

Addis Ababa University
College of Business and Economics
School of Commerce

**Assessment of Project Managers' Competencies in the Construction
Industry; with special reference to Team Role Inventories.**

By
Sosina Tesfahun

Advisor
Solomon Markos [PhD]

June, 2018
Addis Ababa, Ethiopia

Addis Ababa University

College of Business and Economics

School of Commerce

**Assessment of Project Managers' Competencies in the
Construction Industry; with special reference to Team Role
Inventories.**

By

Sosina Tesfahun

Approved by Board of Examiners

Coordinator office for postgraduate studies

Signature

Advisor

Signature

Internal Examiner

Signature

External Examiner

Signature

DECLARATION

I, the undersigned, declare that this research study is my original work, prepared under guidance of Solomon Markos (PhD). All sources of materials used for the research study have been duly acknowledged. I further confirm that the research study has not been submitted either in part or in full in any other higher learning institution for earning any master's degree.

Student Name

Signature

Addis Ababa University

College of Business and Economics

School of Commerce

June, 2018

ENDORSEMENT

This research study has been submitted to School of Commerce, Coordinator office of postgraduate studies for examination with my approval as a university advisor.

Advisor Name

Signature

Addis Ababa University

College of Business and Economics

School of Commerce

June, 2018

DEDICATION

In dedication to the midst of hard workers who have nobly dedicated their life to the service of their community and who take the courage to make a change.

“ It’s better to light a candle than curse the darkness.”

Peter Benenson: English Lawyer and Founder of Amnesty International

ACKNOWLEDGEMENTS

There are a number of people without whom this research study might not have been written, and to whom I am greatly indebted.

First I would like to acknowledge my advisor Solomon Markos (PhD) who has been very helpful along the way. He is a very professional and profound professor I am genuinely thankful to work with.

To *Ato. Abel Kora*, Founder of Meezar Construction Management, *Miss. Hermela Getaneh*, Assistant Project Manager at M&B Engineering plc, *Ato. Kirubel Aseged*, Instructor at Welkita University, *Ato. Samuel Bekele*, our class representative and all professionals that participated in the process of preparing this research study, my special thanks goes to you.

Family, Friends, Co-workers, Classmates, Group members, Rotaractors and everyone who told me to be tough and rewarding for the past year to come by for this point, you all have made an impact so, thank you very much.

TABLE OF CONTENTS

Declaration.....	iii
Endorsment.....	iv
Dedication.....	v
Acknowledgements.....	vi
Table of Contents.....	vii
List of Acronyms.....	ix
List of Tables.....	x
Abstract.....	xi
Chapter One	
Introduction.....	1
1.1 Background of The Study.....	1
1.2 Statement of The Problem.....	2
1.3 Basic Research Questions.....	4
1.4 Objective of The Study.....	5
1.4.1 General Objective.....	5
1.4.2 Specific Objective.....	5
1.5 Significance of The Study.....	5
1.6 Scope of The Study.....	6
1.7 Limitations of The Study.....	7
1.8 Organization of The Study.....	7
Chapter Two	
Literature Review.....	9
2.1 Definitions And Concepts of Project Competency.....	9
2.2 Types & Concepts On The Competencies of Project Managers.....	10
2.2.1 Soft & Hard Competencies.....	10
2.2.2 International Project Management Competency Model.....	11
2.2.3 Critical Success Factors Framework For A Project.....	12
2.2.4 Guide To The Construction Management Core Competencies.....	15
2.3 Team Role Inventories.....	16
2.3.1 Introduction.....	16
2.3.2 Belbin’s Team Role Inventories.....	18
2.3.3 Clustered Behaviors Of Belbin’s Team Role Inventories.....	19

Chapter Three	
Research Methodology	25
3.1 Research Design.....	25
3.2 Research Approach	25
Chapter Four	
Results And Further Discussion.....	30
4.1 Overview On Respondents	30
4.2 Level Of Project Managers’ Competency At The Construction Industry	31
4.3 Awareness Level On Team Roles At The Construction Industry.....	33
4.4 Link Between Competent Project Managers And Their Respective Clustered Behavior	34
4.5 Belbin’s Team Role Inventory Clustered Behaviors That Can Enrich Project Managers’ Competency	36
Chapter Five	
Conclusion And Recommendation	37
5.1 Conclusion	37
5.2 Recommendations And Further Research.....	38
5.2.1 Recommendations.....	38
5.2.2 Limitations Of The Study	39
5.2.3 Further Research	39
References.....	40
Appendices.....	44
Appendix A: Structured Interview	44
Appendix B: Questionnaire.....	46

LIST OF ACRONYMS

AIPM	Austrian Institute for Project Management
BSPI	Belbin Self-Perception Inventory
BTRI	Belbin Team Role Inventory
CIB	Construction Industry Boards
CMAA	Advancing Professional Construction and Program Management Worldwide
CMs'	Construction Managers'
ENAA	Engineering Advancement Association of Japan
EQ	Emotional Quotient
FPC	Finite Population Correction Factor
GNP	Gross National Product
IPA	Independent Project Analysis
ICB	IPMA Competence Baseline
IPMA	International Project Management Association
LSU	Louisiana State University
MoUDC	Ministry of Urban Development and Construction
MUDHo	Ministry of Urban Development, Housing and Construction
NCSPM	National Competency Standards for Project Management
PBOs	Project Based Organizations
PMBOK	Project Management Body Of Knowledge
PMCD	Project Management Competency Development
PMI	Project Management Institute
PLC	Private Limited Company

LIST OF TABLES

Table 4.1	Construction industry stakeholder respondents' profile.....	30
Table 4.2	Respondents profile; by Gender, Age range, Educational qualification, construction category, Employment category and previous experience (years)	31
Table 4.3	Project managers competency level	32
Table 4.4	Project managers' competency level against set dimensions	32
Table 4.5	Awareness level on team role inventories	33
Table 4.6	Awareness level on team role inventories against employment category	34
Table 4.7	Project teams clustered behaviors need	34
Table 4.8	Knowledge and skill based variables to asses project managers' competency	34
Table 4.9	Clustered behaviors recommendation for project managers'	35
Table 4.10	recommended clustered behaviors for competent project managers' very strong at contract administration and material, method & equipment	35

ABSTRACT

This research is about the assessment of project managers' competencies with special reference to Belbin's team role inventories. Emphasizing on project-based organizations at the current construction industry. The purpose of this research is to assess Project Managers' level of competency against knowledge, performance and particularly personal in order to ensure which Belbin's team role inventories clustered behaviors can add value to project effectiveness and efficiency specifically at the construction industry. As defined on PMBOK competency is the skill and capacity required to completing assigned activities within the project constraints. To achieve the research objectives using descriptive research design; data were collected from 48 individuals by using multistage random sampling of clusters of probability-sampling design. A mixed approach was used to analyze the data. The study result shows that project managers' were competent against behavior, knowledge & performance. However, they exempt weakness at safety management and high level of strength at quality management. The awareness level on team role inventories is less but not null. Out of the nine-clustered behaviors' the cluster behavior Resource Investigator is the highly recommended behavior respondents believe that the project manager shall have. As well agreeing that using team role theories at construction companies' project teams is a value adding aspect. Keep in mind this good result is a start for project managers' to strive for even more. The competency of project managers' can affect projects both in a negative and in positive way so, experimenting with additional theories and concepts of project management can actually take the construction industry one step ahead.

Keywords: Project Managers' Competencies, Construction Industry, Team Role Inventories

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

The fundamental concept on which project management is based is that a single individual the project manager is accountable for the success of the project (Goodwin, 1993). External factors other than the project manager could also be the cause for a project failure, however the competency of the project manager “constitute a critical parameter among the many variables that directly affect the outcome of the project.” (Goodwin, 1993, p. 217)

The PMBOK guide states that it contains the standard for managing most projects most of the time across many types of Industries (PMBOK, 2013). The construction industry plays a major role in the development and achievement of society’s goal. It has an impact on the growth as well as down fall of the country. That makes it one of the largest influential industry. The construction industry contributes to about 10% of the gross national product (GNP) in industrialized countries (Navon, 2005).

According to (PMBOK, 2013) Project based organizations (PBOs) refers to various organizational forms that create temporary systems for carrying out there work. These systems are temporary as projects are defined as temporary endeavors undertaken to create a unique product, service or result. Defining that it has a definite beginning and end. One of the firms that conduct majority of their work as projects is the construction firm.

Managing projects can demonstrate project management proficiency in three dimensions; Knowledge, Performance and Personal. The link is that of what a project manager knows about the application of processes, tools and techniques in project activities; how a project manager applies the knowledge to meet the project requirements and how he/she behaves when performing activities in a project environment. The Project Management program can be designed around seven core competency areas. These seven core competency areas are *Managing your project*, *Public service focus*, *leading change*, *Personal integrity*, *Systemic integration*, *developing self* and this papers main focus area related area *Working with people in teams*. (Ohaiodas, 2016)

Project managers manage the project team to meet the project objectives (PMBOK, 2013). “It is observed that some teams just seem to work and others hit the rocks.” There was

research done by Dr. Meredith Belbin and his research team in the 1970s with a view to find out where and how these differences come about. Based on the research progress it was revealed that the difference between success and failure for a team was not dependent on factors as intellect but more on behavior. Which lead to identifying separate cluster of behaviors with distinct team roles at a balanced mix. Today, Belbin's Team Role model is used by over 40% of the top 100 companies in the UK, the United Nations, the World Bank and thousands of organizations through the world to enhance individual and team performance. These clustered behaviors are action-oriented roles, people oriented roles and thinking oriented roles on general bases. (Meredith, 2015)

The application of teams and team working within the construction industry has experienced a renaissance. In 1994 The Latham Report "Constructing the Team" acted as a catalyst for change within the construction industry and challenged the sector to explore innovative ways in which to carry out its business to the mutual benefit of the client, industry and private corporation. More recently, the promotion of teams and the concept of team building was a principle feature of the Construction Industry Board's (CIB) Constructing Success – the Construction Strategy Code of Practice, 1997 and was identified as a key stimulus for change in Sir John Egan's Rethinking Construction 1998. (Stuart, 2001)

1.2 STATEMENT OF THE PROBLEM

The project management institute (PMI) define project management as "the application of knowledge, skills and techniques to execute projects effectively and efficiently." Projects that account for failure in respect to extension of time, scope creep, additional cost and many more situations that are controversial take place in project-based organizations. There has been an estimation stating 30% of the world economy depends on projects, yet 70% of projects fail (Mike, 2016).

Projects seek competent project managers', equipped to perform well as Project Managers' competency plays a great role for the effectiveness and efficiency of a project. According to a study done about Project managers competency by (Sunindijo, et al., 2007) there are significant correlation between all ranges of behaviors in a project such as leadership, teamwork, workgroup effectiveness and managing conflicts. Studies show that there are successful projects led by an effective teams. The world is moving from mastership in management of projects to empowered individuals at a team leadership (Hyden, 1994). Team

based management systems are considered to be the milestones for increasing organizational effectiveness and productivity (Whitfield, 1995).

Identifying the right project manager for specific project is not an easy job. Based on a research done by IPA (Independent Project Analysis) the average difference between having the right Project manager and the wrong project manager accounts for 15% in cost and 30% in schedule. A Project Management Competency Assessment calculates how likely a specific project manager is to achieve success.

According to the existing observed practice of the industry in both contracting and consulting companies, project managers are assigned on position based on previous experience and knowledge on the area. As of May,2017 contractors registered and working from grade one to grade four in Ethiopia as per ministry of urban development, housing and construction account for more than 749 contractor companies and construction consultants account for 82 (MUDHo, 2010), (Construction, 2015).. PMI (Project Management Institute), IPMA (International Project management association), AIPM (Austrian Institute for Project Management) and ENAA (Engineering Advancement Association of Japan) have clearly stated different dimensions to asses' project managers' competency. Among which (Udo, 2004) conference paper suggested Knowledge, previous experience and personality to be the competency areas. This gives room to question the issues of behavior against project managers' competency on the construction industry. As well, it is questionable if the Construction industry leading grade one contractors which are 126 in Ethiopia and 110 in Addis Ababa (MUDHo, 2010), (Construction, 2015) are assigning project managers by giving high consideration to the project manager's competency according to these three se standards among the many. This ultimately could result in a clearer understanding of the projects path and outcome.

The bigger practical problem seen is that the construction design and consulting companies execute supervision work without a construction management license. This can raise the questionability of project managers' competency according to the practice available at the construction industry. (MoUDC, 2013) The Amended Directives for the registration of Design Professionals and Consultants No 22/2013 under part one role number 5 stating the condition of registration "All Design professionals and Consultants desiring to carry out activity related to construction works are required to register with the Ministry in accordance with this Directive. No company or professional may carry out any design or supervision without getting certificate of competence from the Ministry." Among practically following this

system there is (Meezar, 2016) Meezar Construction management PLC. operating with the purpose of being a leader in the construction consulting industry by providing enhanced management services, relationship and profitability. This company gives a construction management service at pre, due and post construction stages.

While coming to the inefficiencies of construction projects, one inefficiency out of the stated was how Ethiopia's project managers are not as adept as other European or Chinese managers; thus making project management a hassle. (Alliance, 2015) under the writing Construction in Ethiopia and opportunities in the Ethiopia building industry state how infrastructure development and housing projects generously cover the landscape of modern Ethiopia. The rise of the country's economic standards has gone beyond the expectations of analyzed data, surveys and opinions of many investors worldwide. Numerous projects have turned around Ethiopia's economic decline, particularly in the city of Addis Ababa. Currently, the country forms the heart of Africa's economic evolution due to high demands in the construction sub-sectors.

According to Ethiopian News Agency report on March 29 /2017, the construction industry is booming in Ethiopia. Due time the competency of project managers' in the sector and the idea of clustered behaviors in a team seems highly doubtful. Additional, perspective of project managers' competency through team role inventories applicability can possibly be one issue that could bring some improvement. This research will describe responses of professionals' in order to know how a clustered behavior in a team could possibly add value at project based organizations.

1.3BASIC RESEARCH QUESTIONS

The basic research questions of the study is as follows:

- i. What is the level of project managers' competency at the construction industry?
- ii. What is the awareness level on team roles at the construction industry?
- iii. What is the link between the competent project managers' and their respective clustered behavior?
- iv. Which clustered behaviors of Belbin's team role inventories can enrich project managers' competency and add value to project effectiveness and efficiency?

1.4 OBJECTIVE OF THE STUDY

The objective of this study is as follows:

1.4.1 General Objective

To assess Project Managers' level of competency against knowledge, performance and particularly personal in order to ensure which Belbin's team role inventories clustered behaviors can add value to project effectiveness and efficiency specifically at the construction industry.

1.4.2 Specific Objective

- i. To determine Project Managers' competency level
- ii. To determine Project managers' awareness level on team role inventories.
- iii. To identify and assess the link between project managers' level of competency and team role inventories clustered behaviors.
- iv. To identify the value-adding cluster behaviors enriching competent project managers' and recommend the benefits to the construction industry.

1.5 SIGNIFICANCE OF THE STUDY

The major stakeholders at the construction industry Construction Contractors, Construction consultants and Construction management companies providing the service can significantly benefit from this research. The heart for a country are the citizens, the people and the heart for a construction project based company are the project team members.

This study envisions showing the impact of using specified clustered behavior team roles at construction project teams, individuals' clustered behavior in link with project managers' competency and ultimately adding value for the project effectiveness and efficiency. As well how project managers can be competent by following the results found from the study. The core idea of teamwork will further be seen in terms of all Belbin's nine team roles. These roles do not only give insight for project managers' but as well for the team members of the project team.

As stated at the statement of the problem construction-consulting companies are not supposed to supervise without a certificate of competency, which entitles license. Moreover,

possibly having a department of construction management at the company. As the directive is that of 2013 we see the progress is very low as many construction management companies or departments are not yet seen. The research results can be used as an input for the progress of implementing the condition of registration where construction projects will be supervised by certified competent construction management companies or departments within companies. Because, assessment result of project managers' competency will show the existing state of their competency level and the aspired level of competency needed in the industry. This ultimately becomes a major input for the progress as the need for having competent Project Managers' will be a core issue at this transition phase. Making these study beneficiaries the construction industry major stakeholders and all directly & indirectly involved organizations.

1.6 SCOPE OF THE STUDY

The study focuses on the construction industry as the researcher's background of study is on construction technology and management and that it is the booming industry in the country. As mentioned at the problem statement-consulting companies execute supervision work without a construction management license. The construction management companies are the likely professionals who shall manage such construction projects. As the topic of interest for this research is competency of project managers' it will consider project managers' and assistant project managers' operating in the construction industry.

Studying the competency of project managers in the construction industry is delimited in the region of Addis Ababa because of the high number of existence of construction companies. According to (MUDHo, 2010) 72 construction consulting companies and 582 grade one to four construction contractor companies that account for 87.8% & 77.7% of Ethiopian construction companies are found in the capital city Addis Ababa reg. Additionally, the construction management company Meezar Construction Management PLC. which can give an insight on construction management practice is also located in the capital city of Ethiopia. These considered companies are all domestic companies currently operating.

Assessment of project managers' competency will be against set standards considered in PMI, IMPI, AIPM and ENAA. Using (Uma S., 2009) and the (PMI, 2013) as a base major dimensions to asses will be Knowledge, Performance and Personal while considering previous experience. Due time Belbin's team roles help A-team to understand ways in which it could improve performance which is one of the dimension's for competency. Belbin describes a team

role as “a tendency to behave, contribute and interrelate with others in a particular way”. Classifying the nine-team roles under three role orientations Action, People and Cerebral roles (Meredith, 2003) which will be used as set standards of assessment.

1.7 LIMITATIONS OF THE STUDY

The construction industry is a very vast industry in Ethiopia. There are 5263 construction contractors in Ethiopia out of which 4184 are found in Addis Ababa (MUDHo, 2010). As our focus is on project managers and the likelihood of having project managers is seen at grade one to four contractors the interest of the researcher wishes to investigate is 582 construction contractors found in Addis Ababa. This is certainly a big number. Additionally the number of project managers is unlikely to be known, as there is no form of registration or certification requirement to be followed that can ultimately give us the population size of project managers at the construction companies. This affects the sampling and instrument used for data collection.

Therefore, to mitigate the effects of the noted limitations the researcher will take samples of construction contractor companies from a specific wereda in one of sub city’s of Addis Ababa that are registered from grade one to four. These grade contractors are only 14.2% of the total population but; economically, technically, equipment and employ wise these are strong and experienced compared to the rest. Additionally coming to performance these are involved in many of the construction projects that are seen in Addis Ababa let alone the idea of these companies not having project managers. For thus reasons the data collected from the grade one to four companies will be more feasible for the study.

1.8 ORGANIZATION OF THE STUDY

The paper has a preliminary section, which will include cover page, declaration on plagiarism, endorsement, dedication, acknowledgment, abstract, list of acronyms, list of tables & figures and list of appendices.

The body of the study has five chapters and a reference. The first chapter is the Introduction part. It is composed of Introduction/background, statement of the problem, basic research questions, objective of the study, and significance of the study, scope of the study, limitations of the study and this specific part organization of the study. The second chapter is the Literature Review. This chapter will review relevant and appropriate theoretical and

empirical literatures while acknowledging the sources. It has two major parts; the core competencies of project managers and team role inventories. The third chapter is the research methodology. In this chapter the research design, the research approach (Population and sample, sample design, data sources, data and data collection method, data analysis and presentation, last but not list limitations) will be briefly elaborated. Chapter four emphasizes on results and further discussions. It will report how the response rate was, who the respondents were, major results and findings, Interpretation and discussion, finally giving the presentation. Before going to the fifth chapter conclusion and recommendation for further study, the basis will be stated on the fourth chapter.

Appendices are the final elements of the paper comprising Interview questions, questionnaire and additional special documentations along the research.

Definition of Terms

Project manager's competency is the process by which the project manager continuously applies his/her knowledge, skills and personal behaviors with the intention of delivering projects that will meet the requirements of the different stakeholders (PMI, 2007).

The construction industry service providers' construction contractors, construction management companies and construction consultant companies.

Team role is a tendency to behave, contribute and interrelate with others in a particular way (Meredith, 2003).

CHAPTER TWO

LITERATURE REVIEW

2.1 DEFINITIONS AND CONCEPTS OF PROJECT COMPETENCY

Testing for competence rather than intelligence was born when David McClelland, a former Harvard psychologist was asked by US Foreign service to find a method that could predict human performance and minimize the bias of traditional intelligence and aptitude testing in the early 1970s. (Bauer, 2005) Defines competency as an underlying characteristic of an individual that is causally related to criterion referenced effective and/or superior performance in a job or situation. According to research, competence is a combination of skills, knowledge and individual characteristics. These competencies are grouped under different umbrellas by different authors despite being generally similar such as (Thomas, 2008) concluded competencies are measurable.

In (Glader, 2001) Berglund provides this definition. *“Competence is used to accomplish something. It includes knowledge in all their shapes, but it also includes personality traits and abilities, such as social competence, persistence, and stress tolerance and so on. Competence is at first an individual based term, but is not impossible to also talk about organizational competence. One can then refer back to the complete competence at the individuals in the organization, or the stored knowledge concerning systems, techniques or the culture”*.

The Project Management Competency Development (PMCD) Framework defines a project manager's competency as the process by which the project manager continuously applies his knowledge, skills and personal behaviors with the intention of delivering projects that will meet the requirements of the different stakeholders (PMI, 2007). (Crawford, 2003) Explains competencies of project management are of a common consensus that there are competencies that should be possessed by project managers to ensure success on projects.

PMBOK defines project management as “the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.” Whereas, the project manager is “the person assigned by the performing organization to lead the team that is responsible for achieving the project objectives.” The Project manager is the link between the project team and the critical strategic discipline project management while satisfying individual, team and task needs. Accordingly, knowledge, tools and techniques are recognized

as good practices for an effective project management but are not sufficient as project manager competencies on knowledge, performance and personal, area specific skills and general management proficiency can immensely add up. The knowledge about project management; the performance of which having the ability to accomplish by applying the knowledge and the personality which is the behavior while performing are the three major requirements of project managers' competency. Personal effectiveness can be determined in terms of attitude, core personality characteristics, leadership and of course ability to guide project team in order to achieve project objectives and balance the project constraints. Scalars define project management as getting things done through other people, as interpersonal skills of project managers' focus on accomplishing work through project team and other stakeholders. Accordingly, effective project managers require balanced ethical, conceptual and interpersonal skills. These interpersonal skills include team building, communication, negotiation, trust building, and conflict management few among the many. (PMI, 2013).

2.2 TYPES & CONCEPTS ON THE COMPETENCIES OF PROJECT MANAGERS

2.2.1 Soft & Hard Competencies

The construction industry professional needs to poses different skills during operations. In order to gather bases of assessment soft and hard competencies define the detailed nature of skills. (Gardiner, 2005) Made a distinction between hard and soft competencies based on the nature of the skills. Soft competencies are people skills, which involved behavior, whereas hard skills are technical in nature. The soft skills include things like interpersonal communication, commitment to success, negotiation, decision making, consensus, problem solving, leadership, motivation, and ability to influence people. It is stated that the soft skills are more difficult to master as Emotional Quotient (EQ) of a person is highly related to the issue. The hard skills are the ones most training courses focus on; they refer to the mechanical and technical skills of planning, estimating, scheduling and controlling a project.

(Palu, 2016) as Projects are completed and knowledge of best practices grow Project managers need to maintain and improve their professional skills – as with other disciplines, a body of knowledge is well documented and can be applied in real-world situations. Yet because the management of projects is a discipline spanning so many areas of human interaction; with different types of people in different fields, project management, uniquely as a profession, requires us to develop a range of personal skills, or soft skills, to complement our "hard

skills". It has been said before but projects are all about the people; so it is a combination of this range of skills from the hard to soft and everything that encompasses in between that makes for an effective project manager, by which we mean simply a consistently successful PM. It is about getting the balance of skills right so that project management techniques and tools expedite the project rather than adding unnecessary bureaucracy. The human perspective really matters when handling problems or barriers to success. It is about knowing the right strategies and behaviors to use for any given situation. This is what is meant by true competence, what differentiates the best project managers from the rest.

2.2.2 International Project Management Competency Model

Technical, contextual and behavioral project management competencies: tend to describe the fundamental project management competence elements; these related to the context of the project and the personal project management competence elements respectively. This model is an assessment base, which clearly gives direction for critical criteria. According to IPMA's competency model called as IPMA competence baseline (ICB), project manager's competences are described in three different ranges. Along the same lines, the IPMA classifies 46 competency elements into three groups: contextual, behavioral, and technical competencies (Caupin et al., 1999). Each element is composed of a knowledge and experience component that can be evaluated to yield a competency assessment. In this context, Morris et al. (2006) have highlighted the role of formal Bodies of Knowledge (BOKs) and their associated certification programs in the development of project management profession. Although there are different project management competency models available, the international project management association (IPMA's) model chosen for this assessment, the competence range - to describe the fundamental project management competence elements are contextual, behavioral and technical competencies.

IPMA's vision is "promoting competence throughout society to enable a world in which all project succeed". This can be used for self-assessment as well for organizational assessment. (IPMA, 2017) IPMA European based international project management association considers knowledge, experience (42 key competencies for Knowledge and Experience), personal attitude (8 aspects) and general impression (10 aspects).

Additionally PMI competency dimensions: Knowledge, performance,(Knowledge and Performance organized around the 9 project management knowledge areas), personal (around 6 areas achievement and action, helping and human service, impact and influence, managerial,

cognitive, personal effectiveness). Whereas (PMI, 2013) AIPM Australian institute for project management developed NCSPM (national competency standards for project management) around the 9 knowledge areas.

2.2.3 Critical Success Factors Framework for a Project

(Muller, 2006) Sited by Antencio (2013) summarized fifteen project managers' competency dimensions under project managers' leadership competence factors; one of the four critical success factors framework for a project.

- A. Project managers leadership competence factors
- B. Project team factors
- C. Project factors
- D. Organizational factors

A. Project Managers Leadership Competence factors

1. Intellectual leadership competence

- i. Critical analysis and judgement: to collect relevant information from a wider source, looking deep into the facts, identify the advantages and disadvantages accordingly. Making sound judgment and decision while considering impacts of any assumptions made.
- ii. Vision and imagination: Being imaginative, innovative and thinking outside of the box. To clearly see and visualize the future ahead of time through the impacts of any changes to implement.
- iii. Strategic perspective: being aware of the wider and broader implications. To balance the short and long term considerations while identifying the opportunities and treats.

2. Managerial leadership competence

- i. Resource management: to organize resources efficiently and effectively. Establish clear objectives and prepare action plan for the long-term goals.
- ii. Engaging communication: To engage and win support of each audience through tailored communication. As well, being approachable and accessible.
- iii. Empowering: Give direct report autonomy, encourage others to face challenges, solve problems and develop ones accountability.

- iv. Developing: encourage others to take tasks, roles and responsibilities that are more demanding. Ultimately developing others competence and invest time and effort on coaching.
- v. Achieving: To show unwavering determination to achieve objective and implement decisions.

3. Emotional Leadership Competence

- i. Self-awareness: being ware of ones feelings and ability to recognize and control theme.
- ii. Emotional resilience: Being able to maintain consistent performance in a range of situations. To retains focus on a course of action or the need to obtain certain results in the face of personal challenge or criticism.
- iii. Intuitiveness: To arrive at a clear decision and be able to drive the implementation in the face of incomplete or ambiguous information by using both rational and emotional perceptions.
- iv. Interpersonal sensitivity: to be aware and take account of others needs and perceptions at decision making and proposing solutions for problems and challenges.
- v. Influence: To persuade others to change their viewpoints based on their understanding of their position and recognition of the need to listen to this perspective and provide rationale for a change.
- vi. Motivation: The drive and energy to achieve clear results and make an impact.
- vii. Conscientiousness: To display clear commitment to a course of action in time of challenge and match “words and deeds” in encouraging others to support the chosen direction.

B. Project team factors (In order of importance)

- 1. Communication skills: Team members having the aptitude ability to effectively communicate and provide necessary information and data with the project manager, client and organization concerning all key project tasks, issues and status.
- 2. Technical background: Team members having the necessary skills and technical expertise needed to help contribute to successful completion of the project.

3. Trouble shooting Team members having the aptitude to take an active part in the monitoring and troubleshooting projects throughout the lifecycle in order to increase the quality the project activities and deliverables.
4. Commitment: Team members having sufficient commitment towards project goals, objectives, project team and established success criteria in order to help increase the projects likelihood of success.

C. Project factors

1. Urgency: when a project is of pressing importance to be implemented as soon as possible or a pre-defined schedule that is aggressive due to a condition of being urgent.
2. Strategic importance: when it is highly important to an intended organization or client objective, or essential in relation to the organizations plan of action.
3. Complexity: when the project is unpredictable and dynamic due to many varied interrelated constructs.
4. Independences between activities: when the relationship of project tasks or activities are mutually dependent on one another.
5. Uniqueness of project: activities that are not considered as standard activities a project has make it more difficult to plan, schedule and monitor accordingly.
6. Size and value: Involves determining the relative size of a project effort and the benefit value it offers.

D. Organizational factors

1. Top management support: which provides the project manager with authority, direction, support and access to resources.
2. Project organization structure: The structure in which the project manager delivers projects in according to the classified organizational structure. Which could be weak/ functional matrix, balanced/ functional matrix or string/ project matrix.
3. Project champion: an individual appointed by the client and/or top management to help the project manager and the project team understand and achieve the project objective. They help legitimizes the project's goals and objectives, keeps abreast of key project activities, and who could also be the ultimate decision-maker for the project.
4. Functional manager: management authority in an organizational department or business unit.

2.2.4 Guide To The Construction Management Core Competencies

(CMAA, 2018) Advancing Professional Construction and Program Management Worldwide presented a guide to the construction management core competencies and their body of knowledge. This guide include seven core points stated as follows.

- i. Construction management professional practice
- ii. Construction management project management
- iii. Cost management
- iv. Time management
- v. Quality management
- vi. Contract administration
- vii. Safety management

Another article written on core competencies of a construction manager state construction mangers (CMs) require a certain expertise and skill set to perform complex duties in a safe and responsible manner. Six core competencies have been identified for this growing and lucrative field: (LSU, 2017)

- i. Estimating
- ii. Scheduling
- iii. Structural Principles and Practices
- iv. Mechanical and Electrical Systems
- v. Construction Contracting, and Materials
- vi. Methods and Equipment

Estimating: The fundamentals of construction estimating include document reviewing, quantity surveying, material, equipment and labor pricing, and bid package preparation for projects. Essentially, this competency is used to take account of all materials and labor needed to complete a project — a very important step which will influence future bidding processes.

Scheduling: involves the planning of network-based schedules, resource scheduling, probabilistic scheduling and computer applications. This competency is widely and universally used by CMs, as builds are complex processes that involve collaboration and cooperation of many different units, build phases and subcontractors.

Structural Principles and Practices: involves the statistics and strengths of materials. A construction manager would need to know the design of materials such as timber, steel and reinforced concrete for construction applications. This skill set is necessary so that buildings are built properly and can withstand use and remain structurally sound.

Mechanical and Electrical Systems: A Construction Manager would be required to know about the systems in residential and commercial buildings. Mechanical and electrical system design must be in compliance with safety and quality control standards. The construction manager would be responsible for ensuring the completion and accuracy of such installed systems.

Construction Contracting: is essentially the principles and theories of construction company ownership and organization, bidding processes, contracts, bonds and insurance, business methods and plans, management and administration, safety, and avoidance of claims. Contracting is an essential skill and competency for potential entrepreneurs or project managers.

Materials, Methods and Equipment: The methods and materials used in the building process, along with specific knowledge on equipment, would be a major and essential competency. A complete knowledge of the construction systems and sustainability are a must for any construction manager.

2.3 TEAM ROLE INVENTORIES

2.3.1 Introduction

Most people use the term team and group interchangeably but there is a clear distinction between the two terms. As group is defined as “two or more amount of people who perceive themselves as a group and share the common goals, who have stable relation in between and are within interaction”. (Greenberg, 1996). . A team is defined as “a small number of people with complementary skills who are committed to a common purpose, performance goals and approach for which they are mutually accountable” (Katzenbach, 1993) . (Katzenbach, 1993) Describe devotion, accountability and the skills as three fundamental characteristics of a team. These definitions clearly shows the difference between the two terms as they have a lot in common as well.

The project management body of knowledge states that one of the major roles any project manager has is to develop his project team (PMI, 2013) Project teams are referred to as teams that carry out defined, specialized, time-limited projects that disperse upon completion of project. Team members have specific roles or functions, and the life span of membership is limited (cannon-Bowers, 1998).

Role is a sociology-origin concept, which was used to apprehend the behaviors of individuals in a social environment (Biddle, 1966). Now coming to the idea of an important component of social structure that plays important part in understanding human behaviors in organizations (Johnson, 1998).

Project teams consist variety of individuals. Each having their own personality, communication style, decision-making approach and influence on others. They can play a distractive or constructive role in terms of their effort of their contribution to the team effort. As the constructive are valuable assets to the project the distractive need to be handled diplomatically by the project manager. People can actually function at more than one role at different time. (Vijay, 1997)

A research done on developing and managing a project team states how Project roles and responsibilities should be clear to the entire team. Acquiring developing and managing staff are management's responsibilities and having conflict is natural so, resolution should be handled with care and skill. (Detra, 2012)

As sited on (Hasan, 2008) there are a number of team role theories over the years. Benne and Sheats (1948)'s study which classified 27 team members roles has been recognized as the pioneer in this field (Benne, 1948). The research was based on the assumption that the membership roles are required for group development and production. These 27 team roles were categorized under three main groups, which were team role, mission and individual roles.

One of the important studies that has contributed to the field belongs to Bales and his colleagues (Bales, 1955). At the beginning of their research, they tried to categorize different behaviors exhibited by individuals in small groups. Behaviors were also classified concerning their being positive or negative and their being active and passive.

Another study about team roles belongs to Ancona and his colleagues (Ancona, 1992). This study differs from the others on the assumption that within a team, team members claim only

the interrelated roles. They developed the team role perspective considering environmental affairs (boundaries) of the roles discussed.

One of the widely known studies about team roles belongs to (Parker, 1994). (Parker, 1994).He described four team players styles that represented the choices the individuals made for the interaction within the team context. Parker classified the style as; contributor, collaborator, communicator and challenger.

One of the most useful recent classification is (Barry, 1991)'s delegated leadership behavior approach within the team (Barry, 1991). (Barry, 1991) Emphasized the self-managing team paradox by asking the question of "who manages the leaderless teams?" He described four types of leadership required for self-managing teams through qualitative researches he applied in 15 teams operating in industrial field. Those leadership styles are; envisioning leadership (innovative and vision fostering), organizing leadership (giving orders on missions), spanning leadership (facilitating the activities that connects team to the organization) and social leadership (developing and maintaining the psychology and sociability of the team).

The last classification to be mentioned in the literature is Belbin (1981; 1993)'s team roles theory which also constitutes the theoretical fundamentals of this study (Belbin, 1981) (Belbin, 1993). Belbin determined eight team roles at first, but then came up with the ninth.

2.3.2 Belbin's Team Role Inventories

The Belbin team inventory is a behavioral test, also called the Belbin Self-Perception inventory (BSPI), Belbin team role inventory (here in after referred as BTRI) according to the definition given at Wikipedia. The inventory assess how an individual behaves in a team environment. The assessment includes 360-degree feedback from observers as well as the individual's own view of their behavior, and contrasts how they see their behavior with how their colleagues do. The scholar has asserted team roles are not equivalent to personality types that sort people into one of the 16 personality types as of Myers-Briggs type indicator. Rather, Belbin inventory scores people on how strongly they express behavioral traits from nine different team roles. With enough room for a person to exhibit strong tendency towards multiple roles.

Belbin is one of the world's leading authorities on the formation and performance of teams and has conducted extensive research in to management teams and why they succeed or

fail. Belbin's concept of Team Role Theory was the result of nine years research carried out at Henley Management College, England. By utilizing a number of psychometric tests it became possible to predict team performance and further illustrated that, various combinations of personnel would result in varying degrees of success. As the research progressed patterns emerged that could be identified and more importantly related to the typical contributions that individuals brought to a team. After further research, Belbin identified nine distinct Team Role categories as worthwhile to have in team formations. They were labelled as plant, resource investigator, coordinator, shaper, monitor evaluator, team worker, implementer, completer and specialist. Each category incorporates formulaic behavioral patterns that carry strengths in addition to weaknesses (acceptable and unacceptable). The application of Team Role Theory therefore offers an insight in to team dynamics, providing a framework for team selection and a prediction on the level of team synergy likely to be attained. (Stuart, 2001)

The research for the development of Belbin's team role inventory took over a period of nine years studying international management teams. Each participant completed a battery of psychometric tests, so that attributes such as personality and behavior could be brought into play and their effects on the team could be accurately considered. As the research progressed, the research revealed that the difference between success and failure for a team was not dependent on factors such as intellect, but more on behavior. The research team began to identify separate clusters of behavior, each of which formed distinct team contributions or "Team Roles". A Team Role came to be defined as: "A tendency to behave, contribute and interrelate with others in a particular way." It was found that different individuals displayed different Team Roles to varying degrees. Today, the Belbin Team Role model is used by over 40 percent of the top 100 companies in the UK, the United Nations, the World Bank and thousands of organizations throughout the world to enhance individual and team performance. (Belbin, 2012)

2.3.3 Clustered Behaviors of Belbin's Team Role Inventories

There are nine clusters of behaviors that individuals adopt when participating in a team. During the extensive experiments at Henley Management College it was clear that teams comprising of balanced mix of Team Role outperformed unbalanced teams. Belbin describes a team role as "a tendency to behave, contribute and interrelate with others in a particular way." There are 3 action oriented roles - Shaper, Implementer and Completer Finisher; 3 people oriented roles - Co-coordinator, Team worker and Resource Investigator and 3 cerebral roles -

Plant, Monitor Evaluator and Specialist. Each team role has its own distinctive cluster of behavioural characteristics with potential strengths and allowable weakness. (Belbin, 2012)

I. Action oriented roles

1. Shaper:

Shapers are highly goal and oriented people with great drive and energy. They push themselves and others and tend to overcome obstacles by sheer determination. They tend to be highly assertive and have very directive management styles. Shapers also tend to be competitive and like to win. They frequently progress upward in organizations because they get results and because many people are impressed by their courageous and decisive leadership style. Shapers are not noted for their interpersonal sensitivities and can be argumentative and even aggressive.

In terms of function, they are generally perceived as ideal managers because they generate action and thrive under pressure. They come into their own when quick and decisive action is called for to overcome threats and difficulties or when progress towards goals and objectives is unacceptably slow.

2. Implementer:

Implementers are characterized by their practical approach and possess higher than normal levels of self-control and discipline. They are prepared to work hard to ensure things are done as prescribed in a systematic way. They are typically loyal to the organization, prescribed, and established ways of doing things. They are likely to be regarded as someone who will not seek personal agendas and self-interest. On the downside implementers may be inflexible in accepting new ways of doing things, particularly if they are radical or impracticable.

Coming to function they are valuable in an organization because of their reliability and capacity for application. They succeed because they are efficient and because they have a sense of what is feasible and relevant. While many people might stray favoring the tasks they like to do and neglect things they find not to be to their liking an implementer is more likely to do what needs to be done in a systematic and relentless way.

3. Completer finisher:

Completer Finishers have a great capacity for the attention to detail. They constantly strive for perfection and correct errors. Completer finishers are quite introvert and require less external stimulus than most people. The Completer Finisher can be trusted to do work to the highest standard and to complete it on time. The combination of striving for perfection and meeting deadlines often creates anxiety though and they are likely to be reluctant to trust others to do work to their own high standards.

Functionally the Completer Finisher is invaluable where tasks demand close concentration and a high degree of accuracy. The standards they set make them well suited to situations where precision and high standards are essential. Completer Finishers will also demand the same high standards from people around them and therefore create their own micro culture where the only standard acceptable is perfection.

II. People Oriented roles

1. Coordinator:

The distinguishing feature of Coordinators is their propensity for helping others to work towards shared goals. Mature, trusting and confident, they delegate readily. In interpersonal relations, they are quick to spot individual talents and to use them in pursuit of group objectives. While coordinators are not necessarily the cleverest or most senior member of a team, they are likely to have a broad outlook and perspective. The natural goal focus of coordinators can sometimes lead to them manipulating others to achieve their personal objectives. In some situations, Coordinators are inclined to clash with Shapers due to their contrasting management styles.

Functionally they are well placed when put in charge of a team of people with diverse skills and personal characteristics. They perform better in dealing with colleagues of near or equal rank than in directing junior subordinates. Their motto might well be "consultation with control" and they usually believe in tackling problems calmly.

2. Team worker:

Team workers possess a mild and sociable disposition and are generally supportive and concerned about others. They have a great capacity for flexibility and adapting to different situations and people. Team workers are perceptive, diplomatic and caring and tend to be good listeners. Because of these qualities, it is hardly surprising that they are popular with their colleagues. Their concern about creating harmony and avoiding conflict can make them indecisive when faced with having to make difficult solo decisions.

In terms of function, the team worker may be legitimately compared to the lubricating oil in a car engine. We do not always appreciate how important it is until it is not there. Because of their ability to be able to resolve interpersonal problems team worker has come into their own when situations are tense and people feel uncared for and not appreciated. They can rise to senior positions because they have few enemies and the fact that they are ready to listen to the views and suggestions of others.

3. Resource investigator:

Resource Investigators are usually enthusiastic extroverts. They are natural communicators with people both inside and outside the company. They are natural negotiators and are adept at exploring new opportunities and developing contacts. Although not a great source of original ideas, the resource investigator is effective when it comes to picking up other people's ideas and promoting them. As the name suggests, they are adept at finding out what is available and from whom. They usually receive a warm reception from others because of their warm outgoing nature. Resource Investigators are generally relaxed people with a strong inquisitive sense and a readiness to see the possibilities in anything new. However, unless they remain stimulated by others, their enthusiasm can rapidly fade.

Functionally they are good at exploring and reporting back on ideas, developments or resources outside their immediate group. They are the natural people to set up external contacts and to carry out any subsequent negotiations. They have an ability to think on their feet and to probe others for information.

III. Cerebral roles

1. Plant:

Plants are innovators and inventors and can be highly creative. They provide the source of original ideas to support innovation. Usually they prefer to operate by themselves at some distance from other members of the team, using their imagination and often working in an unorthodox way. They tend to be introverted and react strongly to criticism and praise. Their ideas may often be radical and may lack practical constraint. They are independent, and usually regarded as being clever because of their original and radical perspective. They do not always manage to communicate in a compelling way and offer their ideas in a practical and relevant framework.

Functionally the main use of a plant is to challenge conventional and established ways of doing things and provide suggested solutions for solving complex problems. Plants are often needed in the initial stages of a project or when a project is failing to progress. Plants have usually made their mark as founders of companies or as originators of new products. However, too many plants in one team or group may be counter-productive, as they tend to spend their time reinforcing their own ideas and engaging each other in combat.

2. Monitor evaluator:

Monitor Evaluators are serious-minded, prudent individuals with a built-in immunity for being over-enthusiastic. They are likely to be slow in making decisions preferring to carefully think things over. Usually they have a high critical thinking ability. They have a good capacity for shrewd judgements that consider all factors. A good monitor evaluator is unlikely to make intuitive and reckless mistakes. They deal in facts and logic rather than emotion when considering options. They are often regarded as over-critical and can be seen to be slow and boring.

Functionally monitor evaluators are best suited to analyzing problems and evaluating ideas and suggestions. They are very good at weighing up the pro's and

con's of options. In a managerial position, their ability to make high quality decisions consistently is likely to make them highly regarded.

3. Specialist:

The Specialist Team Role and the functional title of Specialist is often a cause for confusion. While it is true that both uses of the term may relate to people who are a source of technical knowledge and expertise the Specialist in Team Role terms has some very specific attributes. Their main distinguishing feature is their love of learning. They see learning and the accumulation of knowledge as the main reason for their existence and their single minded and resolute pursuit of this end is their main motivation. The specialist is likely to be recognized by colleagues as an expert to turn to for help and guidance. The specialist will usually try to avoid being involved in unstructured meetings and discussions or those of a social nature. They may also be somewhat unyielding when challenged about the validity of their knowledge or field of expertise.

Coming to function while specialists may not be regarded as natural team players teams will be wise to engage the specialist as a means of providing in depth research. As managers, they command respect because of their in-depth knowledge and they can be used to mentor others to raise their technical expertise.

As described in this chapter competency and team role inventories are wide concepts we see in projects and specifically at the construction industry service providers. The best practices seen from the guide to the construction management core competencies, set critical success factors framework for projects and the international project management competency model gave this research critical assessment criterions. As the research focus balances on behavioral factors this literatures result was very helpful for data collection and analysis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

The research topic is open to describe the phenomenon of PMs' competency, team role inventories, their link and value adding clustered behaviors onto projects ultimately being an input for project effectiveness and efficiency. It seeks an insight about value adding clustered behaviors' on Project Managers' competency through team role inventories. Even though, there were researches done on the area of Project managers' competency, the research's desire is to address the issue with special reference to team role inventories and gain feasible information. It will have a result describing the current practice of project managers' competency level through assessment against set dimensions. Therefore, *Descriptive Research Design* is selected accordingly. According to (Burns & Grove, 2003), descriptive research "is designed to provide a picture of a situation as it naturally happens". The study will describe link between the practice of competent project managers' as of results found from the assessment with awareness and use of Belbin's team role inventories clustered behaviors.

3.2 RESEARCH APPROACH

The research approach to be used for the study is a *Mixed Approach* in order to incorporate methods of collecting and analyzing data from the quantitative and qualitative research approach as stated by (Creswell, 2009). The researcher has picked this approach to collect and analyze numerical as well narrative data by using an interview and a survey questionnaire. This approach provides room to study the competency and awareness study phenomena from participants and the relationship between the measurable variables of the study.

Accordingly; the research population, sample, sampling design, sampling process, data sources, data types and data analysis is to be discussed as follows.

Research Population:

The research approach to be used has considered a *Population Size* according to (MUDHo, 2010) 582 construction contractor companies and 72 construction consulting companies that account for 77.7% & 87.8% of Ethiopian construction contractor and consulting

companies which are found in the capital city of Addis Ababa registered from grade one to four. Additionally, the construction management company Meezar Construction Management PLC. which is also located in the capital city of Ethiopia.

Sample:

As discussed at the limitations of the study the researcher will take *Samples* from construction companies at a specific woreda and sub city of Addis Ababa that are construction managers, consultants and from grade one to four for registered contractors. As these are more invested in the current projects in the city that can give a feasible insight to the study.

Sampling Design:

Coming to determining the *Sampling Design Probability Sampling Design* is to be used as (Uma S., 2009) states “Probability sampling design is used when the representatives of the sample is of importance in the interests of wider generalizability” in this case project managers’ were the major representatives of the project based companies; construction firms.

For a country that is geographically large, the typical sample design is a stratified multistage-clustered area sample (Leyla, 2003). For this research, the unit of analysis is at individual level and the time horizon is a one shot / cross sectional study. It is seen that the population size is large therefore; a frame is needed so that all in the population were identified, so that there is equal opportunity for subject selection. Considering this *Clustered Sampling* is the type of probability sampling picked for the study. This involves stages of sampling by which the population is first listed by clusters or categories. (Uma S., 2009) “*When several groups with intragroup heterogeneity and intergroup homogeneity are found, then a random sampling of the clusters or groups can ideally be done and information gathered from each of the members in the randomly chosen clusters.*” In which this sample offers more heterogeneity within groups and more homogeneity among groups that can be construction contractor companies found at a specific woreda of a subcity is Addis Ababa. This cluster includes different grade contractors but one cluster from another cluster is homogenous as the contents elements were likely.

Sampling Process:

For this research, *Multistage Cluster Sampling* is used, as there are several stages of probability sampling. Following the procedure stated at (Uma S., 2009) The first cluster sampling will be used to select Sub Cities from Addis Ababa. From the primary unites selected, a probability sample of secondary sampling unit is drawn. At the third level from the secondary units another probability sampling is done. Which ultimately brings the breakdown for the sample unit. Here is the stage followed:

1st Select Sub-cities from Addis Ababa: The primary units selected were *Arada & Bole Sub Cities* from Akaki Kaliti, Addis Ketema, Arada, Bole, Gulele, Kolfe Keranio, Kirkos, Lideta, Nifas Silk Lafto and Yeka Sub Cities.

2nd Select woredas from the respective sub cities: The secondary units were *woreda 8* from Arada subcity and *woreda 4* from Bole subcity. In which there were 9 woredas at Arada Subcity and 14 woredas at Bole sub city.

3rd Select project based construction companies from woreda 8 and woreda 4: The sample selected is 29 organizations.

Now the sample unit is in number of organizations as, the number of employees of these companies total estimation is 51 . To determine the sample size by using (Scott, 2013) when the number of individuals in the population is known considering margin of error of +/- 5%, confidence level of 95% with a z-score of 1.96 and 0.5 standard of deviation.

First let's calculate the sample size without considering the fpc (finite population correction factor).

$$\text{Necessary sample size not considering fpc} = \frac{(Z \text{ score})^2 \times (\text{Standard Divation})^2}{\text{Margin of Error}^2}$$

$$n_0 = \frac{(1.96)^2 \times (0.5)^2}{0.05^2}$$

$$n_0 = 384.16 \cong 385$$

Now, determining the sample size using the fpc.

$$\text{Necessary sample size} = \frac{n_0 \times N}{n_0 + (N - 1)}$$

$$n = \frac{385 \times 51}{385 + (50 - 1)}$$

$$n = \frac{19635}{434}$$

$$n = 45.24 \cong 46$$

Therefore, **46 respondents** is the necessary sample size.

Data Sources:

For this study, **Primary & Secondary Data Sources** were used. The primary data source is through interviews and administered questionnaire to the specified sample size. Therefore, accordingly the data collection method will include interview to obtain first-hand information on the issue of interest. As the number of project managers is not known few direct interview with pronounced project managers in the industry will be more curtail and representative to collect the necessary research data. To respond for the research questions with a bigger representative sample size questionnaires were by far the most important measurement instruments statisticians use to grasp the phenomena to be measured (G. Brancato, 2005).

As secondary data, source indispensable literatures written on core competencies of project managers and team role inventories were to be used. There were many scholars literatures written on core competencies of project managers' explaining about soft & hard competencies, an international project management competency model, a critical success factor framework for a project and a very good input for the area of study a guide to the construction management core competencies. As well about Belbin's tam role inventories and the clustered behaviors within the theory.

Data Type & Collection Method:

The **Data Type** to be collected is pure data, which informs the level of project managers' competency and awareness level on team role theories. In line for this study it is also, a data that can inform about the interactional behavior of the competent project managers' and their respective clustered behavior in the context under study. The **Data Collection Methods** of the

research were *Structured Interview*, as the outset information needed for the study is known and *Personally Administered Questionnaire* (Adapted from the psychology department's web site at the University of California-Davis campus) (UcDavis, 2014) based on organizations willingness if not to be filled and collected with a convenient timeframe.

Data Analysis:

(Uma S., 2009) The *Data Analysis* begins with getting data ready for analysis. This involves Editing data, handling blank response, coding data, categorizing data, creating data file and programming. *Quantitative data analysis* and *Qualitative data analysis* is to be used for this research as the approach is a mixed approach. Accordingly getting a feel for the data which will give preliminary ideas of how good the scales were, how well the coding and entering of data have been done. This followed by testing the goodness of the data by using SPSS in which the reliability and validity of the measures will be tested. The data analysis will compute frequency distributions, measures of central tendency & dispersion of the variables in the cases under descriptive statistics. The presentation will be facilitated with tables and charts that will present the collected raw data's analysis result. Descriptive output tables, and other useful tables and charts produced by SPSS will be used.. The research process is summarized and shown in the figure below.

CHAPTER FOUR

RESULTS AND FURTHER DISCUSSION

4.1 OVERVIEW ON RESPONDENTS

The questionnaire survey was designed and distributed in order to fulfil the research objective. To make the analysis comprehensive according to the sample size 55 questionnaires were distributed to the three major stakeholders. Out of which 46 were collected, which is 83.64% of what was distributed but which accounts for 100% of the research sample size. Table 4.1 shows the frequency of returned questionnaires by stakeholders; contractors, consultants and construction management companies according to their respective employment category. Additionally for some qualitative responses for the study two interviews were conducted with a Project Manager and CEO of a Construction Management Company and a Deputy Director at a Contractor Company.

Table 4.1 Construction industry stakeholder respondents' profile

		Employment category				Total
		Project Manager	Assistant Project Manager	Site Engineer	Office Engineer	
Construction category	Construction management	2	0	0	0	2
	Consultants	2	2	2	4	10
	Contractors	5	8	12	9	34
Total		9	10	14	13	46

Source: own computation by the help of SPSS.ver.20. (2018)

Below Table 4.2 indicates the profile of respondents' gender, age range, educational qualification, working construction category, employment category and previous experience. Male respondents account for more than twice the size of female respondents. The age range that accounts for most is between 25-34 years old. The educational qualification of Bachelor degree graduate is high. Whereas 2-5 years of experience in the industry holds a bigger range. The table shows how the female respondents' number, higher educational qualification and longer years of work experience is very low. Against all the job categories (46.15%) of the office engineers were female that shows female engineers were highly affiliated at that specified job category. As well out of the highly educated individuals holding a master's degree (75%) of the (8.7%) balances to female respondents.

Table 4.2 Respondents profile; by Gender, Age range, Educational qualification, construction category, Employment category and previous experience (years)

Gender	Male	67.39%
	Female	32.61%

Age range	25-34 years of age	76.09%
	35-44 years of age	21.74%
	45-54 years of age	2.17%

Educational qualification	Bachelor degree	86.96%
	Master's degree	8.7%
	Diploma	4.35%

Construction category	Contractor	73.91%
	Consultants	21.74%
	Construction management	4.35%

Employment category	Site engineer	30.43%
	Office engineer	28.26%
	Assistant project manager	21.74%
	Project manager	19.57%

Previous experience	2-5 years	52.17%
	6-10 years	36.96%
	Under 1 year	6.52%
	11-15 years	4.35%

Source: own computation by the help of SPSS.ver.20. (2018)

4.2 LEVEL OF PROJECT MANAGERS' COMPETENCY AT THE CONSTRUCTION INDUSTRY

As per the study's general objective of assessing Project Managers' level of competency against knowledge, performance and particularly personal at the construction industry mode value computed by SPSS 20 indicates that respondents have agreed at 21 variables, neutral at 2 variables, disagree at 2 variables and strongly disagree at one variable.

Additionally, by looking through the statistics of responses of these 26 variables at table 4.3 respondents have agreed on project managers' competence level as the sum value is 499, meaning (38.4%) of the responses show that respondents agree that the project managers at the construction industry were competent. Followed by 318 (24.69%) neutral, 218 (16.93%) disagree, 196 (15.22%) strongly agree and 57 (4.43%) strongly disagree.

Table 4.3 Project managers competency level

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Project managers competency Level	15.22%	38.4%	24.69%	16.93%	4.43%

Source: own computation by the help of SPSS.ver.20. (2018)

Against personal dimension the statistics of the 19 variables indicate that 371 agree, 229 neutral, 163 disagree, 129 strongly agree and 28 strongly disagree responses were given. For knowledge the frequency sum of the 5 variables indicate that 64 agree, 50 neutral, 48 strongly agree, 42 disagree and 26 strongly disagree responses were given. Coming to performance and skill the frequency sum of the 4 variables indicate that 79 agree, 46 neutral, 31 strongly agree, 25 disagree and 3 strongly disagree responses were given. As well, looking at the three dimensions separately at Table 4.4 the mean value shows respondents agree that Project Managers are competent regarding personal and performance.

Table 4.4 Project managers' competency level against set dimensions

	Personal Regarding [PM's Intellectual, Managerial & Emotional leadership competence, Project team Factors]	Knowledge Regarding [Knowledge areas]	Performance Regarding [Skills]
Mean	2.4	2.7	2.3

Source: own computation by the help of SPSS.ver.20. (2018)

As well looking at response from the interview on the general view from a construction management company sight of view and contractor's site of view knowledge is at a good level but, communication is a big loop hole. Starting the project scope phase where there is the need to sit and discuss clearly what the wants and needs of the client were project managers' do not listen very well. PM's need critical thinking and judgment when giving a professional advice. Project managers' were expected to have 'A mile long knowledge but, an inch deep understanding' to have a good communication with the electrical, sanitary and mechanical engineers. The idea of 'it is not my job' is not a good habit. Additionally there is lack of proper documentation. There is lack of project managers who balance these three and operate with confidence. Experience is helpful but each project is different. It will help at technical issues

and can be considered as asset. (Male 33 years old, PM at a Construction Management Company) Technical knowledge and experience matters most. There were highly advanced individuals with only an advance diploma on site. To label based on knowledge with this situation is very difficult because they were actually very good on the job. Educational level is considered for functionality purpose but the industry seeks to see actual feasible results, actual buildings. (Female 28 years old, Deputy Director at a Contractor Company)

The responses show that there is a gap at communication & documentation. It states that the construction industry seeks technical practicability and feasible result. Which leaves us at the middle of the competency level.

4.3 AWARENESS LEVEL ON TEAM ROLES AT THE CONSTRUCTION INDUSTRY

The questionnaire survey addressed the level of knowledge on team role inventories, knowledge on Belbin’s team role inventories and using team role inventories at their company in order to see the awareness level as seen on Table 4.5. This numbers show that the awareness level is very low but not null to say we were at zero.

Table 4.5 Awareness level on team role inventories

		Knowledge on team role inventories		Knowledge on Belbin’s team role inventories		Using team role inventories	
		Frequency	Percent	Frequency	Percent	Frequency	Percent
Valid	Yes	16	34.8	1	2.2	5	10.9
	No	30	65.2	45	97.8	41	89.1
	Total	46	100	46	100	46	100

Source: own computation by the help of SPSS.ver.20. (2018)

Specifically looking at the awareness level on team role inventories at the employment category, 9 project managers response indicates 7 (77.78%) know about team role inventories, 1 (11.11%) know about Belbin’s team role inventory and 3 (33.33%) use team role inventories. This result gives an insight of how project managers know the general concepts of team role inventories but not Belbin’s team role inventories specifically or implement it on site. This is further elaborated on Table 4.6.

Table 4.6 Awareness level on team role inventories against employment category

		Knowledge on team role inventories		Knowledge on Belbin's team role inventories		Using team role inventories	
		Yes	No	Yes	No	Yes	No
Employment category	Project Manager	7	2	1	8	3	6
	Assistant Project Manager	4	6	0	10	1	9
	Site Engineer	2	12	0	14	0	14
	Office Engineer	3	10	0	13	1	12
Total		16	30	1	45	5	41

Source: own computation by the help of SPSS.ver.20. (2018)

Survey questions crafted to check the need for these 9 clustered behaviors at a team for the construction industry shows that 15 (32.6%) agree for a shaper, 26 (56.5%) strongly agree for an implementer, 27 (58.7%) strongly agree for a completer finisher, 20 (43.5%) strongly agree for a coordinator, 25 (54.3) strongly agree for a team worker, 29 (63%) strongly agree for a resource investigator, 17 (37%) neutral on the need for a plant, 25 (54.3%) agree for a monitor evaluator and 19(41.3%) were neutral on the need for a specialist. This result shows that respondents have a positive response towards the need for these clustered behaviors in a team. Further, the following Table 4.7 shows the mean value of each variable. Which shows respondents agree that project team needs the clustered behaviors.

Table 4.7 Project teams clustered behaviors need

	Resource Investigators	Completer Finisher	Implementer	Coordinator	Team Worker	Monitor Evaluator	Shaper	Plant	Specialist
Mean	1.5	1.6	1.7	1.8	1.8	1.9	2.2	2.5	2.5

Source: own computation by the help of SPSS.ver.20. (2018)

4.4 LINK BETWEEN COMPETENT PROJECT MANAGERS AND THEIR RESPECTIVE CLUSTERED BEHAVIOR

Against all set criteria to assess project managers, the mean value is 2.2 at contract administration and material, method & equipment. Which indicates these competent project managers were very strong at this two knowledge areas. As well, the mean value is highest at safety management, which indicates these competent project managers were very weak at safety management. This is shown at Table 4.8.

Table 4.8 Knowledge and skill based variables to asses project managers' competency

	Contract administration	Material, method & equipment	Structural principles & practices	Cost management	Time management	Mechanical & electrical system	Quality management	Safety management
Mean	2.2	2.2	2.3	2.4	2.6	2.7	2.8	3.6

Source: own computation by the help of SPSS.ver.20. (2018)

The above result shows a positive response on the competence of project managers with an average mean value 2.6. Respondents highly recommended six of the clustered behaviors for project managers. Such as a response frequency and proportion of 36 (78.3%) resource investigator, 29 (63%) completer finisher, 21 (45.7%) team worker, 19 (41.3%) monitor evaluator, 18 (39.1%) implementer, 17 (37%) shaper, 15 (32.6%) coordinator, 9 (19.6%) specialist and 7 (15.2%) plant. Table 4.9 below shows the mean value accordingly.

Table 4.9 Clustered behaviors recommendation for project managers'

	Resource investigator	Completer finisher	Team worker	Monitor evaluator	Coordinator	Implementer	Shaper	Plant	Specialist
Mean	1.3	1.5	1.7	1.9	1.9	2	2.1	2.5	2.4

Source: own computation by the help of SPSS.ver.20. (2018)

Looking at cases that indicated project managers were very strong at contract administration and material, method & equipment the mean value at the three recommended clustered behaviors is as shown at Table 4.10. Which indicates respondents recommendation.

Table 4.10 recommended clustered behaviors for competent project managers' very strong at contract administration and material, method & equipment

	Resource Investigator	Completer Finisher	Team Worker
Very strong at Contract Administration	1.2	1.8	1.8
Fairly strong at Material, Method & Equipment	1.4	1.5	1.7

Source: own computation by the help of SPSS.ver.20. (2018)

4.5 BELBIN'S TEAM ROLE INVENTORY CLUSTERED BEHAVIORS THAT CAN ENRICH PROJECT MANAGERS' COMPETENCY

As discussed above to see the link between these two variables the mean value of the recommendation's from respondents shows that resource investigator, completer finisher, team worker, monitor evaluator, implementer and shaper in line of importance were the highly recommended clustered behaviors that can enrich project managers' competency.

The research additionally took some recommendation from experienced individuals in the industry to address the benefits of using Belbin's team role theory through an interview. The results show based on site experience completer finisher and monitor evaluator were the top choices as they really would work in details and be very innovative. As there is a lot we do not know so we need to experiment with different theories, styles of managing and increasing staffs' members' asset value which ultimately enhance the companies business value. Anything that can enhance knowledge, performance and personality can actually add value. (*Male 33 years old, PM at a Construction Management Company*). The other interview resulted a team worker and an implementer as team effort is always better than individual effort, by which the PM will be an asset. The construction industry seeks actual result and this behavior is very important. This theory can add value to bring the achievement higher in terms of time, cost and quality. Moreover, the likelihood of project successes will be better because of using a team with a proper delegation. (*Female 28 years old, Deputy Director at a Contractor Company*)

Both responses show that it can benefit in a way by enhancing project success and as well add business value at the construction industry.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 CONCLUSION

According to the results and discussion of the assessment of project managers level of competency in the construction industry with special reference to team role inventories is at a good level.

Therefore, based on the results from the analysis, the following major conclusions have been derived and summarized in accordance with the objectives of the research as follows. The level of project managers' competency at the construction industry against personal/behavior, knowledge, and performance/skill is at a good state. Even though, there is some gap at communication and documentation, the construction-industry currently seeks technical practicability and feasibility at high level of knowledge on the issue of project management for which the result shows project managers were competent at the current state. The awareness level on team role inventories is low but not none. Few project managers know this and as well use it. Therefore, it can possibly grow into use if a little more attention is given to the idea. As per the survey, the need for having clustered behaviors in their respective teams was an idea most respondents agreed on which can ultimately add value. These competent project managers' strength against both knowledge and performance is in Contract administration and material, method & equipment. For this reason, project managers' at the construction industry are strong at design phase, construction procurement, contract document preparation, project closeout, knowledge on the equipment, construction system and sustainability. As there is strength, on the contrary the weakness is on safety management; poor safety records, manuals, emergency plans, contractors safety program, insurance and alternative ways of dispute resolution. Project managers were advised to be more of a resource investigator and completer finisher out of the nine-clustered behaviors of Belbin's team role theory. The highly value-adding cluster behavior enriching competent project managers' is resource investigator who is a natural communicator, negotiator, open to adapt new opportunities and relaxed people who see possibilities in anything new. These highly recommended clustered behaviors can enrich project managers' competency by enhancing project success and as well add business value at the construction industry.

5.2 RECOMMENDATIONS AND FURTHER RESEARCH

5.2.1 Recommendations

Based on the findings of the research study, these recommendation points are stated:

1. The construction industry having competent project managers is good but as some knowledge and performance dimensions still need to be improved additional work is expected from all project managers' in the industry. This study recommends project managers' to enhance their competency level even more by exploring on the industries new technologies and knowledge bases, experience the skill in projects and grow ones performance day by day. Especially safety management is very week; competency level on safety management needs to be enhanced by giving emphasis to the problem and practicing the knowledge area intensively because ultimately; The fundamental concept on which project management is based is that a single individual the project manager is accountable for the success of the project (Goodwin, 1993).
2. To highly recognize the use of team role theories and implement it on project teams will be one great input for the current construction industry. Having a team with members knowing their respective role and fulfilling that need is a great accomplishment for a project team leader. He/she will have an effective and efficient team that meets project objective. Some practices show that, the promotion of teams and the concept of team building was a principle feature of the Construction Industry Board's (CIB) Constructing Success – the Construction Strategy Code of Practice, 1997 and was identified as a key stimulus for change in Sir John Egan's Rethinking Construction 1998 (Stuart, 2001).

Change starts from oneself. Before working on the project team, Project managers' need to work on themselves. The research result of project managers' current competency level is a good quality and a call to strive for even more. As there is a lot to know by being a project manager to experiment with different theories, styles of management and increasing staffs' members' asset value will not just improve the organizations' but, the construction industry. Knowledge is a logical concept in our mind that needs to be practiced, performed, developed as a skill and improve actual implementation at an industry.

5.2.2 Limitations of the Study

This study's respondents were at large contractors in which the current project managers' of the construction industry were available. As the end users were clients, their view in the assessment of PM's competency level might have a big impact on the result, which was not synchronized in this study.

5.2.3 Further Research

There were a number of researches done on project managers' competency, of which one is this. During the study period, the research has come across some important aspects that can be research topics and future studies.

1. This research study participants were the service providers of the construction industry. How about including the service end users and assess project managers' competency level at a bigger and wider level.
2. This descriptive research reflects the actual existing situation. Nevertheless, how about preparing an actual approach or manual for project managers' competency level assessment.
3. It is seen that project management is progressing rapidly in the IT industry. But it seems quite ideal at the construction industry. Which is why the construction management companies were very few in number and against the directive construction design companies were doing the construction project management work. How can we identify the gap, propose possible solutions and actually implement what is written on the directive.

It is the researcher's pleasure for a reader, or a researcher to take this study as an input and do further studies related to the topic. Wishing you a good luck and as well hoping to see some work, which could be of the above stated further study points.

REFERENCES

- Alliance, 2015. *Allianceexperts.com*. [Online]
Available at: <https://www.allianceexperts.com/en/knowledge/countries/africa/business-opportunities-in-the-ethiopia-construction-sector/> [Accessed 30 april 2018].
- Ancona, D., 1992. Bridging the boundary; external activity and performance in organizational teams. 4(37), pp. 634-665.
- Bales, R., 1955. Role differentiation in small decision-making groups. *H. Free Press*, pp. 259-306.
- Barry, D., 1991. Managing the bossless team: lessons in distributed leadership. *Org Dynamics*, Issue 20, pp. 31-47.
- Bauer, B., 2005. *Success Paradigm for Project Managers in the aerospace Industry*. Dissertation Abstracts International.
- Belbin, R., 1981. *Management teams: why they succeed or fail*. Oxford: Butterworth Heinemann.
- Belbin, R., 1993. *Team roles at work*. Oxford: Butterworth Heinemann.
- Belbin, R., 2012. *belbin*. [Online] [Accessed 24 4 2018].
- Benne, K., 1948. Functional roles of group members. *Social Issues*, 2(4), pp. 41-49.
- Biddle, B., 1966. *Role theory, concept and research*. new york: wiley and sons.
- Brandel, M., 2006. *The New Project Manager*. [Online]
Available at:
<http://www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=110268>[Accessed 26 4 2018].
- Burns & Grove, 2003.
- Bowers, J., 1998. Team performance and training in complex environments: recent findings from applied research current directions in psychological science. 3(7), pp. 83-87.

- CMAA, 2018. *CMAANET*. [Online] [Accessed 29 4 2018].
- Construction, P., 2015. *CONSTRUCTIONPROXY.com*. [Online]
Available at: <https://constructioninethiopia.com/catalog/ethiopian-construction-consultants>
[Accessed 25 april 2018].
- Crawford, L., 2003. Senior management perceptions of project management competence. *International journal of project management*, Issue 23, pp. 7-16.
- Creswell, J., 2009. *Research Design Qualitative, Quantitative, and Mixed Methods Approaches*. 3rd ed. London: SAGE Publications.
- Detra, R., 2012. *Acquiring, developing and managing the project team*, Mwanza.
- Detra, R., 2012. *Human Resource Managment Acquiring, Developing and Managing the Project Team*, Mwanza: Research Project Management Track.
- Edum-Fotwe, F. & McCaffer, R., 2000. Developing project management competency: perspective from the construction industry. *International Journal of Project Management*, 2(18), pp. 111-124.
- G. Brancato, 2005. *Handbook of recommended practices for questionnarie development and testing in the european statistical system*. 1st ed.
- Gardiner, P., 2005. *Project Management: A Strategic Planning Approach*. Hampshire: Palgrave macmillan.
- Glader, A., 2001. *Learning and competence development*.
- Goodwin, R., 1993. Skills required of effective project managers. *Journal of Management in Engineering*, 3(9), pp. 217-226.
- Greenberg, J., 1996. *managing Behaviour in Organizations*. London: Prentice hall.
- Hasan, B., 2008. An Evaluation on Belbin's Team Role Theory. *World applied sciences journal*, 3(4), pp. 460-469.
- Hyden, H., 1994. From Manager to Leader. *Executive Excellence*, p. 10.

- IPMA, 2017. *IPMA.world*. [Online] [Accessed 30 4 2018].
- Johnson, D., 1998. The role-based performance scale: validity analysis of a theory-based measure. 5(41), pp. 540-555.
- Katzenbach., 1993. The discipline of teams. *Harvard Business Review*, Issue 71, pp. 111-120.
- Leyla, M., 2003. *Sampling design*.
- LSU, 2017. *LSU Online*. [Online] [Accessed 30 4 2018].
- Meezar, 2016. *Meezar Construction Management Company Profile*. Addis Ababa: Meezar Construction Management PLC..
- Meredith, B., 2003. *Managment teams: why they succeed or fail*. 2nd ed. Oxford: Butterworth Heinemann.
- Meredith, B., 2015. *belbin*. [Online] [Accessed 20 april 2018].
- Mike, D., 2016. *Effective & Efficient Project Management*, Scotland: Simple Improvment.
- MoUDC, 2013. *Directives for the registration of design professionals and consultants*. addis ababa.
- MoWUD, 1994. *Standard conditions of contract for construction of civil work projects*. Addis Ababa.
- MUDHo, 2010. *List of registered contractor's for 2010 budget year*. Addis Ababa: construction professionals company and construction machinarys industry development and regulatory bureau.
- Muller, 2006. *International Journal of project managment*, Issue 27, pp. 21-32.
- Navon, R., 2005. Automated project performance control of construction projects. *Automation in construction*, Volume 14, pp. 467-476.
- Ohaiodas, 2016. *Project Managment Competencies*.:Ohaiodas Human Resources Division.
- Palu, N., 2016. *Association for project management*. [Online] [Accessed 30 4 2018].

- Parker, G., 1994. *Cross-functional Teams*. San Francisco: Jossey-Bass Publishers.
- PMBOK, 2013. *A Guide to the Project Management Body of Knowledge*. 5th ed. Pennsylvania: Project Management Institute.
- PMI, 2013. *PMBOK guide*. 5th ed. Pennsylvania: Project Management Institute.
- Scott, M., 2013. Determining Sample Size. In: *Qualtrics.*, pp. 1-2.
- Stuart, T., 2001. *Belbin and the formation of construction project teams*, New Zealand: Bell college of thechnology, school of science and technology.
- Stuart, T., 2001. *Belbin and the formation of construction project teams*, scotland.
- Sunindijo, R., 2007. Emotional Intelegence and Leadership Styles in Construction Project managment. *Managment in Engineering*, 4(23), pp. 166-170.
- Thomas, J., 2008. Preparing project managers to deal with complexity – advanced project management education. *International journal of project management*, Issue 26, pp. 304-315.
- UcDavis, 2014. [Online]
Available at: <http://psychology.ucdavis.edu/sommerb/sommerdemo/scaling/semdiff.htm>
[Accessed 7 May 2018].
- Udo, N., 2004. *What are the core competencies of a successful project manager?*, Koppensteiner.
- Uma S., 2009. *Research Methods for Business*. 5th ed. West Sussex: John Wiley & Sons Ltd..
- Vijay, K., 1997. *Managing the Project Team*. 3rd ed. Pennsylvania: Project managment institute.
- Whitfield, J., 1995. Evaluation of Team Based Managment. 2(8), pp. 17-28.

APPENDICES

Appendix A: Structured Interview

Date: _____

Start time: _____

End time: _____

Hello, my name is *Sosina Tesfahun* and I am an MBA student at AAU School of Commerce. I thought it would be a good idea to interview you, so that I can gather more information regarding my thesis title *Assessment of Project managers' competencies in the Construction Industry; with special reference to team role inventories*.

I would love to ask you about your practice in the construction industry, opinions and feelings against the current seen practice in the construction industry against the core concepts of my thesis project managers' competencies and team role inventories in order to learn more about value adding concepts in the construction industry.

I will be delighted to use the information from our interview as an input that can add value at the research ultimately at the construction industry.

The interview shall take 45minutes maximum. Will that be convenient for you?

Topic 1. Can you tell me about yourself? Your Educational level, professional background, past experience and current working position?

Topic 2. Can you tell me about the construction management professional practice?

Considering the construction / project manager as a professional, the historical evolution of the practice in AA, the delivery method and legal obligations of the construction/project manager.

Added at delivery methods: cost, time, quality, safety management and contract administration.

Topic 3. Can you tell me about how project teams' function in the company you are working?

Considering how roles of each individual is labeled, If there are action oriented roles (shaper, implementer & completer finisher), people oriented roles (Coordinator, team worker & resource investigator) and cerebral roles (plant, monitor evaluator & specialist).

Topic 4. What is your opinion regarding project managers competencies regarding Knowledge, Skills, Performance and Past experience at the current construction industry practice in order to meet stakeholders requirements?

Topic 5. What do you feel about using team role inventories clustered behaviors at project teams? Do you feel like it can add value? If so, How?

Topic 6. What do you feel about which clustered behaviors is very important for project managers? Do you feel like it can add value? If so, How?

Topic 7. What is your opinion regarding the research topics practicability?

(Summarize the topic responses in short.)

I appreciate the time you took for this interview. If there is anything else you think will be helpful for the topic please.

I should have all the information I need. Would it be all right to contact you for any additional information? Thank you, I look forward to seeing you again.

Appendix B: Questionnaire

Addis Ababa University

School Of Commerce

This is a questionnaire prepared for a research purpose conducted by Sosina Tesfahun, master of business and administration in Project management student at Addis Ababa University, School of Commerce. This study is designed to gather information about the level of project managers' competency, awareness level of Belbin's team role inventories and there link in line with how the clustered behaviors of Beblin's team role inventories can add values for a projects effectiveness. This research is being done under the supervision of my advisor Solomon M. PhD.

1. Your participation in this project is voluntary; you will not be paid for your participation. You may withdraw from the study at any time without penalty or harm of any type. If you decline to participate in or choose to not complete the questionnaire, the researcher will not inform anyone of your decision, and no foreseeable negative consequences will result.
2. Completing the questionnaire will require approximately 25 - 30 minutes. There are no known risks associated with completing the questionnaire. If, however, you feel uncomfortable in any way during this process, you may decline to answer any question, or not complete the questionnaire.
3. The researcher will not identify you by name in any report using information obtained from your questionnaire; your confidentiality as a participant in this study will remain secure. Subsequent uses of data generated by this questionnaire will protect the anonymity of all individuals.
4. This research effort and this questionnaire have been reviewed and approved by the advisor of the paper.

For further information, including a copy of the results of this study, please contact me on pomey.t@gmail.com, +251913-590054.

NOTE: By completing and submitting this questionnaire, you are indicating that you understand the statements above, and consent to participate in this study. **Do not put your name on the questionnaire;** your signature acknowledging that you understand the information presented above is not required. I greatly appreciate your help!

1. What is your gender	<input type="checkbox"/> 1. Male
	<input type="checkbox"/> 2. Female

2. How old are you?	<input type="checkbox"/> 1. Under 25 years of age
	<input type="checkbox"/> 2. 25–34 years of age
	<input type="checkbox"/> 3. 35–44 years of age
	<input type="checkbox"/> 4. 45–54 years of age
	<input type="checkbox"/> 5. Other: _____ [explain]

3. What is your highest educational qualification-accomplishment?	<input type="checkbox"/> 1. Diploma
	<input type="checkbox"/> 2. Bachelor's degree
	<input type="checkbox"/> 3. Master's degree
	<input type="checkbox"/> 4. Doctorate degree
	<input type="checkbox"/> 5. Other: _____ [explain]

4. What is the construction category of the company you are working for / own?	<input type="checkbox"/> 1. Construction management
	<input type="checkbox"/> 2. Consultants
	<input type="checkbox"/> 3. Contractors
	<input type="checkbox"/> 4. Architectural design
	<input type="checkbox"/> 5. Other: _____ [explain]

5. What is your current working position?	<input type="checkbox"/> 1. Project manager
	<input type="checkbox"/> 2. Assistant Project Manager
	<input type="checkbox"/> 3. Site Engineer
	<input type="checkbox"/> 4. Office Engineer
	<input type="checkbox"/> 5. Other: _____ [explain]

6. How long have you been on your current working position?	<input type="checkbox"/> 1. Under 1 year
	<input type="checkbox"/> 2. 2 to 5 years
	<input type="checkbox"/> 3. 6 to 10 years
	<input type="checkbox"/> 4. 11 to 15 years
	<input type="checkbox"/> 5. Other: _____ [explain]

7. Do you know about Team Role Inventories?	<input type="checkbox"/> 1. Yes
	<input type="checkbox"/> 2. No

8. If your answer is yes, do you know Belbin's team role inventories?	<input type="checkbox"/> 1. Yes
	<input type="checkbox"/> 2. No

9. Do you use team role inventories at your company?	<input type="checkbox"/> 1. Yes
	<input type="checkbox"/> 2. No

Instructions: Please carefully read each of the following statements and respond by ticking the response box that best reflects your opinion. Please be completely open and honest in your responses. Please state your level of agreement regarding the following statements by marking one of the boxes. 1 = Strongly Agree, 2 = Agree, 3 = Uncertainty/Neutral, 4 = Disagree, 5 = Strongly Disagree.

Hereinafter PM referring to the Project Manager.

[Regarding the PMs' Intellectual, Managerial and Emotional Leadership Competence]

	1	2	3	4	5
The PM uses critical analysis and judgment to collect relevant information and make sound judgment / decision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM has an innovative imagination and visualizes the future ahead of time.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM has a strategic perspective that make him/her aware of the wider and broader implications.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM organizes resources efficiently and effectively, by establishing clear objectives and action plan to the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM engages and wins support of the audience while being approachable and accessible.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM empowers by giving direct report autonomy, encouragement to face challenges and solve problems.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The PM invests time and effort on coaching to encourage others to take more demanding roles and responsibilities.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM shows unwavering determination to achieve objective and implement decision.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM is aware of his/her feelings and is able to recognize and control them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM is able to maintain consistent performance in a range of situations.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM arrives at a clear decision to implement based on ambiguous information but, rational and emotional perceptions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM is aware of others need and perception at decision-making and decision proposition at problems and challenges.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM is influential by persuading others to change their viewpoints based on their understanding.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM motivates others to achieve clear results and make an impact.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The PM displays clear commitment at time of challenge and encourage others to support the course of action.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[Regarding Project team factor]

	1	2	3	4	5
The project team members have the ability to effectively communicate and provide data to the PM.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project team members have the necessary skills and technical expertise for the successful completion of the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project team members take active part in monitoring and troubleshooting projects in order to increase deliverables quality.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The project team members have commitment towards project goals, objectives and project team to increase project success.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[Regarding Belbin's team role inventory clustered behaviors]

The project team needs individuals which includes:	1	2	3	4	5
<i>Shaper</i> [highly goal oriented, assertive & very directive management style, competitive & like to win, courageous & decisive leadership style, argumentative & even aggressive].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Implementer</i> [high level of self-control & discipline, prepared to work hard & ensure things are done systematically, loyal to their organization, inflexible on accepting new ways of doing things].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Completer Finisher</i> [have attention to detail, strive for perfection, trusted to do work with high standard & on time].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Coordinator</i> [help others to work towards shared goals, delegate readily, spot individual talents & use them for the pursuit of group objectives, broad outlook & perspective, sometimes manipulate others to achieve their objectives].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Team worker</i> [mild, sociable, supportive & concerned about others, flexible to adapt to situations & people, diplomatic, caring, good listeners, at difficult solo decisions they tend to create harmony and avoid conflict].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Resource Investigator</i> [natural communicators, negotiators inside & outside the company, adapt new opportunities & develop contact, picks up others idea and promotes it, find out what is available, relaxed people who see possibilities in anything new].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Plant</i> [innovators, inventors & highly creative, provide original ideas, prefer to operate by themselves, react strongly to criticism & praise].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<i>Monitor Evaluator</i> [serious-minded, likely to be slow in making decision preferring to carefully think things over, high critical thinking ability, deal by facts & logic rather than emotion, analyze problems & evaluate ideas, good at weighting pro's and con's of options].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Specialist</i> [special love of learning & accumulation of knowledge, an expert to turn to at help & guidance, usually try not to be involved at unstructured meetings].	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Instructions: Rate the project managers' competency level when operating in a project team on each of the following eight dimensions.

Tick the box between the opposing (contrasting) adjectives that best represents the strength or intensity of your feelings about the project managers' competency level.

A tick next to one of the words indicates a very strong feeling... Strong Weak

A tick near the middle indicates a fairly weak feeling:..... Strong Weak

A tick in the center (mid-point) box indicates you are undecided: Strong Weak
(or do not understand the words themselves)

There are no right or wrong answers.

<i>Cost Management</i> [Budgeting, estimating, cost compliance monitoring, design phase of cost management and cost control].	Strong	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Weak
<i>Time Management</i> [Schedule development, pre-design & design scheduling].	Strong	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Weak
<i>Quality Management</i> [planning the quality management, selecting project team, quality management at design and construction, field inspection, quality control plan, material acceptance and documentation].	Strong	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Weak

<i>Safety Management</i> [safety records, manuals, project emergency plan, contractor's safety program, insurance and alternative ways of dispute resolution].	Strong	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Weak
<i>Contract Administration</i> [design phase, construction procurement, contract document preparation, communications procedures and project closeout].	Strong	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Weak
<i>Structural Principles and Practices</i> [Statics and strength of materials, design of materials for properly built buildings that can withstand and remain structurally sound].	Strong	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Weak
<i>Mechanical and Electrical System</i> [knowledge on systems at residential and commercial buildings to ensure accuracy of such installed systems].	Strong	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Weak
<i>Material, Method and Equipment</i> [specific knowledge on the equipment, knowledge on the construction system and sustainability].	Strong	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Weak

Instructions: Rate the level of behavior you feel is very necessary in line of importance for an individual project manager participating in a team at a construction company on each of the following nine dimensions (Belbin's team role inventories clustered behaviors).

Write the level from 1 to 5 next to the description that best represents the strength or intensity of the value adding behavior. 1 being the clustered behavior you highly recommend and 5 least recommended in line of importance.

There are no right or wrong answers.

	Rate 1 to 5
<i>Shaper</i> [highly goal oriented, assertive & very directive management style, competitive & like to win, courageous & decisive leadership style, argumentative & even aggressive].	
<i>Implementer</i> [high level of self-control & discipline, prepared to work hard & ensure things are done systematically, loyal to their organization, inflexible on accepting new ways of doing things].	

<i>Completer Finisher</i> [have attention to detail, strive for perfection, trusted to do work with high standard & on time].	
<i>Coordinator</i> [help others to work towards shared goals, delegate readily, spot individual talents & use them for the pursuit of group objectives, broad outlook & perspective, sometimes manipulate others to achieve their objectives].	
<i>Team worker</i> [mild, sociable, supportive & concerned about others, flexible to adapt to situations & people, diplomatic, caring, good listeners, at difficult solo decisions they tend to create harmony and avoid conflict].	
<i>Resource Investigator</i> [natural communicators, negotiators inside & outside the company, adapt new opportunities & develop contact, picks up others idea and promotes it, find out what is available, relaxed people who see possibilities in anything new].	
<i>Plant</i> [innovators, inventors & highly creative, provide original ideas, prefer to operate by themselves, react strongly to criticism & praise].	
<i>Monitor Evaluator</i> [serious-minded, likely to be slow in making decision preferring to carefully think things over, high critical thinking ability, deal by facts & logic rather than emotion, analyse problems & evaluate ideas, good at weighting pro's and con's of options].	
<i>Specialist</i> [special love of learning & accumulation of knowledge, an expert to turn to at help & guidance, usually try not to be involved at unstructured meetings].	