.3), the average mean score of respondents is 3.0351, which is between 2.34 and 3.66. Therefore, the mean score result indicated that the project managers have a medium level of competence on project environmental management in Bahir Dar city public building construction projects.

Project environmental management is related with identifying the environmental characteristics surrounding the construction site and the potential impacts the construction may bring to the environment; planning the approach towards avoiding environmental impacts and achieving environmental conservation (and improvement if possible); auditing the plan and controlling the results; inspecting environmental conditions. Environmental planning. Identifying what are the characteristics of the environment surrounding the construction site and which environmental standards are relevant to the project, and
determining what impact the project will bring to the environment and how to satisfy the identified environmental standards (PMI, 2007).

### 4.3.2. Project Managers’ Soft Competence

Table 4.4: Mean scores of the project managers’ soft competence.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean scores</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soft competence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project managers</td>
<td>3.875</td>
<td></td>
</tr>
<tr>
<td>site and office engineers</td>
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<td></td>
</tr>
<tr>
<td>supervisors</td>
<td>4.1176</td>
<td></td>
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<td>Average mean scores</td>
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</tr>
<tr>
<td>Interpretation</td>
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<td>High</td>
</tr>
<tr>
<td>Organizing</td>
<td>3.875</td>
<td></td>
</tr>
<tr>
<td>site and office engineers</td>
<td>3.9167</td>
<td></td>
</tr>
<tr>
<td>supervisors</td>
<td>3.7647</td>
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</tr>
<tr>
<td>Flexibility &amp; alertness</td>
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</tr>
<tr>
<td>site and office engineers</td>
<td>3.5417</td>
<td></td>
</tr>
<tr>
<td>supervisors</td>
<td>3.4706</td>
<td></td>
</tr>
<tr>
<td>Average mean scores</td>
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<td>Medium</td>
</tr>
<tr>
<td>Interpretation</td>
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<td>Medium</td>
</tr>
<tr>
<td>Team working</td>
<td>3.875</td>
<td></td>
</tr>
<tr>
<td>site and office engineers</td>
<td>3.6667</td>
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<td>supervisors</td>
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</tr>
<tr>
<td>Positive work attitude</td>
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<td></td>
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<tr>
<td>site and office engineers</td>
<td>3.6667</td>
<td></td>
</tr>
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<tr>
<td>Average mean scores</td>
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</tr>
<tr>
<td>Interpretation</td>
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<td>High</td>
</tr>
<tr>
<td>Leadership</td>
<td>3.625</td>
<td></td>
</tr>
<tr>
<td>site and office engineers</td>
<td>3.6667</td>
<td></td>
</tr>
<tr>
<td>supervisors</td>
<td>3.6471</td>
<td></td>
</tr>
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<td>Average mean scores</td>
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<td>High</td>
</tr>
<tr>
<td>Interpretation</td>
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<td>High</td>
</tr>
<tr>
<td>Conflict management</td>
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<td>site and office engineers</td>
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<td></td>
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<tr>
<td>supervisors</td>
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<td></td>
</tr>
<tr>
<td>Average mean scores</td>
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<td>High</td>
</tr>
<tr>
<td>Interpretation</td>
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<td>High</td>
</tr>
<tr>
<td>Leadership</td>
<td>3.625</td>
<td></td>
</tr>
<tr>
<td>site and office engineers</td>
<td>3.6667</td>
<td></td>
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<tr>
<td>supervisors</td>
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<td>Average mean scores</td>
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</tr>
<tr>
<td>Interpretation</td>
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<td>Medium</td>
</tr>
<tr>
<td>Flexibility &amp; alertness</td>
<td>3.9375</td>
<td></td>
</tr>
<tr>
<td>site and office engineers</td>
<td>3.5417</td>
<td></td>
</tr>
<tr>
<td>supervisors</td>
<td>3.4706</td>
<td></td>
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<tr>
<td>Average mean scores</td>
<td>3.6316</td>
<td>Medium</td>
</tr>
<tr>
<td>Interpretation</td>
<td>3.6316</td>
<td>Medium</td>
</tr>
<tr>
<td>Human resource management</td>
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<td></td>
</tr>
<tr>
<td>site and office engineers</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>supervisors</td>
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<td>Average mean scores</td>
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<tr>
<td>Interpretation</td>
<td>3.4737</td>
<td>Medium</td>
</tr>
<tr>
<td>Creativity &amp; innovation</td>
<td>3.3125</td>
<td></td>
</tr>
<tr>
<td>site and office engineers</td>
<td>3.25</td>
<td></td>
</tr>
<tr>
<td>supervisors</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Average mean scores</td>
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<td>Medium</td>
</tr>
<tr>
<td>Interpretation</td>
<td>3.193</td>
<td>Medium</td>
</tr>
</tbody>
</table>

(1) Communication

Communication comprises sets of ability to communicate effectively across all levels of organization, including executive management; excellent speaking and writing skills; ability to write reports, business correspondence, and procedure manuals; fluent with multiple languages particularly helpful; maintain a good professional relationship with the client, acting as first point of contact for any issue or query and keeping senior stakeholders in the picture with presentations on how the projects are tracking PMI (2013). Umer et al. (2010), reveal that communication is another of the project managers’ skills that you need in order to succeed. To lead a project to success, project managers need to be able to effectively communicate goals and delegate tasks to the team, as well as communicate project progress and updates to stakeholders. But this study has assessed the Bahir Dar city public building construction project managers’ competence on; ability to communicate effectively across all levels of an organization, including executive management; excellent speaking and writing skills; ability to write reports, business correspondence, and procedure manuals.
Based on a questionnaire survey, as shown clearly in Table (4.4), the average mean score of respondents for the assessment is 3.9474. The mean score exists within the range of 3.67 and 5. Hence, regarding this result, the project managers have a high level of status on communication skills in Bahir Dar city public building construction projects.

(2) Organizing

Organizing refers to the arrangement of people, material and support resources to meet the organizational objectives successfully (Mandson & Selnes, 2015). But in this study, the researcher has assessed the Bahir Dar city public building construction project managers’ competence on; the ability to understand the organizational formal structure, the chain of command, positional power, rules, regulations and standard. Therefore, based on the questionnaire survey result, as shown in Table (4.4), the average mean score of respondents for organizing is 3.8596, which is between 3.67 and 5. Thus, the result indicated that the project managers have a high level of status on this competence component.

(3) Team Work

Team working comprises consensus, team building, delegation, the ability to encourage maximum inputs from team members, involving the right people, gaining powerful allies, and the use of networking to gain information (APM, 2015). In order to create and maintain an effective team, the project manager must employ many different roles as a motivator and encourager, coach, cheerleader, peacemaker, and conflict resolver. Occasionally, the project manager may need to resort to implementing teambuilding sessions or activities (Miranda & Ghimire, 2007). But this research has been concerned on assessment of the Bahir Dar city public building construction project managers’ competence on; the ability to motivates and inspires the team; builds relationships within and outside the team; delegates appropriately; demonstrates team organization and governance; promotes team morale and productivity; demonstrates personal commitment to the team.

Based on a questionnaire survey, as clearly shown in Table (4.4), the average mean score of the respondents is 3.8421. The average mean is between 3.67 and 5. Thus, the mean score result indicated that the project managers have a high level of status on team working.
(4) Positive Work Attitude

On this competence component, the researcher has been concerned on the assessment of the Bahir Dar city public building construction project managers’ competence on; commitment to success; high self-esteem and enthusiasm; trustworthiness; fairness; acting assertively; behaving ethically; coping with authority and managing self. Therefore, as indicated in Table (4.4), the average mean score of respondents for positive work attitude competence is 3.7895, which is between 3.67 and 5. It is indicated that the project managers have a high level of status on positive work attitude competence.

According to APM (2015), a positive work attitude refers to relates to positive attitude as behavioral characteristics as a function of values, beliefs, and identity. It also includes a commitment to success, high self-esteem & enthusiasm, trustworthiness, fairness, a can-do attitude, acting assertively, behaving ethically, coping with authority and managing self.

(5) Conflict Management

On conflict management competence, this study has assessed the Bahir Dar city public building construction project managers’ competence on; ability to seek a consensus, resolving differences and aligning views; getting people to agree and accept upon terms and conditions of a certain situation. Thus, as shown in Table (4.4), the average mean score of the respondents is 3.7544. The result exists within the range of 3.67 and 5. Hence, the result indicated that the Bahir Dar city public building construction project managers have a high level of status on conflict management.

According to APM (2015), conflict management is the process of identifying and addressing differences that if unmanaged would affect the project. The project manager lives in a work environment characterized by conflict. This requires the project manager must have conflict management competence. APM (2015), negotiation is related to seeking a consensus, resolving differences and aligning views, it has to do with getting people to agree and to accept and agree upon terms and conditions of a certain situation.
(6) Leadership

On this competence component, the researcher has assessed the Bahir Dar city public building construction project managers’ competence on; the ability to establish vision and direction, to empower and inspire people to achieve project success; the knowledge to make decision and; ability to make decision; ability to keep project moving toward successful completion in face of aggressive schedules. According to Mandson and Selnes (2015), leadership is shaping goals, obtaining resources, building roles and structures, establishing good communications, seeing the whole picture and moving things forward to a successful conclusion. Raija et al. (2006), also realized that one of the most important project managers’ competencies is the leadership skill and the ability to influence practices creating conditions for a learning organization. Project managers need to be flexible in their leadership style, as not all situations merit the same responses. Certain circumstances require an autocratic approach, while others may be better served with a consensual approach (APM, 2015).

As it is indicated in Table (4.4), based on a questionnaire survey, the average mean score of the respondents is 3.6491, which is between 2.34 and 3.66. Therefore, this result indicated that the project managers have a medium level of status on the competence of leadership in Bahir Dar city public building construction projects.

(7) Flexibility & Alertness

On this heading, the researcher has assessed the project managers’ competence on; adaptability; ability to work under pressure and; the ability to handle multi-task in Bahir Dar city public building construction. Alertness refers to the competence that facilitates managers to see quickly, understand and act in a particular situation in projects (Oxford English Dictionary, 2007). On the other hand, project managers need to be flexible and have good leadership and management skills to cope with unpredictable events and make results in confusion, which on the other hand acts as the source of innovativeness (Raija et al., 2006).

Based on a questionnaire survey, as it is indicated in Table (4.4), the average mean score of the respondents is 3.6316, which is between 2.34 and 3.66. Therefore, this result
indicated that the Bahir Dar city public building construction project managers have a medium level of status on flexibility & alertness competence component.

(8) Problem-Solving

Problem-solving comprises phrases like make decisions on problem resolutions; possess excellent analytical skills; must be able to solve practical problems and deal with variables in situations where only limited standardization exists; selecting and implementing application solutions; trouble-shooting mentality and proactively identify potential problems (Miranda & Ghimire, 2007). Having a structured approach to solving problems always yields positive results. problem-solving is one of the skills for project managers who will stay relevant in every era. Before coming up with solutions, the project manager should be able to weigh the associated pros and cons and then formulate the best strategy to cope up with the challenges. But in this study, the researcher has been concerned on the assessments of project managers’ competence on; the ability to solve practical problems and deal with variables in situations where only limited standardization exists; trouble-shooting mentality and proactively identify potential problems in Bahir Dar city public building construction projects. Hence, based on the questionnaire survey assessment, as shown in Table (4.4), the average mean score of the respondents is 3.614, which is within the range of 2.34 and 3.66. Thus, this result indicated that the project managers have a medium level of status on problem-solving competence component.

(9) Human Resource Management

On this heading, this study has assessed the Bahir Dar city public building construction project managers’ competence on; ability to perform staff recruitment, selection, training and evaluating people in the project. Therefore, based on the questionnaire survey result, as shown in Table (4.4), the average mean score of respondents is 3.4737, which is between 2.34 and 3.66. This result indicated that the project managers have a medium level of status on this competence component.

According to Walker (2008), in the early phases of a project it is necessary for the project manager to plan how the project team should be organized and determine what roles are
required. Each role in the project team should be assigned with areas of responsibility, authority, and required competence. It is important that a role with a defined area of responsibility also has the authority to make decisions within that area. Responsibility without authority makes it very hard for middle management to influence the work, which most likely will affect the project negatively.

(10) Creativity & Innovation

On the project managers’ creativity & innovation competence component, this study has assessed the Bahir Dar city public building construction project managers’ competence on; inventiveness; open-mindedness; innovation and change and; acting as a change agent in the project. Therefore, based on a questionnaire survey, as shown in Table (4.4), the average mean score of the respondents is 3.193, which is between 2.34 and 3.66. This indicated that Bahir Dar city public building construction project managers have a medium level of status on creativity & innovation competence component.

On the study of Crawford (2000), creativity & innovation lay an important role in managing projects successfully as they help project managers come up with new solutions to problems. Crawford (2000), also points out that both creativity and innovation are related to ‘out of box thinking’ or ability to tackle problems from a different angle. Innovation refers to the new ideas, process or product offering that could be either in the form of product innovation or process innovation.

4.4. Analysis and discussion on the impacts of project managers’ competencies on project success

The second specific objective of this research was to investigate the impact of construction project managers’ competence on project success in Bahir Dar city public building construction projects.

To answer this question, data was gathered from active building construction projects by a questionnaire survey. Questionnaires were employed to collect data concerning on project success criteria: sustainability and reliability; clients’ satisfaction; project time; stakeholders’ relationship; project cost; technical specifications and functional requirements; end-user satisfaction; health, safety and environment (HSE); supplier
satisfaction and; team satisfaction). Each of the items in the instrument was measured on a five-point Likert scale. Likert measurements coded as: 1 = Strongly Disagree, 3 = Neutral, 2 = Disagree, 4 = Agree, 5 = Strongly Agree.

Table 4.5: Mean scores and ranking on the impacts of project managers’ competence on project success criteria

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean scores</th>
<th>Total mean score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Project managers</td>
<td>site and office engineers</td>
<td>site supervisors</td>
</tr>
<tr>
<td>Project cost</td>
<td>4.8125</td>
<td>4.375</td>
<td>4.4706</td>
</tr>
<tr>
<td>Project time</td>
<td>4.625</td>
<td>4.4583</td>
<td>4.2353</td>
</tr>
<tr>
<td>Technical specifications &amp; functional requirements</td>
<td>4.5</td>
<td>4.5</td>
<td>4.2941</td>
</tr>
<tr>
<td>Clients’ satisfaction</td>
<td>4.5625</td>
<td>4.1667</td>
<td>4.4706</td>
</tr>
<tr>
<td>Stakeholders relationship</td>
<td>4.4375</td>
<td>4.2917</td>
<td>4.1765</td>
</tr>
<tr>
<td>Sustainability and reliability</td>
<td>4.4375</td>
<td>4.2083</td>
<td>4.1176</td>
</tr>
<tr>
<td>Team satisfaction</td>
<td>4.3125</td>
<td>4.125</td>
<td>4.1176</td>
</tr>
<tr>
<td>End-user satisfaction</td>
<td>4</td>
<td>4</td>
<td>4.3529</td>
</tr>
<tr>
<td>Health, safety and environment (HSE)</td>
<td>4.25</td>
<td>3.9583</td>
<td>4.1176</td>
</tr>
<tr>
<td>Supplier satisfaction</td>
<td>3.875</td>
<td>3.625</td>
<td>3.5294</td>
</tr>
</tbody>
</table>

The analysis for the impacts of project managers’ competence on project success has been calculated based on the respondents’ perception of the questionnaire survey. In this study, the top five project success criteria that were impacted by the competence of construction project managers are:

- Project cost
- Project time
- Technical specifications & functional requirements
- Clients’ satisfaction and
- Stakeholders relationship

As clearly indicated in Table (4.5), the project cost is ranked first by the respondents with an average mean score of 4.5263. This implies that the project managers’ competence has high impacts on project cost in Bahir Dar city public building construction projects. In line with this study, Intan et al. (2015), also found that the problem in the poorest of effective
leadership of the project managers in the construction industry causes unnecessary costs. Successful project cost performance also depends on the budgeting skill of project managers. Without this skill, project managers would not be able to evaluate the impacts of alternative solutions on project costs. Intan et al. (2015), also remarked that project managers’ competence is one of the factors that affect cost performance.

Table (4.5) shows that project time and, technical specifications & functional requirements have been equally the second-ranked project success criteria by having the average mean score of 4.4386. This result indicated that the project time and, technical specifications & functional requirements can be affected by the competence of the project manager. In agreement with this result, Intan et al. (2015), also revealed in his study that the incompetent project managers in the construction industry will cause wasted time and increases of errors in the construction process or completed construction. Walker (2008), also found that a key factor that influences project time performance is a collaboration among stakeholders across the supply chains which should be facilitated by project managers who are able to negotiate and meet the expectations of those stakeholders.

Clients’ satisfaction was ranked fourth by having the average mean score of 4.3684, as shown in Table (4.5). This result also indicated that the clients’ satisfaction can be affected by the competence of the project manager. In line with this study, Intan et al. (2015), remarked that the leadership skills of project managers are one of the factors that affect client satisfaction. Belassi and Tukel (1996), also found that a lack of manager competence leads to project failure and this leads to a lack of client satisfaction.

The fifth-ranked project success criteria that were impacted by project managers’ competence is found to be stakeholders’ relationship with the average mean score of 4.2982, as shown in Table (4.5). This result indicates that the stakeholders’ relationship can be affected by the competence of the project manager. In line with this result, Ballesteros and Chavarria (2015), also found that lack of project managers’ competence can affect stakeholders’ relationship in terms of communication, collaboration, and team cohesiveness.
4.5. Analysis and discussion on the level of impact project managers’ competencies have on project success

The third specific objective of this research was to identify the project managers’ competencies level of impact on project success. Each of the items in the instrument was measured on a five-point Likert scale. Likert measurements coded as: 1 = Very low impact, 3 = Moderately impact, 2 = Low impact, 4 = High impact, 5 = Very high impact.

Level of impact were calculated based on the following criteria: \((\frac{5-1}{3}) = 1.33\) (interval) as follows:

1. Low degree: between 1 and 2.33 \((1 + 1.33 = 2.33)\).
2. Medium degree: lies between 2.34 and 3.66 \((2.33 + 1.33 = 2.34 - 3.66)\).
3. High degree: lies between 3.67 up to 5.

Source: Suhaib Ahmad (2017)

4.5.1. Project Managers’ Hard Competence

The analysis for the project managers’ competence components level of impact on project success has been calculated based on the respondents’ reply from the questionnaire survey. In this study, project managers’ hard competence components level of impact on project success has been assessed. The average mean scores, impact levels and ranks are shown below in Table (4.6).

The first ranked competence component with the highest impact in project success is found to be project procurement management with the average mean score of 4.4211 (exist in high levels of impact range). The respondent's average mean score also revealed that the project managers’ procurement management competence has high levels of impact on project success. In line with this study, Umer et al. (2010), poor management of the procurement process can run off a project short of resources at critical stages, eventually, it can have an impact on project outcomes.

Project cost management has been ranked by the respondents in the second position with the average mean score of 4.2982 (exist in high levels of impact range). This average mean score result indicated that project managers with insufficient ability to determine resources
needed to perform project activities, ability to develop project budget based on resources needed, and ability to control the project budget throughout the project life cycle has high levels of impact on project success. In line with this result, Karlsson (2011), also revealed that it is important to keep track of total costs as well as costs for different work packages in a project. A professionally developed budget does not only control the project costs but also creates good conditions for the development of well-functioning cash flow in the project, at the end, it can have an impact on project success.

Project time management and project financial management are equally third-ranked with the average mean score of 4.1579 (exist in high levels of impact range). This study found that project managers’ ability to prepare project schedules; ability to monitor the projects’ progress in terms of planned versus actual schedule; ability to monitor project milestones and deliver the project within agreed time has high levels of impact on project success. In agreement with this result, Umer et al. (2010), also realized that a failure to recognize and describe all actions required for the project can make it extremely complicated to meet up project deliverables on time. Delays may cause growing sponsor trouble which may outcome in project termination. This study also found that project managers’ financial management competence has high levels of impact on project success.

Project quality management is put on the fifth rank with the average mean score of 4.1404 (exist in high levels of impact range). This study revealed that lack of project managers’ competence in time management has high levels of impact on project success. According to Karlsson (2011), the project team must identify which quality standards are relevant in the project in order to perform quality control. The identified standards should be considered the baseline in the development of a quality plan. It is important that the quality plan not only consists of required levels of quality in different activities but also methods to achieve the requested quality.

Project integration management has been ranked by the respondents in the sixth position with the average mean score of 4.0175 (exist in high levels of impact range). Thus, a project manager with insufficient competence in project integration management has high levels of impact on project success. In the agreements of this study, Umer et al. (2010), lack of
clear project integration and plan is basic neglect of conscientiousness on the project managers’ part, typically, the foremost damage of the project success.

Project scope management is seventh-ranked with the average mean score of 4 (exist in high levels of impact range). Therefore, a project manager with insufficient competence in project scope management has high levels of impact on project success. According to Karlsson (2011), a project is rushed into a start without proper planning and preparation. This often leads to problems for both suppliers and customers as extra costs and delays are likely to occur. Karlsson (2011), also revealed that a clear project scope facilitates the project organization to realize the actual magnitude of the work and creates an understanding of the achievements that are required in the project.

Project safety management has been ranked by the respondents in the eighth position with the average mean score of 3.8947 (exist in high levels of impact range). This indicated that the project managers’ ability to analyze the hazards inherent in the work and ability to take the measurement; ability to apply and implement the safe construction practices on-site in accordance with the requirements of the plan have high levels of impact on project success.

Project risk management has been ranked in the ninth position with the average mean score of 3.7895 (exist in high levels of impact range). Thus, the project managers’ competence on; ability to manage the risks of the project and ability to provide risk management planning, ability to identify risks, ability to implement risk planning and risk monitoring has high levels of impact on project success. In line with the result of this study, Mandson and Selnes (2015), points out that by implementing proper risk management techniques, can project managers save the project from uncertainty and then the project can turn into being rigid and stable.

Project environmental management is put on tenth ranks by having an average mean score of 3.754 (exist in high levels of impact range). Therefore, this study revealed that the project managers’ competence in project environmental management has high levels of impact on project success. Finally, PM software competence is put on the eleventh rank with a mean score of 3.5263, which is within the range of 2.34 and 3.66. Thus, the result
indicated that the project managers’ PM software competence has medium levels of impact on project success in the Bahir Dar city public building construction projects.

Table 4.6: Mean scores and ranking the project managers’ hard competence components’ level of impact on project success

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project procurement management</td>
<td>Site and office engineers site supervisors</td>
</tr>
<tr>
<td>Project cost management</td>
<td>4.25 3.7917 3.6471</td>
</tr>
<tr>
<td>Project time management</td>
<td>4.1875 4.25 4</td>
</tr>
<tr>
<td>Project Financial Management</td>
<td>4.0625 4.3333 4</td>
</tr>
<tr>
<td>Project quality management</td>
<td>4.1875 4.2083 4</td>
</tr>
<tr>
<td>Project integration management</td>
<td>4 3.9792 4.1765</td>
</tr>
<tr>
<td>Project scope management</td>
<td>3.9375 3.9583 4.1176</td>
</tr>
<tr>
<td>Project Safety Management</td>
<td>3.8125 4 3.73712</td>
</tr>
<tr>
<td>Project risk management</td>
<td>3.75 3.9583 3.5882</td>
</tr>
<tr>
<td>Project Environmental Management</td>
<td>3.6875 3.9583 3.5294</td>
</tr>
<tr>
<td>PM software competence</td>
<td>3.25 3.8333 3.3529</td>
</tr>
</tbody>
</table>

4.5.2. Project Managers’ Soft Competence

In this section, project managers’ soft competence components level of impact on project success were analyzed and discussed like that of hard competence components. The average mean scores, impact levels, and ranks are shown below in Table (4.7).

Team working has been ranked by the respondents in the first position with the average mean score of 4.1579 (exist in high levels of impact range). Therefore, the study revealed that the project managers’ team working competence has high levels of impact on project success. In agreement with this study, Mandson and Selnes (2015), found that team working help in achieving a more effective, efficient and successful project execution and project control.

Positive work attitude is put on the second rank by having the average mean score of 4.140 (exist in high levels of impact range). According to the respondents’ perception project
managers with insufficient competence in the ability to solve practical problems and deal with variables in situations where only limited standardization exists; trouble-shooting mentality and proactively identify potential problems has high levels of impact on project success.

The third-ranked competence components with the highest impact in project success is found to be communication with the average mean score of 4.0877. In line with this study, Umer et al. (2010), also revealed that communication is another of the project managers’ skills that need in order to succeed. To lead a project to success, project managers need to be able to effectively communicate.

Leadership competence is put on the fourth rank by having an average mean score of 4.0351 (exist in high levels of impact range). Therefore, the study revealed that the project managers’ leadership competence has high levels of impact on project success. Along the line of this study, APM (2015), project managers’ leadership skills help a project manager to lead people and the organization as a whole to achieve project objectives. And also, this competence is critical to successful project management Mandson and Selnes (2015).

The fifth-ranked competence components with the highest impact in project success are found to be organizing with the average mean score of 4.0175. Thus, this study showed that project managers’ ability to understand the organizational formal structure, the chain of command, positional power, rules, regulations, and the standard has high levels of impact on project success.

The sixth, seventh and eighth competence components with the highest impact in project success are found to be problem-solving, conflict management and flexibility & alertness with the average mean scores of 4, 3.9825 and 3.9298 respectively.

Human resource management has been ranked by the respondents in the ninth position with the average mean score of 3.8596 (exist in high levels of impact range). Therefore, this study revealed that the competence of project managers on human resource management has high levels of impact on project success. According to Umer et al. (2010), poor team planning and development, including understaffing, vague responsibilities and instability,
lead to a lack of staff motivation and direction, causing slow down the progress of the project.

The last ranked competence component with the highest impact in project success is found to be creativity & innovation competence with an average mean score of 3.7544 in the Bahir Dar city public building construction projects.

Table 4. 7: Mean scores and ranking of the project managers’ soft competence components level of impact on project success

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean scores</th>
<th>Total mean score</th>
<th>Rank</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team working</td>
<td>4.1875</td>
<td>4.125</td>
<td>4.1765</td>
<td>4.1579</td>
</tr>
<tr>
<td>Positive work attitude</td>
<td>4.0625</td>
<td>4.2083</td>
<td>4.1176</td>
<td>4.1404</td>
</tr>
<tr>
<td>Communication</td>
<td>4.0625</td>
<td>4.2917</td>
<td>3.8235</td>
<td>4.0877</td>
</tr>
<tr>
<td>Leadership</td>
<td>4.0625</td>
<td>4</td>
<td>4.0588</td>
<td>4.0351</td>
</tr>
<tr>
<td>Organizing</td>
<td>3.875</td>
<td>4.125</td>
<td>4.1765</td>
<td>4.0175</td>
</tr>
<tr>
<td>Problem solving</td>
<td>3.9375</td>
<td>4.0833</td>
<td>3.9412</td>
<td>4</td>
</tr>
<tr>
<td>Conflict management</td>
<td>3.8125</td>
<td>4.0833</td>
<td>4</td>
<td>3.9825</td>
</tr>
<tr>
<td>Flexibility &amp; alertness</td>
<td>4.0625</td>
<td>3.9583</td>
<td>3.7647</td>
<td>3.9298</td>
</tr>
<tr>
<td>Human resource</td>
<td>3.75</td>
<td>3.9583</td>
<td>3.8235</td>
<td>3.8596</td>
</tr>
<tr>
<td>management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creativity &amp; innovation</td>
<td>3.625</td>
<td>3.9167</td>
<td>3.6471</td>
<td>3.7544</td>
</tr>
</tbody>
</table>

4.6. Statistical Tests for the Agreement between Respondents

To test the agreement between the mean score of respondents, Spearman’s correlation method was employed.

Table 4. 8: The correlation limit

<table>
<thead>
<tr>
<th>Correlation limit</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00-0.19</td>
<td>“very weak”</td>
</tr>
<tr>
<td>0.2-0.39</td>
<td>“weak”</td>
</tr>
<tr>
<td>0.4-0.59</td>
<td>“moderate”</td>
</tr>
<tr>
<td>0.6-0.79</td>
<td>“strong”</td>
</tr>
<tr>
<td>0.8-1.0</td>
<td>“very strong”</td>
</tr>
</tbody>
</table>

Source: [http://www.statstutor.ac.uk](http://www.statstutor.ac.uk)
4.6.1. Test for agreement between respondents on the results of project managers’ competence.

The assessments of project managers’ hard and soft competence components were done using the mean score method. Thus, to check the agreement between the mean score of respondents, Spearman’s correlation method was employed.

4.6.1.1. Project Managers’ Hard Competence

The mean score given to project managers hard competence by the respondents are summarized and tabulated on the Table (4.9).

Table 4. 9: Mean scores on the assessments of project managers’ hard competence components

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hard competence</strong></td>
<td></td>
</tr>
<tr>
<td>Project time management</td>
<td>4.25</td>
</tr>
<tr>
<td>Project Financial Management</td>
<td>3.9375</td>
</tr>
<tr>
<td>Project cost management</td>
<td>4</td>
</tr>
<tr>
<td>Project quality management</td>
<td>4</td>
</tr>
<tr>
<td>Project integration management</td>
<td>3.8125</td>
</tr>
<tr>
<td>Project scope management</td>
<td>3.6875</td>
</tr>
<tr>
<td>Project procurement management</td>
<td>3.875</td>
</tr>
<tr>
<td>PM software competence</td>
<td>3.4375</td>
</tr>
<tr>
<td>Project risk management</td>
<td>3.3125</td>
</tr>
<tr>
<td>Project Safety Management</td>
<td>3.5625</td>
</tr>
<tr>
<td>Project Environmental Management</td>
<td>3.3125</td>
</tr>
</tbody>
</table>

Using the data in Table (4.9), the Spearman’s correlation coefficients are calculated and summarized in Table (4.10) below. The agreement among the parties participated in the survey can be tested using Spearman’s correlation coefficients.

Table 4. 10: Spearman’s correlation between the respondents’ result
As clearly shown in Table (4.10), the correlation between project managers and site & office engineers is 0.804 (80.4%). This shows that there is a very strong positive association or agreement between them because it is within the range of (0.8-1.0) as shown in Table (4.8). The correlation between project managers and site supervisors is 0.854(85.4%) this also shows that there is a very strong positive association or agreement between them, because it is within the range of (0.8-1.0) as shown on Table (4.8). finally, the correlation between site engineers & office engineers and, site supervisors is 0.819(81.9%), this also reveals that there is a very strong positive agreement between two respondents because it is within the range of (0.8-1.0) as shown on Table (4.8).

All the Spearman’s correlation coefficients shown in Table (4.10) are within the range of (0.8-1.0). That means there is a very strong agreement between the perceptions of all of the respondent groups and thus most of the respondents have a similar perception on the assessment of project managers’ hard competence in Bahir Dar city public building construction projects.

4.6.1.2. Project Managers’ Soft Competence

The mean score given to project managers’ soft competence components by the respondents are summarized and tabulated in Table (4.11).

Table 4.11: Mean scores on the assessments of project managers’ soft competence components

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soft competence</strong></td>
<td>Project managers</td>
</tr>
<tr>
<td>Communication</td>
<td>3.875</td>
</tr>
<tr>
<td>Organizing</td>
<td>3.875</td>
</tr>
<tr>
<td>Team working</td>
<td>3.875</td>
</tr>
<tr>
<td>Positive work attitude</td>
<td>3.75</td>
</tr>
<tr>
<td>Conflict management</td>
<td>3.75</td>
</tr>
<tr>
<td>Leadership</td>
<td>3.625</td>
</tr>
<tr>
<td>Flexibility &amp; alertness</td>
<td>3.9375</td>
</tr>
<tr>
<td>Problem solving</td>
<td>3.4375</td>
</tr>
<tr>
<td>Human resource management</td>
<td>3.5</td>
</tr>
<tr>
<td>Creativity &amp; innovation</td>
<td>3.3125</td>
</tr>
</tbody>
</table>
Using the data in Table (4.11), Spearman’s correlation coefficients are calculated and summarized in Table (4.12) below.

Table 4. 12: Spearman’s correlation between the respondents’ result

<table>
<thead>
<tr>
<th></th>
<th>Project managers</th>
<th>Site and office engineers</th>
<th>Site supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project managers</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site and office</td>
<td>0.568</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Site supervisors</td>
<td>0.735</td>
<td>0.754</td>
<td>1</td>
</tr>
</tbody>
</table>

As clearly shown in Table (4.12), the correlation between project managers and site & office engineers is 0.568 (56.8%). This shows that there is a moderate agreement between two parties because it is within the range of (0.4-0.59) as shown in Table (4.8). The correlation between project managers and site supervisors is 0.735(73.5%), this shows that there is a strong agreement between two respondent groups, because it is within the range of (0.6-0.79) as shown on Table (4.8). Finally, the correlation between site & office engineers and site supervisors is 0.754(75.4%), this also reveals that there is a strong positive agreement between them because it is within the range of (0.6-0.79) as shown on Table (4.8), on project manager soft competence in Bahir Dar city public building construction projects.
4.6.2. Test for agreement between respondents’ result on the impacts of project managers’ competence on project success

The mean score given on the impacts of project managers’ competence on projects success by the respondents are summarized and tabulated in Table (4.13).

Table 4. 13: Mean score of the respondents on the impacts of project managers’ competence on project success.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Scores</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project managers</td>
<td>site and office engineers</td>
<td>site supervisors</td>
<td></td>
</tr>
<tr>
<td>Sustainability and Reliability</td>
<td>4.4375</td>
<td>4.2083</td>
<td>4.1176</td>
<td></td>
</tr>
<tr>
<td>Clients’ satisfaction</td>
<td>4.5625</td>
<td>4.1667</td>
<td>4.4706</td>
<td></td>
</tr>
<tr>
<td>Project time</td>
<td>4.625</td>
<td>4.4583</td>
<td>4.2353</td>
<td></td>
</tr>
<tr>
<td>Stakeholders relationship</td>
<td>4.4375</td>
<td>4.2917</td>
<td>4.1765</td>
<td></td>
</tr>
<tr>
<td>Project cost</td>
<td>4.8125</td>
<td>4.375</td>
<td>4.4706</td>
<td></td>
</tr>
<tr>
<td>Technical Specifications and Functional Requirements</td>
<td>4.5</td>
<td>4.5</td>
<td>4.2941</td>
<td></td>
</tr>
<tr>
<td>End-user satisfaction</td>
<td>4</td>
<td>4</td>
<td>4.3529</td>
<td></td>
</tr>
<tr>
<td>Health, Safety, and Environment (HSE)</td>
<td>4.25</td>
<td>3.9583</td>
<td>4.1176</td>
<td></td>
</tr>
<tr>
<td>Supplier satisfaction</td>
<td>3.875</td>
<td>3.625</td>
<td>3.5294</td>
<td></td>
</tr>
<tr>
<td>Team satisfaction</td>
<td>4.3125</td>
<td>4.125</td>
<td>4.1176</td>
<td></td>
</tr>
</tbody>
</table>

Using the data in Table (4.13), Spearman’s correlation coefficients are calculated and summarized in Table (4.14) below.

Table 4. 14: Correlation between the respondents’ result

<table>
<thead>
<tr>
<th></th>
<th>Project managers</th>
<th>Site and office engineers</th>
<th>site supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project managers</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site and office engineers</td>
<td>0.861</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>site supervisors</td>
<td>0.697</td>
<td>0.708</td>
<td>1</td>
</tr>
</tbody>
</table>

The correlation between respondents on the impacts of project managers’ competence on project success in Bahir Dar public building construction projects have been tested. Hence, as shown in Table (4.14), the correlation between project managers and site & office engineers is 0.861 (86.1%). This shows that there is a very strong agreement between two respondent groups because it is within the range of (0.8-1.0) as shown in Table (4.8). The correlation between project managers and site supervisors is 0.697(69.7%). This shows that
there is a strong agreement between the respondents because it is within the range of (0.6-0.79) as shown in Table (4.8). Finally, the correlation between site & office engineers and site supervisors is 0.708(70.8%), this also reveals that there is a strong positive agreement between them because it is within the range of (0.6-0.79) as shown on Table (4.8) on impacts of project managers competence on projects success in Bahir Dar public building construction projects.

4.6.3. Test for agreement between respondents’ result on project managers’ competencies level of impact on project success

Like that of the above section, the mean score results of the respondents’ on project managers’ competence components levels of impacts on project success was checked by Spearman s’ correlation coefficient.

4.6.3.1. Project Managers’ Hard Competence Components

The mean score given to project managers' hard competence components levels of impacts on project success by the respondents are summarized and tabulated on Table (4.15).

Table 4.15: Mean score of the respondents on project managers’ hard competence components levels of impact on project success.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hard competence</strong></td>
<td>Project managers</td>
</tr>
<tr>
<td>Project procurement management</td>
<td>4.25</td>
</tr>
<tr>
<td>Project cost management</td>
<td>4.375</td>
</tr>
<tr>
<td>Project time management</td>
<td>4.1875</td>
</tr>
<tr>
<td>Project Financial Management</td>
<td>4.0625</td>
</tr>
<tr>
<td>Project quality management</td>
<td>4.1875</td>
</tr>
<tr>
<td>Project integration management</td>
<td>4</td>
</tr>
<tr>
<td>Project scope management</td>
<td>3.9375</td>
</tr>
<tr>
<td>Project Safety Management</td>
<td>3.8125</td>
</tr>
<tr>
<td>Project risk management</td>
<td>3.75</td>
</tr>
<tr>
<td>Project Environmental Management</td>
<td>3.6875</td>
</tr>
<tr>
<td>PM software competence</td>
<td>3.25</td>
</tr>
</tbody>
</table>

Using the data in Table (4.15), the Spearman’s correlation coefficients are calculated and summarized in Table (4.16) below. The agreement among the parties participated in the survey can be tested using Spearman’s correlation coefficients.
Table 4. 16: Correlation between respondents’ result

<table>
<thead>
<tr>
<th></th>
<th>Project managers</th>
<th>Site and office engineers</th>
<th>site supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project managers</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site and office engineers</td>
<td>0.557</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Site supervisors</td>
<td>0.756</td>
<td>0.650</td>
<td>1</td>
</tr>
</tbody>
</table>

As shown in Table (4.16), the correlation between project managers and site engineers & office engineers is 0.557 (55.7%). This shows that there is a moderate positive association or agreement between two respondents because it is within the range of (0.4-0.59) as shown in Table (4.8). The correlation between project managers and site supervisors is 0.756(75.6%), this also shows that there is a strong positive association or agreement between two respondents. Finally, the correlation between site & office engineers and site supervisors is 0.650(65.0%), this reveals that there is a strong positive agreement between two respondents, because it is within the range of (0.6-0.79) as shown on Table (4.8).

4.6.3.2. Project Managers’ Soft Competence Components

The mean score given to project managers' soft competence components levels of impacts on project success by the respondents are summarized and tabulated in Table (4.17).

Table 4. 17: Mean score of the respondents on project managers’ soft competence components levels of impact on project success.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Soft competence</strong></td>
<td>Project managers</td>
</tr>
<tr>
<td>Team working</td>
<td>4.1875</td>
</tr>
<tr>
<td>Positive work attitude</td>
<td>4.0625</td>
</tr>
<tr>
<td>Communication</td>
<td>4.0625</td>
</tr>
<tr>
<td>Leadership</td>
<td>4.0625</td>
</tr>
<tr>
<td>Organizing</td>
<td>3.875</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>3.9375</td>
</tr>
<tr>
<td>Conflict management</td>
<td>3.8125</td>
</tr>
<tr>
<td>Flexibility &amp; alertness</td>
<td>4.0625</td>
</tr>
<tr>
<td>Human resource management</td>
<td>3.75</td>
</tr>
<tr>
<td>Creativity &amp; innovation</td>
<td>3.625</td>
</tr>
</tbody>
</table>

Using the data in Table (4.17), the Spearman’s correlation coefficients are calculated and summarized in Table (4.18) below.
Table 4.18: Correlation between respondents’ result

<table>
<thead>
<tr>
<th></th>
<th>Project managers</th>
<th>Site and office engineers</th>
<th>site supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project managers</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site and office engineers</td>
<td>0.529</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>site supervisors</td>
<td>0.613</td>
<td>0.475</td>
<td>1</td>
</tr>
</tbody>
</table>

As clearly shown in Table (4.18), the correlation between project managers and site & office engineers is 0.529 (52.9%). This shows that there is a moderate agreement between two respondents because it is within the range of (0.4-0.59) as shown in Table (4.8). The correlation between project managers and site supervisors is 0.613(61.3%), this also shows that there is a strong agreement between two respondents, because it is within the range of (0.6-0.79) as shown on Table (4.8). Finally, the correlation between site & office engineers and site supervisors is 0.475(47.5%), this also revealed that there is a moderate agreement between two respondents, because it is within the range of (0.4-0.59) as shown on Table (4.8).
4.7. Analysis and discussions of semi-structured interview data

A total of 9 interviews were carried out. The interviewees were informed of their rights to confidentiality as well as their freedom to abstain from answering any question. The interview period took approximately 20 minutes per individual and was conducted in a semi-formal way which gave the participants the opportunity to feel comfortable with sharing their views on the matter. The language used in the interviews was Amharic with a simple and clear to make sure that the questions were understood and there were no unknown terms. As the interviewee gave their answers the researchers took notes to follow up on specific topics or ideas as well as recorded by cell phone. This practice granted the researcher a better understanding of the interviewees’ perceptions and a more accurate interpretation of the results.

The questions raised by the researcher have been analyzed and discussed as follows under five categories.

4.7.1. Basic competence every project manager need to have

The interviewees were asked to describe the basic competencies every project manager needs to have to be an effective project manager.

In this regard, interviewee 1 mentioned that the ability to communicate is important for the project managers, it says that a project manager needs to communicate and that means to actually figure out, to see people and to see the ability of the person. Interviewee 1, also mentioned that leadership is important for the project managers so as, to establish vision and direction, to empower and inspire people to achieve project success; the knowledge and ability to make a decision; ability to keep the project moving toward successful completion in face of aggressive schedules. In other circumstances, interviewee 2, stated that human resource management competence is very important to project managers so as to perform staff recruitment, selection, training and evaluating people in the project. Interviewee 2, also stated that it is important to manage the stakeholders who are involved building trust, relationships, communication, etc… Interviewee 3, emphasized that project managers need to know the rules and regulations of the organization as well as the
construction industry of the country, and they need to know also the situations or conditions of the project which he/she were involved.

Participant 4, also provided good explanations and he stated that at the beginning of the project manager's career the formal knowledge in the methodologies or technical aspects is very important. Later when the project manager shifts to a more strategic position, where he/she has to convince people of his/her vision of the project, then competencies such as leadership, team building, team working and communication are more important. In the view of interviewee 5, leadership competence is very essential so as to inspire people of the project. Interviewee 6, also thought that project managers should have leadership and communication skills because according to him the majority of the skills they needed were related more to leadership than management.

Interviewee 7, remarked that sometimes a project manager needs have to be quite forceful and authoritative where other times he needs to be more like a mentor. This participant also points out that the ability to make a decision is important for the project managers in a way it might have routing groups or committees involved; groups that have to do with the project, so decision making is very important. In the view of interviewee 8, the project manager needs to know how to manage people in different countries or regions and cultures because we are in a diversified world. This participant also believes that the ability to be flexible and to adapt to different situations is important for the project managers to be effective. On behalf of other interviewees’ interviewee 9, added that being a good listener, having the ability to present points of view, observing reactions are important. And this interviewee emphasized that the project managers need to be “other-centered” instead of “self-centered” and that there is a need to be aware of the reaction of others and their perception.

In accordance with interviews and literature reviews, this study found that the project managers need to have the following basic competence to be effective project manager: communication, leadership, problem-solving, team working, flexibility & alertness, human resource management, conflict management, stakeholder management, time management, cost management, quality management, risk management, and PM software competence. These competence components were included under hard and soft competence categories.
4.7.2. Recruitments of project managers

The interviewees were asked to describe the sets of competencies used as criteria for recruiting someone to work as project managers in their company.

Concerning the process for recruiting project managers, all interview participants of the projects, which is undertaken by the private contractors, were agreed that the company has a human resource policy to hire a potential project manager. First, the human resource department sets a selection criterion from the head office, which is related to the knowledge required for the specific project for which they are looking. According to the participants, the selection process may have two ways the first one internal hiring (upgrading) and the second one is external hiring. During the external hiring, based on a set of a selection criterion from the head office preliminary section will be completed and candidates who passed to the interview will be identified. And finally, the company will hire the project manager after the interview.

Concerning the process for recruiting project managers, all interview participants of the projects, which is undertaken by the public contractors, were agreed that the company has a human resource policy to hire a potential project manager. First, the human resource department set a selection criterion with the cooperation of the construction division, which is related to the knowledge required for the specific project for which they are looking. According to the interviewees, the selection process may have two ways the first one internal hiring (upgrading) and the second one is external hiring. During the external hiring, based on a set of a selection criterion from the human resource and construction division preliminary section will be completed and the candidates who pass to the interview will identify. Finally, the company will hire the project manager after the interview.

Concerning the criteria for recruitment of project managers, all public and private contractors interview participants revealed that each divisions’ chief officer has their own criteria to select project managers. In doing so, there are criteria which are common for each divisions’ chief officer to assign individuals as a project manager. Those criteria include; educational background, relevant year of experience, an annual evaluation of the applicant, pervious project efficiency and recommendations.
4.7.3. Evaluations of project managers’ competence

The interviewees were asked to describe any scientific way to evaluate project managers’ competence in their company. From 9 interview participants, 8 participants were agreed that there is no standard assessment tools for the evaluation of project managers’ competence. But, they mentioned that experience as a project manager, leadership skills, communication skill, contractual & non-contractual problem-solving skills, contract administration skills, ethics & corruption, and ability to determine resources needed for the project, to develop project budget, and to control the project budget were used for the evaluations of project managers’ competence. From 9 interview participants, 1 participant stated that they use a scientific way to evaluate project managers’ competence and he mentioned BSC (balanced scorecards) as an example.

4.7.4. Impacts of project managers’ competence on project success

The interviewees were asked to describe the impacts of project managers’ competence on project success.

Interviewee 2, said that the role of the project manager is extremely important because he/she is the “center point” of the project. Interviewee 3 also believed that the project manager is someone who sees the whole picture and plays a vital role. Interviewee 4, also concluded that the project managers’ competence and ideas will play a vital role in the successfulness of the project. Interviewee 1 and 7, on the contrary to other interview participants, they stated other factors that contribute to the project success rather than project managers’ competence. For them, even though the project manager plays a vital role he/she alone does not determine project success. Interviewee 1, emphasized that the importance of the environment and the maturity of the organization regarding projects is important for project success. For interviewee 7, the project manager is also somewhat important but the team carries the responsibility for making the project successful.

According to interviews, this study found that project managers’ competencies were important to the successfulness of the project. Therefore, the project managers’ competence had an impact on successfulness of the project. Therefore, the project managers’ competence had an impact on sustainability & reliability, clients’ satisfaction, project cost,
project time, stakeholders’ relationship, technical specifications & functional requirements, end-user satisfaction, health, safety & environment (HSE), supplier satisfaction, and team satisfaction. In line with this study, Valencia (2007), found that the project manager is the bonding medium holding the project together; therefore, the appointed project manager directly influences the success or failure of the project.

4.7.5. Techniques to develop project managers’ competencies

The interviewees were asked to describe the methods to develop project managers’ competences. On this study, all interview participants were agreed that to develop the project managers’ competence the following development methods would be recommended i.e. short term training (software and project management skills), long term training (Upgrading to BSc and MSc), self-improvement (through reading), experience sharing with groups of professionals, on-site experience (physically doing different construction tasks), understanding company systems i.e. (quality, safety, procurement, HR, conducting test …), understanding the project & construction environment and different project stages, etc.

4.8. Conceptual framework for the development of project managers’ competencies

The fourth specific objective of this research was to propose a framework for the development of project managers’ competence. This study was reviewed different literature and PMI (2007) guidelines for constructing the project managers' competence development framework.

As shown below in Figure (4.2), in step 1, the competence of the project manager will be assessed. The purpose of step 1 is to identify a project manager existing and required competency level and to determine where further competence development is needed. Levels of competence can be expressed as low competent, medium competent, high competent. In step 2, a competence development plan is prepared in light of the step 1 assessment results. By focusing on the high priority items, a more effective plan can be implemented. Just as the work breakdown structure, whatever there is a gap, the framework describes the extent of the gap to define the development required. This framework
proposed the following methods to address development needs: exposed and adapt to different circumstances, training, learning by experience, self-improvement (through reading), experience sharing with groups of professionals, workplace learning, mentoring, learning in adults (understanding the project & construction environment). In step 3, the developmental activities planned in step 2 are executed. The entire process is then repeated as the overall competence of the project manager is further developed.

There may be cost associated with the execution of the plan and this needs to be approved and budgeted. The competence development plan should be monitored regularly with the sponsor. Formal review of the plan should be performed on the completion of major milestones, phases, or projects and should be conducted with the manager/sponsor/mentor. Organizations should include this review as a major part of their performance management processes.

This framework did not perform any analysis to select the suitable methods for each competence components, this may be considered as the limitations of the proposed framework.
Figure 4.2: Framework for the development of project managers’ competences
Table 4.19: Sample for project managers’ competencies assessment and competencies development

<table>
<thead>
<tr>
<th>Competence components</th>
<th>Required skills</th>
<th>Assessment methods</th>
<th>Assessor</th>
<th>Status on Pre-development</th>
<th>level to be achieved on Post-development</th>
<th>Methods of development</th>
<th>Development plan implementation date</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hard competence</strong></td>
<td>PM software competence</td>
<td>Questionnaire</td>
<td>Project managers and team members</td>
<td>Medium</td>
<td>High</td>
<td>Project management software training</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Know and able to apply PM related software which includes: MS Project, Primavera and other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Soft competence</strong></td>
<td>Human resource management</td>
<td>Questionnaire</td>
<td>Project managers and team members</td>
<td>Medium</td>
<td>High</td>
<td>Training course on HRM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Able to perform staff recruitment, selection, training and evaluating people in the project.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.9. Summary of the study result

In this section, the findings of the study were summarized herein below in each category;

**Status of project managers on hard competencies**

The study revealed that the project managers have high levels of competence status on project time management, project financial management, project cost management, and project quality management. Whereas, the project managers have medium levels of competence status on project integration management, project scope management, project procurement management, PM software competence, project risk management, project safety management and project environmental management. These result of a questionnaire survey of the respondents’ has been statically checked by spearman’s correlation and it was found that all the correlation between the groups of respondents is very strong. Which means, the above result of project managers’ hard competence status has a very strong agreement between all groups of the respondent.

**Status of project managers on soft competencies**

This study has shown that, in the soft competencies status of project managers, communication, organizing, team working, positive work attitude and conflict management have high levels of competence status. But, in leadership, flexibility & alertness, problem-solving, human resource management and creativity & innovation they have a medium level of competence status. The above results of the questionnaire survey were statically checked by spearman’s correlation and it was found that the agreement between project managers and site & office engineers is moderate, the agreement between project managers and site supervisors is strong. finally, the agreement between site & office engineers and site supervisors is strong. Therefore, this study concluded that the agreement between the respondents on the given result was moderate and above moderate.

**Impacts of project managers’ competence on project success**

In accordance with the result of the questionnaire survey and interviews, this study revealed that project managers’ competencies are important to the successfulness of the project.
Therefore, the project managers’ competence had an impact on sustainability & reliability, clients’ satisfaction, project cost, project time, stakeholders’ relationship, technical specifications & functional requirements, end-user satisfaction, health, safety & environment (HSE), supplier satisfaction, and team satisfaction.

In line with the above result, this study point out that project cost, project time, technical specifications & functional requirements, clients’ satisfaction, and stakeholders’ relationship are the top five project success criteria that were impacted by the competence of project managers. For this result, the agreement between project managers and site & office engineers were a very strong. The agreement between project managers and site supervisors and the agreement between site & office engineers and site supervisors were strong.

**Project managers’ hard competence components levels of impacts on project success**

This study has shown that project procurement management, project cost management, project time management, project financial management, project quality management, project integration management, project scope management, project safety management, project risk management and project environmental management and PM software competence had a high level of impacts on project success. PM software competence component had a medium level of impact on project success. These result of a questionnaire survey of the respondents’ has been statically checked by spearman’s correlation. The correlation between project managers and site & office engineers were moderate. The correlation between project managers and site supervisors and the correlation between site & office engineers and site supervisors is found to be strong.

**Project managers’ soft competence components levels of impacts on project success**

The study revealed that team working, positive work attitude, communication, leadership, organizing, problem-solving, conflict management, flexibility & alertness, human resource management, creativity & innovation soft competence components had a high level of impact on project success. For these results of the respondents, the correlation between project managers and site & office engineers and the correlation between site supervisors
and site engineers & office engineers were moderate. The correlation between project managers and site supervisors were strong.

According to the interviews, this study found that all the project managers’ hard and soft competence components are important for project managers to be effective. This study also revealed that the Bahir Dar city public building construction projects didn’t use the project managers’ hard and soft competence components for selection and evaluation criteria of project manager members. In addition, they didn’t have any standard assessment tools for the evaluations of project managers’ hard and soft competencies.
CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATION

This chapter presents the general research conclusions and recommendations of this study, which are based on the findings of the data analysis and discussions done in the previous chapters. The area for further research is also highlighted at the end of the chapter.

5.1. Conclusion

The main goal of this research was to assess the competence of construction project managers, to investigate the impacts of construction project managers’ competence on project success, and to assess the construction project manager competence components’ level of impact on project success in the case of Bahir Dar city public building construction projects. An additional goal of this research was to propose a framework for the development of project managers’ competence.

Thus, the following are the major findings of the research work.

1. On the project managers’ hard competence assessment, the competence areas of project time management, project financial management, project cost management and project quality management of construction project managers have shown comparatively higher competence on Bahir Dar city public building construction projects. Whereas, the competence areas of project integration management, project scope management, project procurement management, PM software competence, project risk management, project safety management and project environmental management of construction project managers have shown a comparatively medium level of competence.

2. On the project managers’ soft competence assessment, the competence areas of communication, organizing, team working, positive work attitude and conflict management of construction project managers have shown comparatively higher competence on Bahir Dar city public building construction projects. Whereas, the competence areas of leadership, flexibility & alertness, problem-solving, human
resource management and creativity & innovation of construction project managers have shown a comparatively medium level of competence.

3. Project managers’ competence has an impact on project success criteria. Project cost, project time, technical specifications and functional requirements, clients’ satisfaction and stakeholders’ relationship were the top five project success criteria that were impacted by the competence of project managers in the Bahir Dar city public building construction projects.

4. All project managers’ soft and hard competence components have a high level of impact on project success except PM software competence of hard competence component has a medium level of impact on project success.

5. The study provides a conceptual framework that could be used for improvements of project managers’ competencies on page 80 and 81.
5.2. Recommendation

Based on the conclusion made above, this research recommends the following points:

1. The construction companies, as well as the construction industry, should develop a set of assessment tools for evaluation of project managers’ competence, such as questionnaires, to determine their own competency strengths and weaknesses and do a continuous assessment to enable them based on the assessment result. The higher management department should evaluate their project managers’ competencies to figure out what they are lacking off. This helps project managers to elevate their performance which reflects on projects’ outcomes.

2. The construction companies, as well as the construction industry, should use the project managers’ hard and soft competence components as selection criteria of project managers. Furthermore, the construction industry should use the project managers’ hard and soft competence results as the main criteria for bid evaluation.

3. The company should design different workshops and training that could solve project managers’ competency gaps.

5.3. Future Research Works

This research was conducted in Bahir Dar city public building construction projects, which is undertaken by Grade-1 general and building contractors, so the findings and opinions are likely to be biased. Based on this limitation, a number of recommendations for future research are made, as set out below:

1. The study should be repeated with a various construction companies or contractors at different grades or categories in different parts of Ethiopia.

2. The study should be conducted an analysis to select the suitable methods for each project manager competence components so as to be able to prepare a detailed competence improvement framework.

3. Challenges that hinder the project managers to implement their competencies on their given projects should be investigated.
REFERENCES


El-Sabaa, S. (2001). The skills and career path of an effective project manager. The American University in Cairo, Egypt.


APPENDICES

APPENDIX A: QUESTIONNAIRE SURVEY

BAHIR DAR UNIVERSITY
BAHIR DAR INSTITUTE OF TECHNOLOGY
FACULTY OF CIVIL AND WATER RESOURCES ENGINEERING

QUESTIONNAIRE SURVEY

On
ASSESSMENT OF CONSTRUCTION PROJECT MANAGERS’
COMPETENCE AND ITS IMPACT ON PROJECT SUCCESS. THE CASE OF
BAHIR DAR CITY PUBLIC BUILDING CONSTRUCTION PROJECTS

For the Partial Fulfillment of the Requirements for the Degree of Master of Science
in Civil Engineering (Construction Technology and Management)

By
Chekol Menberu

Advisor: Bahiru Bewket (Ph.D.)

June, 2019
Bahir Dar, Ethiopia
Dear respondent,

This questionnaire is prepared by the researcher in the postgraduate program of the Bahir Dar University, institute of technology on the title: “Assessments of construction project managers’ competence and its impact on project success. The case of Bahir Dar city public building construction projects”. The objectives of the study are:

- To assess the competence of construction project managers in Bahir Dar city public building construction projects.
- To investigate the impact of construction project managers’ competence on project success in Bahir Dar city public building construction projects.
- To assess the construction project manager competence components’ level of impact on project success in Bahir Dar city public building construction projects.
- To propose a framework for the development of project managers’ competence.

This questionnaire is, therefore, designed to collect firsthand information/data on the above objectives. Since it is for academic research purpose all the responses will be treated in strict confidentiality. This is, therefore, to kindly request you to take a few minutes to fill out the questionnaire as genuinely and completely as possible.

In the event of questions or queries, please do not hesitate to contact me. Thank you for your time and valid contribution in advance.

Yours sincerely,

Chekol Menberu

Bahir Dar University, Bahir Dar Institute of Technology, Department of Civil Engineering

Tel: - +251-922-21 01 46

E-mail: -chekmenberu@gmail.com

Bahir Dar:
Part I: General information of the respondents.

1. Education level:
   A. Less than high school   B. High school
   C. Diploma               D. First degree   E. Masters and above

2. Working experience in the construction industry (overall)
   A. Less than 5 years      B. 5 year – 9 years
   C. 10 years – 15 years   D. more than 15 years

3. Working experience as a project manager (For project managers only)
   A. Less than 5 years      B. 5 year – 9 years
   C. 10 years – 15 years   D. more than 15 years

4. What is your position: ______________________________
Part II: Competence of project managers

1. The items which are described below on the table are relating to the list of project managers’ competency every project manager need to have. Please show in the table which you believe describes to which degree the following statements are reflective of your project management practices (reflecting the competence in the last or current project). Here, the researcher is interested to show your level of agreement on your project management competence status by putting a tick “✓” mark in appropriate place from 1-5 in the table below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Project managers competences</th>
<th>Level of status</th>
<th>Level of impact on project success</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project integration management: Able to prioritize tasks based on project objectives; able to identify, define, combine and integrate project management activities and processes like initiation, planning, execution, monitoring and controlling and closing</td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>Hard competence (cont. … )</td>
<td>Level of status</td>
<td>Level of impact on project success</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------</td>
<td>----------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td><strong>Project scope management:</strong> The ability to determine and control what needs to be and not to be included in a project; Able to frequently monitor the scope of the project to identify changes and able to validate the scope of the project at the beginning of the project. Ability to make sure that the project delivers on the scope that has accepted and to make sure the project stays within scope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>Project time management:</strong> Able to prepare project schedule; able to monitor the projects’ progress in terms of planned versus actual schedule; able to monitor project milestones and deliver the project within the agreed time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td><strong>Project cost management:</strong> Ability to determine resources needed to perform project activities, to develop project budget based on resources needed, and to control the project budget throughout the construction life cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td><strong>Project quality management:</strong> Able to identify relevant quality standards, to determine methods to meet the standards, and to control results to monitor compliance and eliminate unsatisfactory performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td><strong>Project risk management:</strong> Able to manage the risks of the project and provide risk management planning, identification, implementation, and monitoring.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td><strong>Project procurement management:</strong> Able to manage the process of attaining goods, services, or results from outside the project team in order to complete the required work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>PM software competence:</strong> Know and able to apply PM-related software which includes; MS Project, Primavera and other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><strong>Project Safety Management:</strong> Able to analysis the hazards inherent in the work and able to take the measurement; able to apply and implement the safe construction practices on-site in accordance with the requirements of the plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><strong>Project Environmental Management:</strong> Ability to determine impacts the project will bring to the environment and the ability to satisfy the identified environmental standards.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td><strong>Project Financial Management:</strong> Able to identify key financial issues to be addressed; The ability to acquire and manage the financial resources for the project concerned with revenue source and analyzing/updating net cash flows; Able to manage the day-to-day costs of the project resources.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Level of status</th>
<th>Level of impact on project success</th>
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</thead>
<tbody>
<tr>
<td><strong>B. Soft competence</strong></td>
<td>1 2 3 4 5</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>1</td>
<td><strong>Communication:</strong> Ability to communicate effectively across all levels of an organization, including executive management; excellent speaking and writing skills; ability to write reports, business correspondence, and procedure manuals.</td>
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<td>2</td>
<td><strong>Leadership:</strong> The ability to establish vision and direction, to empower and inspire people to achieve project success; the knowledge and ability to make a decision; ability to keep the project moving toward successful completion in face of aggressive schedules</td>
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<td>3</td>
<td><strong>Problem-solving:</strong> Be able to solve practical problems and deal with variables in situations where only limited standardization exists; trouble-shooting mentality and proactively identify potential problems.</td>
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<td>Soft competence (cont. … )</td>
<td>Level of status</td>
<td>Level of impact on project success</td>
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<td>2</td>
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<tr>
<td>Team working: Be able to Motivates and inspires the team; builds relationships within and outside the team; delegates appropriately; demonstrates team organization and governance; promotes team morale and productivity: demonstrates personal commitment to the team.</td>
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<tr>
<td>Organizing: Ability to understand the organizational formal structure: the chain of command, positional power, rules, regulations, and standard.</td>
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<td>Flexibility &amp; alertness: Adaptability, ability to work under pressure and the ability to handle multi-task.</td>
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<td>Creativity &amp; innovation: Inventiveness, open-mindedness, innovation and change and acting as a change agent in the project.</td>
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<td>Human resource management: Able to perform staff recruitment, selection, training and evaluating people in the project.</td>
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<tr>
<td>Conflict management: Be able to seek a consensus, resolving differences and aligning views; getting people to agree and to accept and agree upon terms and conditions of a certain situation.</td>
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<tr>
<td>Positive work attitude: Commitment to success, high self-esteem, and enthusiasm, trustworthiness, fairness, acting assertively, behaving ethically, coping with authority and managing self.</td>
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</table>

Project managers’ competence which are described on the above table is adapted from different research and books. If you have any others, please specify?
Part IV: Impacts of project managers’ competence on project success

To what extent the competence of project managers may impact the following project success criteria? Please tick (√) in the box that best reflects your answer where:

1. Strongly Disagree       3. Neutral
2. Disagree                   4. Agree         5. Strongly Agree

Please write your contact information if you want to receive the result of the research.

Thank you again for taking the time to complete this questionnaire.

<table>
<thead>
<tr>
<th>No.</th>
<th>Project success criteria</th>
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<th>2</th>
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<td>2</td>
<td>Clients’ satisfaction</td>
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<td>3</td>
<td>Project time</td>
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<td>4</td>
<td>Stakeholders relationship</td>
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<td>5</td>
<td>Project cost</td>
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<td>6</td>
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<td>Health, Safety, and Environment (HSE)</td>
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<td>Supplier satisfaction</td>
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<td>10</td>
<td>Team satisfaction</td>
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APPENDIX B: SEMI-STRUCTURED INTERVIEW

1. What are the basic competence every project manager need to have to be an effective project manager?
2. What are the sets of competencies used as criteria for recruiting someone to work as project managers? At what stage of construction the project manager hired?
3. Is there any scientific way to evaluate project managers’ competence?
4. Does project managers’ competence impact project success?
5. What would the project manager have to do to develop their competence?