ASSESSMENT OF KEY COMPETENCIES FOR PROJECT MANAGERS IN CONSTRUCTION PROJECTS

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L. B. S. K Mendis

Department of Civil Engineering

University of Moratuwa

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ASSESSMENT OF KEY COMPETENCIES FOR PROJECT MANAGERS IN CONSTRUCTION PROJECTS

BY

Liyana Bigunuwan Shehan Kumara Mendis

Supervised by

Dr. Chandana Siriwardana

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Department of Civil Engineering

University of Moratuwa

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

ABSTRACT

Purpose of this study was to identify the key competencies of a project manager who has the responsibility of project success. Literature survey was conducted to identify the Project Manager's competency profile towards project success.

Expert interviews were conducted to design the questionnaire survey and validate the competencies identified from the literature. Web-based questionnaire was circulated among Team Leaders, Project Directors, Project Managers and Engineers in Sri Lankan construction industry. They were requested to rank the 57 competencies for an effective project manager, based on their experience, 66 completed questioners were returned and used for analysis.

It was identified that Communication skill under the category of Leadership Competencies as the most important competency followed by Analytical thinking skill under the category of Technical Competency and Leadership skill under the category of Leadership Competencies. Results of this research can be used as a guideline to select project managers for projects as well to design training programs for project managers in order to develop their competencies.

Respondents perception of the ranking of competencies also evaluated, and results showed that there is a strong relationship between Technical and Leadership competencies. The analysis conducted to check the relationship between project managers work experience and their competency ranking found that the mean-variance was not significant.

Keywords: Project Management, Construction Industry, Competency, Sri Lanka

CHAPTER ONE

1. INTRODUCTION TO THE RESEARCH

1.0. Background

Sri Lanka is a middle-income country, and in the process of the development of such a country, it has been identified that development of infrastructure plays a major role. After the conflict period in the country for almost thirty years, the governments have focused mainly on infrastructure development by introducing various construction projects all over the county. Expressways, Powerplants, Reservoirs, Airports etc. are examples for massive projects. As well as government agencies, local and international private companies also heavily invest in the construction industry due to the growing demand.

Successful completion of those projects would be highly expected in terms of cost, time and quality. Massive investments are made by both public & private sector with the emergence of the peaceful environment in the country. Success or failure of these complex projects are highly dependent on the set of skills used by the Project Manager who leads the project. Therefore, the selection of correct Project Manager with required skills and competencies is mandatory to get the best outcome in return of the investment. Apart from that identification of the most important competencies will help them to be in-cooperated into the training programs as well as a tool for self-learning.

According to PMI (PMI, 2017), a Project Manager needs to have a good insight about the project. They should be passionate and goal oriented. Project managers should be capable of playing the role of a change agent, and at the same time they should be capable of withstanding the change and complexity in dynamic environments. They require the skill to potentiate the people they are allocated to manage, and capable of capturing the people's skills which will ensure the trust and effective communication between stakeholders and its sponsors

A research conducted in China depicts that the so called "hard" technical skills were given much attention compared to the "soft" skills, which also plays a major role. Even

though the well-known hard skills like planning, follow-up, controlling etc are essential for a PM they will not differentiate the level of excellency a PM can achieve. The soft skills, mainly social competencies are important in order to achieve a higher level of success as a PM (Zhang, Zuo, & Zillante, 2013).

There is a relationship between emotional intelligence and project success where EI plays a role in job satisfaction and gaining the trust of the followers which links it to the success of the project (Rezvani, et al., 2016).

It has highlighted that competencies of PMs should be identified and need to be included in training programs as well as in learning materials to achieve a satisfactory level of understanding regarding these competencies among relevant people (Ramazani & Jergeas, 2014)

Many organizations in construction industry are interested in establishing the competencies of their Project Managers since the project's success is highly dependent on its manager competencies

Therefore, a study focused on the competencies of project managers in construction projects in Sri Lanka will reveal the key competencies necessary for this field within the context of Sri Lanka.

1.1. Problem Statement

Client, consultants, contractors, government officers, community, labourers and project team members comprise the number of stakeholders who has a direct or indirect influence toward the project and its final result. Hence it is the project manager who has to manage these numerous stakeholders to get things done even though he/she may have little or no direct influence over certain stakeholders (El-Sabaa, 2001).
In this complex and unpredictable environment, project managers have an important role to be the hub that integrates all project components and propel them towards successful delivery of the project. A set of skills are needed for project managers to undertake such complex but an important responsibility.

Construction companies' revenue highly depends on the projects that they have undertaken. Since the project success is highly depended on project managers competencies, most of the organizations are interested in developing project manager competencies.

However, with the increasing demand of PM's for construction projects, the need of more researches to identify the critical competencies that will be used for appointing new PM's or implement programs for competency development of current PM's is crucial.

1.2. Structure of the dissertation

The study is divided into five chapters

Chapter 1 – Introduction; This chapter presents the background, aim, objectives, scope and limitations to the study.

Chapter 2 – Literature Review; This chapter presents the theoretical background of the study. It includes past studies which were conducted related to the competencies of project managers.

Chapter 3 – Research Methodology; This chapter explains the research methodology including sampling, data collection and statistical analysis methods and limitations

Chapter 4 – Data Analysis; This chapter presents the analysis of the data collected from the questionnaire survey.

Chapter 5 – Conclusion and Recommendations; This chapter presents the summary conclusion and recommendations of the study.

1.3. Research Objectives

The purpose of this research is to study the key competencies of construction project managers which will be helpful to produce a confident and productive project manager to drive the project towards success. Also, to provide recommendation for institutes regarding the required competencies of a project both at undergraduate and

postgraduate levels. This can also be used during interviews of project managers during the initial phase of the project.

Main objectives are as follows;

1. Identify the key competencies of the project managers in the construction industry
2. Identify the most important skills for project managers.
3. Prioritize the identified key competencies
4. Identify the relationships between key competency areas

1.4. Research Questions

To achieve the above objectives following research questions were identified;

1. What are the competencies identified for project managers from previous studies?
2. What are the competencies of project managers outlined for the success of construction projects in Sri Lanka?
3. What are the project managers perception regarding the important competencies within the context of Sri Lanka?

1.5. Limitations of the Study

This study was limited to the construction industry in Sri Lanka, therefore generalizing the findings of this research for other industries and global context may be questionable. Due to the busy schedules of Project Managers, they were hard to reach and busy with their duties. Most of the time, the response rate for the questioners' survey and interviews were very low, although to an acceptable level. Data gathering period through questionnaire survey and interviews were controlled to the period of this study, which may affect the quality of the data collected.

CHAPTER TWO

2. LITRITURE REVIEW ON PROJECT MANAGERS COMPTENCIES

2.1. Introduction

This chapter demonstrates the theoretical background and previous studies on the competencies of project managers. The main variables of project managers' competency study; Technical Competency, Leadership Competency and Strategic & Business Management competency (PMI, 2017) are displayed together with definitions and historical roots of project management.

2.2. Evolution of Project Management

Even though project management has been in practice for hundreds of years (PMI, 2017), there are very little documentations regarding methodologies or techniques before the 1950s. The field of project management was greatly contributed by the U.S Navy towards the modern project management methodologies and techniques which are practised nowadays. (Seymour & Hussein, The History Of Project Management, 2014).

There are numbers of great ancient constructions in Sri Lanka such as Buddhist pagodas, Giant Canal and Ancient Reservoirs. Pyramids of Giza, The Great wall of China, Taj Mahal and Panama Canal are few, among the impressive ancient construction projects in the world which were believed to be the outcome of ancient leaders and managers who used their project management practices, principles, processes, tools, and techniques (PMI, 2017). Mark Kazak-Holland argues that those great ancient projects would not have succeeded without a good understanding on project management principles. (Kozak-Holland, 2011).

Completion of such great projects opened up the way to next historic project and the progressive advancement of knowledge, skills, tools and technics; ultimately resulted in evolution of modern project management. (Seymour & Hussein,2014).

2.3. Definitions of Key Words

Project: There are number of definitions to describe project and its nature. Leading project management institution definitions are as follow;

> "A temporary endeavor undertaken to create a unique product, service or result" (PMI, 2017)
>
> "A project is a time and cost constrained operation to realize a set of defined deliverables (the scope to fulfill the project's objectives) up to quality standards and requirements" (IPMA, 2006)
>
> "Unique, transient endeavors, undertaken to achieve a desired outcome" (APM, APM Body of Knowledge, 2006)
>
> "Project is a unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraints of time, cost and resources" (ISO10006, 2003)

Project Manager (PM): A person who has the overall responsibility for the successful initiation, planning, design, execution, monitoring, controlling and closure of a project

Competency: Various researches and project management organizations defined competency in different ways, few of those definitions are stated below;

"A competency is an individual's underlying characteristic that is causally related to effective performance in a job or situation" (Liikamaa, 2015)

"Underling characteristics of the person that leads to or causes effective or superior performance" (Boyatzis, 1982)

"Competence can be defined as a cluster of related knowledge, attitude, skills, and other personal characteristics that affect a major part of one's job, correlates with performance on the job.." (Cartwright & Yinger, 2007)

It can be concluded that competency is a predicted behavior of an individual who utilize motives, traits, self-concept, social roles and knowledge, to get the things done. (Liikamaa, 2015)

Project Management: Leading project management institutions defined Project Management as follows;

"The application of knowledge, skills, tools and techniques to project activities to meet the project requirements" (PMI, 2017)

"The process by which projects are defined, planned, monitored, controlled and delivered such that the agreed benefits are realized" (APM, APM Body of Knowledge, 2006),

"The application of processes, methods, knowledge, skills and experience to achieve the project objectives" (APM, 2012)

"The total framework of practical professional capability to deliver a project product meeting a given mission, by organizing a dedicated project team aware of due diligence, effectively combining the most appropriate technical and managerial methods and techniques and devising the most effective and effective work breakdown and implementation routes" (PMCC, 2002)

Project Success: Traditional "Iron triangle" consists of time, cost and quality can be expanded to define project success by adding stakeholder satisfaction, benefits to organization that owns the project, and long-term impacts on project environment. (Mladen Radujković, 2017).

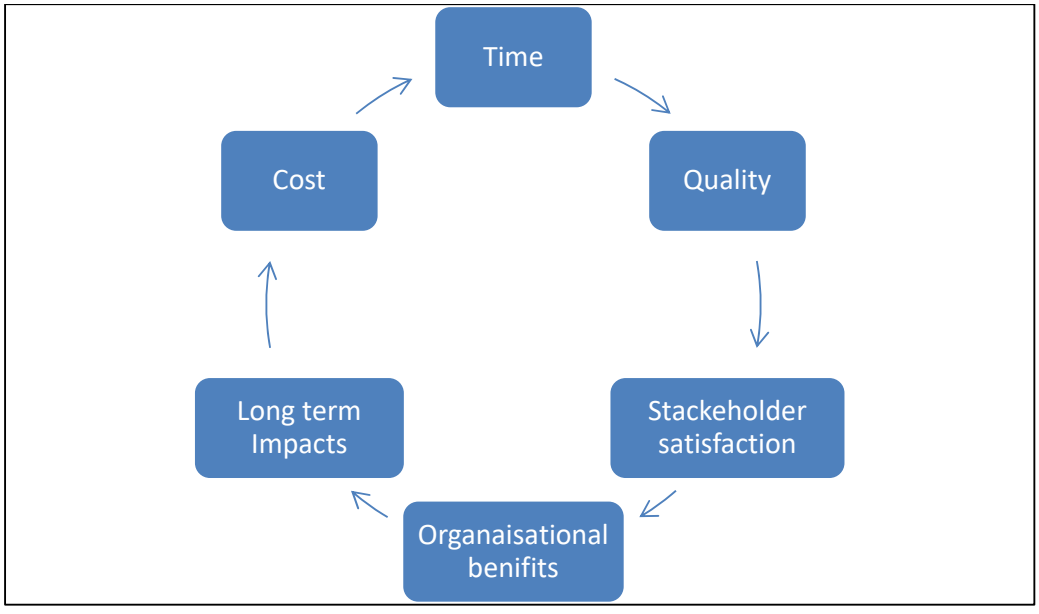


Figure 1.1: Project Success Criteria

Project failure: If a project does not achieve its project objectives with respect to time, cost, quality, stakeholder satisfaction, organizational benefits and adverse long-term impacts is known as project failure.

Project Success Factors: According to (Radujković & Sjekavica, 2017) Project manager's competence, Project team's competence, Organization competence and Project management methodologies, methods, tools and techniques are the success factors of the project.

2.4. Role of the Modern Project Manager.

According to PMI a project manager needs to have a good insight about the project. They should be passionate & goal oriented. Project managers should be capable to play the role of a change agent & in the same time they should be capable to withstand the change and complexity in dynamic environments. They require the skill to potentiate the people they are allocated to manage, capable of capturing the people's skills which will ensure the trust and effective communication between stakeholders & its sponsors.

Project manager should be good enough in all aspects with regards to knowledge, skills & personal characteristics in order to lead the project toward success. For a project manager to be competent enough knowledge in all aspects regarding the subject is essential. But knowledge is not the only thing that matter as there are some PMs with more experience and little background on technical knowledge regarding construction projects. Therefore, skills and personal characteristics do play a major role in the makeup of a successful PM. Especially since a project is not a static thing but a dynamic process a person's' ability to withstand changes and adapt accordingly which could be a characteristic feature of a person is extremely helpful (Alias, Baharum, & Idris, 2012).

Project management is not a static process it is dynamic process with the ultimate target of achieving the objectives of the project. It is composed of leadership, management skills, ability to work efficiently with different stakeholders and ability

of decision making. A project can fail entirely due to appointment of a wrong PM (Jeffrey & Kharbanda, 1995).

Project manager has to play the role of leader, the manager, the facilitator and the mentor concurrently (Flannes & Levin, 2001). Project manager is not a person who has just one task assigned to perform. He/she must perform different roles at the same time. Cost, time. Quality and scope are the four important factors which affect the success of a construction project and a PM need to possess the ability of giving the leadership to his team for which effective communication is essential. Because a PM has to communicate with different stake holders to give a clear picture on above mentioned four important factors in order to achieve success in a project (Zulch, 2014). The efficiency of PM is critical to the success of a given project and the therefore they need to acquire and adapt to the competences which are needed to keep in phase with the prevailing demands. It is not only the technical skills which needs to be updated but competencies should also be given attention as it has a direct impact on daily activities and ability to cope up the challenges with regard to timing, resources; which in return affect the productivity of the project (Liikamaa, 2015).

The success of a PM relies on his/her ability to accomplish targets of the given project within the limitation of time and cost which include budget and resources.

Completion of the project within the expected criteria, standard & specifications with the above-mentioned limitations is a challenge that every PM has to face (Muller & Turner, 2007).

Construction industry is based on a project system and management of these projects effectively is the role of a PM. The success of the project solely depends on how good the PM manages the project (Hubbard, 1990). The need of project managers' is in increase and interest on the competencies of a PM is also on demand (Crawford, 2005). The success of a construction project is usually determined before the commencement of the project by well-defined measures on performance. An organization should meet these required demands and for that they must appoint a PM with competencies who is capable of catering the requirements (Omar & Fayek, 2016).

The role of the PM is to guide the project to end up in success. But there are certain differences despite the overall similarities of the role of a PM depending on which sector (public or private) he/she works mainly due to the difference in ownership. Therefore, a PM need to adapt and act accordingly with the circumstances they were

appointed to work with (Jałocha, Krane, Anandasivakuma, & Prawelska-Skrzypek, 2014).

Whatever the type of project a PM is the changing agent of the given project with regard to the success (Crawford, 2005).

Role of the PM is not similar to the role of other managers as a PM has to work with a dynamic process where problems can emerge at any time and solutions should be made then and there to achieve the ultimate desired goal. Management of these unplanned situations denotes the importance of a PM with not only technical knowledge but also a set of competencies to handle such circumstances (Loosemore & Uher, 2003).

A study conducted in Ghana revealed that even in the background of a growing economy where the position of the PM is not well defined yet the importance of such a position is an emerging trend with a promising future as there are evidence that recruiting such a position at the initial stage of design phase results in more success (Ahadzie, Proverbs, & Sarkodie-Poku, 2013).

Apart from managing numerous stakeholders PM has to manage all aspects of the project from problem solving to emotional aspect of work and guide the team to the ultimate goal of project success (Brière S. , Proulx, Flores, & Laporte, 2014).

The construction industry is made complex with the ongoing competitiveness around the whole globe, rapidly changing regulatory mechanisms and the new trends where the need of highly educated competent construction management graduates has come to the limelight (Hasan, Ahamad, & Mohamed, 2011).

PM does not need to be having all the competencies in the world. But he/she should be competent enough to delegate duties among the team members who are competent enough to carry out a specific task (Loufrani-Fedida & Missonier, 2015).

Nowadays where the whole world is concerned about the climate changes and green construction projects are an upcoming trend. A study conducted based on green construction projects revealed even though the background of such projects differs from usual construction projects due to the high cost and lengthy project duration the importance of the role of PM is still crucial for the success of such projects (Hwang & Ng, 2013)

Depend on the sector a PM is recruited; the circumstances which h he/she has to work may change. As in public sector they have to work in projects which are solely result oriented and the influence of politics is more or less high when compared to the private sector (Jałocha, Krane, Anandasivakuma, & Prawelska-Skrzypek, 2014).

In a study based on construction projects at Poland the researchers identified that the competencies of the PM are strongly linked to the utmost outcome of the project. Since construction industry nowadays is mainly build upon projects and it is the source of revenue to the organization success of the project is extremely important (Dziekoński, 2017).

PM is the central character of any construction project who holds each and every part/aspect of the project in correct place which includes human resources too Thus it denotes the high level and wide variety of competency such a person should have in his/her hand to drive the project towards success (Skitmore, 2004).

2.5 Previous studies of project managers competencies

"Competencies are often difficult to define and measure due to the multidimensional and subjective nature of their assessment" (Omar & Fayek, 2016)

Defining "competency" is not an easy task as it is a term used widely and incorporating all these meanings all together is impossible. (Winterton & Delamare, 2005).

(Boyatzis, 1982) suggested a model for managerial competence. It depicts how the organizational circumstances and the role of a manager is interconnected and the behavior and the functions of these interconnections. According to Boyatzis competence could be a skill, intentions, behavioral pattern of a person or the knowledge he/she possess.

Competency of an individual is the capability of achieving superior performance (Deist & Winterton, 2007). Competency is an underline characteristic of an individual which he or she use. "It could be a motive, trait, skill, and an aspect of individuals self-image or social role"

It is identified that core competencies are the most important for both the individual and the company (Jałocha, Krane, Anandasivakuma, & Prawelska-Skrzypek, 2014)

Core competency of an organization is what a particular organization is well known with regard to its function. Core competency of a professional is the skill that particular position holder should bear in order to achieve the task assigned (Herling & Provo, 2000). Individual competency is not merely a one thing but a collection of many things consists of factual knowledge, skills, experiences, attitudes, and value judgments directly related to one's job (Herling & Provo, 2000).

Under behavioural competences the examples are Leadership, Engagement, motivation self-control, assertiveness, relaxation, openness creativity, result orientation, efficiency. Under technical competency falls technical competency in the particular subject area. Employees' competences are identified as one of the most precious things for a company. (Alias, Baharum, & Idris, 2012)

Understanding the circumstances, scope, the resource availability, management of different stakeholders and ultimately to achieve project success are the major roles of a PM. In order to perform above mentioned roles, the PM should be armed with all the competencies required to perform the role successfully. Out of all the competencies leadership and communication are important (Zulch, 2014)

It is identified that among hundreds of competences Achievement drive and Leadership, as well as Conflict management and Initiative were the most important ones. Furthermore, analytical thinking, stress management, decision quality was also identified as important. Organizations should be competent to identify what is the most important competency for that specific organization and need to develop it concomitantly (Liikamaa, 2015).

A project manager to be effective he needs to possess good communication skills, ability to adapt and work efficiently in unexpected situations, stress management, the ability to work with his team and also to be skilful at different influence tactics (Jeffrey & Kharbanda, 1995). The project manager should be competent in both managerial competencies as well on emotional competencies. Both these competencies are contributory factors for a success of a project (Muller & Turner, 2007).

Communication skills were denoted as the most important according to the view of contractor. According to Client's view decision making was on the top. To sum up it was identified decision making was the most important skill and least important skill is negotiating (Odusami, 2002). Majority of the industry agents had denoted that time management is the most important skill. Decision making, communication, leadership were the other important skills out of the top five skills. The least important competencies were financial management, risk taking, follow up ability. Organization and technical knowledge were placed in the third position (Farooqui, Saqib & Ahmed, 2008)

There is no general agreement on specificity of competencies in project management. But majority of studies has identified number of competencies which can be categorized into three groups. They are organizational and management competencies, project management or technical competencies and human skills, soft skills or behavioural competencies. Furthermore, certain studies also reveal distinct competencies such as change management, stress management, result oriented project management, & ethical thinking as important features in project management. When it comes to the competencies of a project manager who works in the international development NGO arena it is mainly focused on the ability to work efficiently based on the environment where they were assigned to work. Even though other competencies which are common to most of the PMs like leadership, good communication is important the above-mentioned fact is placed first for such PMs. "International development projects cannot be enforced without the profound acceptance of stakeholders and cannot be financed without accepting donor's conditions. This is particularly important for NGO projects, meaning the behavioural competencies are particular for them."

According to the study out of the competencies identified majority were related to human aspects such as adaptability, set of knowledge, (general, international, intercultural) communication, personal qualities, interpersonal skills, leadership, ethics, and local network & change management. It is found that deficiencies are noted in PMs with regard to interpersonal skills, preparedness to accept and applying new methods (Hasan, Ahamad, & Mohamed, 2011).

According to the "Guide to the project management body of knowledge" which was published by PMI categorized project management competencies into ten basic knowledge areas; scope, time, cost, quality, human resources, etc. It has also classified competencies into three groups; contextual, behavioural and technical.

According to a research done on 2006 there are several project management competencies comprise of the ability to understand project management knowledge areas, leadership skills & business environment (Suikki, Tromstedt & Haapasalo, 2006).

Understanding critical competencies in project-based organizations from a multilevel approach" there are six critical competencies for a project manager; Leadership, the ability to communicate at multiple levels, verbal skills, written skills, attitude & change management.

The competency of an individual PM inevitably affects the level of performance of that particular individual. There are two types of competencies hard and soft. PMs ability of planning, controlling is categorized under hard skills. More emphasis was on hard competencies yet the importance of soft competencies should be taken into consideration (Suikki, Tromstedt & Haapasalo, 2006).

According to a study focused on development pathways for PMs it emphasizes the fact that they should improve their ability of informal & innate learning experiences in practice. It is a competency which enables them to learn reflectively & improve themselves (Savelsbergh, Havermans, & Storm, 2016).

More attention needs on the leadership and communication skills of a PM in order to improve the overall outcome of a project and its benefit towards the construction industry as a whole. Furthermore, they denote the fact that "The Situational leadership style is the best style a project manager may apply during the execution of a project because it adapts a style according to the situation, which allows team members to take responsibility for their work, and allowing them to participate in the decision-making process" (Clutterbuck & Hirst, 2002).PM is the responsible personality who should

work with his team in order to achieve the objectives of the project. Therefore, he needs to possess good leadership qualities to drive the team in the correct pathway (Loosemore & Uher, 2003).

Project manager's leadership style is an important factor for the success of a project. Leadership and motivation were identified as the most important skill and decision making was also noted as important when it comes to the consultant's view. Leadership refers to the capability to make things possible by the team & stakeholders (Brière S. , Proulx, Flores, & Laporte, 2015).

Leaders need to have good communication skills (Zulch, 2014). Communication is not only the language a PM use but also include other nonverbal communication methods such as behaviour, attitude, personality in order to maintain the flow of information the PM should divide the responsibilities within his team. Situational leadership style is the best method to adhere for a PM as the working process is dynamic (Zulch, 2014)

Communication is a foundation function which integrates cost, scope & time to achieve a quality product. There are three communication methods which are important for a project, written, oral & electronic communication (Zulch, 2014). Communication in project management is mainly focused on understanding others (Brière S. , Proulx, Flores, & Laporte, 2015).

Projects do fail as a result of the inability to cope up with the increasing complexity efficiently. "This complexity arises to a great extent from the human factor and a frail understanding of the more complex behavioural aspects in projects, such as the Shadow (the thing a person has no wish to be) A PM who is capable to identify and cope up with it is a valuable quality (Bértholo, 2013).

There are certain common areas to be considered when it comes PMs of both sectors. They are contextual competences, behavioural competencies & technical competences. Under contextual competencies examples are permanent organization Business competence on the branch /sector to which the organization belongs, systems, production & technology, Personnel management, health, security, safety and environment, general finance, general legal knowledge.

In a study focused on emotional competencies it was noted that most important emotional competencies to achieve the objectives of a running project were; influence, self-confidence, teamwork & organizational awareness, adaptability, empathy & achievement motivation (Winter, Smith, Morris, & Cicmil, 2006).

There are job task competencies which is purely depend on the industry in which they are recruited to work. So, job task competencies for the construction industry are unique for the PMs involved in this sector. But the behavioural competencies are somewhat common to all most all the PMs in different industries (Cheng, Dainty, & Moore, 2006).

When it comes to skills the top 5 skills identified in the Malaysian construction industry was project Management Skills, business Skill, management Skills, technical Skills & interpersonal Skills. Personal characteristics also play a major role when it comes to the success of a project. The research has identified that ambitious, energy, flexibility fairness and impartially is some of the key characteristics among them. (Alias, Baharum, & Idris, 2012)

Many studies have been conducted by past researchers, in oreder to identify the skills required from the project managers in perspective of clients, contractors and consultants. Major findings of those researches are listed below;

(Katz, 1974) in the study “Skills of an effective administrator” proposed a three-skill approach as a skill of effective administrator. The skills are technical skills, human skills and conceptual skills. Katz stated that the importance of those skills for all level’s successful administrations as indicated in below Table 2.1.

Table 2.1 – skill of effective administrator (Katz, 1974)

Administrative level	Technical Skill	Human Skill	Conceptual Skill
Lower	✓		
Higher	✓	✓	
Top		✓	✓

(Goodwin, 1993) in his study concluded that the project manager's effectiveness will depend on his/her conceptual, human and negotiation skills together with some degree of technical skills according to the discipline in which the project is base on.

Table 2.2 – project managers skills (Goodwin, 1993)

	Technical Skill	Human Skill	Conceptual Skill	Negotiation Skill
Project Manager	✓	✓	✓	✓

(Kerzner, 2002) subjected ten required skills managing complex projects named as n team building, leadership, conflict resolution, technical expertise, planning, organization, entrepreneurship, administration, management support, and the allocation of resources. Managers ability to integrate effective team integrating many disciplines is a key factor to good performance (Kerzner, 2002)

(Odusami, 2002) in his study tested most important skill for effective project manager in construction field and found that the decision making skill followed by communication skill are most critical for project managers as per the overall perspective of clients, contractors and consultants, while contractors think communication, clients think decision making and consultants think leadership and motivation is most critical skill.

Table 2.3 – project managers skills (Kerzner, 2002)

Project Manager's Skill	Overall Rank
Decision making	1
Communication	2
Leadership and motivation	3
Problem solving	4
Time management	5
Organizing	6
Planning and goal setting	7
Technical knowledge	8
Financial management	9
Quality management	10
Listening	11
Delegating	12
Negotiating	13

In a study conducted in Chicago it revealed that for new project managers with less experience who are at the bottom of the ladder scope , time ,cost management skills development is important than leadership skills whereas for experienced project managers who are on the top of the ladder leadership competency is much important.((Sumner & Powell, 2013)

(Farooqui, Saqib, & Ahmed, 2008) in their study stated that time management is the most important project management skill for low level complexity projects and communication and creativity are the skills for medium and level complexity projects respectively.

Table 2.4 – project managers skills (Odusami, 2002)

Project Manager's Skill	Overall Rank
Time Management	1
Communication	2
Decision Making	3
Leadership and Motivation	4
Problem Solving	5
Administration	6
Listening	7
Technical Knowledge	8
Planning and Goal Setting	9
Organizing	10
Quality Management	11
Critical Path Thinking	12
Creativity	13
Negotiation	14
Delegating	15
Personal Adaptability	16
Risk Taking	17
Financial Management	18
Result Orientation	19
Ability to Follow Up	20

(Liikamaa, 2015) In this study evaluate 750 number of project managers for most important competency and find out Achievement drive, Leadership, Conflict management and Initiative are more significant. Categorization of competency group of the study mentioned in Figure 3.1.

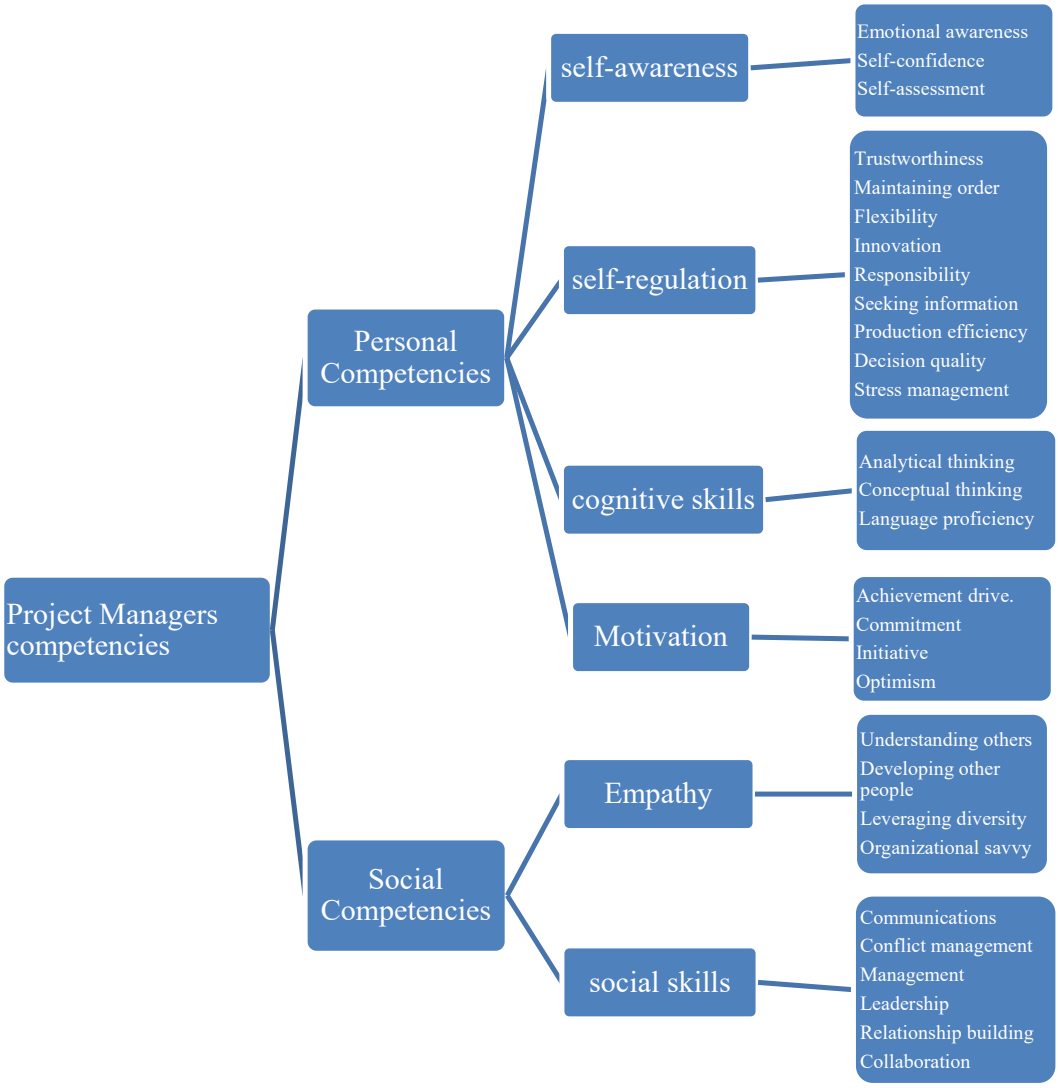


Figure 2.1 – project managers skills (Liikamaa, 2015)

(Dziekoński, 2017) In this study proposed a four-cluster model defined as basic management skills, supporting managerial skills, behavioural manifestations of competence and formal skills for construction project managers.

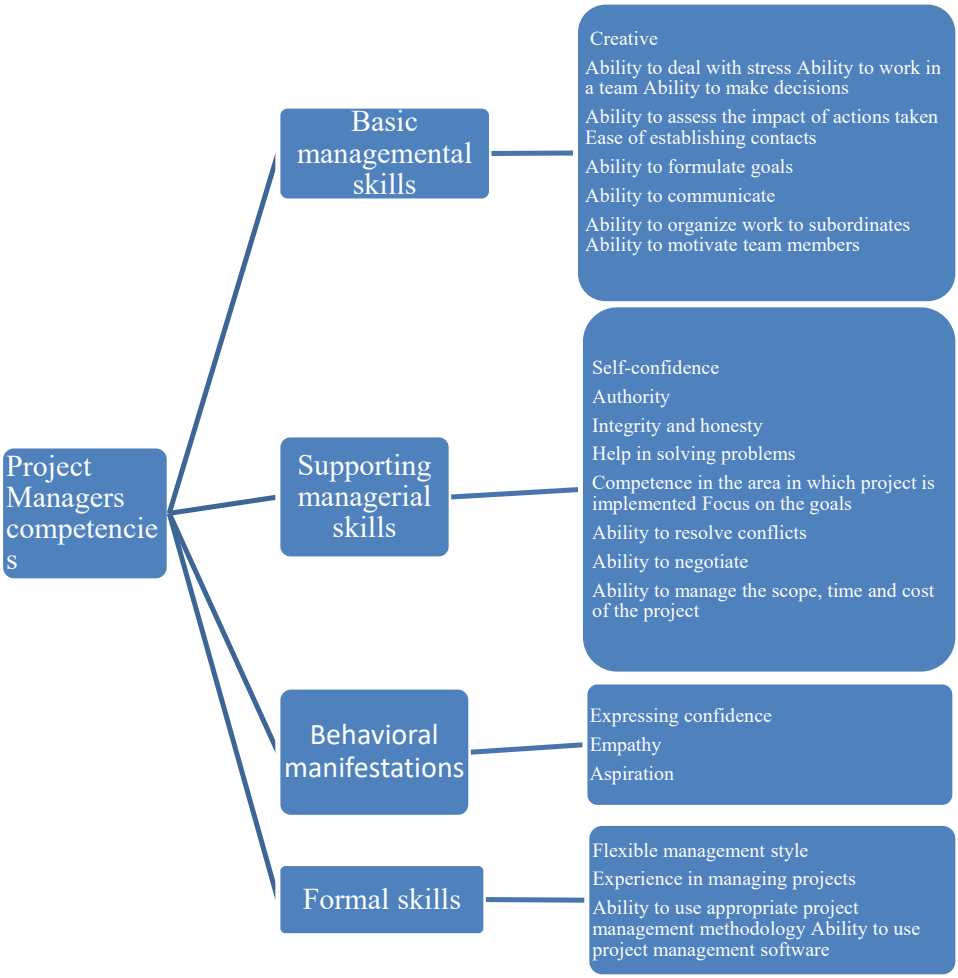


Figure 2.2 – project managers skills (Dziekoński, 2017)

Project Management Institute introduced PMI talent triangle for project managers forcing three key skill sets as Technical project management, Leadership, Strategic and business management (PMI, 2017)

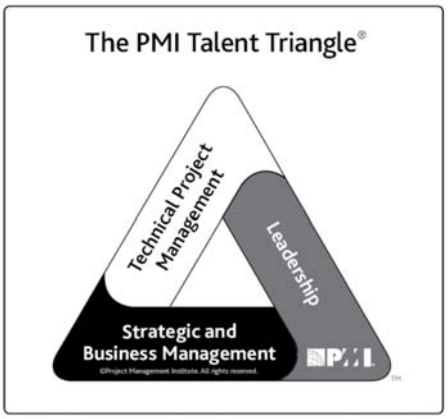


Figure 2.3 – The PMI Talent Triangle (PMI, 2017)

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the methodology adopted in this research and the analysis methods carried out to achieve the project objectives. Data were gathered through online questionnaire survey which was produced based on detailed literature review based on journals, books and online articles. Pilot study was conducted before circulating the questionnaire to verify the completeness of the and check the validity to Sri Lankan context. questionnaire was distributed among project managers who are working as a project manager and who had worked as project managers previously mainly in Sri Lankan construction industry. Data were analyzed using Relative importance index method and Descriptive analysis methods.

3.2. Formulation of questionnaire

Competencies identified form literature were categorized into three groups - technical skills, leadership skills and Strategic & Business Management Skills (PMI, 2017) and validated through expert interviews during pilot study. questionnaire consist with four section. First section of the questionnaire was to find demographic data of respondents, second section for technical competencies, third section for leadership competency and forth section for strategic & business management competency. Composition of the questionnaire is tabulated in Table 3.1.

Table 3.1 – Number of questions for test competencies

Questionnaire Sections	No of Questions
Respondents details	06
Technical	14
Leadership	29
Strategic & Business Management	14

List of competencies used for questionnaire survey is presented in Appendix – B. Respondents were requested to categories the competency in Likert scale based on his/her experience. Five-point scale yield betta quality data than seven and eleven scale (Revilla, Saris, & Krosnick, 2014) ,therefore following five scale responses used in questioner.

1. Strongly disagree
2. Disagree
3. Neither
4. Agree
5. Strongly agree

Relatively Important Index (RII) was computed and find the ranking of the competencies.

$$\text{Relative Importance Index (RII)} = \frac{\sum w}{AN} = \frac{5n5 + 4n4 + 3n3 + 2n2 + 1n1}{5N}$$

Where w is the weighting given for each factor by respondent from the scale 1 to 5 (‘1’ is Strongly disagree to ‘5’ is Strongly agree), A is the highest weight (5 for the study), N is the total sample size. ‘n1’ is the number of respondents how strongly disagree and n2 number of respondents who disagree, n3 number of respondents who select neither, n4 is the number of respondents who agree and n5 is the number of respondents who strongly agree.
Relatively Important Index ranges from 0 to 1 were 0 is strongly disagree to 1 is strongly agree.

Questionnaire was designed and hosted in Google survey platform and it is attached in the Appendix A. Total of 66 completed questioners collected from both private and public sector project managers who had experience in project management, were evaluated in this research.

3.3. Pearson Correlation analysis

Pearson correlation analysis was conducted to find the relationship between three competency sections Figure 3.1. Scatter plots were plotted to present the relationships and relationship was calculated according to the Table 3.2

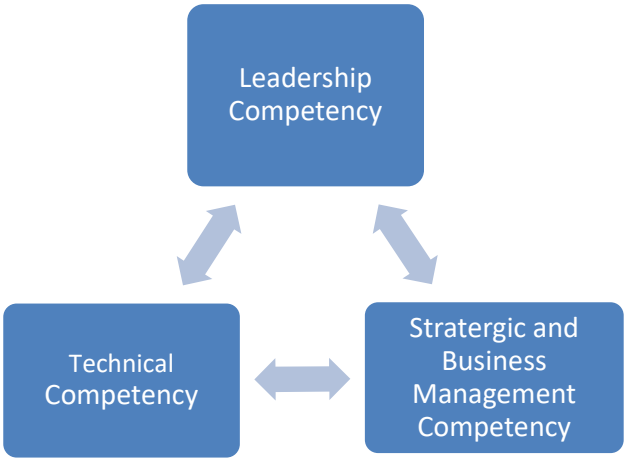


Figure 3.1 – Competency relationship

Following formula was used to calculate relative score of each respondent

$$\text{Relative Score} = \frac{\sum qi}{AN}$$

Where, qi is the score given by each respondent for the competency. A is the highest weight (5 for the study), N is number of questions for competency sections (For this study 14 for Technical competency, 29 for Leadership competency and 14 for Strategic and business management competency)

To check the relationship of each respondent's selection of the competency category following Hypothesis were conducted;

H_o = There is no significant relationship among competency categories

H_1 = There is significant relationship among competency categories

Significance Interval = 0.05

Table 3.2 – Interpretation of Pearson Correlation

Size of Correlation	Strength of Correlation
0.90 to 1.0	Very high
0.70 to 0.90	High
0.50 to 0.70	Moderate
0.3 to 0.50	Low
0.00 to 0.30	Negligible

3.4. One-way ANOVA analysis

One-way ANOVA analysis was conducted in Minitab software to check respondent's experience vs affect to rating of each competency categories. To check whether there were any significance in the mean following Hypothesis were conducted.

H_o = There is no significant difference of experience category means

H_1 = At least one mean is different

Significance Interval = 0.05

CHAPTER FOUR

4. DATA ANALYSIS AND RESEARCH FINDINGS

4.1.Introduction.

This chapter comprises the descriptive analysis of the data which was obtained through questionnaire survey as described in previous chapter. Online questionnaire was distributed among 80 Engineers in Sri Lanka, representing public and private sector construction industry. Out of all distributed questionnaires 66 responded. Response rate was 83%, therefore the final sample size was 66 for this study (Appendix B).

Figure 4.1 shows the distribution of respondents' job positions in different managerial section in construction industry. Most responses were received from project managers and there were no responses received from project directors.

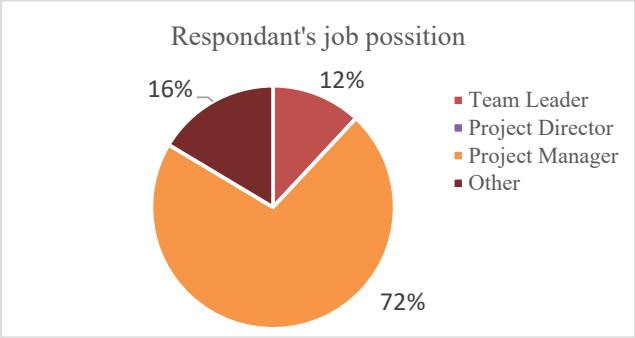


Figure 4.1 – Respondent's job positions

Figure 4.2 shows the distribution of the respondents' career experience as a project manager. Most of the respondents' have 5 years to 9 years of experience and 77% of respondents' have 5 years or more experience as project manager.

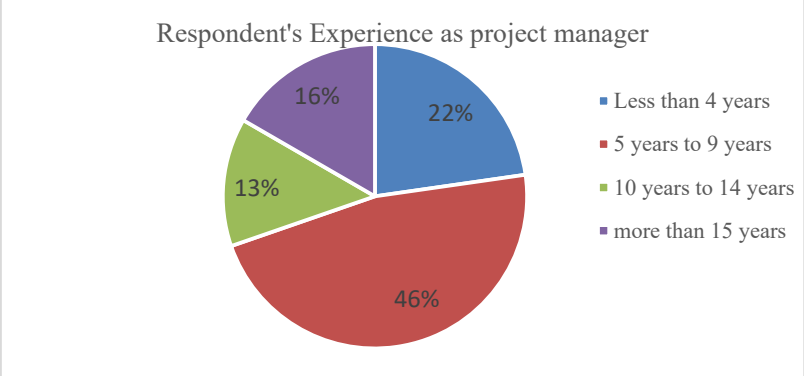


Figure 4.2 – Respondent's Experience as project manager

Figure 4.3 illustrated the educational background of respondents', 52% of the respondents are having

bachelor degrees and 23 % having Master's degree.

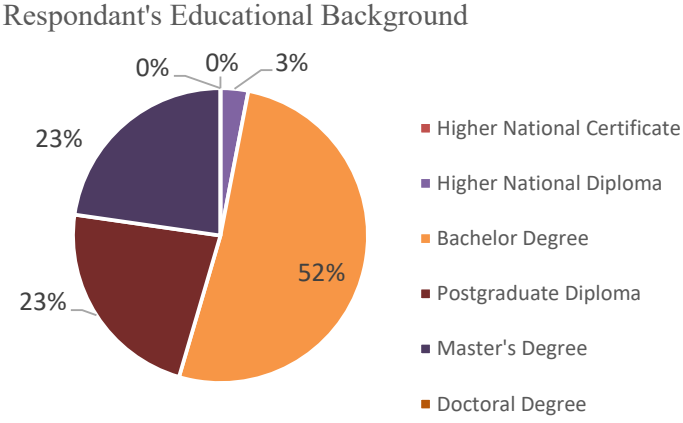


Figure 4.3 – Respondent's Educational Background

Figure shows the gender distribution of the respondents. It can be seen that female participation in the construction industry is relatively less. Responses received for questionnaire are tabulated in Table 4.1, 4.2 and 4.3

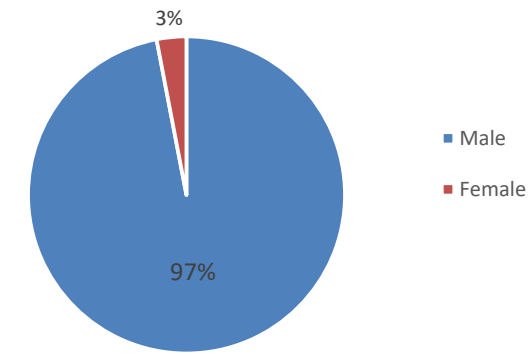


Figure 4.4 – Respondent's gender distribution

Table 4.1 – Rating for Technical competency

No	Technical competency	1	2	3	4	5
1	Ability to use Project Management Software	5%	3%	23%	56%	14%
2	Language proficiency	6%	3%	9%	32%	50%
3	Inter-organizational learning competence	0%	0%	0%	68%	32%
4	Technical Knowledge	0%	0%	9%	41%	50%
5	Production efficiency	0%	0%	5%	45%	50%
6	Analytical thinking	0%	0%	5%	27%	68%
7	Critical Path Thinking	0%	0%	0%	41%	59%
8	Public administration	0%	0%	18%	32%	50%
9	Financial Management	0%	0%	5%	41%	55%
10	Data gathering and modelling	0%	0%	32%	45%	23%
11	Quality Management	0%	0%	9%	61%	30%
12	Seeking information	0%	0%	9%	64%	27%
13	Apply office policies	0%	0%	14%	67%	20%
14	Legal and cultural awareness	0%	0%	14%	55%	32%

Table 4.2– Rating for Strategic and Business management Competencies

No	Strategic and business management	1	2	3	4	5
1	Ability of Work with the stakeholders and subject matter experts	0%	5%	9%	53%	33%
2	Organizing	0%	0%	8%	53%	39%
3	Ability to Explain essential business aspects	0%	0%	12%	52%	36%
4	Broad view of company operations	0%	9%	11%	65%	15%
5	Develops long-term relationships with clients	0%	0%	30%	65%	5%
6	Keep current with laws, regulations, policies, trends	9%	14%	11%	61%	6%
7	Diversity awareness	0%	5%	17%	55%	24%
8	Risk Taking	0%	0%	24%	58%	18%
9	Interacts socially with stakeholders.	0%	0%	11%	65%	24%
10	Knows the orientation of senior management	0%	0%	14%	62%	24%
11	Determines who makes decisions in the company	0%	0%	53%	38%	9%
12	Organizational savvy	0%	9%	20%	53%	18%
13	Client's benefits are given highest priority	0%	9%	15%	62%	14%
14	Ability to analyze political support and opposition	0%	5%	24%	55%	17%

Table 4.3 – Rating for Leadership competency

No	Leadership Competency	1	2	3	4	5
1	Ability to assess the impact of actions taken	0%	0%	5%	55%	41%
2	Delegating	0%	3%	2%	41%	55%
3	Communication	0%	0%	0%	27%	73%
4	Leadership and motivation	0%	0%	0%	41%	59%
5	Flexibility	0%	0%	5%	50%	45%
6	Optimism	0%	0%	9%	68%	23%
7	Creativity	0%	0%	14%	55%	32%
8	Stress management	0%	0%	5%	48%	47%
9	Relationship building	3%	2%	9%	50%	36%
10	Negotiation	0%	0%	5%	36%	59%
11	Decision Making	0%	0%	5%	36%	59%
12	Listening	5%	0%	12%	38%	45%
13	Ability to Follow Up	0%	0%	5%	55%	41%
14	Assertiveness	0%	5%	5%	55%	36%
15	Trustworthiness	0%	0%	14%	36%	50%
16	Self-confidence	0%	0%	5%	36%	59%
17	Accountability	0%	0%	9%	55%	36%
18	Select team based on their expertise.	0%	0%	14%	59%	27%
19	Adapts negotiation skills	0%	0%	0%	68%	32%
20	Responds calmly and appropriately for problems	0%	0%	14%	64%	23%
21	Consults before making decisions.	0%	0%	27%	39%	32%
22	Genuinely values the team	0%	0%	27%	41%	32%
23	Builds informal or casual relationships	5%	5%	11%	64%	18%
24	Planning and Goal setting	0%	0%	5%	64%	32%
25	Emotional awareness	0%	5%	18%	41%	36%
26	Subordinates development	0%	5%	9%	64%	23%
27	Does not hide or attempt to avoid conflicts	0%	5%	14%	77%	5%
28	Makes an effort to treat all team members equitably	0%	5%	33%	27%	32%
29	Exercise power, authority and influence appropriately	0%	5%	14%	59%	23%

4.1.Analysis of the key competencies

In this section key competencies with respect to technical, leadership, strategic and business management categories are evaluated. Respondents rated each attribute in five-point Likert scale. Obtained rankings are shown in Table 4.4, Table 4.5 and Table 4.6 based on Relative Importance Index and mean.

Table 4.4 – Means of leadership competencies

No	Leadership	Mean	RII	Rank	S.D
3	Communication	4.727	0.945	1	0.449
4	Leadership and motivation	4.591	0.918	2	0.495
10	Negotiation	4.545	0.909	3	0.587
11	Decision Making	4.530	0.909	4	0.588
16	Self-confidence	4.515	0.909	5	0.588
2	Delegating	4.470	0.894	6	0.684
8	Stress management	4.424	0.885	7	0.583
5	Flexibility	4.409	0.882	8	0.581
1	Ability to assess the impact of actions taken	4.364	0.873	9	0.572
15	Trustworthiness	4.364	0.873	11	0.715
13	Ability to Follow Up	4.348	0.873	10	0.568
19	Adapts negotiation skills	4.318	0.864	12	0.469
17	Accountability	4.273	0.855	13	0.621
24	Planning and Goal setting	4.273	0.855	14	0.542
14	Assertiveness	4.227	0.845	16	0.740
7	Creativity	4.182	0.836	17	0.654
9	Relationship building	4.152	0.830	18	0.881
12	Listening	4.152	0.830	15	0.976
6	Optimism	4.136	0.827	19	0.552
18	Select team based on their expertise.	4.136	0.827	20	0.630
20	Responds calmly and appropriately for problems	4.091	0.818	21	0.601
25	Emotional awareness	4.091	0.818	22	0.854
22	Genuinely values the team	4.045	0.809	23	0.773
26	Subordinates development	4.045	0.809	24	0.711
21	Consults before making decisions.	4.030	0.806	25	0.784
29	Exercise power, authority and influence appropriately	4.000	0.800	26	0.744
23	Builds informal or casual relationships	3.876	0.773	27	0.904
28	Makes an effort to treat all team members equitably	3.864	0.773	28	0.926
27	Does not hide or attempt to avoid conflicts	3.818	0.764	29	0.579

Table 4.5 – Means of technical competencies

No	Technical competency	Mean	RII	Rank	S. D
6	Analytical thinking	4.64	0.927	1	0.907
7	Critical Path Thinking	4.59	0.918	2	1.117
9	Financial Management	4.50	0.900	3	0.469
5	Production efficiency	4.45	0.891	4	0.656
4	Technical Knowledge	4.41	0.882	5	0.587
3	Inter-organizational learning competence	4.32	0.864	6	0.572
8	Public administration	4.32	0.864	7	0.495
11	Quality Management	4.21	0.842	8	0.768
12	Seeking information	4.18	0.836	9	0.588
14	Legal and cultural awareness	4.18	0.836	10	0.739
2	Language proficiency	4.17	0.833	11	0.595
13	Apply office policies	4.06	0.812	12	0.579
10	Data gathering and modelling	3.91	0.782	13	0.579
1	Ability to use Project Management Software	3.71	0.742	14	0.654

Table 4.6 – Means of strategic and business competencies

No	Strategic and business management	Mean	RII	Rank	S.D
2	Ability of Work with the stakeholders and subject matter experts	4.318	0.864	1	0.769
3	Organizing	4.242	0.848	2	0.612
1	Ability to Explain essential business aspects	4.152	0.830	3	0.658
9	Broad view of company operations	4.136	0.827	4	0.782
10	Develops long-term relationships with clients	4.106	0.821	5	0.535
7	Keep current with laws, regulations, policies, trends	3.985	0.797	6	1.095
8	Diversity awareness	3.939	0.788	7	0.774
4	Risk Taking	3.864	0.773	8	0.653
14	Interacts socially with stakeholders.	3.833	0.767	9	0.579
12	Knows the orientation of senior management	3.803	0.761	10	0.611
13	Determines who makes decisions in the company	3.803	0.761	11	0.659
5	Organizational savvy	3.742	0.748	12	0.845
11	Client's benefits are given highest priority	3.561	0.712	13	0.789
6	Ability to analyze political support and opposition	3.409	0.682	14	0.756

Communication skill ranked as most important competency for project managers followed by Analytical thinking, Leadership, and Critical path thinking. Mean attribution of first ten competencies of each sections are shown in Table 4.7; It can be seen that Leadership competency was given relatively highest score. Second and Third ranking was given to Technical competency and strategic and business management competency respectively.

Table 4.7– Relative score and Rank of Competency

Competency	Relative Score	Rank
Leadership & Motivation	4.50	1
Technical	4.38	2
Strategic and Business Management	4.04	3

4.2. Pearson Correlation Analysis

In order to find the relationship among three competency groups, Pearson correlation was computed using Minitab software and results are presented in Table 4.8.

Table 4.8– Correlation Analysis

Competency	Pearson correlation	Strength of Relationship	P- Value
Technical vs and business	0.546	Moderate	<0.05
Technical vs Leadership	0.830	High	<0.05
Leadership vs and business	0.526	Moderate	<0.05

P- Value for all groups are less than 0.05. Therefore, we can reject the null hypothesis (H_0) and adopt there is a relationship between each competency groups. Scatter plots were computed to elaborate the relationship strength of each competency groups Figure 4.5, Figure 4.6 and Figure 4.7. Results of this study shows that there is a high relationship between Technical and Leadership competencies, while moderate relationships were found in Technical vs and Business competencies and Leadership vs and Business competencies.

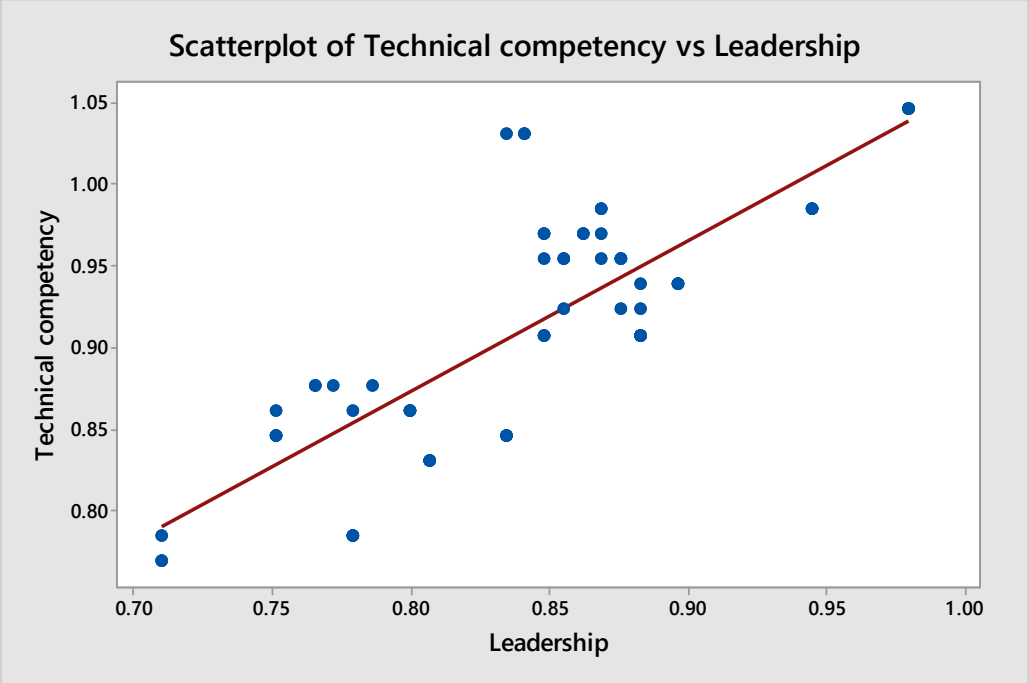


Figure 4.5 – Scatterplot Technical vs Leadership

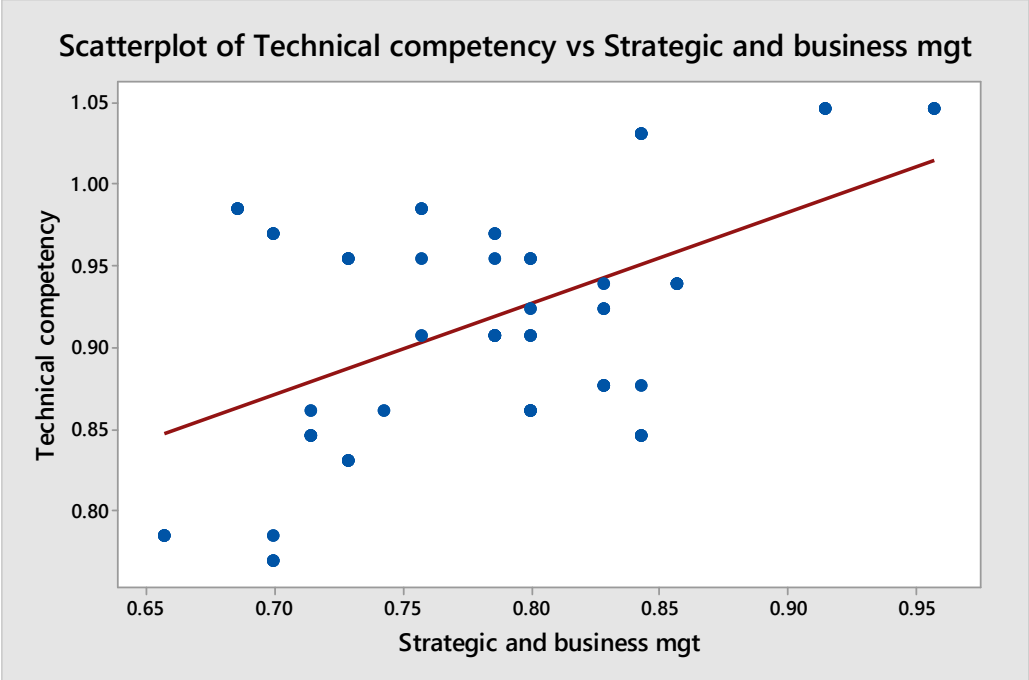


Figure 4.6 – Scatterplot Technical vs Business

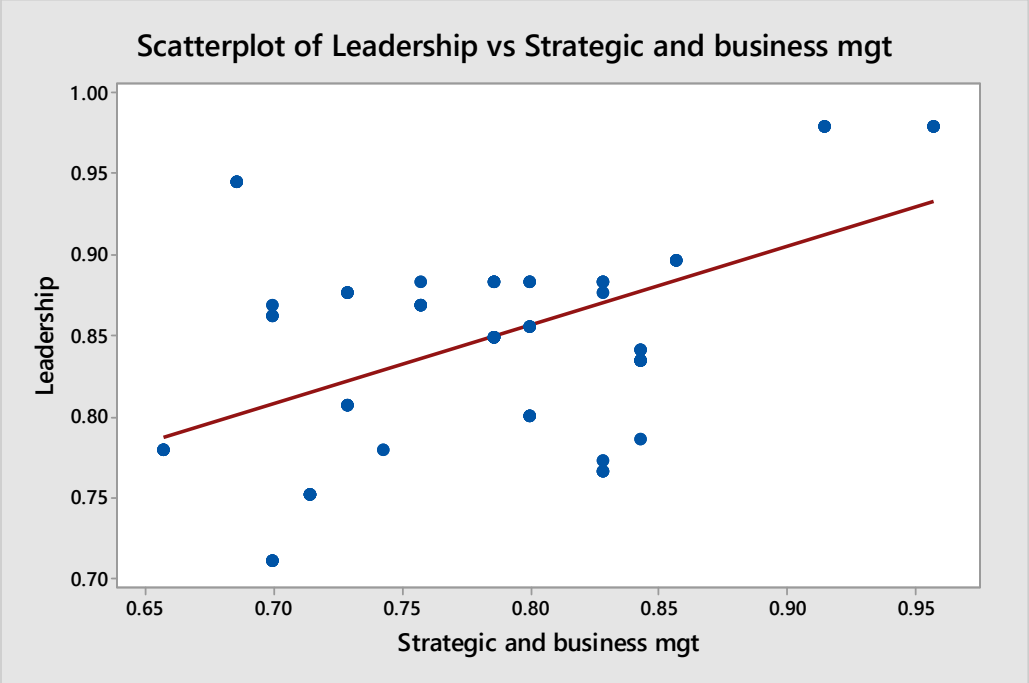


Figure 4.7 – Leadership vs Business

4.3. One-way ANOVA analysis

1. Analysis were done to check whether the respondents work experience was affected to rating of each competency categories. Hypothesis testing was conducted to check the relationship between respondent's experience and rating of Technical competency. Results were tabulated in Table 4.9

Table 4.9 –Technical competency vs Experience

Overall Experience	No of Respondents	Mean	Standard Deviation	95% Confidence Interval	P-Value
Less than 4 years	15	0.9118	0.0924	(0.8724, 0.9512)	P = 0.473 > 0.05
5 years to 9 years	31	0.9181	0.0744	(0.8907, 0.9455)	
10 years to 14 years	9	0.8923	0.0565	(0.8415, 0.9431)	
more than 15 years	11	0.9455	0.0706	(0.8995, 0.9914)	

Since P- value is greater than 0.05 we do not reject null hypothesis (H_0). Therefore, we can say there is no significant difference in mean of Technical rating with respondents' experience at 5% significance. 95% confident intervals plotted in Figure 4.8.

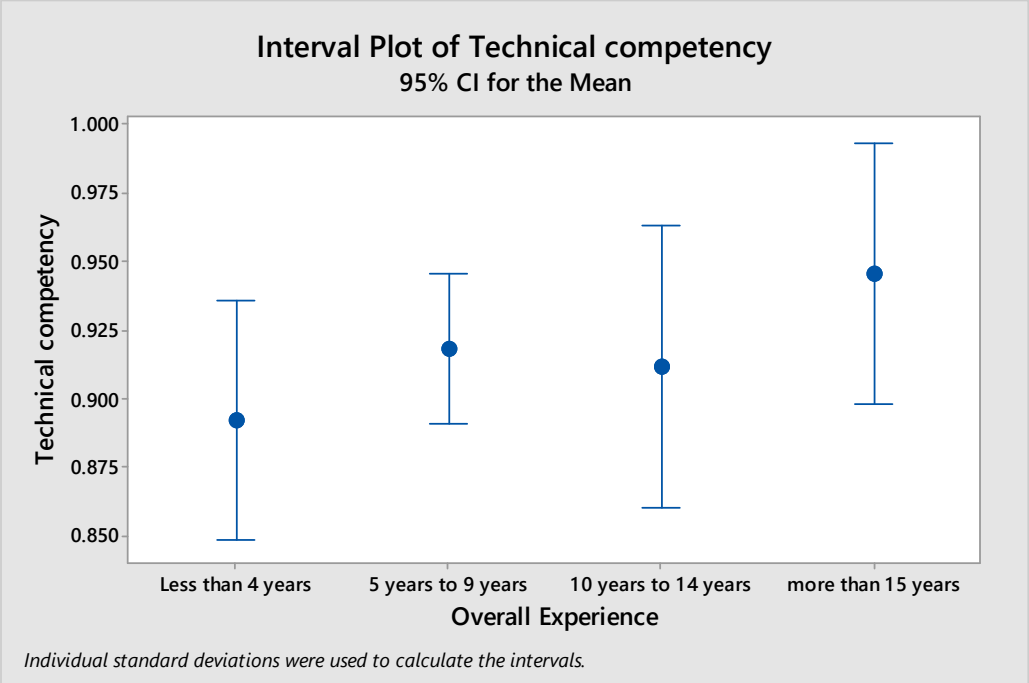


Figure 4.8 – 95% CI mean Technical competency rating with experience

2. Hypothesis test was conducted to check the relationship between respondent's experience and rating of Leadership competency. Results were tabulated in Table 4.10

Table 4.10 –Leadership competency vs Experience

Overall Experience	No of Respondents	Mean	Standard Deviation	95% Confidence Interval	P-Value
Less than 4 years	9	0.8291	0.0612	(0.7834, 0.8749)	
5 years to 9 years	31	0.8572	0.0715	(0.8325, 0.8818)	P = 0.554
10 years to 14 years	15	0.8556	0.0775	(0.8202, 0.8911)	> 0.05
more than 15 years	11	0.8307	0.0501	(0.7893, 0.8721)	

Since P- value is greater than 0.05 we do not reject null hypothesis (H_0). Therefore, we can say there is no significant difference in mean of Leadership rating with respondents' experience. 95% confident intervals plotted in Figure 4.9.

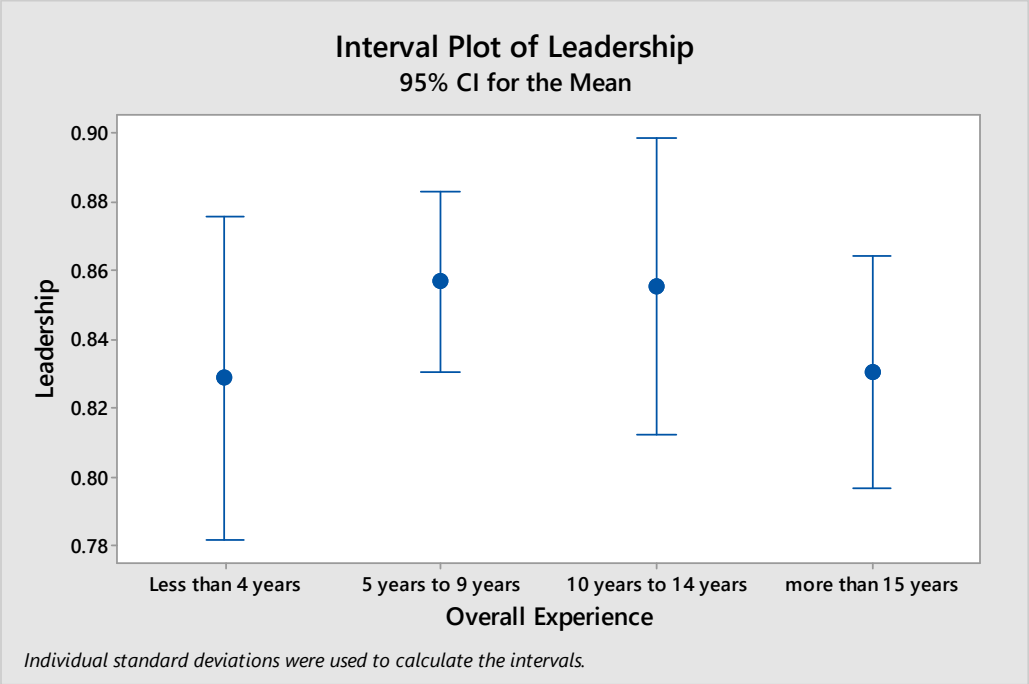


Figure 4.9 – 95% CI mean Leadership competency rating with experience

3. Hypothesis test was conducted to check the relationship between respondent's experience and rating of Business competency. Results were tabulated in Table 4.11

Table 4.11 –Business competency vs Experience

Overall Experience	No of Respondents	Mean	Standard Deviation	95% Confidence Interval	P-Value
Less than 4 years	9	0.8486	0.0836	(0.8170,0.8803)	
5 years to 9 years	31	0.8365	0.0598	(0.8084,0.8646)	P = 0.661
10 years to 14 years	15	0.8680	0.0661	(0.8159,0.9201)	> 0.05
more than 15 years	11	0.8582	0.0635	(0.8237,0.8927)	

Since P- value is greater than 0.05 we do not reject null hypothesis (H_0). Therefore, we can say there is no significant difference in mean of Strategic & Business management competency rating with respondents' experience. 95% confident intervals plotted in Figure 4.10.

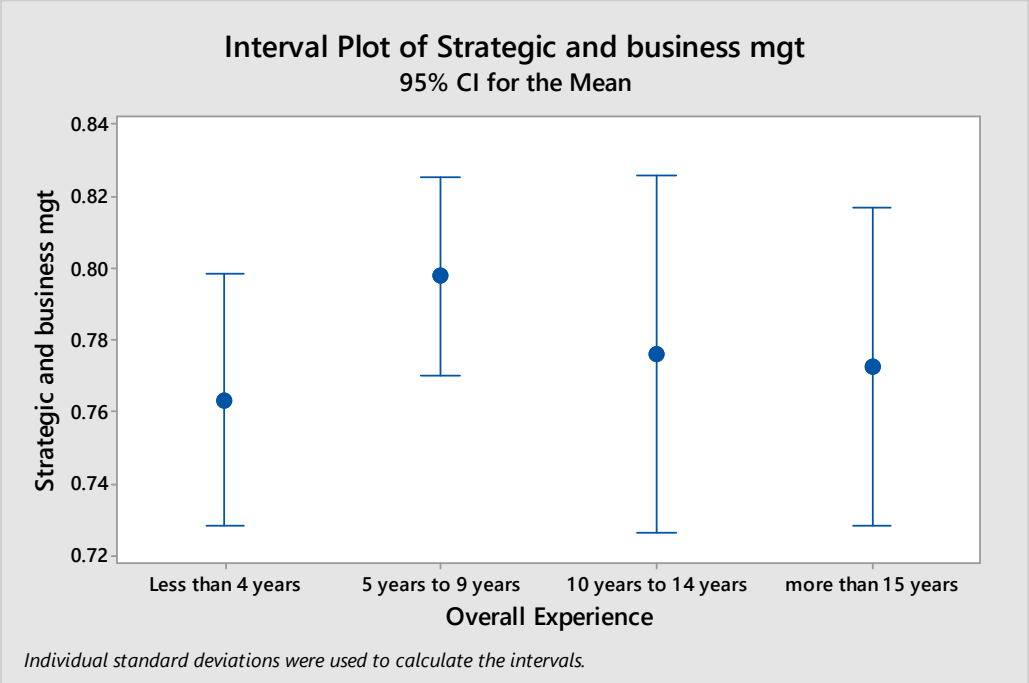


Figure 4.10 – 95% CI mean Leadership competency rating with Experience

CHAPTER FIVE

5 CONCLUTION AND RECOMMENDATIONS

5.1 Introduction

The main objective of this research was to identify the key competencies for construction project managers in Sri Lanka. Literature survey conducted in relation to previous competency studies presented in chapter 2. Questionnaire survey was designed to identify most critical competencies of project managers in construction industry. Research methodology was presented in chapter 3 with explanations to research objectives. In chapter 4 detailed analysis of the data obtained from questionnaire survey was presented. This final chapter concludes the research findings and recommendations from this research.

5.2 Discussion: Competencies for a Project Manager in the arena of construction projects in Sri Lanka.

Key competencies identified in this study showed in Table 5.1

Table 5.1 Key Competencies

Category	Rank	Competency
Leadership	1	Communication Skills
	2	Leadership and Motivation Skills
	3	Negotiation Skills
Technical	1	Analytical Thinking Skills
	2	Critical Path Thinking Skills
	3	Financial Management
Strategic and Business Management	1	Ability to Work with the stakeholders and subject matter experts
	2	Organizing Skills
	3	Ability to explain essential business aspects

Analysis of this research shows highest mean score in Leadership Competencies and next mean was found on Technical competencies and lowest mean was found in strategic and business management competencies as per the perspective of project managers in Sri Lanka

It was identified that communication skills are the most important out of all mentioned overall skills for a project manager. It denotes that project manager has to communicate with all levels of personals within the project as well as outside the project. Also, communication skill required to manage project stockholders effectively in order drive the project forward.

Analytical thinking which came under the category of technical skills was found to be the second highest important skill for project managers. This skill is useful to find effective solutions to problems which project managers have to face in day today work. This skill denotes breaking down problems to subproblems and give rational solutions by analyzing the circumstances.

Leadership and motivation have been identified as the next highest rated competency which takes the overall place of third; that project managers required to possess. Leadership skill is essential to influence and motivate project team to achieve project goals. The soft skill of leadership considered to be highly important to experienced project managers rather than entry level project managers. There are evidences worldwide to denote the importance of leadership for successful project manager, these skills can be developed through actual contribution to projects as well and by incorporating them to skills developmental programs.

The lowest ranked skill in the technical category was the ability to use project management software which was further supported by the literature. According to a survey done in Australia the least important skills were identified as management of legal issues and ability to use the computers/ project management software. (Skitmore, 2004)

In this study relationship between the three competencies; Technical , Leadership, Strategic and business management was also tested and found that there is a strong relationship between Technical and Leadership competencies whereas moderate

relationships among other competency categories Therefore we can that within the context of Sri Lanka the perception of project managers is that with the importance of the technical competency increment of leadership competency is also mandatory.

The analysis conducted to check relationship between project managers work experience and their perspective on competency ranking found that the mean variance was not significant. In other words, it indicates that irrespective of the respondent work experience the ranking of the main competency groups were not affected.

5.3 Recommendation

The findings of this research can be used as a guideline to selecting project managers for projects. Competency assessment tests can be conducted to evaluate project managers based on the complexity of the project.

Competency is a predicted behaviour of an individual who utilize motives, traits, self-concept, social roles and knowledge, to get the things done, also the fact that performances of individual differ from each other. Since success or failure of the project highly depend on its manager it is recommended to enhance and develop project manager's competencies.

Competencies can be gained through training and development therefore constructions companies were recommended to organize competency development programs for their project managers to get the best outcome. They also can follow relevant training programs to improve their skills which they lack in.

Further research also recommended to investigate the relationship of each competency towards project success.

5.4 Limitations to the study

This study was limited to the construction industry in Sri Lanka, therefore generalizing the findings of this research for other industries and global context may questionable. Due to the busy schedules of project managers they were hard to reach and busy with their duties. Most of the time the response rate for the questioners' survey and interviews were very low, although to an acceptable level.

Data gathering period through questionnaire survey and interviews were controlled to the period of this study, which may affect the quality of the data collected. In this study complexity and the cost of the projects were not considered. Therefore, the critical competencies may differ with the project complexity and the cost

REFERENCES

Ahadzie, D. K., Proverbs, D. G., & Sarkodie-Poku, I. (2013). Competencies required of project managers at the design phase of mass house building projects. *International Journal of Project Management*.

Alias, Z., Baharum, Z. A., & Idris, M. F. (2012). Project Management towards Best Practice . *Social and Behavioral Sciences 68*, 108 – 120 .

APM. (2006). *APM Body of Knowledge 5th Ed.* Princes Risborough: Association for Project Management.

APM. (2012). *APM Body of Knowledge.* Princes Risborough: Association for Project Management.

Bértholo, J. (2013). The Shadow in Project Management. *Procedia - Social and Behavioral Sciences*, 358–368.

Boyatzis, E. (1982). *The Competent Manager: A Model for Effective Performance.* Hoboken: John Wiley & Sons.

Brière, S., Proulx, D., Flores, O. N., & Laporte, M. (2015). Competencies of project managers in international NGOs: Perceptions of practitioners. *International Journal of Project Management*, 116-125.

Brill, J. M., Bishop, M., & Walker, A. (2005). The Competencies and Characteristics Required of an Effective Project Manager A Web-Based Delphi Study. *Educational Technology Research & Development*.

Cartwright, C., & Yinger, M. (2007). *Project management competency development framework—second edition.* Budapest: Project Management Institute.

Cheng, M.-I., Dainty, A., & Moore, D. (2006). What makes a good project manager? *Human Resource Management Journal* , 25-37.

Clutterbuck, D., & Hirst, S. (2002). Leadership communication: A status report. *Journal of Communication Management*, 351-354.

Crawford, L. (2005). Senior management perceptions of project management competence, International Journal of Project Management. *International Journal of Project Management 23*, 7-16.

Deist, F. D., & Winterton, J. (2007). What Is Competence? *Human Resource Development International*, 27-46.

Dias, M., Tereso, A., Braga, C. A., & Fernandes, G. (2014, January). *The Key Project Managers' Competencies for Different Types of Projects.* Retrieved

from Researchgate: https://www.researchgate.net/publication/281709169_The_Key_Project_Managers'_Competences_for_Different_Types_of_Projects

Dziekoński, K. (2017). Project Managers' Competencies Model for Construction Industry in Poland. *Procedia Engineering*, 174 â€“ 181.

El-Sabaa, S. (2001). The skills and career path of an e ective project manager. *International Journal of Project Management 19*, 1-7.

Farooqui, R. U., Saqib, M., & Ahmed, S. M. (2008). Assessment of Critical Skills for Project Managers in Pakistani Construction Industry. *International Conference on Construction In Developing Countries*, (pp. 221-234). Karachi.

Flannes, S. W., & Levin, G. (2001). *People Skills for Project Managers.* San Francisco: Management Concepts; 1st Edition edition.

Gale, A., & Luo, J. (2004). Factors affecting construction joint ventures in China. *International Journal of Project Management*, 33-42.

Goodwin, R. S. (1993). Skills Required of Effective Project Managers. *Journal of Management in Engineering*.

Hasan, H. S., Ahamad, H., & Mohamed, M. R. (2011). Skills and Competency in Construction Project Success:Learning Environment and Industry Application- The GAP. *Procedia Engineering 20*, 291 – 297.

Herling, R., & Provo, J. (2000). Knowledge, Competence, and Expertise in Organizations. *Advances in Developing Human Resources* , 1-7.

Hubbard, D. G. (1990). *Successful Utility Project Management from Lessons Learned.* Pennsylvania: Project Management Institute.

Hwang, B. G., & Ng, W. ,. (2013). Project management knowledge and skills for green construction Overcoming challenges. *International Journal of Project Management 31*, 272–284.

IPMA. (2006). *International Project Management Association.* Nijkerk: Netherlands.

ISO10006. (2003). *Quality Management Systems - Guidelines for Quality Management in Projects.* New York: American National Standards Institute (ANSI).

Jałocha, B., Krane, H. P., Anandasivakuma, E., & Prawelska-Skrzypek, G. (2014). Key competences of public sector project managers. *Social and Behavioral Sciences*, 247 - 256.

Jeffrey, K. P., & Kharbanda, O. P. (1995). *Successful Project Managers: Leading Your Team to Success (Industrial Engineering).* New York: Van Nostrand Reinhold.

Katz, R. L. (1974). *Skills of an Effective Administrator.* Retrieved from Harvard Business Review: https://hbr.org/1974/09/skills-of-an-effective-administrator

Kerzner, H. (2002). *PROJECT MANAGEMENT A Systems Approach to Planning, Scheduling and Controlling.* Hoboken: John Wiley & Sons, Inc.

Kozak-Holland, M. (2011). *The History of Project Management.* Multi-Media Publications.

Liikamaa, K. (2015). Developing a project manager's competencies: A collective view of the most important competencies. *Procedia Manufacturing 3*, 681 - 687.

Loosemore, M., & Uher, T. (2003). *Essentials of Construction Project Management.* Randwick : University of New South Wales Press.

Loufrani-Fedida, S., & Missonier, S. (2015). The project manager cannot be a hero anymore! Understanding critical competencies in project-based organizations from a multilevel approach. *International Journal of Project Management*.

MASIELLO, I. (2009). Learning to succeed in European joint projects: The role of the modern project manager – the flow-keeper. *Journal of Interprofessional Care*, 498â€“507.

Mba, M. B., & Agumba, N. (2018). Critical Success Factors of Joint Ventures in the Construction Industry: Literature Review. *21st International Symposium on Advancement of Construction Management and Real Estat* (pp. 597-605). Springer Nature Singapore Pte Ltd.

Mladen Radujković, M. S. (2017). Project Management Success Factors. *Procedia Engineering*, 607 – 615.

Muller, R., & Turner, R. (2007). Matching the project manager's leadership style to project type. *International Journal of Project Management*, 21-32.

Odusami, K. T. (2002). Perceptions of Construction Professionals Concerning Important Skills of Effective Project Leaders. *Journal of Management in Engineering*.

Omar, N. M., & Fayek, R. A. (2016). Modelling and evaluating construction project competencies and their relationship to project performance. *Automation in Construction 69*, 115–130.

Ozorhon, B., Arditi, D., Dikmen, I., & Birgonul, M. T. (2007). Effect of host country and project conditions in international construction joint ventures. *International Journal of Project Management*, 799-806.

PMCC. (2002). *A Guidebook of Project & Program Management for Enterprise Innovation.* Tokyo: Project Management Professionals Certification Center.

PMI. (2017). *A Guide to the Project Management Body of Knowledge (PMBOK Guide).* Pennsylvania: Newtown Square, PA: Project Management Institute.

Project Management Institute, P. (2013). *A Guide to the Project Management Body of Knowledge.* Pennsylvania: Project Management Institute.

Radujković, M., & Sjekavica, M. (2017). Project Management Success Factors. *Procedia Engineering*, 607 – 615.

Ramazani, J., & Jergeas, G. (2014). Project managers and the journey from good to great: The benefits of investment in project management training and education. *International Journal of Project Management*.

Revilla, M. A., Saris, W. E., & Krosnick, J. A. (2014). Choosing the Number of Categories in Agree–Disagree Scales . *Sociological Methods & Research*, 73-97.

Rezvani, A., Chang, A., Wiewiora, A., Ashkanasy, N., Jordan, P., & Zolin, R. (2016). Manager emotional intelligence and project success: The mediating role of job satisfaction and trust. *International Journal of Project Management 34*, 1112–1122.

Savelsbergh, C., Havermans, L., & Storm, P. M. (2016). Development paths of project managers: What and how do project managers learn from their experiences? *International Journal of Project Management*, 559-569.

Seymour, T., & Hussein, S. (2014). The History Of Project Management. *International Journal of Management & Information Systems – Third Fourth*.

Skitmore, M. (2004, January). Project management competencies: a survey of perspectives from project managers in south east queensland. Retrieved from https://www.researchgate.net/publication/27465322_Project_management_competencies_a_survey_of_perspectives_from_project_managers_in_South_East_Queensland: https://www.researchgate.net/publication/27465322_Project_management_competencies_a_survey_of_perspectives_from_project_managers_in_South_East_Queensland

Sumner, M., & Powell, A. (2013). What Project Management Competencies are Important to Job Success? *Americas Conference on Information Systems AMCIS.* Chicago.

Sunindijo, R. Y. (2015). Project manager skills for improving project performance. *International Journal of Business Performance Management* , 67-83.

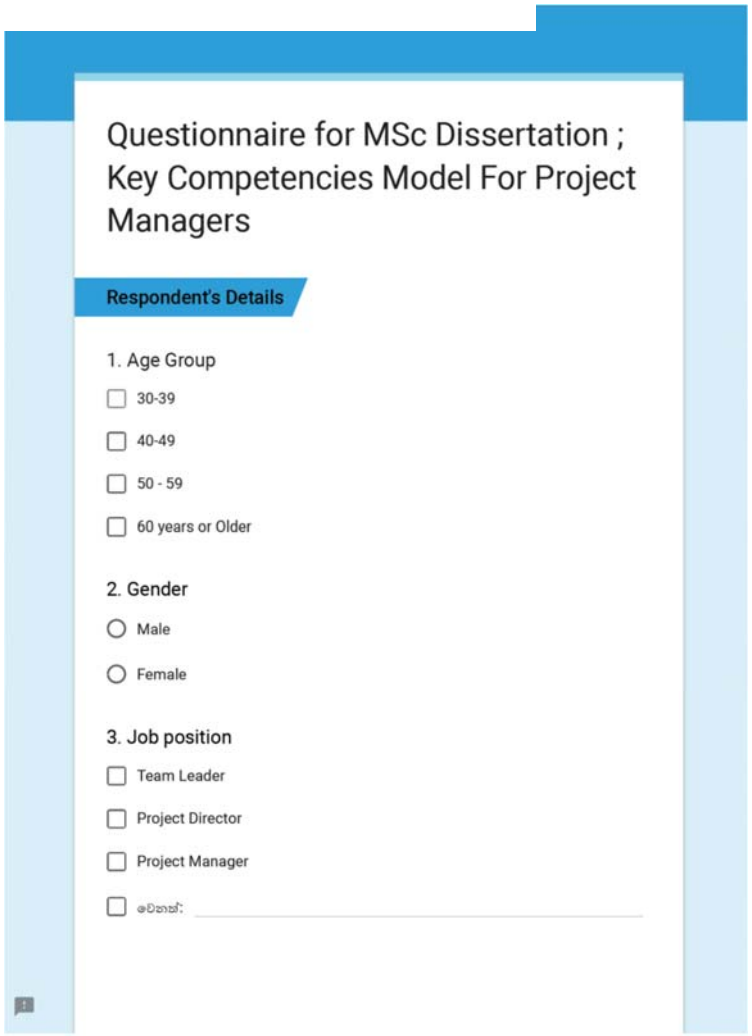
Winter, M., Smith, C., Morris, P., & Cicmil, S. (2006). Directions for future research in project management: The main findings of a UK government-funded research network. *International Journal of Project Management*, 638-649.

Winterton, J., & Delamare, L. D. (2005). What Is Competence? Human Resource. *Human Resource Development*, 27 – 46.

Zhang, F., Zuo, J., & Zillante, G. (2013). Identification and evaluation of the key social competencies for Chinese construction project managers . *International Journal of Project Management 31*, 748 – 759.

Zulch, B. (2014). Leadership communication in project management. *Procedia - Social and Behavioral Sciences 119*, 172 – 181.

Appendix - A



Questionnaire for MSc Dissertation ; Key Competencies Model For Project Managers

Respondent's Details

1. Age Group

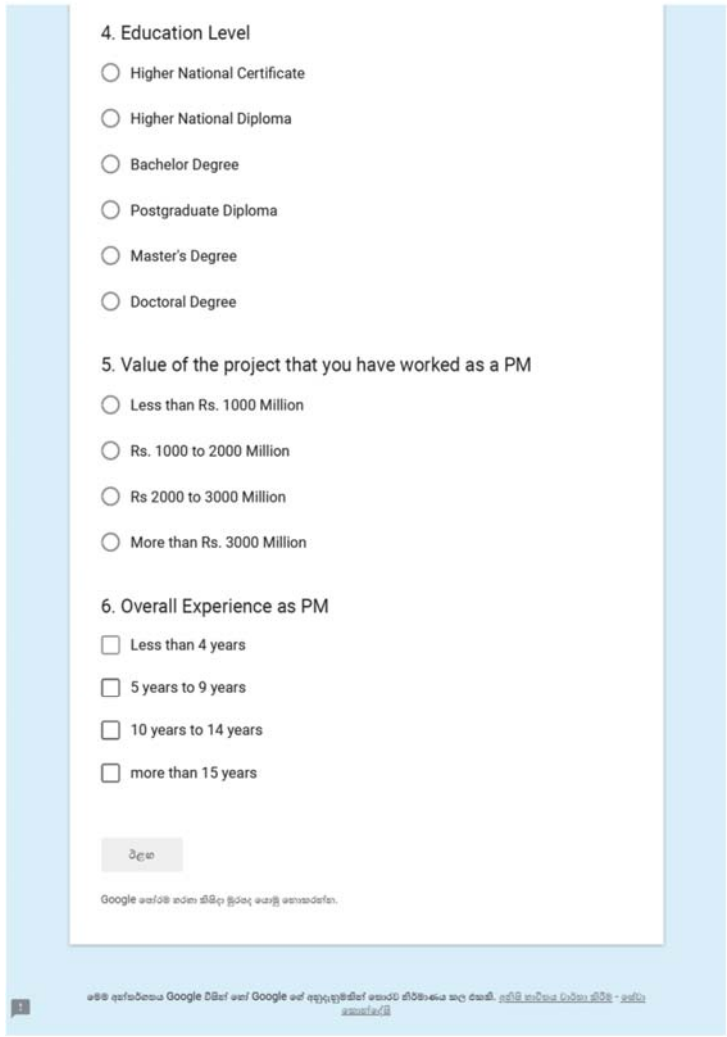
- [ ] 30-39
- [ ] 40-49
- [ ] 50 - 59
- [ ] 60 years or Older

2. Gender

- ○ Male
- ○ Female

3. Job position

- [ ] Team Leader
- [ ] Project Director
- [ ] Project Manager
- [ ] වෙනත්:



4. Education Level

- ○ Higher National Certificate
- ○ Higher National Diploma
- ○ Bachelor Degree
- ○ Postgraduate Diploma
- ○ Master's Degree
- ○ Doctoral Degree

5. Value of the project that you have worked as a PM

- ○ Less than Rs. 1000 Million
- ○ Rs. 1000 to 2000 Million
- ○ Rs 2000 to 3000 Million
- ○ More than Rs. 3000 Million

6. Overall Experience as PM

- [ ] Less than 4 years
- [ ] 5 years to 9 years
- [ ] 10 years to 14 years
- [ ] more than 15 years

Questionnaire for MSc Dissertation ; Key Competencies Model For Project Managers

Technical Skills

Based on your experience, please check the importance of the following competencies;

Categorize the below competencies based on the level of importance of the factor for project management according to your view (by selecting the relevant checkbox)

1- Strongly disagree
2- disagree
3- Neither
4- agree
5- Strongly agree

1. Ability to use Project Management Software (Primavera , MS Project etc)

1	2	3	4	5
○	○	○	○	○

2. Language proficiency; Ability and courage to use foreign languages

1	2	3	4	5
○	○	○	○	○

3. Inter-organizational learning competence; analyze and apply lessons learned from other organizations

1	2	3	4	5
○	○	○	○	○

4. Technical Knowledge; An understanding of complex elements required to effectively complete tasks associated with a given profession.

1	2	3	4	5
○	○	○	○	○

5. Production efficiency; Performing work quickly and with a high quality

1	2	3	4	5
○	○	○	○	○

6. Analytical thinking; Breaking down problems into sub-problems and their systematical diagnosing by rational principles

1	2	3	4	5
○	○	○	○	○

7. Critical Path Thinking; Ability to set and execute project priorities consistent with the project critical path.

1	2	3	4	5
○	○	○	○	○

8. Professional competence in public administration

1	2	3	4	5
○	○	○	○	○

9. Financial Management; Ability to understand financial statements, and financial ratios, and to deal with accounting firms and financial institutions.

1 2 3 4 5

○ ○ ○ ○ ○

10. Ability of Data gathering and modeling

1 2 3 4 5

○ ○ ○ ○ ○

11. Quality Management ;Ability to manage the production of goods or services within a clearly defined set of expectations.

1 2 3 4 5

○ ○ ○ ○ ○

13. Seeking information; Satisfying one's curiosity and desire for knowledge

1 2 3 4 5

○ ○ ○ ○ ○

14. Ability to apply office policies in a consistent manner

1 2 3 4 5

○ ○ ○ ○ ○

15. Adequate understanding on legal and cultural issues

1 2 3 4 5

○ ○ ○ ○ ○

Questionnaire for MSc Dissertation ; Key Competencies Model For Project Managers

Leadership Skills

Based on your experience, please check the importance of the following competencies;

Categorize the below competencies based on the level of importance of the factor for project management according to your view (by selecting the relevant checkbox)

1- Strongly disagree
2- disagree
3- Neither
4- agree
5- Strongly agree

1. Ability to assess the impact of actions taken

1 2 3 4 5

○ ○ ○ ○ ○

2. Delegating; Ability to effectively distribute tasks to other members of the organization.

1 2 3 4 5

○ ○ ○ ○ ○

3. Communication; Ability to interact effectively with others at all levels within and outside the organization.

1 2 3 4 5

○ ○ ○ ○ ○

10. Negotiation ;Ability to engage in a two-way discussion and achieve the interest of the firm though the decisions of others.

1	2	3	4	5
○	○	○	○	○

11. Decision Making ; Ability to take appropriate action under the constraints of limited time, information and resources.

1	2	3	4	5
○	○	○	○	○

12. Listening ; Ability to receive and effectively process information provided by others.

1	2	3	4	5
○	○	○	○	○

13. Ability to Follow Up Ability to convert plans into actions.

1	2	3	4	5
○	○	○	○	○

14. Assertiveness ; Ability of being self-assured and confident without being aggressive

1	2	3	4	5
○	○	○	○	○

15. Trustworthiness ; Behaving honestly and ethically

1	2	3	4	5
○	○	○	○	○

16. Self-confidence ; A strong belief in one's capability, competency and self-esteem

1	2	3	4	5
○	○	○	○	○

17. Accountability ; Accepts responsibility for own actions and decisions

1	2	3	4	5
○	○	○	○	○

18. Ability to select project team members based on their expertise.

1	2	3	4	5
○	○	○	○	○

19. Adapts negotiation skills to resolve conflicts

1	2	3	4	5
○	○	○	○	○

20. Responds calmly and appropriately when dealing with problems

1	2	3	4	5
○	○	○	○	○

21. Consults with subordinates before making decisions.

1	2	3	4	5
○	○	○	○	○

22. Genuinely values inputs and expertise of others on the team

1	2	3	4	5
○	○	○	○	○

23. Builds informal or casual relationships with people relevant to the project during their spare time

1	2	3	4	5
○	○	○	○	○

24. Planning and Goal setting ; Ability to assess and set objectives for the firm, then plot a path to achieve

1	2	3	4	5
○	○	○	○	○

25. Emotional awareness ; Ability to recognize, realize and specify one's feelings

1	2	3	4	5
○	○	○	○	○

26. Provides challenging and difficult tasks to subordinates to enhance their development

1	2	3	4	5
○	○	○	○	○

27. Does not hide or attempt to avoid conflict, but rather resolves it by bringing conflict within the immediate project team into the open

1	2	3	4	5
○	○	○	○	○

28. Makes an effort to treat all team members equitably

1	2	3	4	5
○	○	○	○	○

29. Exercise power, authority and influence appropriately to achieve office goals

1	2	3	4	5
○	○	○	○	○

ආපසු ඊළඟ

Google මෙවරම් භාවිතා කිරීමට මුරපදයක් කිසිවිටක නොඉල්ලන්න.

මෙම අන්තර්ගතය Google විසින් හෝ Google හි අනුග්‍රාහකයින් මගින් නිර්මාණය කළ එකක් නොවේ. පැහැර හැරීමේ වාර්තාව | සේවා කොන්දේසි

Google Forms

Questionnaire for MSc Dissertation ; Key Competencies Model For Project Managers

Strategic & Business Management Skills

Based on your experience, please check the importance of the following competencies;

Categorize the below competencies based on the level of importance of the factor for project management according to your view (by selecting the relevant checkbox)

1- Strongly disagree
2- disagree
3- Neither
4- agree
5- Strongly agree

1. Ability to Explain to others the essential business aspects of a project

1 2 3 4 5

○ ○ ○ ○ ○

2. Ability of Work with the project sponsor, team, and subject matter experts to develop an appropriate project delivery strategy

1 2 3 4 5

○ ○ ○ ○ ○

3. Organizing ; Ability to align resources in such a way as to be most beneficial for the firm.

1 2 3 4 5

○ ○ ○ ○ ○

4. Risk Taking Willingness to undertake tasks with a reasonable, but not assured, potential for success.

1 2 3 4 5

○ ○ ○ ○ ○

5. Organizational savvy ; Understanding and utilizing organizational dynamics in order to achieve objectives

1 2 3 4 5

○ ○ ○ ○ ○

6. Ability to analyze political support and opposition

1 2 3 4 5

○ ○ ○ ○ ○

7. Keep current with laws, regulations, policies, trends

1 2 3 4 5

○ ○ ○ ○ ○

8. Diversity awareness working in a respectful and friendly manner with all customers and coworkers

1 2 3 4 5

9. Has broad view of company operations relating to project stakeholders' organisations

1 2 3 4 5

10. Develops long-term relationships with clients

1 2 3 4 5

11. Client's benefits are given highest priority when conflicts exist between stakeholders' interests

1 2 3 4 5

12. Knows the orientation of senior management

1 2 3 4 5

13. Determines who makes decisions in the company

1 2 3 4 5

14. Interacts socially with stakeholders.

1 2 3 4 5

Thank you very much

Shehan Mendis

Appendix B - Competency Summary

1	**Technical Skills**	**References**	
1	Ability to use **Project Management Softwar**e (Primavera, MS Project etc.)	(Dziekoński, 2017)	
2	**Language proficiency** Ability and courage to use foreign languages	(Liikamaa, 2015)	(Brière, 2014)
3	Inter-organizational learning competence: **analyze and apply lessons learned** from other organizations	(Masiello, 2009)	(PMI, 2017)
4	**Technical Knowledge**; An understanding of complex elements required to effectively complete tasks associated with a given profession.	(Farooqui, Saqib, & Ahmed, 2008)	(Zhang, Zuo, & Zillante, 2013)
5	**Production efficiency**; Performing work quickly and with a high quality	(Liikamaa, 2015)	(Masiello, 2009)
6	**Analytical thinking** Breaking down problems into sub-problems and their systematical diagnosing by rational principles	(Sunindijo, 2015)	(PMI, 2017)
7	**Critical Path Thinking**; Ability to set and execute project priorities consistent with the project critical path.	(Farooqui, Saqib, & Ahmed, 2008)	
8	Professional competence in **public administration**	(Dziekoński, 2017)	(PMI, 2017)
9	**Financial Management;** Ability to understand financial statements, and financial ratios, and to deal with accounting firms and financial institutions.	(Farooqui, Saqib, & Ahmed, 2008)	(Brière, 2014)
10	Ability of **Data gathering and modelling**	(PMI, 2017)	(Masiello, 2009)
11	**Quality Management; Ability** to manage the production of goods or services within a clearly defined set of expectations.	(Farooqui, Saqib, & Ahmed, 2008)	(Brière, 2014)
12	**Seeking information;** Satisfying one's curiosity and desire for knowledge	(Farooqui, Saqib, & Ahmed, 2008)	(Masiello, 2009)
13	Ability to **apply office policies** in a consistent manner	(Masiello, 2009)	(PMI, 2017)
14	Adequate understanding on legal and cultural issues	(Ozorhon, Arditi, Dikmen, & Birgonul, 2007)	

2	**Strategic & Business management**		
1	Ability to **Explain to others the essential business aspects** of a project	(PMI, 2017)	
2	Ability of Work with the project sponsor, team, and subject matter experts to **develop an appropriate project delivery strategy**	(PMI, 2017)	(Dziekoński, 2017)
3	**Organizing** Ability to align resources in such a way as to be most beneficial for the firm.	(Farooqui, Saqib, & Ahmed, 2008)	(PMI, 2017)
4	**Risk Taking** Willingness to undertake tasks with a reasonable, but not assured, potential for success.	(Farooqui, Saqib, & Ahmed, 2008)	(Dziekoński, 2017)
5	**Organizational savvy** Understanding and utilizing organizational dynamics in order to achieve objectives	(Farooqui, Saqib, & Ahmed, 2008)	
6	Ability to a**nalyze political support** and opposition	(Beata Jałocha, 2014)	(Sunindijo, 2015)
7	Keep current with **laws, regulations, policies, trends**	(Beata Jałocha, 2014)	
8	Diversity awareness working in a **respectful and friendly** manner with all customers and coworkers	(Beata Jałocha, 2014)	
9	Has **broad view of company operations** relating to project stakeholders' organizations	(Zhang, Zuo, & Zillante, 2013)	(Masiello, 2009)
10	Develops long-term relationships with clients	(Zhang, Zuo, & Zillante, 2013)	
11	**Client's benefits are given highest priority** when conflicts exist between stakeholders' interests	(Zhang, Zuo, & Zillante, 2013)	
12	Knows the **orientation of senior management**	(Zhang, Zuo, & Zillante, 2013)	(Masiello, 2009)
13	Determines who makes decisions in the company	(Zhang, Zuo, & Zillante, 2013)	(Sunindijo, 2015)
14	**Interacts socially** with stakeholders.	(Zhang, Zuo, & Zillante, 2013)	(Sunindijo, 2015)

	Leadership skill		
1	Ability to **assess the impact** of actions taken	(Dziekoński, 2017)	
2	**Delegating** Ability to effectively distribute tasks to other members of the organization.	(Farooqui, Saqib, & Ahmed, 2008)	(Dziekoński, 2017)
3	**Communication** Ability to interact effectively with others at all levels within and outside the organization.	(Farooqui, Saqib, & Ahmed, 2008)	(Dziekoński, 2017)
4	**Leadership and motivation** Ability to make correct decisions for the firm and then influence others to contribute to attaining the firm's goal.	(Farooqui, Saqib, & Ahmed, 2008)	(Odusami, 2002)
5	**Flexibility** Ability to adapt to changes	(Dziekoński, 2017)	(Dziekoński, 2017)
6	**Optimism** Pursuing goals in spite of obstacles and setbacks	(Liikamaa, 2015)	
7	**Creativity** Ability to conceptualize nontraditional solutions to a problem	(Farooqui, Saqib, & Ahmed, 2008)	(Dziekoński, 2017)
8	**Stress management** the ability to handle adverse, tiring and stressful issues and situations	(Liikamaa, 2015)	(Dziekoński, 2017)
9	**Relationship building,** cultivating and developing useful relationships and informal networks	(Liikamaa, 2015)	(Masiello, 2009)
10	**Negotiation Ability** to engage in a two-way discussion and achieve the interest of the firm through the decisions of others.	(Farooqui, Saqib, & Ahmed, 2008)	(Goodwin, 1993)
11	**Decision Making** Ability to take appropriate action under the constraints of limited time, information and resources.	(Farooqui, Saqib, & Ahmed, 2008)	(Dziekoński, 2017)
12	**Listening** Ability to receive and effectively process information provided by others.	(Farooqui, Saqib, & Ahmed, 2008)	(Masiello, 2009)
13	**Ability to Follow Up** Ability to convert plans into actions.	(Farooqui, Saqib, & Ahmed, 2008)	
14	**Assertiveness Ability** of being self-assured and confident without being aggressive	(Dziekoński, 2017)	
15	**Trustworthiness** Behaving honestly and ethically	(Liikamaa, 2015)	(Sunindijo, 2015)
16	**Self-confidence** A strong belief in one's capability, competence and self-esteem	(Liikamaa, 2015)	(PMI, 2017)
17	**Accountability** Accepts responsibility for own actions and decisions	(Beata Jałocha, 2014)	(Masiello, 2009)
18	Ability to **select project team member**s based on their expertise.	(Beata Jałocha, 2014)	(Dziekoński, 2017)
19	Adapts **negotiation skills** to resolve conflicts	(Zhang, Zuo, & Zillante, 2013)	(Sunindijo, 2015)
20	Responds **calmly and appropriately** when dealing with problems	(Zhang, Zuo, & Zillante, 2013)	

	Leadership skill		
20	Responds **calmly and appropriately** when dealing with problems	(Zhang, Zuo, & Zillante, 2013)	
21	**Consults with subordinates** before making decisions.	(Zhang, Zuo, & Zillante, 2013)	(PMI, 2017)
22	**Genuinely values** inputs and expertise of others on the team	(Zhang, Zuo, & Zillante, 2013)	
23	**Builds informal or casual relationships** with people relevant to the project during their spare time	(Zhang, Zuo, & Zillante, 2013)	(Dziekoński, 2017)
24	**Planning and Goal setting** Ability to assess and set objectives for the firm, then plot a path to achieve	(Farooqui, Saqib, & Ahmed, 2008)	
25	**Emotional awareness** Ability to recognize, realize and specify one's feelings	(Liikamaa, 2015)	(PMI, 2017)
26	Provides challenging and **difficult tasks to subordinates** to enhance their development	(Zhang, Zuo, & Zillante, 2013)	
27	**Does not hide or attempt to avoid conflict**, but rather resolves it by bringing conflict within the immediate project team into the open	(Zhang, Zuo, & Zillante, 2013)	
28	Makes an effort to treat all team members **equitably**	(Zhang, Zuo, & Zillante, 2013)	
29	Exercise power, authority and influence appropriately to achieve office goals	(Dziekoński, 2017)	