

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In order to survive in a competitive market, many organizations today are looking for the “competitive advantages”. One of these “competitive advantages” is having competent personnel and competent project managers. Therefore, pioneer organizations have a remarkable strive on increasing their personnel capabilities and competencies. As a matter of fact, in contemporary human resource management (HRM) practice, establishing competency of an individual is considered as a resourceful and robust tool (Collin, 1997).

For being successful in a business market, project-based organizations should be successful in their projects. One of the factors that influence project success is the employment of competent project managers. Crawford (2000) points out that a competent project manager is a factor that affects project success. Thus, this leads to the development of some standards for assessing project manager’s competencies (Crawford, 2001). Project manager’s competency standards illustrate some evaluative criteria, which not only can be used for measuring manager’s performance, finding training and development needs, setting of goals among project managers and acting as the basis for succession planning (Dainty, Cheng, & Moore, 2003), but also can be used for predicting performance (Motowidlo, Borman, & Schimt, 1997) and providing a performance management system.

1.2 RESEARCH BACKGROUND AND PROBLEM STATEMENT

The competency-based standards which have been developed by project management institutes are as in the following sequence: “Project Manager Competency Development Framework” which is carried out by “Project Management Institute” in

2002, “IPMA Competence Baseline Version 3.0” which is published by “International Project Management Association” in 2006 “AIPM professional competency standards for project management” which is developed by “Australian institute of Project management” in 2008, and “APM Competence Framework” which is developed by Association for Project Management in 2008”.

These standards are prepared based on collective opinions of experienced practitioners in project management and their understanding on competencies required for effective project managers (Crawford, 2005). However, there are some researches that investigate effectiveness of project managers based on other point of views. For instance, Fraser and Zakaria (2003) examined project manager’s effectiveness based on stakeholder’s perception. Crawford (2005) conducted a research for project management competency based on senior management perception.

Although the existing project managers competency standards are trying to propose a comprehensive model that can be used widely to cover most projects, they fail to do so. For instance, AIPM standard and PMCD framework fail to cover all project manager’s competency requirements such as Contextual competencies or in IPMA and APM standards, competency requirements in different project phases are neglected. Other existing project manager’s competency models also fail to propose a comprehensive model.

In a research conducted by Ilias, Abdelnaser, and Mohd Wira (2009) for developing a job competency model for consultant project managers (CPMs), they determined a set of minimum standards for skills and competencies required for consultant project managers. In this research these competencies were addressed by consultant project management (PMC) firms that registered with ministry of finance in Malaysia.

In 2010, Jabatan Kerja Raya Malaysia (JKR) developed competency standards for project management which is called “JKR Competency Standards for Project Management Registered Project Manager.” This standard prepared based on collaboration between JKR and a team of Australian consultants by using Australian Institute of Project Management (AIPM) Project Competency Standards. The required competencies for project managers are based on 9 areas of project management including scope management, time management, cost management, quality management, human resource management, risk management, communication management, procurement management, and finally integration management. For each of these nine areas some criteria and evidence requirements are defined.

Izatul Laili Jabar et al. (2013) investigated required competencies for construction managers in context of IBS construction projects in Malaysia. Based on the findings of the research construction managers need additional competencies on top of competencies required for construction managers in conventional projects.

The National Competency Standard (NCS) for construction project managers is a standard developed by Construction Industry Development Board (CIDB) Malaysia in collaboration with Majlis Latihan Vokasional Kebangsaan (MLVK) Malaysia in 2002. The purpose of this standard is to develop and assess the skills of personnel in construction industry, as a basis for training programs, and for development of instructional materials. This standard is developed through the inputs of industrial experts in public and private sector.

In NCS, the required competencies for project managers are listed. This standard comprises two components including “Job Profile Chart” and “Task Profile”. The first component_ Job Profile_ which is also called “Job Analysis” is obtained through brainstorming sessions that tasks and duties determined and presented in Job Profile

Chart. For second component of this standard_ Task Profile_ an expert committee conducts a “task analysis” and list down all required knowledge, abilities, attitudes, tools and equipment which is required to implement a task.

CIDB issues a Certificate of Proficiency to project managers who are eligible and therefore they are recognized as Certified Construction Project Managers (CCPM). In order to award the certificate, CIDB assesses the knowledge, skills and attitudes of candidates. To conduct the assessment, a certified construction project manager with five years’ post-certification experience or a representative from CIDB would be appointed to assess the candidate eligibility.

Figure 1.1 shows the construction contribution to GDP (%) for year 1980-2009 fluctuated between 2.9% to 5.4%. Although based on this figure, construction industry plays a small role in Malaysia economy; still this industry is essential due to its extensive linkages with other parts of economy, such as construction related manufacturing industries. On the other hand, on account of rapid growth of industry in Malaysia, construction industry role would be emphasized more and more as it can provide the infrastructure to satisfy development needs. Therefore, we need to pay more attention to construction industry in Malaysia.

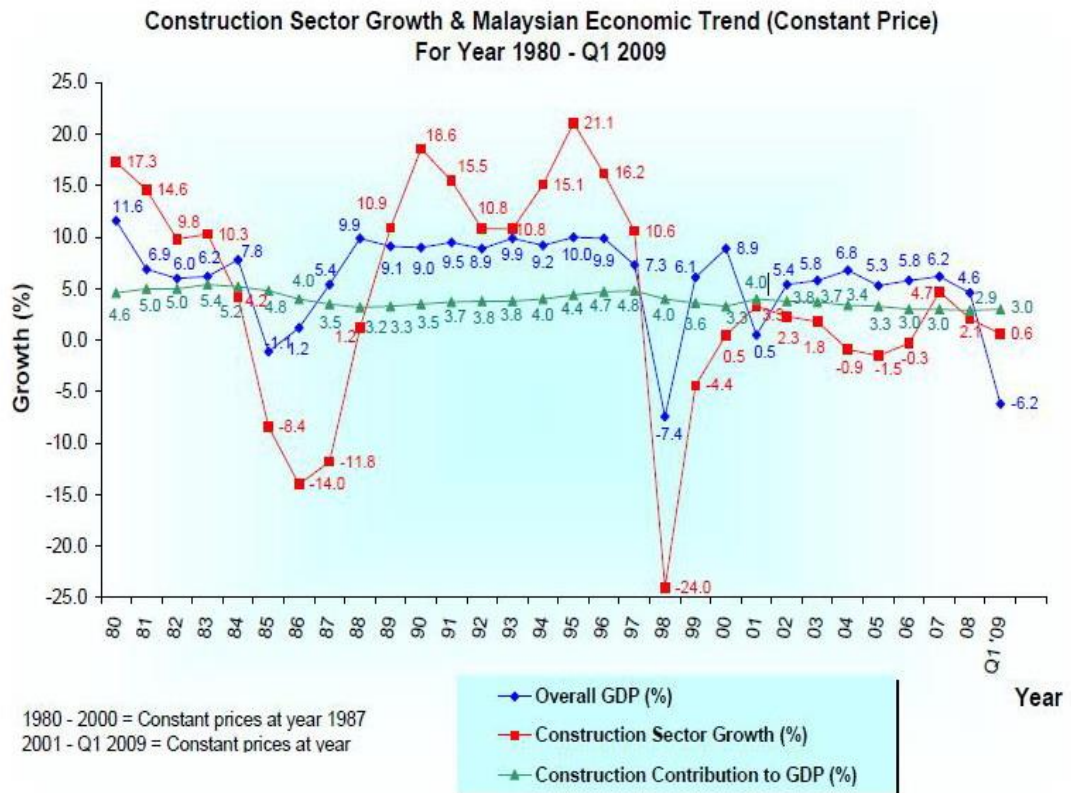


Figure 1.1: Construction Sector Growth & Malaysian Economic Trend (Constant Price)
For Year 1980- Q1 2009

Source: Construction Industry Development Board of Malaysia (<http://www.cidb.gov.my>)

Based on definition of project in Project Management Body of Knowledge (PMBOK),” project is a temporary endeavor to create a unique product, service, or result.” Project management needed to be used for using knowledge, skills, tools, and techniques to meet project needs. This achieving of objectives would be under responsibility of project manager. He should identify requirements, should establish clear and achievable objectives, should balance the demand for quality, scope, time, and cost, and should adapt the specifications, plans to different expectations of various stakeholders.

Since project managers come from different backgrounds, for example some of them are architect, some of them are civil engineer, even some of them do not have any educational background, there is a concern about project managers’ ability to do the

particular tasks and duties. They need to have different skills like management skills such as delegation, leadership, managing changes, managing multiple priorities, meeting management. They also need to have business skills, interpersonal skills, and personal skills, such as creativity, decision making, presentations, problem solving, verbal communication, and written communication. So, there is a need to standardize the expected performance of project managers.

Construction Industry Development Board (CIDB) and Building Industry president Council (BIPC) on 24 June 2003 in order to improve Malaysian construction industry, established priorities, and later identified 10 Working Groups (WGs) including: Construction Industry Master Plan (CIMP);

- Technology, Knowledge, Research and Development (R&D);
- Human Resources;
- Productivity and Quality; -Safety and Health;
- Industrial Building System (IBS);
- Building Materials; Payment;
- Finance.

CIMP (2006-2015) outlines the 10-year strategic roadmap to develop construction industry to a sector that not only to be able to meet challenges in this sector, but also to make a pivotal contribution to nation's aspirations. In order to achieve overall strategic direction, in CIMP, seven strategic trusts are defined including:

- Integrate the construction industry value chain to enhance productivity and efficiency
- Strengthen the construction industry image
- Strive for the highest standard of quality, occupational safety and health and environmental practices

- Develop human resource capabilities and capacities in the construction industry
- Innovate through research and development and adopt new construction methods
- Leverage on information and communications technology on the construction industry
- Benefit from globalization including the export of construction products and services

Table 1.1: The 10-year strategic roadmap developed by CIMP (2006-2015)

Strategic Thrusts	Recommendations
ST1: Integrate the construction industry value chain to enhance productivity and efficiency	1.1 Consolidate the industry 1.2 Standardise and integrate administrative practices and procedures
ST2: Strengthen the construction industry image	2.1 Enhance the professionalism of the construction industry 2.2 Enhance the procure-to-pay strategy 2.3 Raise the sophistication level of the construction community
ST3: Strive for the highest standard of quality, occupational safety and health, and environmental practices	3.1 Foster a quality and environment –friendly culture 3.2 Enhance occupational safety and health 3.3 Adopt Malaysian Standard in the manufacture or import of building and construction material
ST4: Develop human resource capabilities and capacities in the construction industry	4.1 Enhance and enforce the use of skilled labor (Building capability) 4.2 Nurture the desire to work in the construction industry amongst the local workforce (Building capacity)
ST5: Innovate through research and development and adopt new construction methods	5.1 Continuously innovate construction processes and techniques 5.2 Stimulate R&D activities through resource-pooling initiative amongst key players and provision and R&D infrastructure.
ST6: Leverage on ICT in the construction industry	6.1 Encourage knowledge sharing for continuous improvement 6.2 Develop local construction software industry
ST7: Benefit from globalization including the export of construction products and services	7.1 Ensure industry sustainability in the liberalized environment 7.2 Market the construction industry in a focused global manner 7.3 Ensure the financial services sector's development is in line with industry's needs 7.4 Develop complementary industries

Based on some recommendations suggested in Table 1.1 for enhancing the use of skilled labor, for reviewing and amending legal and regulatory frameworks, and for having continuous improvement in construction industry, there is a need to develop a suitable project managers' competency framework in construction industry. Besides, as mentioned before, there is a need to customize the competency frameworks developed by main project management institutes.

Based on the above discussion the real problems pertaining to identification of core and important competencies required by project managers in construction industry in Malaysia are:

- i. The existing competency standards which were developed by main project management institutes cannot simply applied in Malaysian construction industry. There is a need to customize these competency standards and these competency elements need to be identified by project managers, senior project managers, and project experts who are involving and working in Malaysian construction industry due to their better understanding to the required competencies for project managers.
- ii. According to the previous researches (e.g. Crawford's research, 2005, Cheng, Dainty, & Moore, 2003), project managers and senior project managers have different perspective about core and important competencies required for project managers. The lack of project managers', senior project managers' and also project experts' perspective who are working in Malaysia construction industry about required competencies for them, is one of the existing problems which need to be addressed in this regards. The existing competencies in Malaysian construction industry are prepared according to meetings and discussions with some experts in construction

industry and some consultants. However, there is a need to conduct a deep literature review to identify a comprehensive competency elements and also seeking not only project experts perspective, but also project managers' as well as senior project managers' perspectives.

- iii. There is a need to address the importance degree of each competency element which can be used for training purposes and also project managers' selection in construction companies.
- iv. Even though the existing standards pertaining to project managers' competencies address the required competencies for project managers, these competencies neglect the correlation of these competencies. Some of these competencies are correlated and therefore, by improving of a competency another correlated competency which is core as well can be improved. Therefore, organizations and companies can focus more on correlated competencies to achieve higher productivity for their training courses. Therefore, there is a need to evaluate the correlation of identified competencies as core and important competencies to address their correlations and affections in other competency elements.
- v. There is a need to study existing project managers' competency standards in order to identify competencies addressed in these standards and customize them in Malaysia construction industry. By comparing and studying existing competency standards, better understanding of required competencies for project managers would be achieved.

To sum up, there are pertinent issues that make this research unique pertaining to project managers competencies conducted in Malaysia. First of all, in this research the main project managers' competency standards developed by main project management institutes are studied, compared and advantages and disadvantages of these standards

are addressed. In fact, the results of this research these competency standards are customized for Malaysian construction industry.

Second of all, in previous researches conducted in Malaysia about project managers' competencies, the required competencies for project managers identified by for example consultants project managers, experts who are working in CIDB or JKR or these competencies are addressed for some certain project such as IBS projects. According to the previous researches (e.g. Crawford's research, 2005; Cheng, Dainty, & Moore, 2003), project managers and senior project managers have different perspective about core and important competencies required for project managers. The lack of project managers', senior project managers' and also project experts' perspective who are working in Malaysia construction industry about required competencies for them, is one of the existing problems which need to be addressed. In this research, however, the required competencies for project managers is addressed by project managers, senior project managers, as well as project experts in construction companies who come from the front line of the construction industry.

Third of all, in previous researches the importance degree of competencies was not addressed, however, in this research the competencies are categorized as core and important competencies. By knowing the importance degree of competencies, project managers as well as construction companies and CIDB can focus on core competencies for training courses.

Fourth of all, the results of this research shows how project managers, senior project managers, as well as project experts are thinking differently about importance degree of competency elements. In fact, the results of this research show the importance degree of competency elements from project managers', senior project managers', and project experts' perspectives. In first stage of research project managers' and senior project

managers' perspective about importance degree of competency elements are analyzed and in second stage of study with also application of quantitative strategy, project experts perspective about importance degree of competency elements are analyzed.

Finally, the correlation results of this research shows that how important and core competencies are interconnected. It shows how one competency can affect the other competency. It shows by improving one either core or important competency elements, which other core or important competencies might improve as well. In previous researches in Malaysian construction industry the correlation between competencies was not addressed.

1.3 RESEARCH OBJECTIVE AND RESEARCH QUESTIONS

This research is carried out with the aim of developing a competency framework required for project managers in construction industry in Malaysia and to identify core competencies and important competencies required for them. Besides, to address the correlation of these competencies is also a part of study which is carried out.

This research, therefore, studies main project managers competency standards developed by main project managers institutes and also compares project managers' point of view about required competencies for project manager's as well as senior project managers' and project experts' perspectives for developing a competency framework required for project managers in construction industry. The research objectives as well as research questions are shown from Figure 1.2 to Figure 1.4.

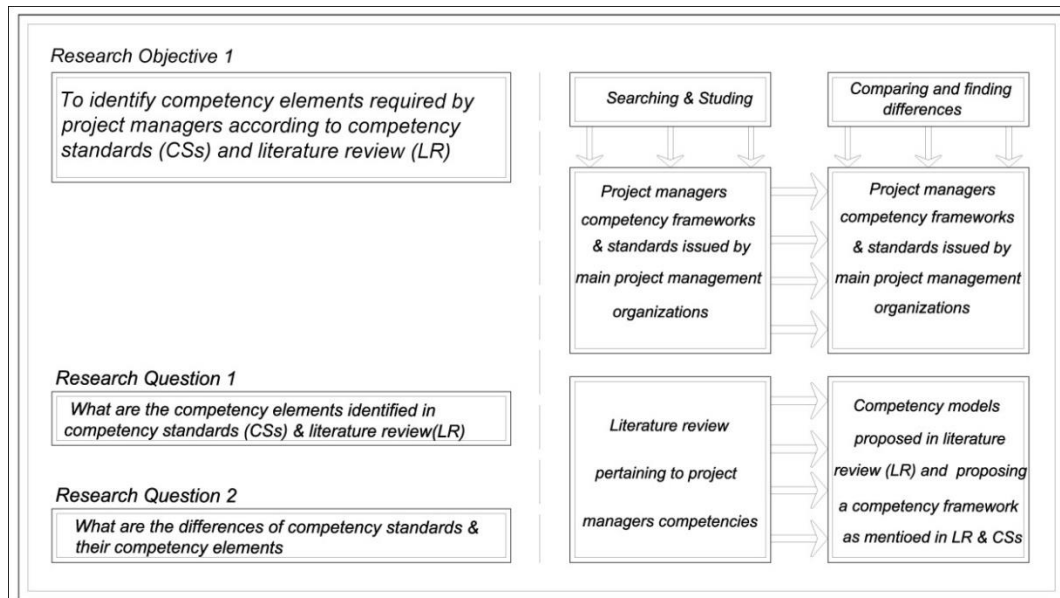


Figure 1.2: Research Objective 1 and its related research questions

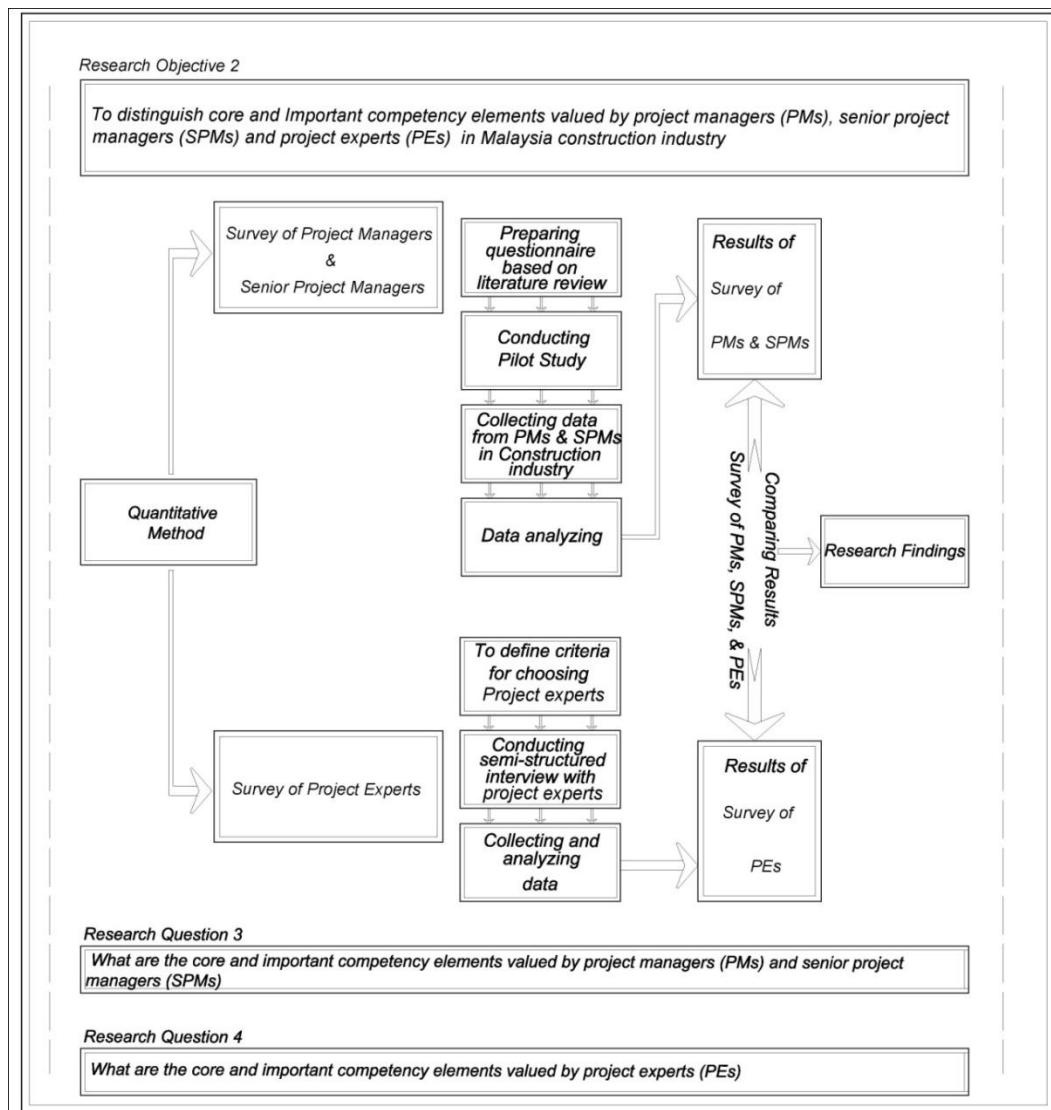


Figure 1.3: Research Objective 2 and its related research questions

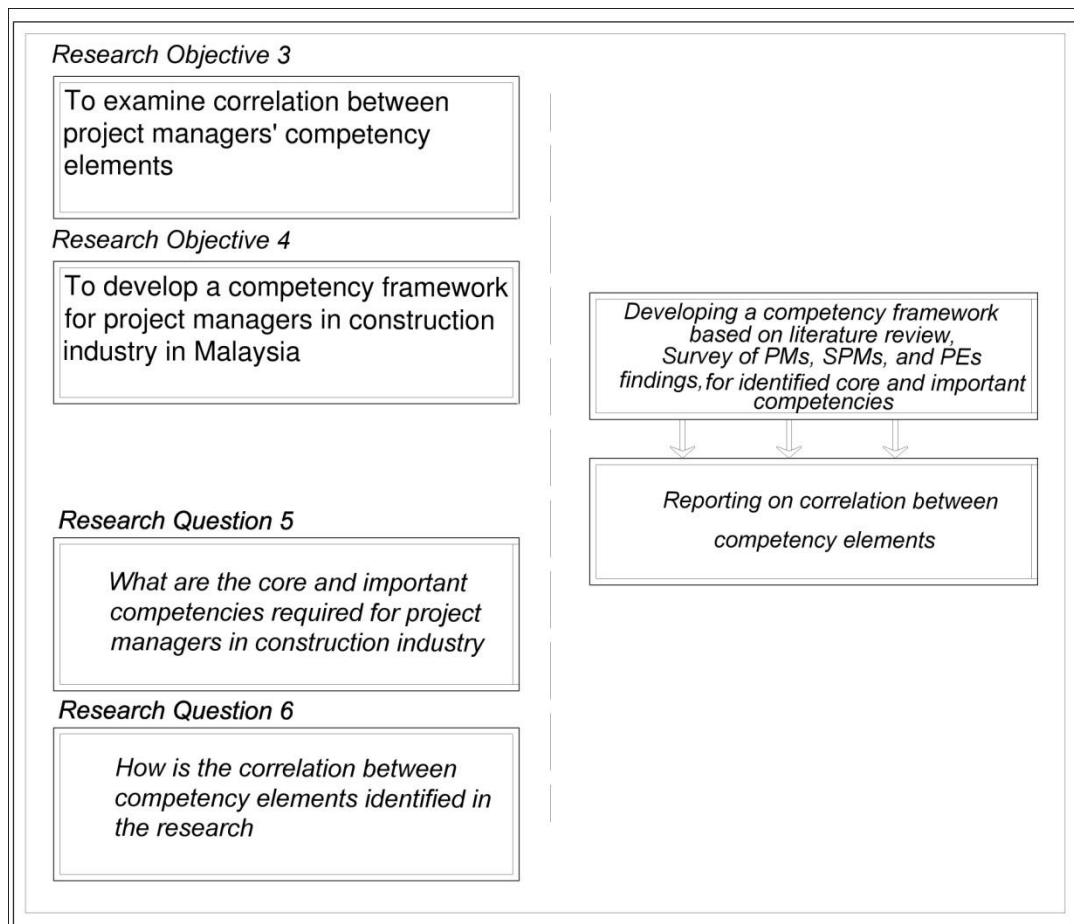


Figure 1.4: Research Objective 3 and its related research questions

To summarize, the specific objectives of this research are:

- i. To identify competency elements required for project managers according to competency standards and literature review.
- ii. To distinguish core and important competency elements valued by project managers (PMs), senior project managers (SPMs), and project Experts (PEs) in Malaysia construction industry.
- iii. To examine correlation between project managers' competency elements.

- iv. To develop a competency framework for project managers in construction industry in Malaysia

1.4 RESEARCH METHODOLOGY

In order to achieve the above objectives, this research is to be carried out in three parts:

Part I: Review of Literature and an Overview of Foreign Countries Practices

To establish possible research aims and objectives, a thorough literature study was conducted, including study of existing competency frameworks developed for project managers by main project management institutes and also other researches focusing project managers' competencies. Therefore, an evaluation and comparison of four existing project managers' competencies conducted.

Part II: Quantitative Survey of Project Managers and Senior Project Managers

This research adopts quantitative survey method as the strategies for data collection. To achieve objectives (ii and iii), this research explores the perceptions of project managers and senior project managers about importance degree of competency elements required for project managers in construction industry in Malaysia. Therefore, the questionnaire is designed. The target respondents are project managers and senior project managers who are working in Building Construction Contractors and Civil Engineering Contractors in G7 category based on Construction Industry Development Board Malaysia (CIDB) categorization.

Part III: Quantitative Survey of Project Experts

This research also adopts quantitative survey method as the final strategy for data collection of project experts and in order to develop a competency framework for project managers in Malaysian construction industry (objective iv). Project managers with more than twenty years' experience in construction industry who are known as Project Experts (PEs) were selected and a questionnaire distributed among them to get their views on the importance degree of competency elements and on the framework that being established in part I and part II of the research methodology.

All data were analysed by quantitative techniques such as descriptive and inferential statistics –frequency, mean, and standard deviation, and Pearson Correlation. The main tool for analysing data being used was Statistical Package for Social Sciences (SPSS).

1.5 SCOPE OF THE RESEARCH

As discussed previously, this research study focuses on core and important competencies required for project managers in construction industry as well as the correlation of these competency elements.

Under regulations made by Construction Industry Development Board (CIDB), contractors are categorized in three different sectors such as “Civil Engineering Construction”, “Building Engineering Construction”, and “Mechanical and Electrical” for a minimum period of one year and maximum three years to perform construction works in Malaysia. All contractors are allowed only to perform construction works only in their registered category and working outside their categories is prohibited. There are 7 grades for registration in each category (As shown in Table 1.2). Applicants for registration in any particular grade need to satisfy CIDB that they have enough resources to meet financial commitment.

Table 1.2: Seven Grades of contractors in CIDB

Grade Tendering Capacity(RM)	
G1	Not exceeding 200,000
G2	Not exceeding 500,000
G3	Not exceeding 1 Million
G4	Not exceeding 3 Million
G5	Not exceeding 5 Million
G6	Not exceeding 10 Million
G7	No Limit

The scope of this research is project managers', senior project managers' and project experts' perspectives who are working in construction industry in Malaysian Building Construction Contractors and Civil Engineering Contractors in G7 category in Wilayah Persekutuan. The reason behind choosing construction companies in grade of G7 is that since this grade includes the biggest and largest construction companies and for sure the numbers of senior project managers and project experts working in this grade is higher than lower grades. The reason behind choosing construction companies in Wilayah Persekutuan is that most G7 construction companies headquarters (HQ) are located in Wilayah Persekutuan. Therefore, samples from construction companies with grade of G7 in Wilayah Persekutuan can be the best representatives for whole population which include project managers, senior project managers, and project experts.

Furthermore, the scope of this research is only limited to identification of competency elements and also the importance degree of these competency elements required for project managers in construction industry as well as evaluation of correlation between these competency elements.

1.6 STRUCTURE OF THE RESEARCH

This thesis is organized into seven chapters including this introduction that are divided into three distinct parts.

Chapter 1 – This chapter describes the contexts of the research, research objective, research structure of presentation, research questions, and the background focuses to the research and the methodology of the research.

Chapter 2 – This chapter provides an overview of importance of competency, competency definition, the relation between project success and project managers' competencies, project managers performances, selection of project managers based on their competencies, comparison and evaluation of existing competency standards developed by main project management institutes, and evaluation of existing framework profiling competencies required for project managers.

Chapter 3 – This chapter discusses about competence in UK approach and competency in US approach, about a comprehensive competency framework based on US and UK approach, job-related competencies and person related competencies and competency elements of each category.

Chapter 4 - This chapter focuses specifically on the research methodology, data collection procedures, sampling procedures and ration of the quantitative methods, and research model.

Chapter 5 – This chapter highlights the finding of the survey of project managers and senior project managers. The aim is to seek project managers' and senior project managers' perception about importance degree of competency elements required for project managers as well as the correlation between these competency elements.

Chapter 6 – This chapter analyses the findings of survey of project experts. This chapter reports the perception of project experts in relation to competencies required for project managers in construction industry in Malaysia.

Chapter 7- This section integrates and compares the results of survey of project managers, senior project managers, and project experts and concludes the core and important competencies required for project managers. Besides this section includes a deep discussion for each competency elements addressed in research framework and compares the results of research with literature review.

Chapter 8 – This chapter addresses the limitation pertaining to research, further researches in this area and highlights the major findings of research.

Figure 1.5 provides a diagram of the overall structure of this research and the research processes.

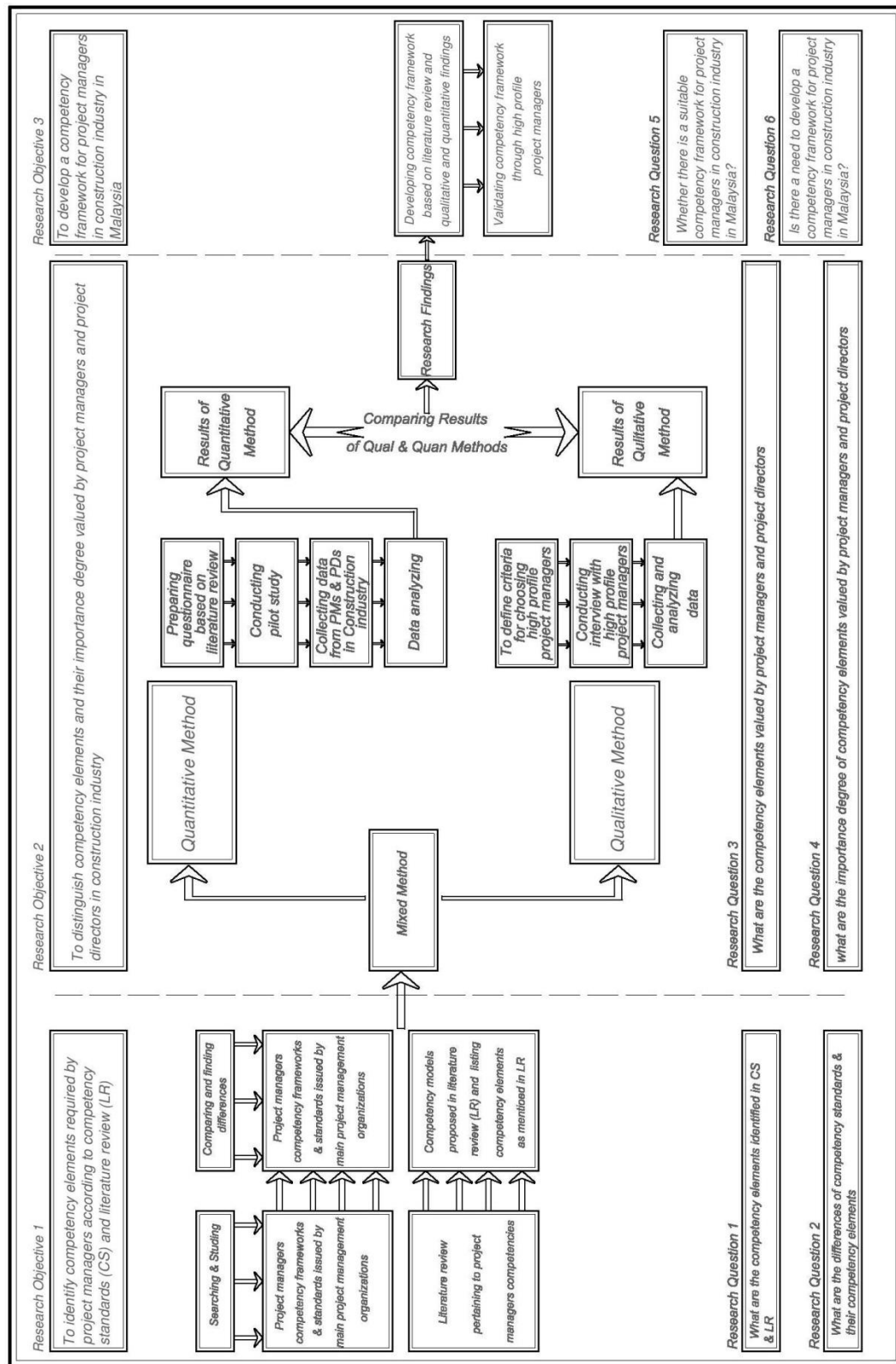


Figure 1.5: Structure of the Research

Note: In order to have a better view, a bigger size of this framework is presented at Appendix A

1.7 SIGNIFICANCE OF THE STUDY

This research identifies core and important competency elements required for project managers in construction industry in Malaysia valued by project managers, senior project managers and project experts in Malaysian construction industry. Until today, there is no existing research in Malaysia which address the required competencies for project managers based on project managers', senior project managers' and project experts' perspective who are working in this industry.

The results of the research are useful for project managers who are working in construction industry area. Based on the finding of this research project managers can identify their competency gaps and can identify the best method for developing their competencies. The results of the research can define a common understanding of project manager's competencies among project managers and senior managers.

The results of this research will help the construction companies for a rigorous method for selecting project managers for projects, to appraise project managers in organization, to identify the competency level of their project managers and also to identify competency gaps in their project managers in order to taking improvement actions such as training courses.

Construction Industry Development Board (CIDB) as the lead organization in construction industry in Malaysia can use the results of the research in order to develop project manager's competencies and also arrange required training courses to match with the market demand.

International construction companies that are working in Malaysia can apply the results of this research which is a framework addressing core and important competencies for project managers, in their organization in order to take project and appropriate step toward selecting project managers.

CHAPTER 2

LITERATURE REVIEW PART 1- IMPORTANCE OF COMPETENCY

2.1 INTRODUCTION

Identifying and developing project manager's competency is becoming more and more important in a today competitive market. This importance also has absorbed the attention of main project management institutions such as Project Management Institute (PMI), Association for Project Management (APM), International Project Management Association (IPMA), and Australian institute of Project management (AIPM). These project management organizations in order to address the importance of project manager's competency have developed their own standards.

In this chapter includes four major parts as shown in Figure 2.1:

-In first part of this chapter the importance of competency is explained. Competency definition is described and project success and its relation with project managers' competencies highlighted. Furthermore, this part addresses how based on project managers' competencies can predict project managers' performances so that it can be a base for selection of appropriate project managers for projects.

-In second part of this chapter the existing project managers' competency standards is compared, their concept and overview, the design and structure of these standards is addressed, and finally the certification assessment based on these standards highlighted. Then, the similarities and dissimilarities of them as well as their advantages and disadvantages of them are mentioned.

-The third part of this chapter focuses on existing profiles for competent project managers and competency elements recognized in literature review is as a part of this section.

-The Fourth part of this chapter focuses on competency measures in construction industry and required competencies for project managers in construction industry.

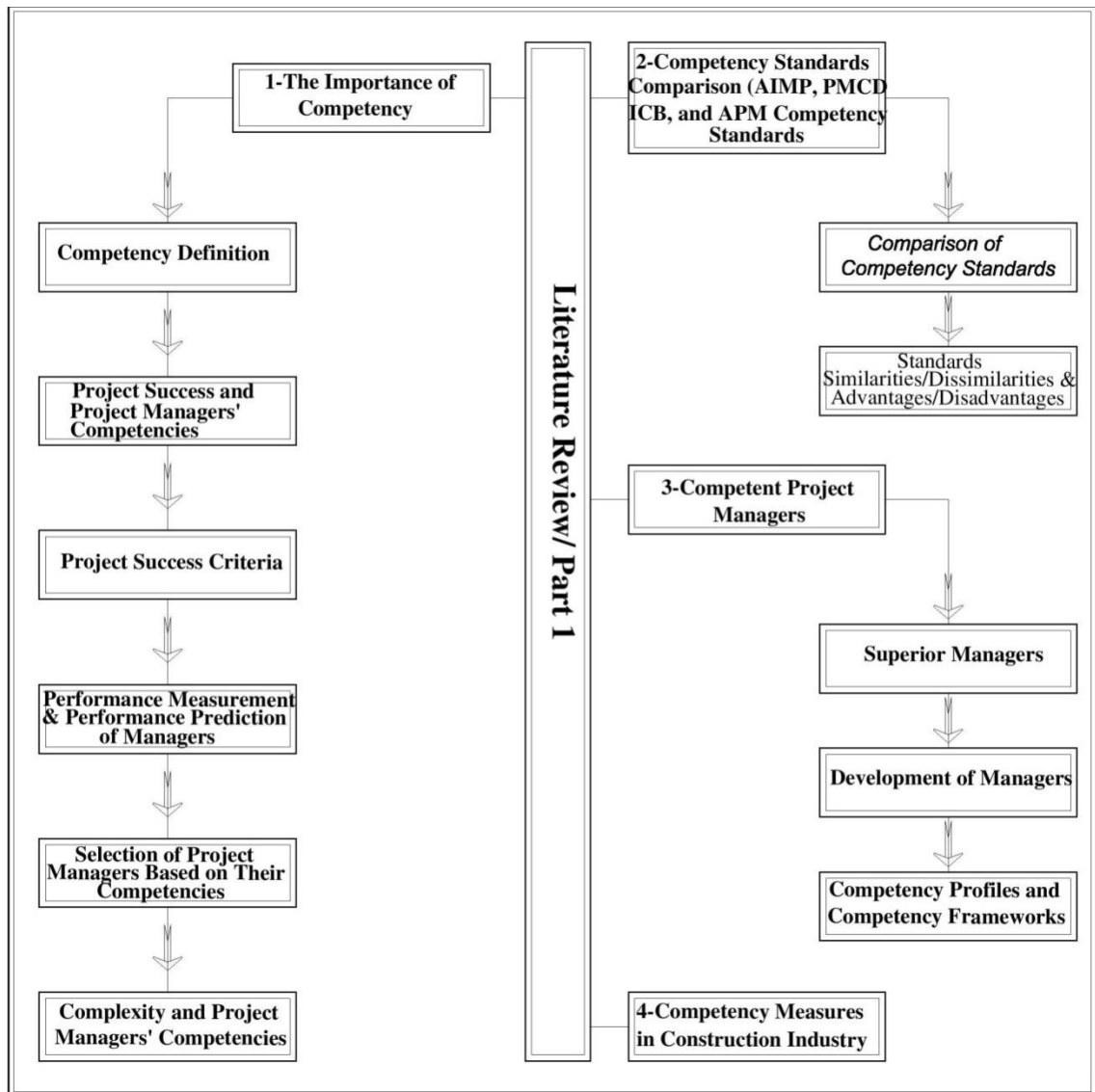


Figure 2.1: Four Major Parts of Literature Review chapter

2.2 THE IMPORTANCE OF COMPETENCY

2.2.1 COMPETENCY DEFINITION

Even though, term “competency” is often used as “competence” and vice versa (Cheng, Dainty, & Moore, 2003), there are some distinctions between these two terminologies (Cheng, et al., 2003; Dainty, Cheng, & Moore, 2004). Competency is defined as person related concept which results to competent performance (Mei, Dainty, & Moore, 2005; Tett, Guterman, Bleier, & Murphy, 2000). Crawford (Crawford, 2005) defined “competency” in three different classifications: input competencies, personal competencies, and output competencies. Input competencies refers to the knowledge and skills that a person brings to a project, output competencies is related to “demonstrable” performance which can be exhibited in the workplace, and personal competencies are core attributes of a person which capable him/her to execute a job. The classification of competency as defined by Crawford (Crawford, 2005) is similar to the contextual-task typology which is proposed by (Ahadzie, Proverbs, & Olomolaiye, 2008). As it is explained by (Ahadzie, et al., 2008), task performance behaviors are those competencies that are demonstrable in the job such as planning, coordination, organizing, and controlling. Contextual behaviors are those competencies that are not directly part of a job; however, these competencies are related to organizational effectiveness.

As described by ("Project Manager Competency Development (PMCD) Framework," 2002) competency is measurable against a standard, it can be improved via training and development, it can be broken down to its competency-elements, and it is correlated to performance. Competence in dictionary (Brown & Trumble, 2002) is defined as “Power, ability or capacity (to do, for a task etc.)” (Brown & Trumble, 2002). Robotham and Jubb (1996) contended that there are different meanings for “competence” and in organizational literature this terminology is one of the most

diffusing term. The concept of competency is being addressed in strategic perspective and HRM perspective. In strategic perspective, competency refers to level of organization competency and combination of resources and capabilities. In HRM perspective, competency is referred as personal characteristics which are related to the performance of the job. Turner and Crawford (1994) classified competencies in two categories: “personal competencies” which include knowledge, skills, experience, and personality of an individual and “corporate competencies” which is referred to processes and structures in the organization. These two competency concept are correlated. “Corporate competencies” of organization determine required personal competency type and also by collecting personal competencies in organization an embedded culture in the organization provided. Woodruffe (1992), defined competency as “the set of behavior patterns that incumbent needs to bring to a position in order to perform its tasks and functions with competence” (Woodruffe, 1992).

Kochanski (1996) defined competencies as “success factors in an employee’s organization”. For instance, competencies can be referred as factors that distinguish higher performers from average performers in an organization. Kennedy and Dresser (2005) defined competencies as anything that an employee has which contributes to success of organization.

A definition for competency model is proposed by Mansfield (1996) as detailed description of employees characteristics. Even though in literature review, the term “competence” and “competency” are being used interchangeably, there are some conceptual and practical distinctions between these two concepts (Moore, Cheng, & Dainty, 2002). While competency refers to personal attributes, competence refers to the ability of person to comply a range of externally agreed standards (Roberts, 1997). Therefore, competency is a person-related concept with behavior dimensions (Woodruffe, 1991), whereas competence is a work-related concept and refers to areas

that a person needs to be competent (Armstrong, 2001). As mentioned by Mansfield (1999), the meaning of being competent is not ability demonstration to achieve minimum standards, but to have behavioral characteristics which results to effective performance. In UK, performance management relies on competence term definition and as described by Employment Department's Standards program, competence means as something that a person who is working in an occupation should be able to do (Training-Agency, 1988). This concept concentrates on the performance requirements of a job instead on concentrating on the abilities of job-holder (Dainty, et al., 2004). Therefore, competence expresses the outcomes that a person needs to be able to demonstrate. Boyatzis (1982) defined competency as "an underlying characteristic of a person. In fact he defined competency as motives, traits, and skills that a person uses in his job. Woodruffe (1991) proposed to apply competence term for job-related sense and apply competency term in person-related sense. He proposed project managers need to accomplish both competence and competency to be considered as competent project manager.

The idea of competency in human resource literature is proposed by David McClelland in 1970. In a case study for selection of Foreign Service Information Officers, he found that superior Information Officer are differentiated from average Information Officers through competencies such as interpersonal sensitivity (Dubois, 1993). Competency movement roots in Taylor studies (1911) which was looking the best way for accomplishing tasks. Therefore, improving efficiency and increasing production led to development of competency approaches (Grugulis, 1997; Raelin & Cooledge, 1995; Sandberg, 2000). Spencer (1983) argued that competencies do not related to employees' capabilities, but instead competency is related to employees' willingness to use and apply their capabilities in different situations. (The summary of definitions of competency in literature review is shown in Table 2.1)

Table 2.1: Competency Definition in Literature Review

(Mei, et al., 2005; Tett, et al., 2000)	As a person related concept which results to competent performance
(Crawford, 2005)	In three different classifications: input competencies, personal competencies, and output competencies
(Ahadzie, Proverbs, & Olomolaiye, 2008)	As <u>Contextual-task typology</u> : <i>task performance behaviors</i> are those competencies that are demonstrable in the job such as planning, coordination, organizing, and controlling. <i>Contextual behaviors</i> are those competencies that are not directly part of a job; however, these competencies are related to organizational effectiveness.
Dictionary(Brown & Trumble, 2002)	As “Power, ability or capacity(to do, for a task etc.
HRM perspective	Competency is referred as personal characteristics which are related to the performance of the job
Turner and Crawford (1994)	Classified competencies in two categories: “ <i>personal competencies</i> ” which include knowledge, skills, experience, and personality of an individual and “ <i>corporate competencies</i> ” which is referred to processes and structures in the organization.
Woodruffe (1992)	As “the set of behavior patterns that incumbent needs to bring to a position in order to perform its tasks and functions with competence”
Kochanski (1996)	As “success factors in an employee’s organization”. For instance, competencies can be referred as factors that distinguish higher performers from average performers in an organization.
Kennedy and Dresser(2005)	As anything that an employee has which contributes to success of organization.
Mansfield (1996)	As detailed description of employees’ characteristics.
(Roberts, 1997)	While competency refers to personal attributes, competence refers to the ability of person to comply a range of externally agreed standards.
(Woodruffe, 1991)	Competency as a person-related concept behavior dimensions
(Armstrong, 2001)	competence as a work-related concept which refers to areas that a person needs to be competent
(Training-Agency, 1988)	As something that a person who is working in an occupation should be able to do
(Dainty, et al., 2004)	Concentrating on the abilities of job-holder
Boyatzis (1982)	As an underlying characteristic of a person. In fact he defined competency as motives, traits, and skills that a person uses in his job

2.2.2 PROJECT SUCCESS AND PROJECT MANAGERS' COMPETENCIES

According to Cheng et al. (2005) there is a link between project success and project managers' competencies in construction industry. In fact, for project success, it is crucial to develop project team (Ng & Tang, 2010; Sung Ho, 2009). By developing project team, skills and technical competencies of team members as well as project performance enhance (Morris & Pinto, 2007). It is critical to assess competencies, skills, knowledge, and personal characteristics of team members to assure choosing a team which is capable to succeed (Morris & Pinto, 2007). According to Mumford et al. (2000), if personal characteristics of project managers meet the job requirements there is more chance for their success as manager in their position (Mumford, et al., 2000).

There are some researches about project success such as Jugdev and Muller (2005) research about our understanding of project success factors, or Pinto and Slevins (1988) research that the most important factors of project success are listed. There are several papers concerning role of project manager. For instance, (Dinsmore, 1993; Gaddis, 1959; Kerzner, 1998; Meredith & Mantel, 1995; Pinto, 1998; Turner, 1993). Other researches (Cleland & King, 1988; Ford & McLaughlin, 1992; Gemmill, 1974; Pettersen, 1991; Posner, 1987; Thamhain & Gemmill, 1974; Thamhain & Wilemon, 1977; Thamhain & Wilemon, 1978; Zimmerer & Yasin, 1998) are primary researches concerning project management competencies.

In the changing working environment, the importance of project management is increasing more and more (Cleland, 1994; Turner, 1993). Crawford (Crawford, 2001) suggested that the more project management is demanded, the more required project manager skills and standards for developing and assessing competencies of project managers demanded. Organizations in order to achieve their strategic goals need to consider a crucial contributor which is project managers' competencies (Boyatzis, 1982; Shenhar, 1997). In order to increase the likelihood of achieving project objectives, team

performance needs to be increased and accordingly for increasing project performance, effective development strategies must be applied (Tabassi & Bakar, 2009).

Adapting to changing industry conditions in order to be successful in delivering project is accentuated by Ahmad (1997). For instance, he highlighted the importance of information technology for project managers. Organizations have reached to the point that for organization changes, competent and knowledgeable project team is required (Adams & Thomas, 1991).

The importance of project management competencies come from this point that if the people who are working in the project to be competent, they would perform effectively which results to the project success and organization success (Beer, Eisenstat, & Spectre, 1990; Karpin, 1995; Smith, 1976).

Turner and Muller (Turner & Muller, 2006) pointed out project managers competency is one of the contributors of project success; they also confirmed that for different project types, different leadership styles are appropriate. Cooke-Davies (2002) conceded the importance of human resource role to accomplish the project. They mentioned projects are delivering by people not by processes. Competencies can be applied for employee management as per following: Workforce planning, recruitment management, performance management, career development, and succession planning (Draganidis & Mentzas, 2006).

2.2.3 PROJECT SUCCESS CRITERIA

As suggested by Wateridge (1995), for managing project first of all important success criteria should be identified by project managers, then the success factor that deliver those success criteria should be identified, and finally based on those success factors, all tools and techniques to be chosen. In a research conducted by Cooke-Davies (2002), success factors for “project success” that focusing on business result and success factors

for “project management success” which focusing on cost, quality and other management aspects identified.

Muller and Turner (2007) in their research measured project managers’ level of achievement based on applying ten success criteria and 7 Likert scale and showed that there is a correlation between project success and project managers competencies.

For defining project success criteria there is a lack of agreement (Baccarini, 1999; Freeman & Beale, 1992; Pinto & Slevin, 1988; Shenhar, 1997). Crawford (2000) contended that based on literature review there is an agreement on Baker, Murphy, and Fisher (1988) definition of project success. Project success is defined by Baker, Murphy, and Fisher (1988) as: “The project meets the technical performance specifications and /or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people on the project team, and key users or clientele of the project effort”

Murphy, Baker and Fisher (Murphy, Baker, & Fisher, 1974) conducted a research concerning factors of project success. In this research they used 650 completed projects, in aerospace industry, construction industry and some other projects. They identified ten factors strongly related to project success and project failure; and identified twenty three project management characteristics that even though are necessary for project success, these factors are not sufficient conditions to be considered success (Baker, et al., 1988).

Other researches pertaining to project success are Pinto and Slevin (1987; 1988) research and Morris and Hough (1993) research. Pinto and Slevin (1987; 1988) used sample of 418 PMI members. These PMI members were asked to rate ten crucial success factors which are relevant to project success. Morris and Hough (1993) identified project success factors based on literature review as well as case study of major projects.

Further researches related to project success factors are (Ashley, Lurie, & Jaselskis, 1987; Geddes, 1990; Jiang, Klein, & Balloun, 1996; Whittaker, 1999; Zimmerer & Yasin, 1998). In all these researches similar method of Pinto and Slevin were used-rating project success factors by project personnel, and professionals. Beale and Freeman (1992) by reviewing twenty nine papers identified fourteen factors that affect project success. Wateridge (1996) identified eight most mentioned success factors.

Selection of criteria for organizations is very important since through these criteria, organizations operationalize their strategy and future vision. These criteria can be served for mentioning what is important for organization, for selection, recruitment, and appraisal system of organization. These criteria are used by top management for decision making for termination or promotion.

Christenson and Walker (2004) in a study referred to “project vision” as pivotal contribution for project success.” They also found that communication and also maintaining of project vision also affect project outcomes. Turner and Muller (2006) in their research concluded that emotional competencies such as self-awareness, resilience, motivation, influence and conscientiousness are the most contributors for project success. In fact, results of their study show that emotional competencies are more important than technical competencies to achieve project success.

There are several studies concentrating determinants and criteria affecting competent project manager (Gadeken, 2000; Pettersen, 1991; Thamhain, 1991; Wateridge, 1998). The summary of relationship between project success and project managers’ competencies are shown in Table 2.2.

Table 2.2: Relationship between Project Success and Project Managers' Competencies

Cheng et al., 2005; Turner & Muller, 2006	Found a link between project success and project managers' competencies in construction industry
Ng & Tang, 2010; Sung Ho, 2009	Developing project team in order to achieve project success
Morris & Pinto, 2007	Developing project team, results to improvement of skills, technical competencies, and performance of project team
Morris & Pinto, 2007	Assessing competencies, skills, knowledge, and personal characteristics of team members to assure choosing a team which is capable to succeed
Mumford et. al. ,2000	If personal characteristics of project managers meet the job requirements there is more chance for success
Jugdev and Muller, 2005	There are some researches about project success such as our understanding about project success factors
Pinto and Slevin, 1988	Listing the most important factors of project success
Dinsmore, 1993; Gaddis, 1959; Kerzner, 1998; Meredith & Mantel, 1995; Pinto, 1998;. Turner, 1993).	Focusing on role of project manager to achieve project success.
Cleland & King, 1988; Ford & McLaughlin, 1992; Gemmill, 1974; Pettersen, 1991; Posner, 1987;; Thamhain & Wilemon, 1977;	Primary researches concerning project management competencies.
Cleland, 1994; J R. Turner, 1993	Importance of project management in changing working environment
Boyatzis, 1982;. Shenhar, 1997	Project manager's competencies as a crucial contributor to achieve strategic goals in organization
Tabassi & Bakar, 2009	Application of effective development strategies in organization in order to increase project performance
Ahmad,1997	Adapting to changing industry conditions in order to be successful in delivering project
Adams & Thomas, 1991	For organization changes, competent and knowledgeable project team is required.
Beer, Eisenstat, & Spectre, 1990; Karpin, 1995; Smith, 1976	If the people who are working in the project to be competent, they would perform effectively which results to the project success and organization success.

2.2.4 Performance Measurement & Performance Prediction of Managers

Traditional measures for performance only considered out-put measures such as time, cost, and quality; however, by application of competency-based measures, other pivotal competency measures such as behavioral metrics that are crucial for achieving superior levels of performance are being addressed as well (Dainty, et al., 2004). Furthermore, competency-based measures can also be used for predicting performance (Motowildo, Borman, & Schmit, 1997). Competency-based measures due to identification of appropriate measures are becoming increasingly pivotal in human resource management practices and actually are eluding of problems that traditional measures are facing (Dainty, et al., 2003; Dainty, et al., 2004).

Traditionally, for performance measuring of construction project managers, only time, cost and quality were being hired (Ahadzie, et al., 2008). There are some researches that discussed the limitation of these measures (Fraser & Zarkada-Fraser, 2003; Latham, Fay, & Saari, 1979). As contended by Ahadzie et al. (2008), these lagging measures are not useful for engendering and development of construction project managers. To avoid jeopardizing project performance, project team must possess required competencies (Institute, 2008).

Performances of projects are affected by several factors such as human-resource factors, external environments, project management actions, and project procedures (Chan, Scott, & Chan, 2004; Söderlund & Bredin, 2006). Improvement of performance is always a challenge for management (Boxall, 2007; Lengnick-Hall & Lengnick-Hall, 1988). Competency-based measures via continuous performance improvement result in achieving higher levels of performance (Ahadzie, et al., 2008). Therefore, transformational management styles are widely being acclaimed (Bass, 1990). In a research by Yang et al. (2011), it contended that project performance is highly influenced by teamwork. Guest and Neil (2007) indicated that workplace performance is

associated to HRM and also employee attitudes. HRM impact on performance of project also investigated in Belout and Gauvreau (2004) research and the results show same results. Pfeffer (1998) argued that in long term only companies can be successful that think about importance of relationship between people and organizational performance. Hence, for achieving a higher level of performance in projects, programs, or organization, performance of staff must be addressed and improved.

There are some researches in political science which applied profiling in order to predict the performance of presidents such as Simonton's (2006) research that for predicting of George W. Bush's performance; he profiled 42 US Presidents, or comparison of Bill Clinton and Bob Dole in Immelman's (1998) research. Other profiling research examples could be profiling Indira Ghandi by Steinberg's (2005) or Raoul Wallenberg profiling by Kunich and Lester (1994). There are also some studies that seeking identification of relationship of job competencies and individual team members such as Carr et al. (2002) research that relationship between performance of designers and their personality traits was investigated. In this research they concentrated on success factors of project and its correlation with personalities of staff members. They proved that it is possible to predict job performance according to personality traits of staff members.

Since project management personnel competencies has an important effect on project performance, hence, it is crucial to address it (Beer, et al., 1990; Karpin, 1995; Pinto & Kharbanda, 1995; Smith, Carson, & Alexander, 1984). There is a connection between overall performance of project and also competencies of top team members (Kakabadase, 1991). In fact, there are some researches that prove performance of the projects is affected by project managers' competencies (Jaselskis & Ashley, 1991).

As quoted by Bredillet (2005), project management is grown from project oriented function to the strategic-oriented function. Currently, there are some project

management standards that are widely used for assessment, developing and certifying of project managers (Crawford, 2005).

In the human resource management (HRM) practice, establishing individuals' competencies is considered as a powerful tool (Collin, 1997). Most companies in order to achieve competitive advantages have concentrated on importance of employee development (Bratton & Gold, 1999). In order to achieve this goal, nowadays, performance management is replaced performance appraisal (Torrington & Hall, 1995). This performance management means continuous performance planning, assessment of employees' performance and then taking corrective actions (Ainsworth & Smith, 1993). Performance management due to its abilities to achieve organizational objective, has received attention in human resource management (Labib, Williams, & O'Connor, 1998). Roberts (1997) proposed input-based criteria and output-based criteria as two ways for defining performance. Input-based criteria mean personal characteristics, behaviors, and competencies that a person brings to his/her job. Output-based criteria relates to external minimum standards which is expected to be achieved by individuals in their workplaces. The output-based measures are often linked to traditional measures for measuring performance (Kagioglou, Cooper, & Aouad, 2001).

Application of traditional measures in construction project management context is not applicable due to a lot of factors that affect achievement of outputs which are out of project manager's control (Dainty, et al., 2004). Furthermore, these output measures set at the beginning of the project while the least is known about project and also quality is based on peoples' attitude and over project life-cycle changes (Atkinson, 1999).

Traditional measurement factors relied on output measures such as time, cost and quality achievement of the project. These are some external factors affecting output measures that are out of control of project managers such as bad weather or market fluctuating condition (Fraser & Zarkada-Fraser, 2003), or these output measures are

affected by other team members (Fraser, 1999, 2000; Fraser & Zarkada-Fraser, 2001). Therefore, these output measure cannot provide an accurate based to measure project managers' performance and to identify project managers' development and training plans. Most importantly, application of output measures for performance measurement of project managers cannot consider the affection of project stakeholders who are playing a crucial role on project outputs (Fraser & Zarkada-Fraser, 2003).

There are some researches that investigated performance measurement of project managers and also their effectiveness (Fraser, 1999, 2000; Mustapha & Naoum, 1997). Fraser (2000) contended that measuring skills and personal characteristics can be a basis to predict future performance. Using feedback processes such as 360-degree method to be aware about project managers' actions on others would results to maximizing project managers' performance (Church & Waclawski, 1999). This method as a communicational tool has a high organizational value (Borman, 1997). The importance of competency to evaluate managers' performance is heart part of researches in last 30 years. (See for example,(Aitken & Crawford, 2008; Loo, 1991; Mei, et al., 2005; Muzio, Fisher, Thomas, & Peters, 2007; O'Brochta, 2008; Thamhain, 2004b).

In order to plan organizational performance, performance of employees needs to be measured (Fraser & Zarkada-Fraser, 2000). Marchington and Wikinson (1996) argued that it is necessary to replace unjustified ideas about factors that constitute effective performance with systematic dimensions that result to effective performance. Fraser and Zarkada-Fraser (2003) argued that although competencies (e.g. Boyatzis, 1982), meta-competencies (e.g. Brown,(1993)) concepts which are suitable for training programs(Winterton & Winterton, 1999), these concepts are not suitable for performance measurement.

According to Subramanian et al.(2007), the factors influencing project management performance are complex. Aladwani (2002) pointed out team's ability to accomplish

tasks as one of the factors to achieve success. For instance, to conduct software development project, cumulative competencies of project development team is required (Rose, Pedersen, Hosbond, & Kraemmergaard, 2007). Gemunden (2001) argued that teamwork has a complex and multifaceted concept that included task-oriented activities and also interaction between team members.

Taylor (1911) is as one of the first persons who addressed contributors of work competencies, conducted “time and motion studies”. Later some other authors such as Armstrong (1991) and Ferris et al. (1990) applied “job analysis” concept instead of “time and motion studies”, and some other researchers applied attribute-based concept. “Job analysis” also known as work-oriented concept, emphasizes on work independently of worker which includes technical requirements of job-tasks (Holmes & Joyce, 1993) while “attribute-based concept” which is worker-oriented, concentrates on knowledge, skills, personal traits and abilities of worker (Veres, Locklear, & Sims, 1990). The summary of performance measurement and performance prediction of managers is shown in Table 2.3.

Table 2.3: Performance Measurement & Performance Prediction of Managers

Dainty, et al., 2004	Application of competency-based measures, and other pivotal competency measures such as behavioral metrics that are crucial for achieving superior levels of performance
Motowildo, Borman, & Schmit, 1997	Application of competency-based measures can also be used for predicting performance
Dainty, Cheng, & Moore, 2003; Dainty, et al., 2004	Competency-based measures due to identification of appropriate measures are becoming increasingly pivotal in human resource management practices and actually are eluding of problems that traditional measures are facing.
Ahadzie, et al., 2008	Traditionally, for performance measuring of construction project managers, only time, cost and quality were being hired

Table 2.3, continued

Boxall, 2007; Lengnick-Hall & Lengnick-Hall, 1988	Improvement of performance is always a challenge for management
Yang et al., 2011	Project performance is highly influenced by teamwork.
Guest and Neil, 2007; Gauvreau, 2004	Indicated that workplace performance is associated to HRM and also employee attitudes.
Simonton's, 2006; Immelman's, 1998; Steinberg's, 2005; Kunich and Lester, 1994	Applied profiling in political science in order to predict the performance of presidents.
Carr et al., 2002	Relationship between performance of designers and their personality traits
Beer, et al., 1990; Karpin, 1995; Pinto & Kharbanda, 1995; Smith, Carson, & Alexander, 1984	Addressing project management personnel competencies for its important effect on project performance
Kakabadase, 1991	There is a connection between overall performance of project and also competencies of top team members
Jaselskis & Ashley, 1991	Performance of the projects is affected by project managers' competencies.
Torrington & Hall, 1995	Nowadays, performance management is replaced performance appraisal
Ainsworth & Smith, 1993	performance management means continuous performance planning, assessment of employees' performance and then taking corrective actions
Roberts, 1997	Proposed input-based criteria and output-based criteria as two ways for defining performance. Input-based criteria means personal characteristics, behaviors, and competencies that a person brings to his/her job. Output-based criteria relates to external minimum standards which is expected to be achieved by individuals in their workplaces.
Dainty, et al., 2004	Application of traditional measures in construction project management context is not applicable due to a lot of factors that affect achievement of outputs which are out of project manager's control

Table 2.3, continued

Atkinson, 1999	Output measures set at the beginning of the project while the least is known about project and also quality is based on peoples' attitude and over project life-cycle changes.
Fraser & Zarkada-Fraser, 2003	Application of output measures for performance measurement of project managers cannot consider the affection of project stakeholders who are playing a crucial role on project outputs
Fraser, 1999, 2000; Mustapha & Naoum, 1997	Investigated performance measurement of project managers and also their effectiveness
Fraser, 2000	Contended that measuring skills and personal characteristics can be a basis to predict future performance.
Church & Waclawski, 1999	Using feedback processes such as 360-degree method to be aware about project managers' actions on others would results to maximizing project managers' performance.
Aitken & Crawford, 2008; Loo, 1991; Mei, et al., 2005; Muzio, Fisher, Thomas, & Peters, 2007; O'Brochta, 2008; Thamhain, 2004b	The importance of competency to evaluate managers' performance
Armstrong (1991); Ferris et al., 1990; Holmes & Joyce, 1993	Applied "job analysis". "Job analysis" also known as work-oriented concept, emphasizes on work independently of worker which includes technical requirements of job.
Veres, Locklear, & Sims, 1990	Applied attribute-based concept. "attribute-based concept" which is worker-oriented, concentrates on knowledge, skills, personal traits and abilities of worker

2.2.5 SELECTION OF PROJECT MANAGERS BASED ON THEIR COMPETENCIES

Lai(1995) argued that process of employee selection is a multi-objective decision making problem. Iwamura and Lin (1998) contended that process of employee selection requires to accomplish and to combine several factors. Labib et al. (1998) explained a four-stage Analytic Hierarchy Process (AHP) for employee selection process. Golec and Kahya (2007) suggested a comprehensive hierarchical structure applied for employee

selection. Other methods applied for employee selection are including artificial intelligence techniques and fuzzy logic. For instance, Lazarevic (2001) that proposed a two-level fuzzy model for employee selection process.

Profiling attributes, characteristics, and behavior of successful managers provides a basis for selection and development of existing management who are candidate for management position through comparing these characteristics, behavior, and attribute of candidate to the profile of successful managers (Müller & Turner, 2010). There is a research by Petersen (1991) that intended to be applied for project managers' selection, conducted based on literature review in order to develop a list of predictors. For development of a vigorous selection of team members, competency assessment can be applied (Dainty, Mei, & Moore, 2005). Application of competencies approaches help to identify techniques for achieving desirable results for the job (Armstrong, 2001). As suggested by Wood and Payne (1998), competency based selection that results to matching person and job avoids many problems existed in traditional techniques, and produce a condition for more accurate prediction of performance. Competency approaches not only can be used for identifying required skills, knowledge, traits, and behavior of personnel and for selection needs of organization, but also these approaches can eliminate the gap between competencies required in projects and existing competencies in organizations. Demands for higher productivity and lowering cost have been led organizations to find the best ways for selection effective employees (Garavan, Bamicle, & O'Sulleabhain, 1999; Hodgetts, Luthans, & Slocum, 1999; Losey, 1999). A summary of literature review pertaining to selection of project managers based on their competencies is addressed in Table 2.4.

Table 2.4: Selection of Project Managers Based on Their Competencies

Lai, 1995	Argued that process of employee selection is a multi-objective decision making problem
Iwamura and Lin, 1998	Contended that process of employee selection requires to accomplish and to combine several factors
Labib et al.,1998	Explained a four-stage Analytic Hierarchy Process (AHP) for employee selection process
Golec and Kahya, 2007	Suggested a comprehensive hierarchical structure applied for employee selection
Lazarevic, 2001	Proposed a two-level fuzzy model for employee selection process
Müller & Turner, 2010	Profiling attributes, characteristics, and behavior of successful managers provides a basis for selection and development of existing management who are candidate for management position through comparing these characteristics, behavior, and attribute of candidate to the profile of successful managers.
Pettersen, 1991	Conducted a research based on literature review in order to develop a list of predictors
Andrew R. J. Dainty, Mei, & Moore, 2005	For development of a vigorous selection of team members, competency assessment can be applied

2.2.6 COMPLEXITY AND PROJECT MANAGERS' COMPETENCIES

There are some researches that investigate complexity and uncertainty in projects such as (Eliat & Dorothea, 1999; Harvir & Amarjit, 2002; Ives, 2005; Jaafari, 2003; Stacey, Griffin, & Shaw, 2000). As contended by Crawford et al. (2006) and Thomas and Mengel (2008) the existing project management standards such as PMBOK, APM standards, PRINCE2 are failing to teach project managers about complexity in today's working environment. Cooke-Davies (2004) suggested that in order to deal with complexity, individuals need to become an important tool and learning to these individuals need to be more pivotal than traditional control processes which in project management standards are emphasized (Turner & Müller, 2005).

Keegan and Den Hartog (2004) argued that due to temporary nature of projects and as a results the complexity of projects, there is a need to more emphasize on dynamic

relationships. Consequently, project managers to be effective in changing environment, need to develop both technical and social competencies (Thamhain, 2004a, 2004b). Thomas and Mengel (2008) asserted that taking complexity theories has some advantages such as better understanding of changing project environment and also finding new competencies required for project success. Traditional project management practices concentrate on processes which are not suitable for developing required competencies to deal with complex projects (Crawford, 2005; Williams, 2005).

2.3 COMPETENCY STANDARDS COMPARISON (AIMP, PMCD, ICB, AND APM COMPETENCY STANDARDS)

This section of this chapter, as shown in figure 2.2 compares project managers competency standards.

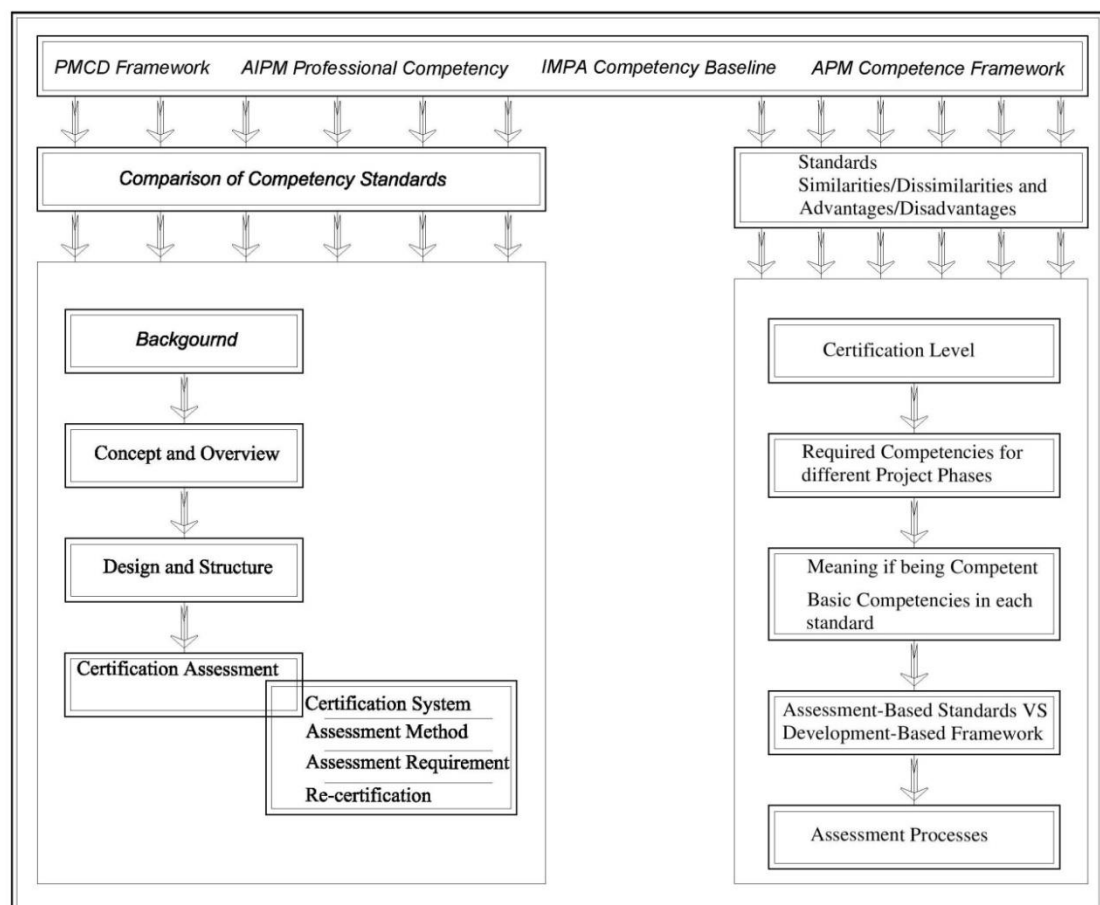


Figure 2.2: Competency Standards Comparison (AIMP, PMCD, ICB, and APM Competency Standards)

2.3.1 BACKGROUND

PMCD framework- This framework was a project sponsored by Project Management Institute (PMI) in 1998. The input was collected from the frameworks published by PMI, National Competency Standard developed by the Australian Institute of Project Management, Competency Dictionary developed by Lyne and Signe Spencer (1993), Project Management Professional (PMP) Role Delineation Study, and Project Management Experience Knowledge Self-Assessment Manual and some other information from international organizations and industries. After some revisions, the draft was submitted to public for their comments and after reviewing the comments, the final version of the framework was issued in 2002.

AIPM Professional Competency Standard- the Australian institute of project management is a non-profit organization, and it acts as the main project management body in Australia, developed the “National Competency Standards for Project Management” in 1996, and based on “Registered Project Manager’s program” it awarded certificates in three levels of the project director, project manager and project practitioner. In order to upgrade this standard and based on requirements of professionalism in the project management, AIPM developed the “AIPM professional competency standards for project management” in 2008. Compared to the previous AIPM Competency Standard, this standard has the three advantages. The first advantage is that it is a rigorous assessment method. Next, it can be used for the senior management level, and finally, it is able to meet industry needs.

IPMA Competence Baseline 3.0- In 1990s IPMA developed IPMA Competence Baseline version 2.0. In order to improve this standard, IPMA defined a revision project and based on the suggestions and directions from 40 association members, IPMA Competence Baseline 3.0 was published.

APM Competence Framework- This standard developed by Association of Project Management in 2008 in order to be used as a base for project manager's certification purpose.

2.3.2 CONCEPT AND OVERVIEW

PMCD framework- This framework is developed by the "Project Management Institute" in 2002 and is intentionally designed to be applicable in most projects, industries, and organizations. This means that the size of projects, the project complexity and the project nature are not considered in this framework. PMDC framework is a performance-based framework. Based on Gonczi and Hager (1993), performance-based approach means being able to perform in certain pre-accepted level of performance.

This standard proposes a methodology for project management development through the definition of the key components of competencies, which affect project manager's performance in most projects. However, in PMCD framework, the degree of importance of each competency element is not considered. Thus, in addressing this weakness, organizations, which want to employ this standard need to define the degree of importance of each of the competency elements.

PMCD framework is aligned with "A Guide of Project Management Body of Knowledge", "Project Management Professional (PMP) Role Delineation Study" and "Project Management Experience and Knowledge Self-Assessment Manual". The purpose of this standard is to define a methodology that can be used by individuals and organizations for developing project managers. This standard does not address organizational context and project type. Hence, organizations need to address organizational context and project type if they are interested to use this standard.

In this standard, the description of competency is based on the definition made by Crawford (1997). She defined competency according to three dimensions, which are project management knowledge, project management performance and personal competencies. Thus, a competent project manager should fulfill all three dimensions requirements.

According to the PMCD framework, a project in order to be successful needs, a competent project manager and a matured organization. If any of these two is not there, it leads to project failure.

As mentioned before, in the PMCD framework, the industry-specific competencies are not addressed and only the project management competencies as the general basis for project managers in a workplace are addressed. Therefore, individuals and organizations use this standard need to include industry-specific competency to the general competencies. Because of the two reasons, this standard is designed to have general natures. Firstly, competencies are transferable from one industry to another industry. Secondly, since the PMCD framework proposes a general competency, the industries can use it as a base and include their own supplement competencies.

The purpose of the PMCD framework is not for the selection of project managers or neither for evaluation of project managers' performance. Its purpose is just to provide guidance for individuals and their organizations for developing project managers.

AIPM Professional Competency Standard- The purpose of this standard is to fulfill the requirement of the project management profession. This standard is designed to cover most industries and most projects from the simple one to the more complicated ones. Assessment of nominates is based on the project managers' workplace performance. This standard covers the higher level of management, which is the senior management level in organizations.

In this standard, being competent means to have the minimum predefined levels of knowledge and skills in project management and to be able to apply this knowledge and skills at the workplace. . From “Project Practitioner Level” to “Project Manager Level”, or from “Project Manager Level” to “Project Director Level”, level of the responsibility and minimum requirements for the knowledge, skills, and experience increase as well.

IPMA Competence Baseline 3.0- IPMA Competence Baseline 3.0 defines a common framework for the certification purpose. 50 members of IPMA worldwide can use IPMA Competence Baseline as a basis and add their own specific competencies and provide a National Competence Baseline. However, this National Standard should be validated by IPMA. The main purpose of IPMA Competence Baseline is to define a standard to be used for the universal certification system. Another purpose of this standard is to develop personnel that are working in the project management area. For assessments, candidates need to submit evidence based on their performance at the workplace, and assessors evaluate candidates’ knowledge and experience according to these submitted evidence. In considering cultural differences, IPMA allows members to have a “National Section” in each competency element by adding new competencies related to cultural differences.

APM Competence Framework- This standard is linked to IPMA Competence Baseline 3 and also APM body of knowledge, and is designed to assess knowledge and experience of candidates who intend to achieve an international recognized certification. In this standard, organizational specific need are not addressed. For the development of the standard, worldwide competence frameworks are studied and project management practitioners’ knowledge and experience inside UK industry has been used.

2.3.3 DESIGN AND STRUCTURE

PMCD framework- In the PMCD framework, project manager's competency components are defined according to three dimensions. They are project management knowledge, project management performance, and personal competencies. The project management knowledge and performance are defined based on nine knowledge areas of PMBOK. These knowledge areas are scope, integration, cost, time, quality, risk, human resource, communication, and procurement management. These nine areas of project management knowledge are assessed in five clusters of project management process groups as outlined in PMBOK. These clusters are called initiating, planning, executing, controlling, and closing. In addition of the Project Management Knowledge and performance competencies, the Personal competencies are also addressed in the PMCD framework. The project management performance competencies describe how a project manager is able to apply project management knowledge at the workplace. In assessing project management knowledge, mechanism such as Project Management Professional (PMP) exams can be used. In assessing the performance competencies, the project manager's actual work or outputs can be reviewed.

Based on these nine units of project management knowledge and the five clusters of the project process, a total of 45 competency components are defined. They are then classified into elements of competency criteria. These elements and criteria are used in measuring the project management knowledge and performance in each unit of competency.

In addressing the personal competencies' structures, the PMCD framework is based on the competency dictionary by Lyne and Singe Spencer (1993). There are six units of competencies in this dictionary. They are achievement and action, helping and human service, impact and influence, and managerial competencies. Each unit is classified into clusters, which describe the required behavior in each unit.

AIPM Professional Competency Standard- The knowledge and skills required in this standard are driven from the project management body of knowledge standard (PMBOK). This means that in this standard the areas of project managements are defined according to scope, time, cost, quality, human resource, communication, risk, procurement, and integration management.

IPMA Competence Baseline 3.0- In this standard, competency is defined within the perimeter of technical, behavioral and contextual competencies, and based on these three, 46 competency elements are defined. They are 20 technical competency elements, 15 behavioral competency elements, and 11 contextual competency elements. Technical competencies dealing with project deliverables. Behavioral competencies deal with the personal relation among all parties involved in a project, and contextual competencies deal with the interrelation of the project team within the context of a project.

Each competency element, requirements of knowledge and experience in different IPMA levels are described. Besides this, there is also a section called “main relation” that describes the relation of each competency element with other competency elements.

APM Competence Framework- In this standard, competency elements are defined within these three domains: technical competencies, behavioral competencies, and contextual competencies. Technical competencies contain 30 functional project management competency elements. Behavioral Competencies contain personal project management competency elements, which cover attitudes and skills. These elements are related to project manager’s interaction with parties involved in executing a project. Behavioral Competencies have nine competency elements. Contextual Competencies describe the interrelationship between organization and project manager, and they include eight competency elements.

2.3.4 CERTIFICATION ASSESSMENT

2.3.4.1 CERTIFICATION SYSTEM

AIPM Professional Competency Standard- AIPM Professional Competency Standard certification is in four levels, which are Project Practitioner, Project Manager, Project Director, and Executive Project Director, and based on these levels, the titles awarded to successful candidates are: Certified Practicing Project Practitioners (CPPP), Certified Practicing Project Manager (CPPM), Certified Practicing Project Director (CPPD), and Executive Project Director (Exec PD). Responsibility increases from Project Practitioner level to Executive Project Director Level.

Assessment done in this standard is the performance-based assessment. It means that in the process of assessing candidates, the project manager's application of knowledge and skills at the workplace are evaluated. These competencies are defined based on units of competencies that explain the kinds of competency required for an effective performance in the workplace.

IPMA Competence Baseline 3.0- Based on this standard, there are four levels for certification awarded to candidates: Certified Project Director (IPMA Level A), Certified Senior Project Manager (IPMA Level B), Certified Project Manager (IPMA Level C), and Certified Project Associate (IPMA Level D). At the Project Director Level, members who have advanced knowledge and experience are able to direct program and portfolio. At the Senior Manager Level (Level B), members are able to manage complex projects. At the Project Manager Level (Level C), members are able to manage projects with limited complexity, and in the Project Association Level (Level D), members are able to apply project management knowledge at their workplace.

2.3.4.2 ASSESSMENT METHOD

AIPM Professional Competency Standard- AIPM Professional Competency standard is a performance-based standard. According to this standard, in order for a candidate to achieve certification, he or she needs to collect evidences based on his or her performance. Then, assessors evaluate these evidences and they will advise the AIPM on the candidate's certification level. AIPM has defined a guideline for assessors in order for them to give a fair assessment and follow AIPM policies.

An assessment can be carried out by one assessor who is chosen by a candidate through the list of candidates available on the AIPM website. All assessors are based in Australia and some of them are able to evaluate candidates from outside Australia. Usually, the candidate meets the assessor twice. In the first session, the assessor usually notifies the candidate on the necessary evidences and documents that the candidate needs to submit. In the second session, all the necessary documents and evidences should have been compiled by the candidate. If there is a need to have more sessions for a more rigorous assessment, the assessor will notify the candidate accordingly. The assessor will report to AIPM on the evaluation of the candidate and almost one month after that, the certificate will be issued by AIPM to the candidate.

IPMA Competence Baseline 3.0- In the IPMA certification system, there are two assessors evaluating candidates. One of the assessors comes from same industry with the candidate, and the other assessor is from another industry. Assessors are certified based on the IPMA certification and must be at least at the same level with the candidate.

For the assessment process, after submitting all necessary documents such as the curriculum Vitae, self-assessment, 360-degree assessment, projects, programs and portfolios of the candidate involved, an interview will be carried out by the assessors.

Assessors evaluate the candidate's knowledge and experience in each competency element, and the scale used is from 0 (no competency) to 10 (absolute maximum). Assessors only evaluate the candidate competency level and do not advise the candidate for any required courses. Assessment tools used are written exam, reports which the candidate writes about the projects, programs, and portfolios he or she is assigned to, workshops(optional) that are problem-solving nature and the last but not least, interviews.

In order to achieve good marks for experience, candidates need to gain experience by working in various types and sizes of projects. They also need to work in different organizations. In the IPMA certification system, the evaluation of candidates is based on all 46 competency elements.

2.3.4.3 ASSESSMENT REQUIREMENT

AIPM Professional Competency Standard- In this standard prerequisite for application for higher level is that nominee must implement one or two projects in lower level. For instance, to apply for the "Project Manager Level", the nominee must prove that he or she has implemented at least one or two projects in the "Project Practitioner level".

At the Project Practitioners Level, members are not responsible for the overall project outcomes. Their responsibility is just limited to their own output. Project Practitioners just apply project performance tools. The minimum requirement at the Project Practitioner level is having competency in applying Scope, Time, and Quality Management Techniques and also having competency in one of the Cost, Human Resource, Communication, Risk, and Procurement Management Techniques. At the Project Manager Level, members are responsible for the overall project outcomes. Candidates in this level need to demonstrate competency in planning and managing all

nine units of competencies, which are scope, time, cost, quality, human resource, communication, risk, procurement, and integration management. At the Project Director Level, candidates are responsible for the Program Management. They must demonstrate competency in directing and managing all the nine units of competency.

Another AIPM assessment requirement is called the “Recognition of Current Competency” which means if a candidate intends to apply in a level, his or her recent experience must be in that level. For instance, if a candidate is going to apply for project director level, he or she must work as the Project Director at the time of applying.

IPMA Competence Baseline 3.0- At IPMA Level A, the candidate must have at least five years of experience in the portfolio or program management. At this level, the candidate must show evidences for portfolio and program management. For the IPMA Level B, the candidate must have at least five years in project management, and must show evidences for managing complex projects. For the IPMA Level C, the candidate must have at least three years of experience in project management and must prove enough evidences for managing projects with limited complexity. For the IPMA Level D, the candidate must provide enough evidences for having knowledge in all competency elements.

2.3.4.4 RECERTIFICATION

AIPM Professional Competency Standard- After three years of issuing the certificate, AIPM notifies members for recertification. The purpose recertification is to have continuous professional development among members. Based on the “Continuous Professional Development Program”, members must develop their capabilities and knowledge. In order to have the recertification, members need to submit points. For different levels of AIPM, the Certificate Level point requirements are varied. For

instance, for the Project Practitioner Level, the nominee must achieve 40 points, or for the Project Manager Level, the candidate is expected to score 60 points. These points are gathered by the project managers within three years of their activities. The activities and the score points are available in Tables. Therefore, for recertification, no assessment is carried out by the assessor, and the recertification relies on the evaluation of achieved points. However, for the members who are going to apply for the next level, they need to be assessed by the assessor. For instance, a candidate who is going to apply from CPPP to CPPM, he needs to be fully assessed by an assessor.

IPMA Competence Baseline 3.0- For the recertification program, IPMA concentrates on candidate's activities beginning from the issuing of the last certification. For this purpose, IPMA will inform the candidate of the expiry date of recertification, and the candidate has to update his or her curriculum vitae, project or program or portfolio lists, self-assessment, 360-degree assessment, and all training courses attended. All these documents have to be compiled and submitted to assessors. The assessors will then evaluate the compiled documents, and they will arrange for an interview with the candidate and lastly, report the outcome to IPMA.

2.3.5 STANDARDS SIMILARITIES/DISSIMILARITIES AND ADVANTAGES/DISADVANTAGES

2.3.5.1 CERTIFICATION LEVEL

In PMCD Framework, required competencies for different levels of management such as Project Practitioner Level, Project Manager Level, and Project Director Level, are not addressed. This issue is one of the disadvantages of PMCD Framework. By defining different competency levels for different management levels, there would be a sense of the competency requirements understanding among all organizations, otherwise

organization expectations about project personnel competencies would be varied from one organization to another organization. Thus, expectation level of competency cannot be standardized. In other words, a project manager that is considered competent in one organization may not be in another organization. In AIPM, IPMA and APM Standards, different certification levels are defined. However, this certification level in IPMA and also APM Standards are different from the AIPM Standard. As described before, in AIPM Standard, management levels are defined for Project Practitioners, Project Managers, Project directors, and Executive Project Directors. This standard emphasizes on the senior management level and for this level defines two categories of Project Director, and Executive Project Director. The advantage of defining this ranking system for management personnel is that, for bigger organizations with different programs and different portfolios, this system is more practical. In IPMA and APM Standards, project manager's levels are defined in two categories: project manager for projects with limited complexity (Level C), and project manager for complex projects (Level B). This ranking categorizing is more practical for organizations with different projects from simple to complex ones.

Furthermore, achieving competency is a continuous process. From time to time, and from a project to the next project, project individuals must develop their competencies and enrich their experiences, skills and knowledge from one level to next level. Based on IPMA, APM, and AIPM Standards, candidates would have enough motivation to increase their competencies and grow to higher competency levels. However, in PMCD Framework which defines the competency just in Project Manager's level, this motivation for growing to next levels diminishes. For instance, in AIPM Standard, the candidate has opportunities to upgrade his or her knowledge and skills in project management area by entering the "RegPM program". Through "continuous professional development program" candidate can upgrade his or her knowledge and skills and

increase competencies from “project practitioner level” to “project manager level” or from “project manager level” to “project director” level. “Continuous professional development program” proposes a “best practice” for growing personnel to be at the highest level of management. Considering that “competency” varies within the time, or in the other words, organizations and individuals in different times and different phases of a project require different competencies; through this “continuous professional development program” they can fulfill this requirement.

2.3.5.2 REQUIRED COMPETENCIES FOR DIFFERENT PROJECT PHASES

Required competencies for project managers in different project phases vary. It seems that once a project starts in the initiating phase, some competencies are required and in other project phases such as in the execution of closing phase, other kinds of competencies is required (PMCD Framework, 2002). In IPMA, APM, and AIPM Standards this issue is not addressed. However, in PMCD Framework this issue is captured and required competencies for project managers in different project phases- initiating, planning, execution, controlling, and closing- are highlighted. This issue is one of the advantages of PMCD Framework.

2.3.5.3 MEANING IF BEING COMPETENT

In IPMA and APM standards, a competent manager is the one who has enough knowledge and experience in three categories of Technical, Behavioral, and Contextual Competencies. In AIPM Standard and PMCD Framework, a competent manager is a person with enough knowledge and experience in Project Management area. In AIPM Standard and PMCD Framework, assessing candidate’s knowledge in project management area is straightforward and can be measured by using some tools such as

PMP exam. The advantage of AIPM Standard and PMCD Framework compare to IPMA and APM Standards is their strength for measuring knowledge in project management. However, these two standards have some weaknesses compare to IPMA and APM Standards. In these standards, the only factor which is seen for assessing candidates is “Project Management Competencies”. The knowledge and skills in project management which need to be applied at a workplace are assessed in these standards. However, other pivotal required competencies for competent project managers are not addressed in these standards. The technical competencies are neglected in these standards and required technical knowledge, and technical skills cannot be assessed. In AIPM Standard, personal competencies which are personal traits, characteristics and behavior of a project manager are not addressed. In PMCD Framework and AIPM Standard, Job-related competencies that are solely related to the job are also neglected in these standards. Contextual competencies which are essential are not included in these standards.

2.3.5.4 BASIC COMPETENCIES IN EACH STANDARD

All AIPM, APM, IPMA Standards and PMCD Framework are designed for covering most projects and most industries. It means that project size, project complexity, and project nature, organizational specific needs, and cultural differences are not taken into account in these standards. It has advantages and disadvantages. The advantage is that, this provides a basis for transportability between organizations. In the other words, it provides circumstances for transferring of project management competencies across different industries, and organizations from different countries. The disadvantage of this issue is that since the size and type of projects, organizational specific needs, and cultural differences are not considered in these standards. Therefore, some required competencies related to aforementioned items would be missed. For instance, the

circumstances of a complex project are totally different from a simple project. Thus, a project manager needs to acquire more knowledge in QA-QC issues and safety issues, and other competencies to manage sundry stakeholders, in which, in a smaller project, may not be necessary. Thus, since all projects are unique, project manager, must possess related competencies for each project.

2.3.5.5 ASSESSMENT-BASED STANDARDS VS. DEVELOPMENT-BASED FRAMEWORK

In spite of other competency standards that are assessment-based, PMCD framework is a development-based framework which defines a methodology for achieving required competencies. Based on this methodology, after defining performance criteria and defining desired level of proficiency, the level of project managers based on these items are assessed and the gaps in competency are addressed and finally required actions to fill these gaps are identified. This issue is another PMCD Framework in comparing to other competency standards, which define a rigorous methodology for competency development.

2.3.5.6 ASSESSMENT PROCESSES

Another advantage of IPMA, APM, and AIPM Standards that cannot be seen in the PMCD Framework, is that based on the assessment carried out by the assessors, a candidate should be aware about his or her deficiencies and gaps. Based on these gaps, the candidate can attend related training courses. Therefore, the candidate can identify his/her weaknesses and resolve them by taking actions in proper directions.

In the AIPM assessment process, there is one assessor and in IPMA and APM Assessment process, there are two assessors that one of them is from same industry the

candidate and another one from a different industry. IPMA and APM assessment process would be more rigorous since industry-specific competencies can be assessed more accurately compared to the AIPM Standard.

2.4 COMPETENT PROJECT MANAGERS

2.4.1 NATIONAL COMPETENCY STANDARD (NCS) FOR CONSTRUCTION PROJECT MANAGERS

The National Competency Standard (NCS) for construction project managers is a standard developed by Construction Industry Development Board (CIDB) Malaysia in collaboration with Majlis Latihan Vokasional Kebangsaan (MLVK) Malaysia in 2002. The purpose of this standard is to develop and assess the skills of personnel in construction industry, as a basis for training programs, and for development of instructional materials. This standard is developed through the inputs of industrial experts in public and private sector.

In NCS, the required competencies for project managers are listed. This standard comprises two components including “Job Profile Chart” and “Task Profile”. The first component_ Job Profile_ which is also called “Job Analysis” is obtained through brainstorming sessions that tasks and duties determined and presented in Job Profile Chart. For second component of this standard_ Task Profile_ an expert committee conducts a “task analysis” and list down all required knowledge, abilities, attitudes, tools and equipment which is required to implement a task.

CIDB issues a Certificate of Proficiency to project managers who are eligible and therefore they are recognized as Certified Construction Project Managers (CCPM). In order to award the certificate, CIDB assesses the knowledge, skills and attitudes of candidates. To conduct the assessment, a certified construction project manager with

five years' post-certification experience or a representative from CIDB would be appointed to assess the candidate eligibility.

According to this standard, for a competent project manager, seven duties and accordingly 39 tasks are defined. These duties are as per following: “Organizing project initiation”, “ Developing project plan”, “ Managing human resource functions”, “ Managing project quality, health , safety and environment”, “ Managing design development and contract administration”, Managing project monitoring and controlling system”, “Administering project close-out”.

For the first duty _ Organizing project initiation_ six tasks are defined in this standard including: “preparing project charter/Memorandum”, “Preparing project brief and project strategy”, “conducting project feasibility study”, “Establishing project organizational strategy”, “Formulating procurement strategy”, and “Compiling project initiation document”. The identified tasks for second defined duty _Developing project plan_ are “Establishing project organization structure”, “Establishing project monitoring and control system”, “Preparing risk management plan”, “Establishing project budget”, “Procuring project funding”, “Establishing information and communication system”, “Administering master schedule”, and “Documenting master execution plan”. For third duty_ managing human resource functions_ five tasks are defined including “Planning human resources requirement”, “Organizing project team”, “Administering interpersonal conflicts”, “Appraising project team member”, and “Reassigning project team members”. As mentioned in this standard, The tasks of fourth duty _Managing project quality, health, safety and environment_ are “Establishing quality plan”, “Establishing health, safety and environmental plan”, “Implementing health, safety and environmental plan”, “Monitoring health, safety and environmental plan”, and “Reviewing health, safety and environmental plan”. Five identified tasks of the fifth defined duty_ Managing design development and contract administration_ are

“Administering design process”, “Administering authority liaison”, “Monitoring tender document”, “Administering tendering process”, and “Establishing dispute resolution mechanism”. For “Managing project monitoring and controlling system” as sixth identified duty in this standard, six tasks are recognized including “Monitoring work progress”, “Monitoring project cost”, “Administering progress reporting system”, “Administering project changes”, “Administering dispute resolution”, and “Monitoring project quality”. Finally, for “Administering project close-out” as the seventh identified duty in this standard, four tasks are defined including “Organizing handing over activities”, “Performing contract close-out”, “Performing post-contract evaluation”, “and “Performing post-mortem review”.

2.4.2 SUPERIOR MANAGERS

According to Kolb and Fry (1984), superior managers instead of simply applying required actions, consciously think about the how to manage and accordingly take actions and based on these experiments they can learn and develop themselves.

Competency, on the other side, refers to underlying characteristics of a person which results to achieve superior performance through effective actions (Boyatzis, 1982). Therefore, this concept of competency addresses the problem existed in competence concept that while competence refers to minimum required standards; competency is looking for excellence performance (Burgoyne, 1988).

Successful project managers in order to manage changes in changing environment, use formal and informal communication skills (HÄLLgren, 2005). O’Brochta (2008) in a macro level study investigated 5000 project managers and project stakeholder in order to identify successful project managers and the contributors to their success. Findings of his research show that successful project managers, have more authority, more planning, and more communications.

Winterton and Winterton (1999) argued that more researches need to be conducted for understanding and developing effective managers. Kloppenborg and Opfer (2002) pointed out that project managers in order to be effective need to develop their abilities as leaders rather than as managers. There are some researches such as (Gadeken, 1991; Gadeken & Cullen, 1990; Mc Veigh, 1995; Pettersen, 1991; Posner, 1987; Thamhain & Wilemon, 1977) concerning identifying high performing project managers competencies.

2.4.3 DEVELOPMENT OF MANAGERS

Organizational values and core competencies are very much connected to managerial core competencies. In fact, managerial core competencies are derived from organizational values and core competencies (Reagan, 1994). The organizations that use competency-based systems are organizations with high performance (Collins & Porras, 1996).

Performance appraisal is the key component of any performance management system (Banks & May, 1999; Burgler, 1995; Mohrman & Mohrman, 1995). Therefore, it is crucial for organizations as a part of their performance management system, they appraise their managerial competencies. In a research conducted by Abraham et al. (2001), they found that many of organizations are not considering managerial competencies for appraising their managers. Therefore, the effectiveness of managerial appraisal system effectiveness in those organizations reduces. In their research, they also identified six critical competency elements for project managers which were leadership, customer focus, results oriented, problem solver, communication skills and team worker. Therefore, organization that are willing to achieve a high performance not only need to identify the competencies required by their project managers, but also need

to make sure that for their managerial appraisal processes they apply same identified competencies (Abraham, et al., 2001).

When we are discussing about competency, it means that competency needs to have attributes to be useful. Some researchers such as Burack et.al (1997), Parry (1998), and Pickett (1998), studied attributes which is needed for competency to be useful. For instance, Parry (1998) mentioned that a competency in order to be useful needs to be measurable, to be improved via training, and to be correlated with job performance, or Pickett discussed competency needs to be transferable, to have capability to be learned, and to be generic.

Competency-based measures enable project managers to develop their personnel through continual professional development (Dainty, et al., 2004; Mei, et al., 2005). Other advantages of competency-based measures are providing the training programs requirements for staff and also a comprehensive definition of job; besides, it is useful for manpower planning as well as goal setting (Dainty, et al., 2003; Latham, Fay, & Saari, 1979; Mei, et al., 2005).

Walker and Kalinowski (1994) explained importance of low task and high relationship attitude for projects in Asia, or Christenson and walker (2004) mentioned about importance of vision for leadership, or Thamhain (2004b) explained importance of creating a supportive environment, or Prabhakar (2005) showed the importance of transformational leadership style. Some other studies address the need for improving project managers' skills (e.g. (Blackburn, 2001; Dainty, Cheng, & Moore, 2005; Huemann, 2002; Moore, Cheng, & Dainty, 2003).

Chan and Chan (2005) found that in order to achieve employee greater performance and satisfaction, professionals should apply transformational leadership for interacting with employees.

Cardy and Dobbins (1994) observed three types of appraisal systems for field of performance appraisal including traits, behaviors, and outcomes. Among these three types behavior is changeable, so it is suitable for training purposes. Therefore, it is very crucial for project-based organizations to define an excellence behavioral term as targets that can be used for professional development of their project managers (Fulmer, Gibbs, & Goldsmith, 2000; Heffernan & Flood, 2000; Latham, et al., 1979). On the other side, traits are relatively fixed characteristics of workers and are not suitable for training purposes. The problem with outcomes is that since some factors are not in the control of worker, so cannot be measured clearly.

Project managers need to fulfill some roles such as facilitator, coordinator, motivator and politician (Briner, Hastings, & Geedes, 1996). Therefore, there is a need to develop some more sophisticated approaches to manage project managers' performance due to their multifaceted roles.

According to Dainty et al. (2003) construction organizations try to develop some criteria to measure project managers' performance. These criteria not only can be used as a basis for rewards, but also can be applied for organization training and development need, for goal-setting among all project managers in the organization, and for succession planning in the organization.

Nowadays the industries are interested in more and more on project management and project management training and education result to industry evolving (Price & Dolfi, 2004; Thomas, Mengel, & Andres, 2004).

There are some researches such as Mullaly and Thomas (2004) and Srivastava et al. (2003) that suggest personality traits could be influenced by several factors and it is possible to adapt to new personality types. In this regards other researches proposed some personality traits that can be learned such as More (1998) espoused the idea that

optimism is dynamic can be learned, or Laske (2001) has shown that employee satisfaction can be learned.

As mentioned by Wateridge (1997) initial training programs need to focusing of processes and tools while later training programs should address conflicts, leadership and strategy.

Organizations in order to increase their competitive advantage need to improve the competencies and skills of their manpower (Houtzagers, 1999). Competency management in organizations results to development of personnel (Beck, 2003), knowledge sharing (Won & Pipek, 2003), and increasing of e-learning in organizations (Hockemeyer, Conlan, Wade, & Albert, 2003).

Development of competencies in organizations includes four stages of: competency mapping, competency diagnosis, competency development and competency monitoring (Draganidis & Mentzas, 2006). Competency mapping shows competencies required in organization in order to accomplishing targets. In competency diagnosis phase, skill gap analysis for employees conducted in order to identify the level of required competencies of employees and required level of competencies that employees need to achieve. In the third phase- competency development- according to previous phase, required competencies would develop and in the last phase- monitoring phase- the results achieved by development of competencies evaluated.

Competency approaches are widely being utilized by organizations for enabling employees with more learning and flexibility capabilities in organizations (Lei & Hitt, 1996; Spangenberg, Schroder, & Duvenage, 1999). In fact, using competency approaches in organizations result to identifying learning needs and also ensuring these learning needs are addressing business needs (Reid & Barrington, 1994; Thomson & Mabey, 1994).

There is a debate about competency that whether it can be learned or it is innate. The dominant view about competency mentioning that competency can be learned and competencies can be developed through workplace learning (Eraut, 1994; Fletcher, 1992). The opposite view mentioning that characteristics such as attitude, emotion and cognition are innate and cannot be learned; they only can be developed (Klink & Van Der Boon, 2000). In Table 2.5, summary of literature review pertaining to development of managers is addressed.

Table 2.5: Development of Managers

Collins & Porras, 1996	The organizations that use competency-based systems are organizations with high performance
Banks & May, 1999; Burgler, 1995; Mohrman & Mohrman, 1995	Performance appraisal is the key component of any performance management system
Abraham, et al., 2001	Organization that are willing to achieve a high performance not only need to identify the competencies required by their project managers, but also need to make sure that they apply same identified competencies for their managerial appraisal processes
Dainty, et al., 2004; Mei, et al., 2005	Competency-based measures enable project managers to develop their personnel through continual professional development
Dainty, et al., 2003; Latham, Fay, & Saari, 1979; Mei, et al., 2005	Other advantages of competency-based measures are providing the training programs requirements for staff and also a comprehensive definition of job; besides, it is useful for manpower planning as well as goal setting
Walker and Kalinowski (1994)	Explained importance of low task and high relationship attitude for projects in Asia
Christenson and walker, 2004	Mentioned about importance of vision for leadership
Thamhain, 2004b	Explained importance of creating a supportive environment
Prabhakar (2005)	Showed the importance of transformational leadership style.
Blackburn, 2001; Dainty, Cheng, & Moore, 2005; Huemann, 2002; Moore, Cheng, & Dainty, 2003	Some other studies address the need for improving project managers' skills

Table 2.5, continued

Chan and Chan, 2005	Found that in order to achieve a greater performance and satisfaction of employee, professionals should apply transformational leadership for interacting with employees
Cardy and Dobbins, 1994	Observed three types of appraisal systems for field of performance appraisal including traits, behaviors, and outcomes
Fulmer, Gibbs, & Goldsmith, 2000; Heffernan & Flood, 2000; Latham, et al., 1979	Therefore, it is very crucial for project-based organizations to define an excellence behavioral term as targets that can be used for professional development of their project managers.
Dainty et al., 2003	Construction organizations try to develop some criteria to measure project managers' performance
Price & Dolfi, 2004; Thomas, Mengel, & Andres, 2004	Nowadays, the industries are interested in more and more on project management and project management training and education result to industry evolving
Mullaly and Thomas, 2004; Srivastava et al., 2003	Suggested that personality traits could be influenced by several factors and it is possible to adapt to new personality types
More, 1998	Espoused the idea that optimism is dynamic can be learned
Laske, 2001	Showed that employee satisfaction can be learned
Wateridge, 1997	Initial training programs need to focusing of processes and tools while later training programs should address conflicts, leadership and strategy
Houtzagers, 1999	Organizations in order to increase their competitive advantage need to improve the competencies and skills of their manpower
Beck, 2003	Competency management in organizations results to development of personnel,
Won & Pipek, 2003	Competency management in organizations results to knowledge sharing
Hockemeyer, Conlan, Wade, & Albert, 2003	Competency management in organizations results increasing of e-learning in organizations
Draganidis & Mentzas, 2006	Development of competencies in organizations includes four stages of: competency mapping, competency diagnosis, competency development and competency monitoring
Lei & Hitt, 1996; Spangenberg, Schroder, & Duvenage, 1999	Competency approaches are widely being utilized by organizations for enabling employees with more learning and flexibility capabilities in organizations

Table 2.5, continued

Reid & Barrington, 1994; Thomson & Mabey, 1994	Using competency approaches in organizations result to identifying learning needs and also ensures these learning needs are addressing business needs
Eraut, 1994; Fletcher, 1992	The dominant view about competency mentioning that competency can be learned and competencies can be developed through workplace learning
Klink & Van Der Boon, 2000	Characteristics such as attitude, emotion and cognition are innate and cannot be learned; they only can be developed

2.4.4 COMPETENCY PROFILES AND COMPETENCY FRAMEWORKS

Competency models are looking for skills, knowledge, experience, and attitudes that enable employee to achieve higher performance and to add more value to organization (Gorsline, 1996). Competency model provides a list of required competencies for specific occupation. Competency models also provide a basis for employees competency gaps which is a comparison between available competencies and needed competencies in the organization. Developing a competency model is happening through surveys, interview, focus groups, and etc. (Draganidis & Mentzas, 2006). Morris (2000) reported a research based on interviews with one hundred and seventeen companies, concerning required knowledge and understandings by project management professionals to be considered competent.

Organizational change projects have absorbed research interest in project management field (Bresnen, 2006; Crawford, Costello, Pollack, & Bentley, 2003; Lehtonen & Martinsuo, 2008; Levene & Braganza, 1996; Leybourne, 2006; Nieminen & Lehtonen, 2008; Pellegrinelli, 1997).

Muller & Turner (2010) identified competency profiles of successful project managers for different project types (engineering & construction, information and telecommunication, and organizational change projects), different project complexity, and different importance degree. They contended that in order to be successful for

different project types, different competency profile is required. Their study was the extension of Dulewicz and Higgs (2005) research who profiled project managers' competencies for organizational change projects. Turner et al. (1996) considered project managers as managers of changes in organizations. However, other researchers such as Partington et al. (2005) believe that for change projects in organizations project managers with different skills are required. Therefore, they proposed that project managers and program managers need to learn required skills and capabilities which are beyond required competencies for projects, to be suited for change projects in organizations. Some researchers believe that change projects should be managed by project managers and program managers (Kliem, Ludin, & Robertson, 1997; Obeng, 1994; Pellegrinelli, 1997; Turner, et al., 1996) whilst some other researchers believe that managers for change project should come from the fields with less focus on technical issues and more focus on interpersonal skills such as psychology or organizational development fields (Caluwe' & Vermaak, 2003; Connor & Lake, 1994; Cummings & Worley, 2001; French & Bell, 1999; Kanter, Stein, & Jick, 1992).

The importance of project management competencies has caused development of project management standards which these standards are normally based on the collective opinion of project management professional about competent project personnel. Sandberg (2000) argued that the national competency standards, are normally derived from job analysis and human aspects are not considered effectively. As contended by Crawford (2005) there is a difference between competencies valued by project management practitioners and senior project managers.

While in US attribute-based competency or competency model- is prevalent, such as McClland and MeBer research in 1970s which reported by Boyatzis (1982), in UK, Australia, and New Zealand, demonstrable performance approaches or competency standards are prevalent. Performance approaches means usage of practices in workplace

based on professional competency standards (Crawford, 2005). Competency by followers of attribute-approach is defined as “underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation” (Spencer & Spencer, 1993). Spencer and Spencer (1993) defined five competency characteristics. These competency characteristics are: knowledge, skill, motives, traits and self-concept. While knowledge and skills can be developed and assessed by training, the other three competency characteristics are difficult to be assessed and developed (Crawford, 2005). Attribute-based inference of competency includes skills, experience, knowledge, personality traits, attitudes and behaviors (Heywood, Gonczi, & Hager, 1992). Finn (1993) called knowledge and skills competencies, as “input competencies”. Abraham et al. (2001) mentioned that competencies include different characteristics, traits, and behavior that is necessary for effective accomplishment of project. Required skills for project managers in Meredith et al. (1995) research is categorized in six groups named, communication, organizational, team building, leadership, coping and technological skills. El-Sabaa (2001) suggested technical expertise are the least important competencies required by project managers and instead of these in-depth technical skill, cross-functional skills and broader range of functional roles is critical for project managers. Therefore, in order to increase organizational competitiveness, softer qualities like flexibility and sensitivity that help for better coordination of activities are more crucial than functional expertise (Jacobs, 1989). Boyatzis (1982) contented that generic competency profiles of superior project managers in all types are similar.

Early literature review of effective project managers show that effective project managers try to build trust, and try to involve team members' emotions (Blake & Mouton, 1964; Likert & Hayes, 1957; Mc Gregor, 1967). Honey (1988) suggested that in order to achieve desirable outcomes with the help of other people, it is important to

utilize interpersonal skills. Kliem and Ludin (1992) suggested that project managers need to apply interpersonal skills such as being able to see things from team members' perspective, showing empathy, and respecting others. Verma (1996) proposed that project managers need to adapt their behavior to the existing conflicts existing in different levels. Thamhain (2004a) suggested that effective project managers, make their team members feel proud to be as a part of team, and align project team members personal goal and organizational goal. Kadefors (2004) considered that trust building is a crucial competency needed by project managers. They must boost level of loyalty in a way that both parties show respect for that. Rosenau (1998) contended that project managers need effective people skills rather than technical skills. Skills such as being flexible, being creative, being able to cope with problems, displaying behaviors showing respecting to team members. In this atmosphere, project manager's wishes will be followed voluntarily with project members. Edmondson et al. (2005) suggested that creating an environment for sharing information, and creating an environment that welcomes other people opinions is very important for effective project managers. Wysocki (2007) suggested that effective project managers try to motive team members to be creative and try "to think outside the box". Jiang et al. (1999) suggested that effective project managers are capable to show empathy, understand how to motivate others, capable to manage conflict, when dealing with others they are diplomatic, being able to accentuating messages to others through facial expressions. Barkley (2006) suggested that effective project managers create a trust, honesty, and commitment environment. They motivate team members to perform and improve. "Soft skills" of project managers are being addressed in some researches (Aronson et al., 2006; Lechler, 2000; Pinto & Thoms, 1999).The importance of soft skills for project managers accentuates the importance of human factors to achieve project success (Pant & Baroudi, 2008; Wateridge, 1997; Wirth, 1992).Dainty et al. (2005) pointed out for this

changing environment of projects, project managers need to develop their client-orientation, flexibility, and self-control competencies as the most crucial competencies required by them. Dulewicz and Higgs (2003) proposed the concept of Emotional Intelligence in project management and showed that for leadership performance this competency accounts for 36% while Intellectual competencies account 27%, and Managerial competencies account 16%. Martin Seligman emphasized the importance of being optimistic. In this book, *Learned Optimism*, Seligman (1991) asserted that to be negative in workplace would result to task failure. Others also pointed out same results that negativity result to task failure (Losada & Heaphy, 2004). Being optimistic provides a basis for training of project managers (Thornley, 2006). The important role of self-confidence and self-belief to achieve project success is accentuated in Lee-Kelly's and Loong's (2003) research. David and Cable (2006) in their research reported that a positive workplace cause individual productivity and also team productivity to be improved. Thornley (2006) research findings suggest that effectiveness of planning process is affected and influenced by having positive attitude about it. Mirabile (1997) offered an extensive competency profile. Thamhain (2004a) emphasized the importance of leadership for project managers. Gokhale (2005) emphasized the importance of experience for competency achievement. Belzer (2001) identified several soft skills that are crucial for successful project management. These factors include: to understand culture of organization and team members that project manager is working with, decision making, leadership, problem solving, team building, to be flexible, to be creative, and trustworthiness. In fact, she mentioned that “. . .(O)ften (projects) fail because of a project manager's inability to communicate effectively, work within the organization's culture, motivate the project team, manage stakeholder expectations, understand the business objectives, solve problems effectively, and make clear and knowledgeable decisions” (Stevenson & Starkweather, 2010). Chen and Partington

(2006) defined project management competency, as hard components of a standard and soft characteristics of personal qualities Thornton and Byham (1982) listed competencies for top management including required management skills, leadership skills, interpersonal skills, creativity, communication skills, and personality traits. Dulewicz (1989) identified required competencies for middle managers. He categorized these competencies in four clusters as: Intellectual competencies, Interpersonal competencies, Adaptability, and Result orientation. The summary of literature review pertaining to competency profiles and competency frameworks are addressed from Table 2.6 to Table 2.24.

Table 2.6: Competency Profiles and Competency Frameworks

(Gorsline, 1996).	Competency models are looking for skills, knowledge, experience, and attitudes that enable employee to achieve higher performance and to add more value to organization
(Draganidis & Mentzas, 2006).	Developing a competency model is happening through surveys, interview, focus groups, and etc.
Morris (2000)	Reported a research based on interviews with one hundred and seventeen companies, concerning required knowledge and understandings by project management professionals to be considered competent.
Muller & Turner (2010)	Identified competency profiles of successful project managers for different project types (engineering & construction, information and telecommunication, and organizational change projects), different project complexity, and different importance degree.
Sandberg (2000)	Argued that the national competency standards, are normally derived from job analysis and human aspects are not considered effectively.
Spencer and Spencer (1993)	Defined five competency characteristics. These competency characteristics are: knowledge, skill, motives, traits and self-concept.
behaviors (Heywood L, Gonczi A, & A, 1992)	Attribute-based inference of competency includes skills, experience, knowledge, personality traits, attitudes and.

Table 2.6, continued

Meredith et al. (1995)	Required skills for project managers in research is categorized in six groups named, communication, organizational, team building, leadership, coping and technological skills.
El-Sabaa (2001)	Suggested technical expertise are the least important competencies required by project managers and instead of these in-depth technical skill, cross-functional skills and broader range of functional roles is critical for project managers.
(Jacobs, 1989)	In order to increase organizational competitiveness, softer qualities like flexibility and sensitivity that help for better coordination of activities are more crucial than functional expertise
(Blake & Mouton, 1964; Likert & Hayes, 1957; Mc Gregor, 1967)	Effective project managers try to build trust, and try to involve team members' emotions
Honey (1988)	Suggested that in order to achieve desirable outcomes with the help of other people, it is important to utilize interpersonal skills.
Kliem and Ludin (1992)	Suggested that project managers need to apply interpersonal skills such as being able to see things from team members' perspective, showing empathy, and respecting others.
Verma (1996)	Proposed that project managers need to adapt their behavior to the existing conflicts existing in different levels.
Thamhain (2004a)	Suggested that effective project managers, make their team members feel proud to be as a part of team, and align project team members personal goal and organizational goal
Kadefors (2004)	Considered that trust building is a crucial competency needed by project managers. They must boost level of loyalty in a way that both parties show respect for that
Rosenau (1998)	Contended that project managers need effective people skills rather than technical skills. Skills such as being flexible, being creative, being able to cope with problems, displaying behaviors showing respecting to team members. In this atmosphere, project manager's wishes will be followed voluntarily with project members
Edmondson et al. (2005)	Suggested that creating an environment for sharing information, and creating an environment that welcomes other people opinions is very important for effective project managers
Wysocki (2007)	Suggested that effective project managers try to motive team members to be creative and try "to think outside the box"

Table 2.6, continued

Jiang et al. (1999)	Suggested that effective project managers are capable to show empathy, understand how to motivate others, capable to manage conflict, when dealing with others they are diplomatic, being able to accentuating messages to others through facial expressions
Barkley (2006)	Suggested that effective project managers create a trust, honesty, and commitment environment. They motivate team members to perform and improve
(Aronson et al., 2006; Lechler, 2000; J. Pinto & Thoms, 1999)	Addressed “Soft skills” of project managers
Dainty et al. (2005)	Pointed out that in this changing environment of projects, project managers need to develop their client-orientation, flexibility, and self-control competencies as the most crucial competencies required by them
Dulewicz and Higgs (2003)	Proposed the concept of Emotional Intelligence in project management and showed that for leadership performance this competency accounts for 36% while Intellectual competencies account 27%, and Managerial competencies account 16%.
(Losada & Heaphy, 2004)	Negativity result to task failure.
(Thornley, 2006).	Being optimistic provides a basis for training of project managers
lee-Kelly’s and Loong’s (2003)	Accentuated The important role of self-confidence and self-belief to achieve project success
David and Cable (2006)	Reported that a positive workplace cause individual productivity and also team productivity to be improved.
Thornley (2006)	Suggested that effectiveness of planning process is affected and influenced by having positive attitude about it
Thamhain (2004a)	Emphasized the importance of leadership for project managers
Gokhale (2005)	Emphasized the importance of experience for competency achievement.
Belzer (2001)	Identified several soft skills that are crucial for successful project management. These factors include: to understand culture of organization and team members that project manager is working with, decision making, leadership, problem solving, team building, to be flexible, to be creative, and trustworthiness.
Thornton and Byham (1982)	Listed competencies for top management including required management skills, leadership skills, interpersonal skills, creativity, communication skills, and personality traits.
Dulewicz (1989)	Identified required competencies for middle managers. He categorized these competencies in four clusters as: Intellectual competencies, Interpersonal competencies, Adaptability, and Result orientation.

Table 2.7: Required competencies for project managers developed by Zika-Viktorsson & Ritzen (2005)

Planning competency	Inter-personal competency	Competency development
Estimation of time consumption	Managing control	Transfer of experience among colleges and knowledge sharing
Coping with changes	Supporting an open climate	Project manager career
	Managing negotiation and conflicts	
	Acting with self-confidence	

Source: Zika-Viktorsson & Ritzen (2005)

Table 2.8: Top 10 Competencies and Characteristics Required for Effective Project Managers Developed by Brill; Bishop; and Walker (2006)

To know the goals of the project
To know the scope of project
To conduct business ethically
To know the mission of the project
To know how project success is measured
To listen effectively
To share credit for successes
To know the available resources
To have strong verbal communication skills
To be able to recognize a problem

Source: Brill; Bishop; and Walker (2006)

Table 2.9: Competency Requirements for Project Managers Developed by Wickramasinghe & Kumara (2009)

1-Analytical skills	14-Written communication
2-Creativity	15-Oral communication
3-Flexibility	16-Result orientation
4-Customer focus	17-Concentrationon demands
5-Proactive thinking	18-Pressue management

Table 2.9, continued

6-Resilience	19-Team working ability
7-Commercial awareness	20-Time management
8-Decision making	21-Taking initiative/responsible
9-Cost Consciousness	22-Listening skills
10-Coaching ability	23-Application of technology
11-Quality focus	24-Strong sense of work ethic
12-Leadership skills	25-Feedback Give/receive
13-Delegation	

Source: Wickramasinghe & Kumara (2009)

Table 2.10: McBer's Scaled Competency Dictionary (1996)

Achievement orientation	Initiative
Analytical thinking	Integrity
Conceptual thinking	Interpersonal understanding
Customer service orientation	Organizational awareness
Developing others	Organizational commitment
Directiveness	Relationship building
Flexibility	Self confidence
Impact and influence	Team leadership
Information seeking	Teamwork and cooperation

Source: McBer's Scaled Competency Dictionary (1996)

Table 2.11: Important and Critical Competencies for Project Managers Developed by Stevenson and Starkweather (2010)

Important Competencies for Project Managers	Critical Competencies for Project Managers
Work history	Leadership
Experience	Ability to communicate at multiple levels
Ability to escalate	Verbal skills
Cultural fit	Written skills

Table 2.11, continued

Technical expertise	Attitude
Education	Ability to deal with ambiguity and change
Length of prior engagements	
Past team size	
PMP certification	

Source: Stevenson and Starkweather (2010)

Table 2.12: Competencies Required for Project Managers Developed by Dulewicz & Higgs (2005)

Intellectual Competencies	Critical thinking
	Vision
	Strategic
Managerial Competencies	Managing resources
	Communication
	Empowering
	Developing
	Achieving
Emotional Competencies	Self-awareness
	Emotional resilience
	Intuitiveness
	Sensitivity
	Influence
	Motivation
	Conscientiousness

Source: Dulewicz & Higgs (2005)

Table 2.13: Managerial Assessment of Proficiency Competencies Developed by Chong (2008)

Managerial Assessment of Proficiency Competencies
Time management and prioritizing
Setting goals and standards
Planning and scheduling work
Listening and organizing
Giving clear information
Getting unbiased information
Training, coaching and delegating
Appraising people and performance
Disciplining and counseling
Identifying and solving problems
Making decisions, weighing risks
Thinking clearly and analytically

Source: Chong (2008)

Table 2.14: Required Competencies for Project Managers Developed by Arditi & Balci (2009)

Global competencies	Competencies
Managing change	Initiative
	Risk taking
	Innovation
	Flexibility and adaptability
Planning and organizing	Analytical thinking
	Decision making
	Planning
	Quality focus
Interpersonal skills	Oral communication
	Sensitivity
	Relationship
	Teamwork

Table 2.14, continued

Result orientation	Achievement
	Customer focus
	Business awareness
	Learning orientation
Leadership	Authority and presence
	Motivating others
	Developing people
	Resilience

Source: Arditi & Balci (2009)

Table 2.15: Required Competencies for Project Managers Developed by Fisher (2010)

Skills, application and ranking of the examined skill sets based on literature review/ face to face	Managing emotions
	Building trust
	Effective communication
	Motivating others
	Influencing others
	Cultural awareness
	Leading others
	Team building
Six specific skills and behavior of an effective project manager	Understanding behavioral characteristics
	Leading others
	Influencing others
	Authentizotic behavior
	Conflict management
	Cultural awareness

Source: Fisher (2010)

Table 2.16: Required Competencies for Project Managers Developed by Crawford & Nahmias (2010)

Leadership	Organizing structure
Team development/Team selection	Project definition
Stakeholder management	Administration, project reporting and documentation
Communication	Transition management
Cultural consideration	Change control
Decision-making and problem solving	Closing
Planning: Cost, time, risk quality, scope	Monitoring and controlling: Cost, time, risk, quality, scope
Governance	

Source: Crawford & Nahmias (2010)

Table 2.17: Required Competencies for project managers developed by Ahadzie, Proverbs, and Olomolaiye (2008)

Contextual performance behaviors:	Task performance behaviors:
1-Job dedication	1-Cognitive ability
2-Interpersonal facilitation	2-Job knowledge
	3-task proficiency
	4-Experience

Source: Ahadzie, Proverbs, and Olomolaiye (2008)

Table 2.18: Required Competencies for Project Managers Based on different Industry Sectors Developed by Muller and Turner (2010)

		Application type		
		Engineering & construction	Information & telecommunication technology	Organizational change
IQ	Critical thinking	High	High	High
	Vision			High
	Strategic perspective		High	High

Source: Muller and Turner (2010)

Table 2.18, continued

MQ	Managing resources		High	High
	Communication		High	High
	Empowering		High	High
	Developing	High	High	
	Achieving		High	
EQ	Self-awareness		High	High
	Emotional resilience		High	High
	Intuitiveness			
	Sensitivity		High	High
	Influence	High	High	High
	Motivation	High	High	High
	Conscientiousness	High	High	High

Source: Muller and Turner (2010)

Table 2.19: Required Competencies for Project Managers Based on Different Complexity Levels Developed by Muller and Turner (2010)

		Complexity		
		Low	Medium	High
IQ	Critical thinking		High	High
	Vision			High
	Strategic perspective			High
MQ	Managing resources		High	High
	Communication			High
	Empowering		High	High
	Developing		High	High
	Achieving			High

Table 2.19, continued

EQ	Self-awareness		High	High
	Emotional resilience			High
	Intuitiveness			High
	Sensitivity		High	High
	Influence		High	High
	Motivation			High
	Conscientiousness		High	High

Source: Muller and Turner (2010)

Table 2.20: Required Competencies for Project Managers Based on Different Importance Degree Developed by Muller and Turner (2010)

		Importance		
		Mandatory	Renewal	Repositioning
IQ	Critical thinking	High	High	High
	Vision			
	Strategic perspective		High	
MQ	Managing resources	High	High	High
	Communication		High	High
	Empowering	High	High	High
	Developing	High	High	High
	Achieving		High	
EQ	Self-awareness		High	
	Emotional resilience		High	High
	Intuitiveness			High
	Sensitivity	High	High	High
	Influence	High	High	High
	Motivation	High		High
	Conscientiousness	High	High	High

Source: Muller and Turner (2010)

Table 2.21: Required Competencies for Project Managers Based on Different Contract Types Developed by Muller and Turner (2010)

		Contract type		
		Fixed price	Re-Measurement	Alliance
IQ	Critical thinking	High	High	High
	Vision	High		
	Strategic perspective	High		
MQ	Managing resources	High	High	High
	Communication	High		High
	Empowering	High		
	Developing	High	High	
	Achieving	High		High
EQ	Self-awareness	High	High	High
	Emotional resilience	High	High	
	Intuitiveness			
	Sensitivity	High	High	High
	Influence	High	High	High
	Motivation	High	High	High
	Conscientiousness	High	High	High

Source: Muller and Turner (2010)

Table 2.22: Critical Competencies for Middle Managers in China Developed by June Xuejun Qiao & Wei Wang (2009)

Team Building
Communication
Coordination
Execution
Continual Learning

Source: June Xuejun Qiao & Wei Wang (2009)

Table 2.23: The Prioritization of Personal Competencies Developed by Hafeez & Essmail (2007)

1-Customer Focus
2-Team orientation
3-People management
4-Planning and organizing
5-Problem solving
6-Communication skills
7-Results orientation

Source: Hafeez & Essmail (2007)

Table 2.24: Competencies Required for Project Managers Developed by Dainty; Cheng and Moore (2005)

Achievement orientation
Initiative
Information seeking
Focus on client's needs
Impact and influence
Directiveness
Teamwork and cooperation
Team leadership
Analytical thinking
Conceptual thinking
Self-control
Flexibility

Source: Dainty; Cheng and Moore (2005)

2.4.5 COMPETENCY MEASURES IN CONSTRUCTION INDUSTRY

Using competency-based measures for engendering professional project managers in construction industry is gaining popularity (Dainty, et al., 2004; Mei, et al., 2005). Competency-based approaches are helping construction project managers to have a

better understanding for effective performance requirements and enabling them for personal development (Mei, et al., 2005). In contrast of traditional measures, competency-based measures are a rational basis for construction project managers (Larson & Buss, 2005). In this regards, as quoted by IPMA website, for example, “competency models have become a dramatic resource in refocusing people on what it takes to succeed in today’s workplace environment” (Brophy & Kiely, 2002).

Team members in construction industry sector for a short period of time would work together and in the end of project team members would disintegrated and deployed with other team members of other projects (Atkins & Gilbert, 2003). Therefore, construction industry in compare to other industries with static product is more unpredictable (Loosemore, Dainty, & Lingard, 2003). This short-term characteristic of construction projects results a great challenge for individuals for performance management (Turner & Muller, 2003), because team member have to undertake a certain kind of work activities within a finite period of time (Turner & Muller, 2003).

In the construction industry many project-based organizations are trying to recognize the behavioral competencies of their project managers (Dainty, et al., 2005). As identifying these behavioral measures would result to have excellent project managers (Dainty, et al., 2003). However, it is difficult to address these competencies (Mei, et al., 2005). One of the earlier researches for determining behavioral competencies of construction project managers is related to the research of Dulaimi and Langford (1999). Other critical researches carried out in this area are belonging to Mustapha and Naoum (1997), Fraser (2000), and Edum-Fotwe and MCCaffer (2000). Dulaimi and Langford (1999) identified an appropriate behavioral profile for construction project managers.

Ahadzie et al. (2008), contend that in order to facilitate the development of appropriate competency models in construction industry, currently, the existing frameworks in HRM genre are being used. To prove it, they gave some example such as Dulaimi and Langford (1999) research which they used Fiedler (1967) proposed contingency model, or Skipper et al. (2006) that applied Kouzes and Posner (2000). Leadership practices Inventory (LPI), Mcber job competency model by McClelland (1973) which applied by Dainty et al. (Dainty, et al., 2004; Dainty, et al., 2005; Mei, et al., 2005) in their research. Since behavioral measures are inherently psychological (Fraser & Zarkada-Fraser, 2003; Liu & Walker, 1998), so HRM genre framework can be applied as a base for researches pertaining to construction project management behavioral measures.

Project managers in the changing industry climate, are not only in charge of technical and traditionally roles such as cost, time and quality, but also undertaking additional roles (Gilleard & Chong, 1996; Shenhar, Levy, & Dvir, 1997). It is acknowledged by Ceran and Dorman (1995) and also Russell and Jaselski (1997) that project managers in construction industry need to have other non-engineering knowledge and skills to fulfill today's professional demands that they are responsible for. Dainty et al. (2005) investigated the existing literature review for effective project managers in construction industry and also existing project management competency standards. The results of their studies show that instead of behavioral competencies that are crucial for effective performance of project managers, the existing standards for selection and assessment of project managers competencies are grounded in performance-based and skills of project managers.

In the project-based organization which projects form a proportion of overall turnover of organization, failure of one project could result on failure of whole organization (Jannadi, 1997; Kangari, 1988). Today's construction companies are looking for professionals with better management and leadership skills rather than technical

expertise (Dulaimi, 2005). As quoted by PMI (2008) traditional project management did not consider project type to be matched with project manager personality and only focusing on using proper tools and techniques for project in order to be successful (PMI, 2008). In the construction industry, project managers in order to maintain their relevance to the industry, from different learning routes achieve all required construction and non-construction specific functions. It is crucial that these learning routes and mechanisms to be identified for addressing training for future construction project managers (Bentil, 1996).

In the construction industry, construction project managers are involved in day-to-day activities; and are focused for achieving short-term goals rather than looking leading their team members for achieving long-term objectives (Toor & Ofori, 2008). It concentration on management activities rather than leadership activities has caused that construction project managers are conceived as managers rather than leaders (Russell & Stouffer, 2003). In order to overcome this problem, Toor and Ofori (2008) proposed the concept of “authentic leaders” who are not only good managers but also are good leaders with vision for future. As quoted by George (2004) leadership style of authentic leaders is consistent to their personality and characteristics and is totally unique. These authentic project leaders show a high level of self-discipline (George, 2003) in their workplace. Dulaimi and Langford (1999) argued that in construction industry most conducted researches addressing personal characteristics and motivational factors of project managers and less researches focusing on leadership development in construction industry.

Pries et al. (2004) argued that construction industry leaders need to take initiative actions to change conventional paradigm of construction industry which is technology-oriented and project-oriented and adapt to modern business environment that is capable to accomplish future challenges. Toor and Ofori (2006) in their research mentioned

about existing challenges in construction industry which is comprised of general business challenges, industry specific challenges, and environmental challenges (such as cultural, economic, ethical, and legal and regulatory challenges.) Therefore future construction project managers need to have psychological capacities to be able to confront with business challenges. Luthans et al. (2004) mentioned that these psychological capacities means having confidence, to be hopeful, to be optimistic, having self-efficacy, and to be resilient. By having these capacities construction project manager would be capable to create a positive environment in their organization (Toor & Ofori, 2008).

There are some researches in the construction industry that appropriate leadership styles are explored such as Fiedler's (1967) research that proposed a contingency model for leadership or Monaghan (1981) that contended successful project managers are high in task and low in people consideration. Seymour and Abd-Elhaleem (1991) refer to effective project manager as person who has task-oriented leadership. Rowlinson et al. (1993) mentioned that for construction project managers in different circumstances different leadership styles is required. The results of their research show that construction project managers in feasibility study stage of project are tending to use supportive style while during construction stage they are tending to use directive style. Ogunlana et al. (2002) in another study about project managers in Thailand found that for project managers relationship- oriented leadership is more important than task-oriented leadership. Other researches proposed that in construction industry project managers not only need to be good managers but also need to have authentic passion for leading projects (Toor & Ofori, 2006). Authentic leaders like all human being make mistakes, but they take responsibility for their actions and accept the weaknesses (George, 2003).

As mentioned by Mustapha and Naoum (1997), the studies conducted in industrial management cannot directly be applied for construction industry. Boyatzis and Kolb (1995) also supported the findings of this research and mentioned that characteristics which are being used to predict managers' success cannot be used to predict success of managers who are working in technical and engineering sectors. Chen and Partington (2006) proposed a concept focusing on relationship between work and the worker. They conducted an interview with 30 construction project managers in the UK, and identified three concept for construction project management work known as 1) planning and controlling, 2) organizing and coordination and 3) predicting and managing potential problems. In Table 2.25 a summary of literature review pertaining to competency measures in construction industry is addressed.

Table 2.25: Competency Measures in Construction Industry

Competency Measures in Construction Industry	
Dainty, et al., 2004; Mei, et al., 2005	Using competency-based measures for engendering professional project managers in construction industry is gaining popularity
Mei, et al., 2005	Competency-based approaches are helping construction project managers to have a better understanding for effective performance requirements and enabling them for personal development.
Larson & Buss, 2005	In contrast of traditional measures, competency-based measures are a rational basis for construction project.
IPMA	competency models have become a dramatic resource in refocusing people on what it takes to succeed in today's workplace environment
Dainty, et al., 2005	In the construction industry many project-based organizations are trying to recognize the behavioral competencies of their project managers
Dainty, et al., 2003	Identification of behavioral measures would result to have excellent project managers
Dulaimi and Langford ,1999; Mustapha and Naoum, 1997; Fraser ,2000; Edum-Fotwe and MCCaffer, 2000;	Identified appropriate behavioral profile for construction project managers.

Table 2.25, continued

Ahadzie et al., 2008	contend that currently, the existing frameworks in HRM genre are being used in order to facilitate the development of appropriate competency models in construction industry
Ceran and Dorman, 1995; Russell and Jaselski, 1997	Project managers in construction industry need to have other non-engineering knowledge and skills to fulfill today's professional demands that they are responsible for
Dainty et al., 2005	Investigated the existing literature review for effective project managers in construction industry and also existing project management competency standards. The results of their studies show that instead of behavioral competencies that are crucial for effective performance of project managers, the existing standards for selection and assessment of project managers competencies are grounded in performance-based and skills of project managers.
Dulaimi, 2005	Today's construction companies are looking for professionals with better management and leadership skills rather than technical expertise
PMI, 2008	Traditional project management did not consider project type to be matched with project manager personality and only focusing on using proper tools and techniques for project in order to be successful
Toor and Ofori, 2008	Proposed the concept of "authentic leaders" who are not only good managers but also are good leaders with vision for future.
Dulaimi and Langford, 1999	Argued that in construction industry most conducted researches addressing personal characteristics and motivational factors of project managers and less researches focusing on leadership development
Toor and Ofori, 2006	Mentioned about existing challenges in construction industry which is comprised of general business challenges, industry specific challenges, and environmental challenges such as cultural, economic, ethical, and legal and regulatory challenges
Luthans et al., 2004; Toor & Ofori, 2008	Future construction project managers need to have psychological capacities such as having confidence, to be hopeful, to be optimistic, having self-efficacy, to be resilient, and to be able to confront with business challenges.
Fiedler's, 1967	Proposed a contingency model for leadership in the construction industry
Seymour and Abd-Elhaleem, 1991	Referred to effective project manager as person who has task-oriented leadership.
Rowlinson et al., 1993	Proposed different leadership styles for project managers in different situations
Ogunlana et al., 2002	Found that for project managers relationship- oriented leadership is more important than task-oriented leadership
Toor & Ofori, 2006	Proposed that in construction industry project managers not only need to be good managers but also need to have authentic passion for leading projects

Table 2.25, continued

Mustapha and Naoum, 1997; Boyatzis and Kolb, 1995	Mentioned that characteristics which are being used to predict managers' success in industrial management cannot directly be applied for construction industry.
Chen and Partington, 2006	Proposed a concept focusing on relationship between work and the worker. They conducted an interview with 30 construction project managers in the UK, and identified three concept for construction project management work known as 1) planning and controlling, 2) organizing and coordination and 3) predicting and managing potential problems

2.5 SUMMARY

The literature review revealed that competency is measurable against a standard, it can be improved via training and development, it can be broken down to its competency-elements, and it is correlated to performance. Besides, it addressed that there is a link between project success and project managers' competencies. In order to be successful in delivering project, organization must adapt to changing industry condition. In this changing working environment, the importance of project management is increasing more and more (Cleland, 1994; Turner, 1993).

Improvement of performance is always a challenge for management (Boxall, 2007; Lengnick-Hall & Lengnick-Hall, 1988). In this regards, competency-based measures not only can be used for project managers' selection in organizations, but also it can be used for prediction of their performance (Motowildo, et al., 1997). Profiling attributes, characteristics, and behavior of successful managers provides a basis for selection and development of existing management who are candidate for management position through comparing these characteristics, behavior, and attribute of candidate to the profile of successful managers (Müller & Turner, 2010).

Moreover, based on project managers' competency standards, it addressed that in IPMA and APM standards, a competent manager is the one who has enough knowledge and experience in three categories of Technical, Behavioral, and Contextual Competencies.

In AIPM Standard and PMCD Framework, a competent manager is a person with enough knowledge and experience in Project Management area. In AIPM Standard and PMCD Framework, assessing candidate's knowledge in project management area is straightforward and can be measured by using some tools such as PMP exam. The advantage of AIPM Standard and PMCD Framework compare to IPMA and APM Standards is their strength for measuring knowledge in project management. However, these two standards have some weaknesses compare to IPMA and APM Standards. In these standards, the only factor which is seen for assessing candidates is "Project Management Competencies". The knowledge and skills in project management which need to be applied at a workplace are assessed in these standards. However, other pivotal required competencies for competent project managers are not addressed in these standards. The technical competencies are neglected in these standards and required technical knowledge, and technical skills cannot be assessed. In AIPM Standard, personal competencies which are personal traits, characteristics and behavior of a project manager are not addressed. In PMCD Framework and AIPM Standard, Job-related competencies that are solely related to the job are also neglected in these standards. Contextual competencies which are essential are not included in these standards

In next Chapter, an overview of the competence in UK approach and competency in US will be explained which will be followed by two main categories of competencies _Job-related competencies and Person-related competencies_ based on these two systems. It then will proceeds to a proposed competency-framework which all recognized competency elements according to literature review are clustered based on two main categories of US approach and UK approach _Person-related competencies and Job-related competencies. Furthermore, next chapter will also discuss about each competency element which is already addressed in proposed competency framework.

CHAPTER 3

LITERATURE REVIEW PART 2- COMPETENCY ELEMENTS

3.1 INTRODUCTION

This chapter begins with an overview of the competence in UK approach and competency in US which explains different perspectives about competency in both approaches are described; besides, two main categories_ Job-related competencies and Person-related competencies_ based on these two systems are mentioned. It then proceeds to proposed competency-framework which recognized competency elements according to literature review are clustered based on two main categories of US approach and UK approach _Person-related competencies and Job-related competencies. Furthermore, this chapter will also discuss about each competency element which is already addressed in proposed competency framework.

3.2 COMPETENCY ELEMENTS

3.2.1 COMPETENCE IN UK APPROACH AND COMPETENCY IN US APPROACH

Woodruffe (1991) suggested that “competence” is pertaining to the areas of work. Armstrong (1998) defined competence as the ability to perform activities for a job. On the other side “competency” has been referred to the ability of the person to perform a job which means the emphasis is to the person who is doing the job rather than the job. American Management Association for defining “competency” refers to Boyatzis (1982) definition as “an underlying characteristic of a person which results in effective action and/or superior performance in a job”. However, in UK “competence” terminology is being applied by Employment Department’s Standards Program and it is defined as “ a description of something which a person who works in a given

occupational area should be able to do, it is a description of an action, behavior or outcome which a person should be able to demonstrate” (Training-Agency, 1988).

Hammond (1989) asserted that in US system characteristics of the superior from average performers identified and competencies are seen as that which enable people to perform a job, not as tasks of a job. Therefore, in US model personal characteristics and qualities have an indispensable role. In fact, in contrast to the UK model, US model emphatically refers to “competencies” required by job holders (Cheng, et al., 2003). UK model leads to establish “appropriate standards” for a profession is linked to “adequacy” while in US model leads to identify characteristics of superior performers and is linked to “excellence” (Iles, 1993; N. Jones & Connolly, 2001). Hence, US approach employs “person-oriented job analysis” whereas UK approach employs “functional analysis” of job (Cheng, et al., 2003).

There are some arguments about UK approach such as Jacobs (1989) that argued management is a creative activity which is related to the person rather than the job and by considering “competence” as skills required for the job, this kind of soft competency would not be included, or Barnett (1994) asserted that UK approach is an impoverished view of human beings and character of human being are neglected. Holmes (1995) believed that there is not enough guidance about how to infer competence from observation of past performance. In addition, Burgoyne (1993) argued that UK approach focusing on studying of current job competences and future demanded competences which is the challenge of organizations, is not considered in UK approach. Furthermore, the more universally competence element are identified, the less it is usable in specific industry (Cheng, et al., 2003).

On the other side, there are some criticisms to US approach as well. First of all, behaviors required for today’s superior project managers are not necessarily same behaviors required for future (Cheng, et al., 2003). Therefore, some researches such as

Briscoe and Hall (1999) contended for planning management development should focus on future needs and the list of competency elements must be flexible to be adjusted based on future organization needs. Another criticism to US approach is pertaining to its ignorance of context of organization, marketplace, and culture due to only focusing on managers' characteristics (Stuart & Lindsay, 1997).

Cheng et al. (2003) proposed that the most appropriate approach is to combine to US and UK approaches. Stuart and Lindsay (1997) suggested that both models are complementary. As suggested by Elkin (1990) the more managers further up in hierarchy in organization, the more crucial role of macro-competencies (US approach) and less important micro-competencies (UK approach). He developed a model which explained that once individuals gain experience in a job, the focus on achieving competencies would change from micro-competences to macro-competencies.

Briscoe and Hall (1999) suggested the concept of meta-competency as the competency that help person's ability to learn and acquire other required competencies. This competency helps managers to learn, to change, to adapt, and to modify their competencies in order to remain competent while job demand is changing. In fact, meta-competency enable managers to learn how to learn constantly (Cheng, et al., 2003).

One criticism related to US approach is that we are not sure that exhibited behaviors of superior managers that are critical in today's project for achieving project success, still maintain critical for future projects. For UK approach, one of the criticisms is related to its emphasis on outputs would cause the knowledge of project managers do not addressed. Therefore, Cheng et al. (2005) in their research proposed a combination of both approaches with consideration of culture of organization can be necessary for competency. From Table 3.1 to Table 3.4 the summary of literature review pertaining to competency in UK and US approaches and criticisms to UK and US approaches are highlighted.

Table 3.1: Competence in UK Approach

Woodruffe, 1991	Suggested that “competence” is pertaining to the areas of work
Armstrong, 1998	Defined competence as the ability to perform activities for a job
Employment Department’s Standards Program in UK (Training-Agency, 1988)	“competence” terminology is defined as “ a description of something which a person who works in a given occupational area should be able to do, it is a description of an action, behavior or outcome which a person should be able to demonstrate”
Iles, 1993; N. Jones & Connolly, 2001	UK model leads to establish “appropriate standards” for a profession and it is linked to “adequacy”
Cheng, et al., 2003	UK approach employs “functional analysis” of job
Roberts, 1997	Defined this competency as performance standard, which is expected to achieve.
Martin & Staines, 1994	Defined this competency as functional competency
Bergenhengouwen, 1996	Defined this competency as task-specific competency
Elkin, 1990	Addressed this competency as “micro competencies”
Cardy & Selvarajan, 2006	In order to define required job-related competencies, first of all an analysis for the job should be carried out for identifying job requirements. Through this job analysis most important tasks would be distinguished
Crawford (2005)	Defined this competency as “performance-based” which refers to work-related competencies

Table 3.2: Criticisms to UK Approach

Jacobs, 1989	Argued that soft qualities such as creativity and flexibility that are pivotal for organizations and cannot be categorized in job-oriented competencies
Barnett , 1994	Asserted that UK approach is an impoverished view of human beings and character of human being are neglected.
Holmes, 1995	Believed that there is not enough guidance about how to infer competence from observation of past performance
Burgoyne, 1993	Argued that UK approach focusing on studying of current job competences and future demanded competences which is the challenge of organizations, is not considered in UK approach.
Cheng, et al., 2003	Furthermore, the more universally competence element are identified, the less it is usable in specific industry

Table 3.2, continued

Cheng et al., 2005	Its emphasis on outputs would cause the knowledge of project managers do not addressed.
Dainty, 2003	Criticized this approach in construction industry that a lot of variables are out of project managers' control and have affection on achievement of defined out-put criteria.
Atkinson, 1999	Argued that out-put competencies define in the early stage of projects, which at least are known in projects and these criteria change within a project life-cycle.
Cole, 2002	Contends that this approach is unsuitable for higher level of management positions

Table 3.3: Competency in US Approach

American Management Association	For defining "competency" refers to Boyatzis (1982) definition as "an underlying characteristic of a person which results in effective action and/or superior performance in a job"
Hammond, 1989	Asserted that in US system characteristics of the superior from average performers identified and competencies are seen as that which enables people to perform a job, not as tasks of a job
Cheng, Dainty, & Moore, 2003	In US model personal characteristics and qualities have an indispensable role. In fact, in contrast to the UK model, US model emphatically refers to "competencies" required by job holders
Iles, 1993; N. Jones & Connolly, 2001	while in US model leads to identify characteristics of superior performers and is linked to "excellence"
Cheng, et al., 2003	Hence, US approach employs "person-oriented job analysis"
Elkin, 1990	The more managers further up in hierarchy in organization, the more crucial role of macro-competencies (US approach) and less important micro-competencies (UK approach).
Cheng et al., 2005	One criticism related to US approach is that we are not sure that exhibited behaviors of superior managers that are critical in today's project for achieving project success, still maintain critical for future projects.
Woodruffe, 1991	Defined this competency as a dimension of behavior.
Roberts, 1997	Defined it as input-based criteria, which means personal behavior, traits, and characteristics that a person brings to projects

Table 3.3, continued

Garavan and McGuire, 2001	Believed that this competency is more popular in US rather than in Europe
Gadeken, 1994	Distinguished six behavioral competencies for effective project managers
	This aspect is the result of research done by McBer Associates, who started in 1970s in order to distinguish characteristics between superior managers and average managers.
Cheng, et al., 2003	This competency is also known as “macro competency”
Brown, 1993; Spencer and Spencer, 1993	Mentioned that personal competency for project managers is more pivotal when dealing with complex situations.
N. Jones & Connolly, 2001	This approach relies on superior effective managers
Crawford (2005)	Defined this competency as “attribute-based” which refers to knowledge, skills, and personal characteristics. In this model, knowledge and skills that a person brings to a project is called “input-competencies” and personal characteristics of a project manager are called “personal competencies”.
Spencer and Spencer (1993)	Developed required personal competencies for project managers. They organized these competencies in six competency units consisting achievement and action, helping and human service, impact and influence, managerial, cognitive, and personal effectiveness.

Table 3.4: Criticisms to US Approach

Cheng, et al., 2003; Briscoe and Hall, 1999	Behaviors required for today’s superior project managers are not necessarily same behaviors required for future.
Stuart & Lindsay, 1997	Its ignorance of context of organization, marketplace, and culture due to only focusing on managers’ characteristics

3.2.2 PROPOSED COMPREHENSIVE PROJECT MANAGERS’ COMPETENCY MODEL (THEORETICAL FRAMEWORK OF THE STUDY)

In this research in order to take advantage of strengths of both US and UK approaches, these two models are combined together. Based on the results of comparing project

manager's competency standards and literature review a model (Figure 3.1) that defines project manager's competencies in two main categories is proposed. These main categories are Person-related Competencies, and Job-related Competencies.

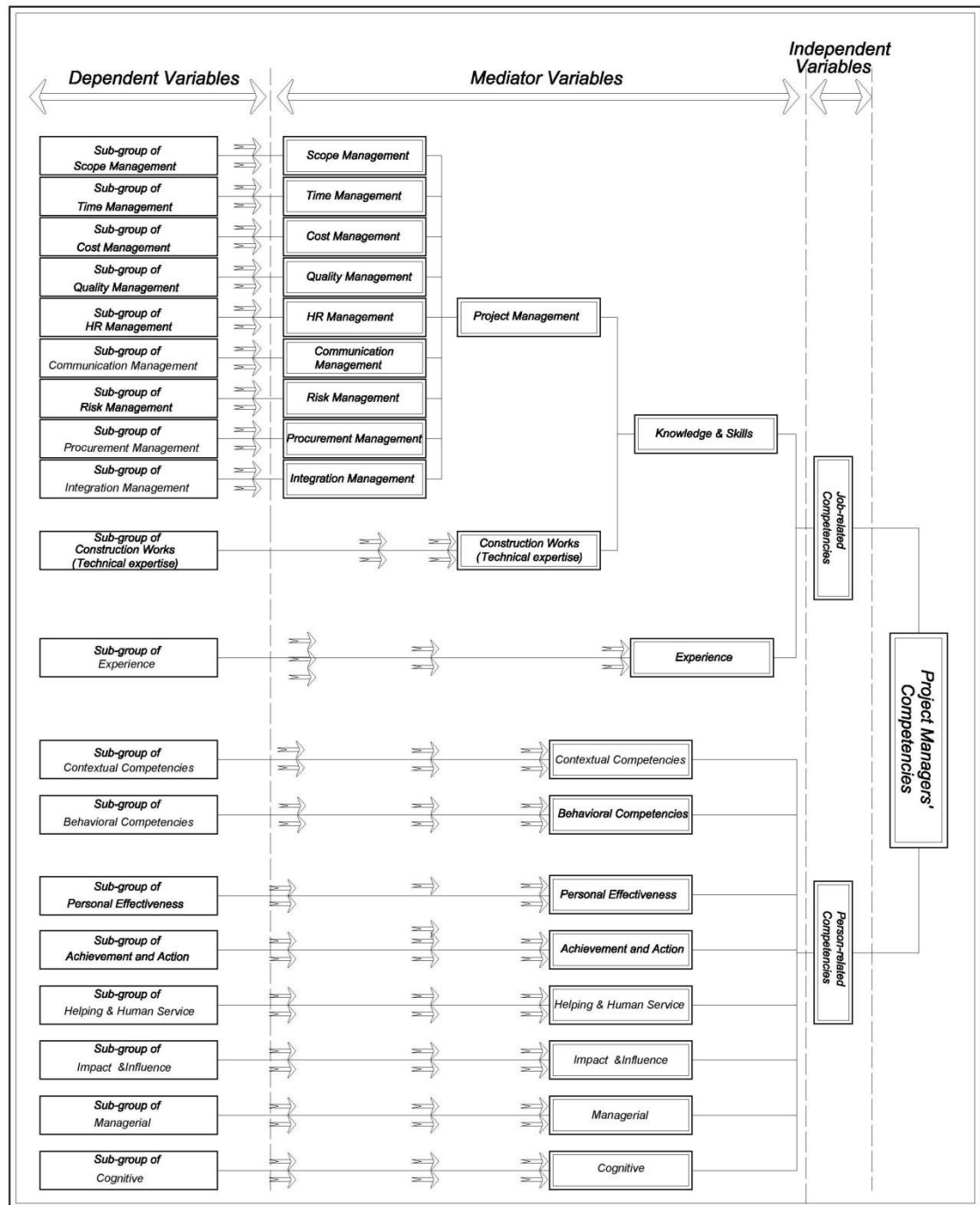


Figure 3.1: Research Framework (Job-related and Person-related Competencies)

Note: In order to have a better view, a bigger size of this figure is presented at Appendix B

3.2.2.1 JOB-RELATED COMPETENCIES

Roberts (1997) defined this competency as performance standard, which is expected to achieve. This competency is also known as functional competency (Martin & Staines, 1994) or task-specific competency (Bergenhengouwen, 1996) or job-focused (Holmes & Joyce, 1993). Elkin (1990) addressed this competency as “micro competencies”.

In order to define required job-related competencies, first of all an analysis for the job should be carried out in order to identify job requirements. Through this job analysis most important tasks distinguished (Cardy & Selvarajan, 2006). The assumption for identifying these competencies is that the job is fixed and therefore, these competencies have a static nature. In order to define the required job-related competencies, job expectations should be rigorously explained. The importance of this type of competency in projects with a consistent set of tasks that all functions are established clearly, like construction industry is higher than other types of projects like research projects for developing a new product that contextual competencies and person-related competencies are more important.

Some researchers have defined competency just in terms of work-related areas and other components of competency such as person-related competencies and contextual competencies are being neglected. For instance, Armstrong (2001) defined competency as the work-related concept, Pettersen (1991) stated that in selecting project managers, they are identified based on task-related aspects. These researchers, who defined competency solely on work-related competencies, are widely criticized. Dainty (2003) criticizes this approach in construction industry that a lot of variables which are out of project managers' control have effect on achievement of defined out-put criteria. Jacob (1989) refers to soft qualities such as creativity and flexibility that are pivotal for organizations and cannot be categorized in job-oriented competencies. Cheng et al. (2003) argue that management is a creative activity. Atkinson (1999) debates that out-

put competencies define in the early stage of projects, which at least are known in projects and these criteria change within a project life-cycle. Cole (2002) contends that this approach is unsuitable for higher level of management positions. The competency elements of job-related category are shown in Figure 3.2.

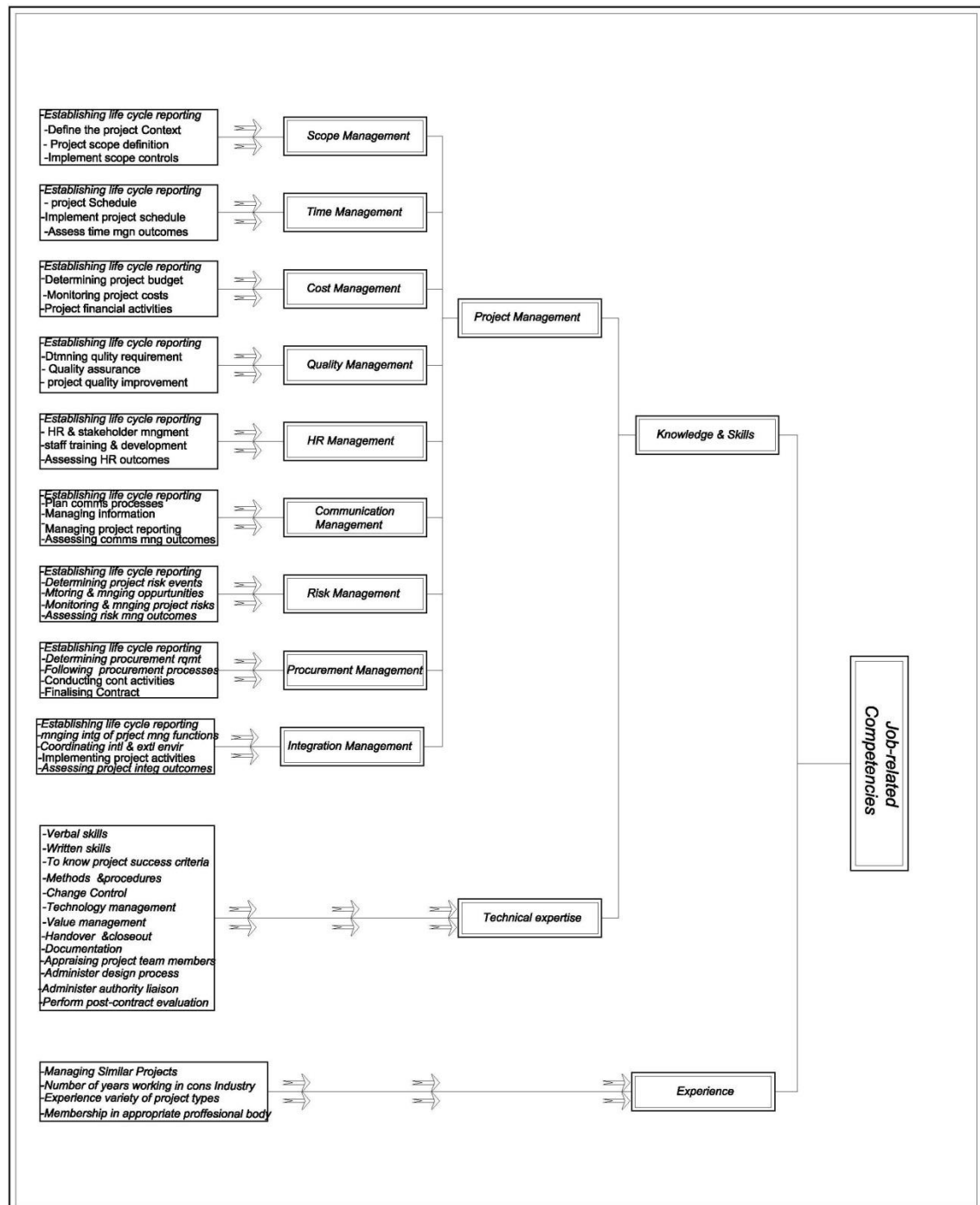


Figure 3.2: Competency Elements of Job-related Category

Note: In order to have a better view, a bigger size of this figure is presented at Appendix C

SCOPE MANAGEMENT

In APM Competence Framework, scope management is a competence under technical category. In this standard, this competence is defined as “the process by which the deliverables and work to produce them are identified and defined. Identification and definition of the scope must describe what the project will include and what it will not include, i.e. what is in and out of scope.” The indicators of this competence are identification and definition of objectives and interested parties requirements, agreeing with relevant stakeholders about appropriate deliverables, documenting the project scope, updating the project scope document while the changes are happening during project.

In AIPM Professional Competency Standards for Project Management, the elements of planning and managing scope are identified as “defining the project context”, “guiding the development of project scope definition activities”, and “Implementing scope control”. In the “defining the project context” project authorization with higher authority would be confirmed, project objectives would be defined and communicated to all stakeholders, deliverables for each stage of project would be established, project acceptance criteria would be developed, and finally project charter would be developed. In second element of scope management which is “guiding the development of project scope definition activities”, lessons learned from previous projects would be examined, the project context communicated with project stakeholders, the outcome criteria for evaluating the achievements would be established, scope management plan would be established, and work breakdown to task and work packages would be developed. The third element of scope management in AIPM Professional Competency Standards is “Implementing scope controls” that in this stage agreed scope management procedures implemented, for monitoring project outcomes agreed key performance indicators

would be used, the impact of scope changes would be managed, and finally project progress and outcomes would be regularly reviewed and evaluated.

In IPMA Competence Baseline, “Scope and Deliverables” competence is under technical category and its possible process steps are defining interested parties requirements and objectives, agreeing on deliverables with interested parties, defining project scope in all project phases, updating project scope based on changes happening, controlling quality of the deliverables, handing over the deliverables to stakeholders formally, and finally documenting lessons learned for applying to future projects.

In Project Manager Competency Development (PMCD) Framework, competency elements are defined based on different phases of project consisting initiating, planning, executing, monitoring, and closing. For initiating stage, “preparing project charter” is identified which means project charter formally documented, responsibilities of project manager and other organization managers would be defined, the interface of budget with resource availability would be identified, project stakeholders would be identified, project purpose and description would be established, and critical success factors would be defined. In the second stage of project- planning stage- identified competency elements are “conducting scope planning” and “conducting scope definition”. In “conducting scope planning”, project scope statement would be further defined, scope statement would be utilized, scope management plan would be developed, components of scope management plan would be identified, and criteria for classifying project scope changes would be identified and evaluated. In “conducting scope definition” appropriate level of decomposition of WBS would be determined, WBS would be developed, the inputs of project scope definition processes would be determined. In the executing stage with “executing scope” element, the WBS would be utilized, and work scope according to plans would be conducted, and approval process for project deliverables would be established. “Conducting scope verification” and “conducting scope change control” are

the two elements of scope management in controlling stage which project inspections, reviews, audits would be conducted, product acceptance by stakeholders documented, the degree to which changes affect the project scope evaluated, scope change control system implemented, and approved changes implemented. In closing stage as the last stage of scope management, with “conducting project closure with regards to scope” element, caused of variances of project scope identified, lessons learned with regards to scope determined and finally post-project review would be performed.

TIME MANAGEMENT

In APM Competence Framework, there is a competence element which is called “scheduling” and is defined as “the process to determine the overall project duration and when activities and events are planned to happen. This includes identification of activities and their logical dependencies, and estimation of activity duration, taking into account requirements and availability of resources.” The indicators of this competence as mentioned in this standard are defining and sequencing the activities and work packages while taking account all dependencies, applying estimation for duration while considering resource constraints, identifying the major phases and milestones, and determining critical path, comparing the actual dates and planned dates in order to take corrective actions, and maintaining schedule with respect to changes.

The elements of planning and managing time in AIPM Professional Competency Standards are “Determining project schedule”, “Implementing project schedule”, and “Assessing time management outcomes”. The performance criteria for “Determining project schedule” are determining project duration and efforts, sequencing and dependencies of tasks, ensuring that project schedule includes all activities, Ensuring the appropriate scheduling software are being used, applying techniques and tools for resource allocation, developing time management plan, and obtaining agreement on

schedule and time management plan from higher project authority. The performance criteria for “implementing project schedule” consists of using mechanisms for measurement and reporting progress of activities, forecasting the effect of changes on project schedule, developing responses to schedule changes, and obtaining approval for changes. Performance criteria for “assessing time management outcomes” consists of review project progress for determining the effectiveness of time management processes, identifying time management lessons learned, and recommending improvement to apply for future projects.

In IPMA Competence Baseline, “time and project phase” competence is defined under technical category and the possible process steps for this competence are identified as defining and sequencing activating and work packages, estimating duration, scheduling project or phases, allocating and balancing resources, comparing planned and actual dates and updating forecast, controlling the time schedule according to changes, and finally documenting the lessons learned to be applied for future projects.

In Project Manager Competency Development (PMCD) Framework, the element of time management for initiating phase of project is “Preliminary planning activities” which means identifying customer expectations with regards to time, identifying the constraints and influences on project schedule, and identification of key milestones. In this standard four competency elements are proposed for planning stage of project which are “conducting activity definition”, “conducting activity sequencing “, “conducting activity duration estimating” and “conducting schedule development”. “Conducting activity definition” means creating activity list, identifying the appropriate level of WBS level, Determining the inputs of project activity definition process, validating the WBS, Verifying that all activities are within the project scope. The performance criteria of “conducting activity sequencing” are determining interactivity dependencies, identifying the relationship between project activities, documenting the

types of interactivity dependencies, constructing a project network diagram, and defining missing activities. For “conducting activity duration” PMCD framework suggested the performance criteria consisting of developing activity duration estimates, utilizing simulations such as Monte Carlo analysis, estimating the work period, and developing activity duration estimates. Finally the performance criteria for “conducting schedule development” element are formulating project and resource calendars, identifying activity constraints, performing appropriate mathematical analysis such as critical path method, identifying review technique needs, developing a schedule management plan, and producing a baseline project schedule. In the executing stage of project, “implementing project schedule” element is identified and it consists of implementing mechanism for measurement, recording, and reporting the progress of activities, conducting analysis to identify variances and also forecasting the impact of changes on project schedule, and implementing responses to the schedule changes to maintain project objectives. In the controlling stage of project “conducting schedule control” means implementing a schedule change control, integrating schedule activities, determining the magnitude of schedule change and the need for reestablishing the baseline, initiating corrective actions, and integrating approved schedule changes with other project control processes. In the closing stage of project the identified element is “conducting project closure with regards to time” which consists of documenting lessons learned, including the causes of schedule changes, reasons for selecting specific corrective actions and classification of schedule changes.

COST MANAGEMENT

In APM Competence Framework, “budgeting and cost management” competence is under technical competences category and it is defined as “the estimating of costs and the setting of an agreed budget, and the management of actual and forecast costs against

that budget.” In this standard the indicators of “budgeting and cost management” competence element are estimating and evaluating costs of each work package, agreeing on overall budget, developing a cash flow forecast, ensuring availability of fund when required, establishing cost monitoring, including inflation management, reporting financial performance to stakeholders, monitoring forecast vs. actual costs incurred, forecasting final costs, and updating the final costs.

In AIPM Professional Competency Standards the three elements for planning and managing cost are suggested including “determining project budget”, “Monitoring and controlling project budget and costs”, and “conducting project financial completion activities”. The performance criteria for “determining project budget” element are determining resource requirement, estimating project costs, developing project budget, and implementing a cost management plan. “Monitoring and controlling project budget and costs” consists of implementing project budget control processes, monitoring actual project billings against project budget forecasts, analyzing budget variations, and determining the causes to recommend actions, implementing actions to maintain project budget objectives. Performance criteria for “conducting project financial completion activities” are using appropriate project close-out procedures, reviewing project performance to determine the effectiveness of processes, and identifying financial management lessons learned and recommending improvements to apply for future projects.

In IPMA Competence Baseline, under technical competence category, “cost and finance” competence element is recognized and the possible cost management process steps are identified as analyzing and deciding on project, program and portfolio cost management system, estimating the costs of each work packages including overhead costs, establishing cost monitoring, defining cost objectives, calculating actual resources usages, taking all changes into account, analyzing variances and causes, forecasting

final costs, developing corrective actions, updating cost estimates with regards to changes, documenting lessons learned to apply for future projects. In addition the possible financial process steps in this standards are introduces as analyzing financial options, negotiating with possible sources of funds, selecting source of funding, allocating budget to cost items, calculating financial resource usage, controlling processes for payments, establishing financial auditing system, validating budgets, documenting lessons learnt.

In Project Manager Competency Development (PMCD) Framework, “high-level budget development preparation” competency element is identified for cost management in initiating stage of project which means developing a cost benefit analysis, identifying budget constraints, and developing business case. For second phase of project- planning stage- the identified competency elements for cost management are “conducting resource planning”, “conducting cost estimating”, and “conducting cost budgeting”. The performance criteria for “conducting resource planning” consists of identifying the available resources to the project, complying with organizational policies regarding to resource usage, using WBS for determining the quantity of resources needed, identifying staff requirements, developing staff management plan, developing resource histograms, identifying material and equipment requirements, developing resource management plan, and developing a responsibility assignment matrix. The performance criteria for “conducting cost estimating” are developing project cost estimates, documenting appropriate cost-estimating methods, utilizing multiple cost baselines to evaluate different aspects of project cost performance, developing cost management plan, developing a cost change control plan, and identifying performance measurement techniques. Finally the performance criteria for “conducting cost budgeting” elements are allocating overall costs to individual activities, and determining cost performance through developing a cost baseline. For the executing stage of project for cost

management the identified competency element is “executing cost baseline” which means implementing agreed financial management procedures, selecting an utilizing cost analysis implementing and monitoring agreed actions to maintain overall objectives. “ Conducting cost control” is the competency element for controlling stage of project which consists of implementing a cost change control system, integrating cost changes within overall change control system, defining and evaluating factors that cause cost changes, revising cost estimates, integrating approved cost changes, and determining modifications needed to estimates for completion. In the closing stage of project the competency element identified in this standard is “conducting project closure with regard to cost” that lessons learned documented, the causes of cost changes and type of cost changes and also reason for selecting specific corrective actions documented for future further analysis.

QUALITY MANAGEMENT

In APM Competence Framework, “project quality management” competence is recognized in technical competence category and is defined as “the discipline that is applied to ensure that both the outputs of the project and the processes by which the outputs are delivered meet the required needs of stakeholders. Quality is broadly defined as fitness for purpose or more narrowly as the degree of conformance of the outputs and processes.” And the indicators of this competence element are discussing and agreeing the quality expectations and quality criteria with stakeholders, developing quality approaches including key activities, developing project quality plan, executing the project quality plan, carrying out quality assurance, recommending and applying corrective actions and continuous improvements.

In AIPM Professional Competency Standards, the identified competency elements for planning and managing quality are “determining quality requirements”, “implementing

quality assurance”, and “implementing project quality improvements”. The performance criteria for “determining quality requirement” competency element are determining quality objectives and standards, using quality management methods and techniques, identifying quality criteria and establishing project performance measurement systems. The performance criteria for “implementing quality assurance” competency element are measuring and documenting project activities, conducting inspections of quality processes, identifying the causes of unsatisfactory outcomes, and maintaining a quality management system. For “implementing project quality improvement” competency element the identified performance criteria are reviewing quality processes, ensuring continuous quality improvement, reviewing project progress, determining the effectiveness of quality management processes, and identifying quality management lessons learned to apply for future projects.

In IPMA Competence Baseline, “quality” competence elements is suggested under technical competence category and possible process steps of this competence element are developing quality plan, getting approval and test for final product, carrying out quality assurance and quality control, recommending and applying corrective actions, documenting the lesson learned.

In Project Manager Competency Development (PMCD) Framework, in regards of quality management at first stage of project-initiating stage-, “determining quality requirements” is identified which means determining quality objectives and standards, determining the organizations quality policy and developing project quality policies. “Conducting quality planning” is the competency element for planning stage of project and consists of developing project quality policies and ensuring their alignment with organization’s quality policy, developing performance checklists, developing project quality management plan, and evaluating project improvement issues. The performance criteria for competency element of executing stage- “conducting quality assurance”- are

performing quality control, determining the costs of project quality efforts, documenting project quality outcomes, identifying and implementing the actions needed to enhance the project effectiveness, documenting lessons learned, implementing quality improvements, and finally executing project quality control and improvement processes. “Conducting quality control” is the competency element for controlling stage of project and it consists of monitoring project results to ensure compliance with requirements, performing inspections, utilizing techniques such as Pareto analysis for inspections, implementing process adjustments to ensure quality improvement, and completing all quality-related documentation. In the closing stage of project “conducting project closure with regard to quality” competency element is identified which means documenting lessons learned including the causes of quality changes, type of quality changes, and reasons for selection of specific corrective actions.

HUMAN RESOURCE MANAGEMENT

In APM Competence Framework, “human resource management” competence element is recognized under behavioral competences and is defined as “the understanding and application of the policy and procedures that directly affect the people working within the project team and working group. These policies include recruitment, retention, reward, personal development, training and career development.” The indicators of this competence as mentioned in this standard are applying the HRM policies of the organization, ensuring appropriate induction for all project team members, explaining to each project member what is expected of them, recognizing individuals personal circumstances, maintaining regular contact with project members for learning and development opportunities, redeploying each team member with appropriate acknowledgement of their contribution to project.

In AIPM Professional Competency Standards, four competency elements are identified for human resource management which are “implementing human resource and stakeholder planning activities”, “implementing staff training and development”, “managing the project team and stakeholders”, and “assessing human resource outcomes”. The performance criteria for “implementing human resource and stakeholder planning activities” are determining human resource requirements, establishing project organization and structure, allocating staff within the project, and using appropriate HR methods and tools. For “implementing staff training and development” competency element, the performance criteria are communicating designated staff responsibilities, rectifying any gaps in individual and group skills, implementing staff development and training, and encouraging individuals to continuously improve their competencies. For “managing the project team and stakeholder” the performance criteria highlighted in this standard are monitoring internal and external influences on individual, implementing procedures for interpersonal communications, regularly reviewing stakeholders expectations, maintaining the desired cultural environment, and promoting cohesive teamwork. “Assessing human resource outcome” as the last competency element for human resource management consists of reviewing project progress and outcomes to determine the effectiveness of HRM processes and identifying HRM lesson learned to apply for future projects.

In IPMA Competence Baseline, “personnel management” competence element is defined under contextual competence category and it covers the aspects of human resource which are related to the project or program such as planning, selection of human resource, training, retention, performance assessment and motivating human resource. The possible process steps of this competence element are identifying the project resource requirements in terms of skills, knowledge, experience and behavior,

selecting the right people, explaining to team members about what is expected from him, and assessing individual's motivations and circumstances. Managing the planned and actual performance of each individual, monitoring changes in personnel situations and motivations, discharging each team member and releasing them to their organization in closing stage of projects, and documenting lessons learned to apply for future projects.

In Project Manager Competency Development (PMCD) Framework, the identified competency element for human resource management in initiating phase of project is “conducting organizational definition” and it means completing stakeholders need analysis, identifying the organizational structure and identifying specific organizational role/responsibility assignment process. “Conducting organizational planning” and “conducting staff acquisition” are the competency elements of planning stage of project. The performance criteria of “conducting organizational planning” are completing overall organizational planning processes, developing an organizational chart, describing project effects, utilizing an OBS to evaluate unit responsibilities, developing and staffing management plan, and developing project team policies and procedures. The performance criteria for “conducting staff acquisition” competency element are determining human resource requirements for individual tasks, establishing project organization and structure, allocating project staff to the project, communicating designated staff responsibilities. In the executing stage of project “conducting team development” competency element is identified which means utilizing project team policies, performing team-building activities, establishing a collocated team, using conflict/stress reduction techniques to enhance project team performance, and implementing rewards according to plan. “Managing human resource” is the competency element identified in controlling stage of project which its performance criteria are managing changes in organizational plans, monitoring results of team-

building activities, and monitoring effectiveness of programs to enhance project team performance. In closing stage of project the identified competency element is “conducting project closure with regard to human resource management” and its performance criteria consists of implementing transition activities to return resources to parent organization, and documenting lessons learned, the causes of changes, and reason for selecting specific corrective action.

COMMUNICATION MANAGEMENT

In APM Competence Framework, “communication” competence is under behavioral category and is defined as “the giving, receiving, processing and interpretation of information. Information can be conveyed verbally, non-verbally, actively, passively, formally, informally, consciously or unconsciously.” The indicators of this competence are effectively communicate to stakeholders throughout the project’s life cycle, developing and executing the communication plan, acknowledging own personal style of communication, seeking feedback on effectiveness of communication, evaluating and taking appropriate actions for ineffective communications, and communicating the decisions and reasons for decisions to team members.

In AIPM Professional Competency Standards, the competency elements of planning and managing communication are “planning communication processes”, “managing information”, “managing project reporting”, and “assessing communication management outcomes”. The performance criteria for “planning communication processes” competency element are identifying and analyzing the information requirements, developing and implementing communication management plan, establishing and applying a project management information system. “Managing information” consists of managing the generation, gathering, analyzing and dissemination of information by project staff, implementing and monitoring information

validation, maintaining agreed communication networks, and ensuring appropriate information transferred to relevant stakeholders. The performance criteria for “managing project reporting” competency element are establishing and managing project reporting, managing information management system, drafting project reports, and maintaining stakeholder relationships. “Assessing communication management outcomes” as the last competency element of communication management means reviewing project progress, determining the effectiveness of communication management, and identifying communication management lessons learned.

In IPMA Competence Baseline, “communication” competence is under technical category and the possible process steps of this competence are setting out the communication plan, identifying the target population for communication, determining what needs to be communicated, choosing the means of communication, planning the communication process and material, seeking feedback on the effectiveness of the communication, evaluating and taking appropriate action, and documenting lessons learned to apply for future projects.

In Project Manager Competency Development (PMCD) Framework, for the first project phase- initiating- regarding to communication management, “preliminary communication planning” competency element is identified which means identifying the project/organization communication policies. “Conducting communication planning” is the competency element of planning stage of project and the performance criteria of this competency element are determining the detailed information requirement of the project stakeholders, establishing project information storage system, determining the format of information needs, developing feedback routines, determining the methods used to transmit information, developing a communication management plan, establishing project status reporting process, and selecting a suitable time-reporting mechanism. For executing stage of project “conducting information

distribution” and “implementing project time reporting” competency elements are identified. The performance criteria for “conducting information distribution” competency element are implementing a project information distribution system, implementing a project information retrieval system, responding to information requests, and maintaining project record. The performance criteria of “implementing project time reporting” competency element are executing requirements and processes for time reporting and including time-reporting data in regular progress reports. “Conducting project performance reporting” is the competency element of controlling stage of project which means implementing project performance reviews, generating and disseminating progress of project to appropriate stakeholders, and monitoring compliance to ensure that accurate data are available. For closing stage of project, “conducting administrative closeout” competency element is identified and the performance criteria for this competency element are, verifying all project results, documenting performance measures, reviewing final specifications, and analyzing project success, documenting the final project scope, documenting lessons learned, formalizing the acceptance of the product, performing final appraisal reviews and archiving relevant project documentations.

In Krahn and Hartment’s (2006) research findings, listening and verbal communication is listed in top 10 most important competencies required by project managers. Although communication processes such as feedback (Pinto & Slevin, 1987; White & Fortune, 2002), influencing other people (Sotiriou & Wittmer, 2001), and getting agreements (Pinto & Pinto, 1991) have received more attention, communication competence has received less attention (Henderson, 2008).

There is a point of view in regards of communication competency that some research efforts support the idea that communication competency of communicators is tied up to their intention and abilities (Argyris, 1965; Bochner & Kelly, 1974; Spitzberg &

Cupach, 1984; wiemann, 1977). Later Parks (1994) supported previous researches that competent communicators not only fulfill their goals through communication, but also they also try to consider future goals as well.

One of the important key factors for individual's communication competency is relating to the behavior of communicator which addressed by Jablin and Sias (2001). Two components of this behavioral factor are encoding and decoding of message. Encoding means sending messages actively, and decoding means receiving and listening messages actively. There are several researches that investigate relation of goal achievement, encoding and decoding behavioral factors such as (Alexander, Penley, & Jernigan, 1992; Monge, Bachman, Dillard, & Eisenberg, 1982; Scudder & Guinan, 1989). In a research conducted by Henderson (2004) project manager's communication –e.g. encoding and decoding of project manager- was significantly associated to satisfaction level of team members. On the other hand, researches about emotional intelligence conducted by Dulewicz& Higgs (2000), Salovey and Mayer (1990) and Goleman (1995) also reflecting importance of effective communication with others in workplace. For instance, interpersonal sensitivity and responsiveness in Dulewicz and Higgs (2000), Leban and Zulauf (2004) researches, reflect importance of communication competencies in workplace.

The importance of communication in other aspects of project also is investigated in several researches. For example, Pinto and Pinto (1991) highlighted the importance of communication for establishing shared agreements, or importance of communicating project goals with project managers is accentuated in Ammeter and Dukerich (2002)research or Sotiriou and Wittmer (2001) showed the importance of communication for project managers to apply influence methods.

Project managers in projects are facing different challenges. They, with high accountability and low authority (Henderson, 2004), need effectively negotiate with variety of project stakeholders (Elmes & Wileman, 1988; White & Fortune, 2002). Therefore, project managers in order to be successful in responding effectively to these challenges need to be competent communicators. Communication competence is defined by several researches such as Wiemann (1977) and O’Hair et al. (1997) researches. For example, O’Hair et al. (1997) defined communication competency as the ability of choosing among communication behaviors by a communicator who needs to accomplish his/her interpersonal goals. Spitzberg and Cupach (1984) and Morreale et al. (2001) asserted that in order to a competent communication to be occurred, individuals must be motivated to communicate and also they must be capable to express their knowledge and skills about the context that interpersonal communication is occurring.

Communication competency refers to the ability of application of language skills in a situation. Some researches such as Wiemann (1977), Larson et al. (1978), and Spitzberg (1983) in their definition of communication competency expressed on situational and functional dimension of it. In fact, its purpose of applying communication competency is to achieve goals effectively. Although some researches such as Spitzberg and Cupach (1984) and Roloff (1987), mentioned that communication competency is related to goal accomplishment, some other researches such as Argyris (1965), Bochner and Kelley (1974), and Phillips (1983) referred to communication competency as behavioral output.

RISK MANAGEMENT

In APM Competence Framework, “project risk management” competency element is under technical competency category and it is defined as “a structured process that

allows individual risk events and overall project risk to be understood and managed proactively, optimizing project success by minimizing threats and maximizing opportunities.” The indicators of the competency element are identifying and assessing risks, developing a risk response plan, identifying and undertaking response action, assessing the probability of achieving time, cost and quality objectives, continuously identifying new risks, reassessing risks, and facilitating risk workshops.

In AIPM Professional Competency Standards, the competency elements of planning and managing risk are “determining project risk events”, “monitoring and managing opportunities”, “monitoring and managing project risk”, and “assessing risk management outcomes”. The performance criteria for “determining project risk events” are identifying and analyzing risk and opportunities, using established risk management techniques, developing risk management plan, establishing risk management processes and procedures to enable effective management of risk, and assigning risk management responsibility to deal with the risks. For “Monitoring and managing opportunities” competency element, the performance criteria are monitoring project opportunities, documenting opportunities and assessing against project progress, presenting opportunities to higher authority for consideration, and implementing changes when necessary to take advantages of new opportunities. Monitoring and managing project risks and implementing risk management strategies are performance criteria of “monitoring and managing project risk” competency elements. The performance criteria for “assessing risk management outcomes” competency elements are reviewing project progress, issues and outcomes to determine the effectiveness of risk management processes and identifying risk management lesson learned.

In IPMA Competence Baseline, “risk and opportunity” competency element is recognized under technical competency category and the possible process steps for this competency element are identifying and assessing risk and opportunities, developing

risk and opportunity response plan, assessing the probability of attaining time and cost objective, continuously identifying new risks, and planning responses, controlling the risk and opportunity response plan, and documenting lesson learned and applying for future projects.

In Project Manager Competency Development (PMCD) Framework, for project risk management for initiating phase of project, “conducting preliminary risk planning” competency element is suggested and it means identifying and reviewing organization’s risk management policies, identifying risk tolerance level of stakeholders, and identifying preliminary risks. The recognized competency elements of risk management in the planning stage of project are “developing risk management plan”, “conducting risk identification”, “conducting qualitative risk analysis”, “conducting quantitative risk analysis”, and “conducting risk response planning”. The performance criteria of “developing risk management plan” are identifying roles, responsibilities for risk management, reviewing preliminary risk assessment matrix, and developing risk management plan. The performance criteria of “conducting risk identification” competency element are identifying potential project risk events, identifying the sources of possible risk events, determining the causes and effects of risks, classifying potential risk events, and identifying risk symptoms. For “conducting qualitative risk analysis” competency elements the identified performance criteria are documenting the manifestation of risk events, confirming stakeholder risk tolerances, estimating risk event probability, estimating risk event value, developing impact risk rating matrix, developing list of prioritized risks, and determining overall risk ranking. The performance criteria for “conducting quantitative risk analysis” competency element are conducting risk interviews with project stakeholders, conducting sensitivity analysis, utilizing simulation, developing decision tree analysis, communicating the limitations of risk quantification, and preparing a probabilistic risk analysis. Finally, the performance

criteria for “conducting risk response planning” competency element consists of working with stakeholders to develop risk responses, determining procurement feasibility as a risk deduction tool, developing contingency plans, determining insurance coverage needs, determining risks events, assigning risk owners, determining and documenting the appropriateness of risk event strategies, and developing a risk response plan. “Conducting risk monitoring and control” is the competency element of risk management in the controlling stage of project and it means creating workarounds for unplanned risk events, quantifying actual risk events, completing risk response plan updates, and completing risk event updates. In this standard in regards of risk management for closing stage of project “conducting project closure with regard to risk management” and “preliminary procurement planning” competency elements are suggested. Reviewing project outcomes to determine the effectiveness of risk management processes and identifying and documenting risk issues are the performance criteria of “conducting project closure with regard to risk management” competency risk while identifying and reviewing organization’s procurement policies is the performance criteria for “preliminary procurement planning” competency element.

PROCUREMENT MANAGEMENT

In APM Competence Framework, “procurement” competency element is defined under technical competency category and is defined as “the process by which the resources (goods and services) required by a project are acquired. It includes development of the procurement strategy, preparation of contracts, selection and acquisition of suppliers, and management of the contracts”. Indicators of this competency element are clarifying requirements of key product and services, agreeing the preferred options and the potential suppliers with the business, ensuring that suppliers are approved, managing the tender, evaluation and selection processes, negotiating with preferred suppliers and

preparing contracts, ensuring effective management of the contract, implementing, maintaining and disseminating procurement strategy and policy.

In AIPM Professional Competency Standards, the competency elements of planning and managing procurement are identified as “determining procurement requirements”, “following agreed procurement processes”, “conducting contracting and procurement activities”, “implementing contract and/or procurement”, and “managing contract and procurement finalization procedures”. The performance criteria of “determining procurement requirements” competency element are identifying procurement requirements, and establishing agreed procurement management plan. Obtaining information from sources, and adopting established selection criteria for selecting suppliers and contractors are performance criteria of “following agreed procurement processes” competency element. The performance criteria of “conducting contracting and procurement activities” competency element are communicating requirement to contractors and suppliers, selecting preferred suppliers, conducting negotiations with preferred contractors and suppliers, and establishing a positive working relationship with contractors and suppliers. “Implementing contract and/or procurement” competency element consists of implementing an established procurement management plan, and managing procurement issues and changes. The performance criteria of “managing contract and procurement finalization procedures” competency element are managing finalization activities of contract deliverables and contracts, reviewing project progress and issues to determine the effectiveness of procurement processes. Identifying procurement lessons learned and recommending improvement to apply for future projects.

In IPMA Competence Baseline, “procurement and contract” competency element is categorized under technical category and the possible process steps of this competency element are identifying and defining what needs to be procured, putting bid out to

tender, selecting suppliers, establishing contract administrations, executing contracts, managing changes, accepting contract completion, closing contracts, and documenting the lesson learned to apply for future projects.

In Project Manager Competency Development (PMCD) Framework, for procurement management in initiating phase of project “preliminary procurement planning” competency element is recognized and it means identifying and reviewing organization’s procurement policies and procedures. “Conducting procurement planning” and “conducting solicitation planning” are competency elements of planning stage. The performance criteria of “conducting procurement planning” are utilizing make-or-buy analysis, determining the contract types, developing rating and scoring evaluation criteria, determining different types of procurement documents, developing the procurement management plan, and developing a procurement statement of work. The performance criteria of “conducting solicitation planning” competency element are obtaining information from established sources, implementing and communicating established selection processes and selection criteria, and obtaining approval from higher project authority. The competency elements of procurement management in executing phase of project are “conducting solicitation”, “conducting source selection/contract development”, and “conducting contract administration”. “Conducting solicitation” means conducting solicitation activities to obtain proposals from sellers, developing advertising to support solicitation, collecting proposals for evaluation. Defining and utilizing project payments, determining project changes, identifying project warranties, conducting contract negotiations, evaluating and selecting sources and awarding contracts are performance criteria of “conducting source selection/contract development” competency element. The performance criteria for “conducting contract administration” competency element are completing payment reviews, and reviewing contractors’ change status. “Managing and reviewing contract

performance” is the competency element of procurement management in controlling phase and it means reviewing contractor costs, schedules and technical performance levels, and implementing a contract change control system. The performance criteria for “conducting contract closeout” as the competency element of procurement management in closing phase of project, are determining the quality and completeness of the contract file, updating records based upon final contract results, verifying contract documentation, and obtaining formal acceptance from customer regarding to contract completion.

CONSTRUCTION WORKS (TECHNICAL EXPERTISE)

To know project success criteria-In APM Competence Framework, project success is defined as “the satisfaction of stakeholder, needs and is measured by success criteria as identified and agreed at the start of the project”. The indicators of this competency element are analyzing and understanding the project and its context, agreeing success criteria for the project, identifying critical success factors, executing and controlling PM plans and change, collecting results and preparing project performance reports, and ensuring that benchmark data is captured.

Methods and Procedures- in APM Competence Framework, “methods and procedures” mean “detailing the standard practices to be used for managing projects throughout a life cycle. Methods provide a consistent framework within which project management is performed. Procedures cover individual aspects of project management practice and form an integral part of a method”. The indicators of this competency element are “understanding the organization’s project management methods and processes, complementing the organization’s methods and procedures, ensuring the methods and procedures adopted to organization’s reporting structure, ensuring all project members

understand the methods and procedures, and ensuring improvements to the organization's methods and procedures.”

Change Control- in APM Competence Framework, “change control” means “the process that ensures that all changes made to a project's baseline scope, time, cost and quality objectives or agreed benefits are identified, evaluated, approved, rejected or deferred”. The indicators of this competency element are agreeing and implementing a change control policy, capturing and logging all proposed changes, conducting and analysis on the consequences of proposed changes, defining various responsibilities and authority levels, getting changes accepted or rejected, controlling and closing approved changes, and reporting the status of changes throughout the project.

Technology Management- in APM Competence Framework, “technology management” is defined as “the management of the relationship between available and emerging technologies, the organization and the project. It also includes management of the enabling technologies used to deliver the project, technologies used to manage the project and the technology of the project deliverables”. The indicators of this competency element are discussing, defining and agreeing about technology management strategy, ensuring the risks of adopting any new technology, ensuring that the deployment of new technologies is compatible with existing technologies, calculating the cost of the technology management strategy, and monitoring the adoption and implementation of the technology management strategy.

Value Management- in APM Competence Framework, “value management” is defined as “a structured approach to defining that value means to the organization and the project. It is a framework that allows needs, problems or opportunities to be defined and

then enables review of whether the initial project objectives can be improved to determine the optimal approach and solution”. The indicators of this competency element consist of understanding and communicating the concept of value management, understanding and communicating the benefits of value management, understanding the key principles of value management, understanding and applying the role of value manager, understanding and applying value management problem solving, and maintaining audit trails and recording of implementation.

Handover and Closeout- in APM Competence Framework, this competency element is defined as “final phase in project life cycle. During this phase final project deliverables are handed over to sponsor and users. Closeout is the process of finalizing all project matters, carrying out final project reviews, archiving project information and redeploying the project team”. The indicators of this competency element are formalizing the project completion process, undertaking an assessment of the readiness of project, ensuring all required deliverables are delivered and accepted by stakeholders, obtaining appropriate sign-off certificates and agreements on handover, closing contracts with contractors, obtaining formal project closedown, conducting a post project review, releasing human resources and other assets, and archiving project records.

The competency elements (dependent variables) of job-related category are shown in Figure 3.3 and Figure 3.4.

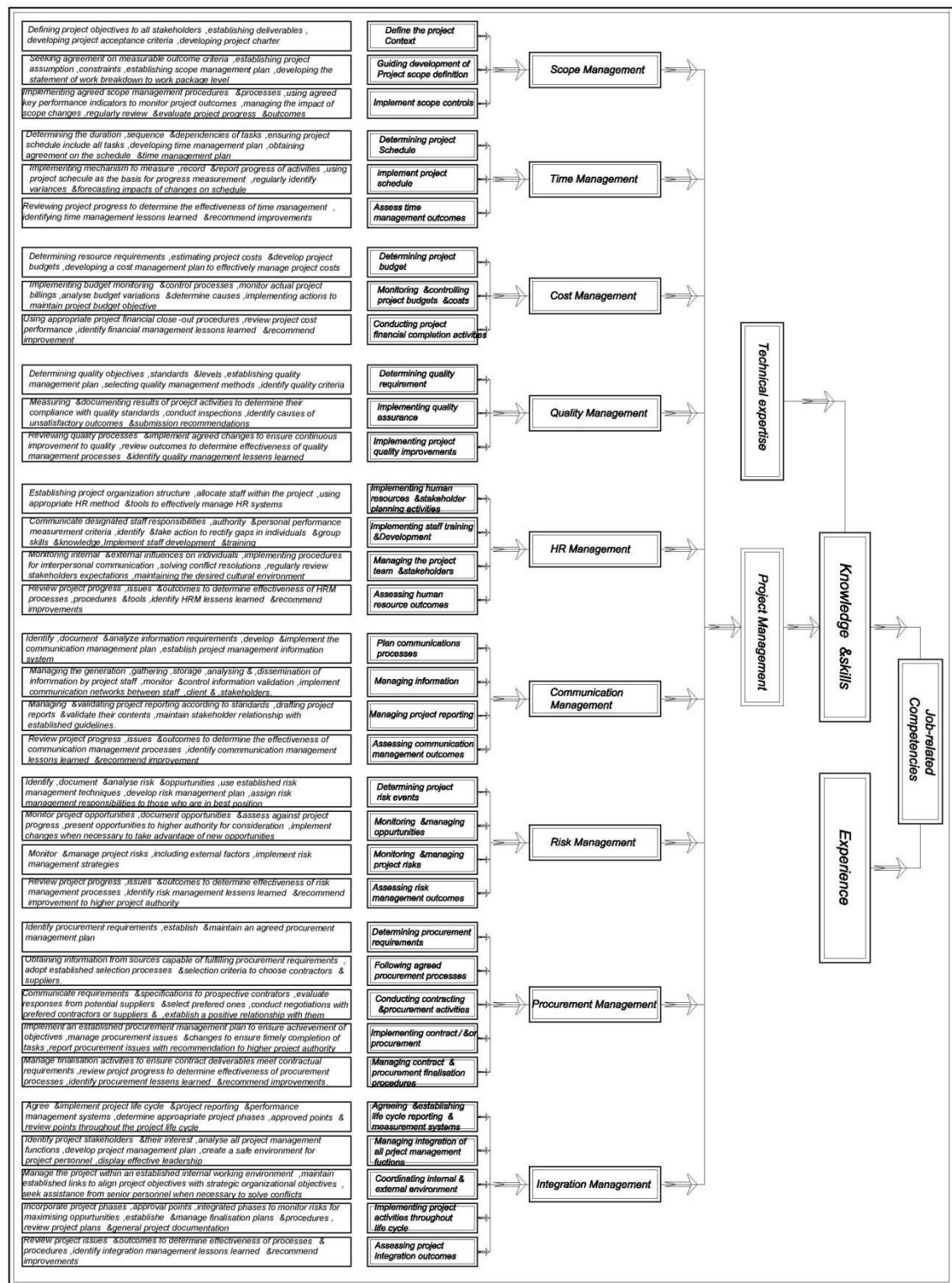


Figure 3.3: Dependent Variables (Competency Elements) of Project Management

Note: In order to have a better view, a bigger size of this figure is presented at Appendix D

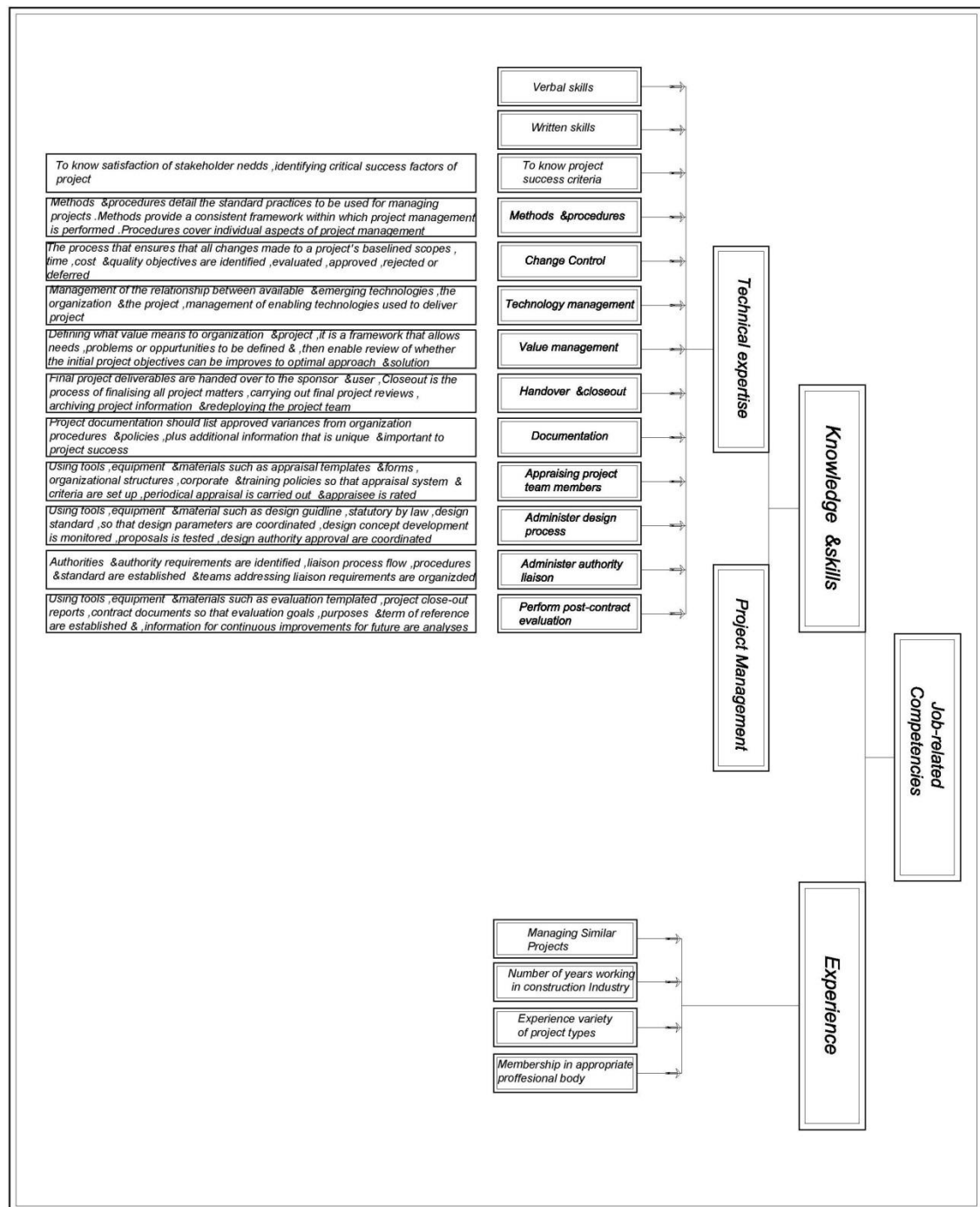


Figure 3.4: Dependent Variables (Competency Elements) of Technical Expertise

Note: In order to have a better view, a bigger size of this figure is presented at Appendix E

3.2.2.2 PERSON-RELATED COMPETENCIES

Woodruffe (1991) defined this competency as a dimension of behavior. Roberts (1997) defined it as input-based criteria, which means personal behavior, traits, and characteristics that a person brings to projects. Garavan and McGuire (2001) believed that this competency is more popular in US rather than in Europe. Gadeken (1994) in

his research distinguished six behavioral competencies for effective project managers. According to the American Management Association, competency is defined as the characteristics of a person whose performance is superior (Boyatzis, 1982). This aspect is the result of research done by McBer Associates, who started in 1970s in order to distinguish characteristics between superior managers and average managers. This competency is also known as “macro competency” (Cheng, et al., 2003). Brown (1993), Spencer and Spencer (1993) mentioned that personal competency for project managers is more pivotal when dealing with complex situations. This approach relies on superior effective managers (Jones & Connolly, 2001). The approaches for defining project managers’ competency that just considers person-related competencies and does not contemplate other aspects of competency such as work-related competencies and also contextual competencies are criticized. For instance, Stuart and Lindsay (1997) argued that since person-related competencies concentrated on project managers’ competency as individuals and did not focus on organization context, this could not fulfill all required characteristics of a competent project manager. In the model proposed by Crawford (2005), she defined components of competency as “performance-based” which refers to work-related competencies and “attribute-based” which refers to knowledge, skills, and personal characteristics. In this model, knowledge and skills that a person brings to a project is called “input-competencies” and personal characteristics of a project manager are called “personal competencies”.

Spencer and Spencer (1993) developed required personal competencies for project managers. They organized these competencies in six competency units consisting achievement and action, helping and human service, impact and influence, managerial, cognitive, and personal effectiveness. “Achievement and action” is broken down to “achievement orientation”, “concern for order, quality, and accuracy”, “initiative”,

“information seeking”, and “identifying and solving problems” clusters. The competency elements of person-related category are shown in Figure 3.5.

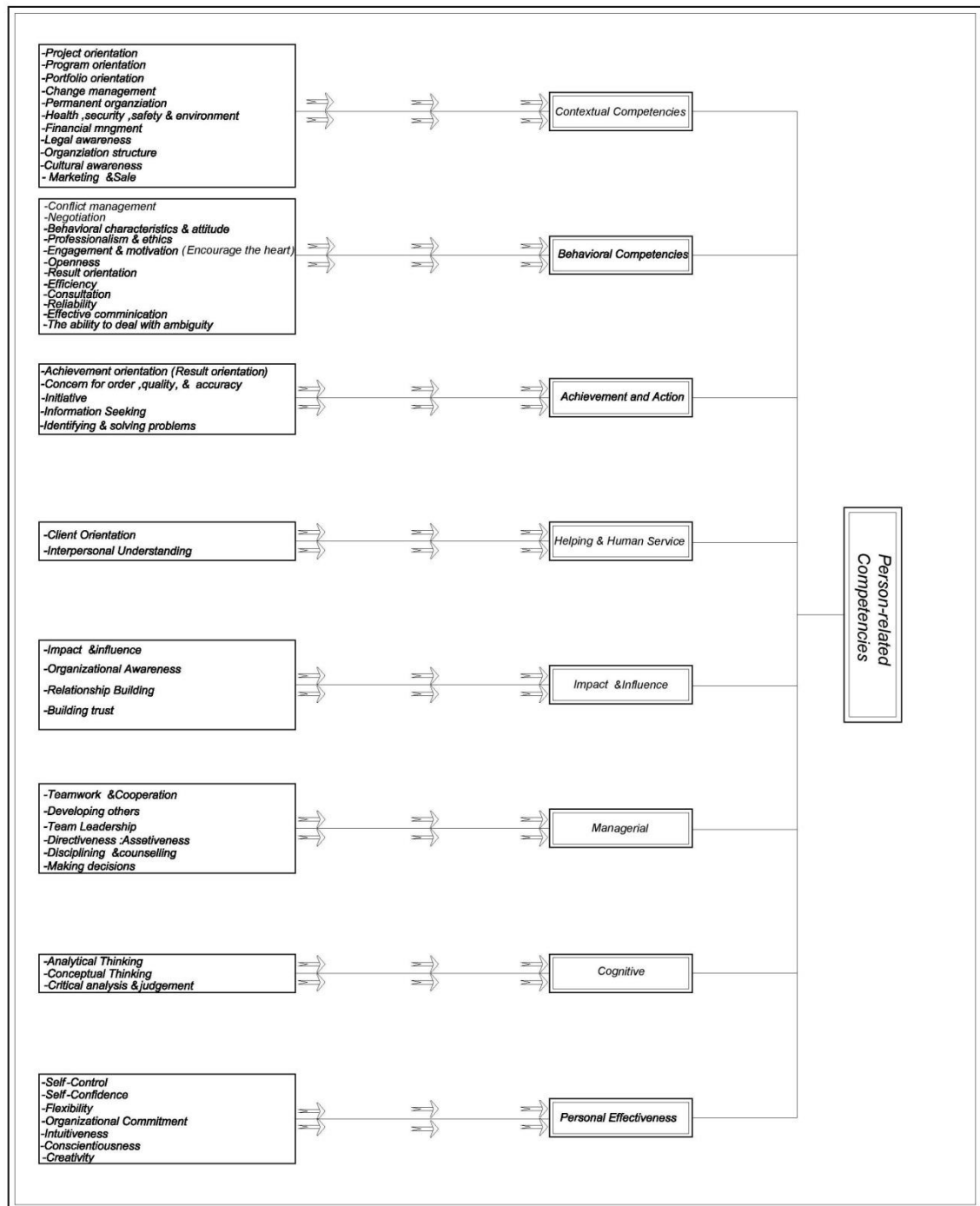


Figure 3.5: Competency Elements of Person-related Category

Note: In order to have a better view, a bigger size of this figure is presented at Appendix F

ACHIEVEMENT AND ACTION

“Achievement orientation” is defined as “a concern for working well, or for competing against a standard of excellence.” Actually, it is expected from project managers to “operate with intensity to achieve project goals”, motivates project stakeholders in a positive way”, “provides new solutions in planning and delivering projects” and “operates with individual integrity and personal professionalism”. “Concern for order, quality and accuracy” means “an underlying drive to reduce uncertainty in the surrounding environment” and it is expected from project manager “to manage projects in an ordered and accurate way”, and “to provide accurate and truthful information”. “Initiative” means “the preference for taking action. It is doing more than is required or expected in the job, doing things that no one has requested, which will improve or enhance project results and avoid problems, or findings or creative new opportunities.” It is expected from project manager “to take initiative when required”, “to take accountability for and to deliver project”, “to seek new opportunities”, and “to strive for best practice”. Information seeking” means “an underlying curiosity, a desire to know more about things, people, or issues. It implies making an effort to get more information, not accepting situations at face value.” Regarding to “information seeking”, it is expected from project manager “to ensure information used to manage project is complete and accurate”.

HELPING AND HUMAN SERVICE

“Helping and human service” competency units is broken down to “customer service orientation” and “interpersonal understanding” competency units. “Customer service orientation” mean “a desire to help or serve others, to meet their needs. It means focusing efforts on discovering and meeting the customer or client needs.” In is expected from project manager to “represent the client inside the project” and “to take

initiative to provide excellent client service”. “Interpersonal understanding” means “wanting to understand other people. It is the ability to hear accurately and understand the unspoken or partly expressed thoughts, feelings, and concerns of others”. Project managers in order to fulfill this competency have to “strive to understand all project stakeholders’ thoughts, feelings, and concerns”, and “listen and respect to others”.

IMPACT AND INFLUENCE

“Impact and influence” competency unit is broken down to “impact and influence”, “organizational awareness”, and “relationship building”. “Impact and influence” means “an intention to persuade, convince, influence, or impress others in order to get them to support the speaker’s agenda or to have a specific impact or effect on others”. “Taking appropriate actions to influence others”, “influencing across projects and organization”, and “understanding and influencing project team members” are required for project managers to fulfill this competency cluster. “Organizational awareness” means “individual’s ability to understand the power relationship in one’s own organization or in other organizations (customers, suppliers, and so on). It includes the ability to identify who are the real decision-makers and the individuals who can influence them.” It is expected from project managers to “understand the organization”, and “to understand the project”. “Relationship building” means “working to build or maintain positive relationship or network of contacts with people who are, or might someday be, useful in achieving work-related goals.” Project managers for fulfilling this competency should be able “to build and maintain suitable relationship with project stakeholders” and “to establish and maintain relationship at the right level inside and outside the organization”.

Project managers in order to be successful need to properly manage their relationship with groups and individual who are affected by their actions and behaviors

simultaneously. Therefore, in order to manage them, they first need to know the expectations of the stakeholders including their peers, subordinated, clients, and superiors (Fraser & Zarkada-Fraser, 2003). According to Kaplan and Norton (1996) and Winterton and Winterton (1999), for performance measurement and planning systems, the knowledge of stakeholders' needs and attitude can be applied. Hartle (1995) argued that more researches need to be conducted for understanding project stakeholders and their expectations.

There are some researches (Boyatzis, 1997; Bracken, 1994; Church & Waclawski, 1999; Jones & Brearley, 1996; Yamarino & Atwater, 1993) that in order to evaluate project stakeholders' expectations and also their assessment of project managers' performance used 360-degree feedback method to measure project managers' performance. Hurley (1998) mentioned that this 360-degree method is efficient and equitable. The findings of other researches show that in order to have more accurate and valid results (Fletcher & Baldry, 1999; Tornow, 1993; Wohlers & London, 1989) higher quality results (Church & Bracken, 1997) and more comprehensive performance picture (Fletcher & Baldry, 1999) a combination of superior, peers, subordinate and self-evaluation should be applied for 360-degree method. To be aware about stakeholders expectations result project managers to adapt their actions and behaviors and also communication skills to achieve highest level of stakeholders satisfaction (Fraser & Zarkada-Fraser, 2003). Charkhan (1992) defined the stakeholders that construction project managers are dealing with as professionals such as consultant, project managers' subordinators, client, and external authorities, and their project managers' immediate superiors.

Thomas and Mengel (2008) argued that current programs in project management produce project managers who are process-oriented. However, there is a need to develop project managers who understand context of projects (Ives, 2005), and project

managers who are capable develop their relationship effectively (Goleman, Boyatzis, & McKee, 2004; Zohar & Marshall, 2001). Some researches highlighted the importance of communication skill for project managers such as Wateridge (1998) research that pointed out importance of communication for achieving project stakeholders agreement on project success criteria, or Clarke (1999) research that emphasized communication skill of project managers results to eliminate unnecessary changes of project, or Wateridge (1997) research that emphasized importance of communication skill for project managers for gaining acceptance between organization, client and all involved parties about project outcomes. The importance of communication skills for project managers to effectively communicate with team members, different levels of management in organization, and stakeholder is also emphasized in Zeilinski's (2005) research.

MANAGERIAL

“Managerial” competency unit is broken down to “teamwork and cooperation”, “developing others”, “team leadership”, and “directiveness: assertiveness and use of positional power” competency clusters. “Teamwork and cooperation” competency cluster means “a genuine intention to work cooperatively with others, to be part of a team, to work together, as opposed to working separately or competitively.” The competency elements of “teamwork and cooperation” are “building team orientation within the project”, “modeling core project stakeholders into a team” and “undertaking team-building activities”. “Developing others” means “a special version of impact and influence in which the intent is to teach or to foster the development of one or several other people. The essence of this competency lies in the developmental intent and effect rather than in a formal role.” The competency elements of this competency cluster are “building a project culture where personal development is encouraged”, “developing

project members to effectively build project culture”, “demonstrating leadership of the project” and “leading the project team”. “Directiveness: assertiveness and use of positional power” means “the individual’s intent to make others comply with one’s wishes. Directive behavior has a theme or tone of “telling people what to do”. “Using assertiveness when necessary” and “managing the complete project” are the competency elements of this competency cluster.

LEADERSHIP STYLES OF MANAGERS

There have been debates for few years about managing and leading differences. While managing values control, efficiency, and stability, leading values innovation, adaptation, and flexibility. Therefore, managers are practical and analytical whereas leaders are visionary and creative (Yukl and Lepsinger, 2005). Kotter (1990) contended that both roles are important and there should be a balance between managing roles and leading roles. He proposed that importance of managing and leading depending to the situation is varied. For instance, if organization becomes larger, managing role importance increases. On the other hand, if external environment to be uncertain and more dynamic, leading role importance increases. Therefore, for both large organizations that are working in uncertain environment, it is necessary that executives encompass both leading and managing roles. Kotter (1990) conducted a research in these companies and he found that only few executives of these organizations encompass both managing and leading roles.

Trait school of leadership- This leadership school which focusing on leaders traits, like personalities or physical appearance of managers started in 1930-1940s. Kirkpatrick and Locke (1991) research or Turner (1999) research are representatives of this school in recent years. Behavior school of studies- This theory argues that leadership is not a trait that people are born with, instead it can be learned. This theory started in 1940s.

Researchers such as Blake and Mouton (1978) or Hersey and Blandchard (1988) are representatives of this theory. Contingency theory developed in 1960s which argued that for different leadership situations different leadership styles must be matched. For instance, Robbins' (1997) defined four styles including directive, supportive, participative and achievement oriented leadership. In 1980s charismatic theory emerged which focuses on organizational changes such as Bass research in 1990. Before 2000 "emotional intelligence theory" developed. Daniel Goleman (1995) is one of the representatives of this theory. In his research with Boyatzis and McKee (2002), he defined six styles for leadership including visionary, coaching, affiliative, democratic, pacesetting, and commanding. He explained that these six styles are moving from a democratic to authoritative and since the last two styles- pacesetting and commanding- are threatening for long-term relations between leader and follower, it is better to be applied in emergency situations (Goleman et. al, 2002). This theory focusing on more soft factors and believe that emotional factors are more critical than intellectual factors. Competency theory which developed in recent years argues that competency is combination Knowledge, skills and personal characteristics (Boyatzis, 1982; Crawford, 2003). Dulewicz and Higgs (2005) as representatives of this theory conducted a research about existing theories and they defined 15 leadership dimensions in three categories of intellectual, emotional, and managerial. In their research, they identified three different leadership styles for organizational change projects, and depending to level of change in the organization three profiles identified. Firstly, "engaging" which is for highly transformational context that by engaging and commitment radical changes produces. Secondly, "involving" that significant but not radical changes happen; and thirdly, "goal oriented" that context relatively remain stable.

Muller and Turner (2007) pointed out that if for organizational change projects, appropriate leadership style can be defined, then for other project types also can define

appropriate leadership styles. Therefore, they defined leadership profiles for some other projects such as engineering and construction project and information & telecommunication technology projects. George (2003) argued that even though project managers can learn from others' experiences (George, 2004), every individual is unique with personal values, personal experiences, and motivation. Therefore, project managers need to have a unique leadership style which is aligned with their personality and personal values (George, 2003).

In several researches it is contended that "authentic leadership" is suitable for future leadership demands and future leadership challenges (George, 2003; Luthans & Avolio, 2003). Some of the characters of "authentic leadership" are sense of integration, positive energy, morality, having self-discipline, to be optimistic, to be resilient and to be hopeful (Avolio & Gardner, 2005; George, 2003; George & Sims, 2007; Luthans & Avolio, 2003). There are some researches that argued that authenticity of leadership depends on several factors such as organizational context, external environment (Avolio & Luthans, 2006; Gardner, Avolio, Luthans, May, & Walumbwa, 2005; Luthans & Avolio, 2003). As mentioned by Gardner et al. (2005) and May et al. (May, Hodges, Chan, & Avolio, 2003), authentic leaders are future-oriented, ethical; they are optimistic, hopeful, and confident. Furthermore, as contended by George (2003), they are courage to move forward, and have a sense of understanding of clients' demands and try their best to fulfill these demands.

Four early school- Trait school argued leadership cannot be learned and successful managers have certain traits that they have born with. Behavioral school assumption is that successful leader have some certain behaviors that make them successful and these behaviors can be developed can trained. Contingency school content that for different circumstances, different behaviors and styles for leaders is required. Seven traits of

effective project managers identified by Turner (1999) are: problem solving ability, result orientation, energy and initiative, self-confidence, perspective, communication, and negotiating ability. Frame (1987) explained four leadership styles including laissez-faire, democratic, autocratic, and bureaucratic and mentioned that for different project life-cycle, different style is appropriate. For example, for feasibility stage, laissez-faire is appropriate, for design stage, democratic leadership is appropriate, for execution stage autocratic leadership is appropriate and finally for close-out stage, bureaucratic leadership is appropriate.

In the visionary school two type of leadership identified including transformational leaders who focus on leadership and communicating of their values, and transactional leaders who focus on processes (Bass, 1990). Dulewicz and Higgs (2003), and Muller and Turner (2007) suggested that for complex change projects, transformational leadership is appropriate and for simple, engineering project transactional style is preferred.

Emotional intelligence school- According to emotional intelligence school, what differentiate leaders are their emotional responses to situation, not their intelligence. Nineteen leadership competencies that was grouped in four categorizes identified by Goleman et al. (2002) including self-awareness, self-management, social awareness, and relationship management. They also proposed six management styles including visionary style, coaching style, affiliative style, democratic style, pacesetting style, and commanding style; they proposed different competency profiles for each of these management styles. They also mentioned that the last two styles are not suitable for long-term situations because of their negative affection on motivation of subordinates. In a research conducted by Lee-Kelley and Leong (2003) the relationship between project managers awareness of project management knowledge and project managers'

success investigated. Based on their finding perception of project managers about project success and also project failure is affected by their self-confidence and also self-belief. Therefore, they found that project success or failure is affected by project managers' emotional intelligence.

Competency school- Competency school is encompassing all previous schools since traits and behaviors also are part of competency. This school explains that successful leaders have certain competencies. This school believes that for different situation, different leadership style is required (Müller & Turner, 2007). Dulewicz and Higgs (2003) grouped fifteen competency elements in three competency categories called intellectual (IQ), managerial (MQ), and emotional (EQ). They also identified three different leadership styles called goal-oriented style, involving style, and engaging style. Their research was limited to organizational change projects; they proposed that for low complex project goal-oriented leaders are preferred, for medium complex project involving leaders are best, and for high complex projects, engaging leaders are appropriate. Some researches such as Keegan and Hertog (2004), and Thamhain (2004a, 2004b) emphasized the need for focusing on leadership perspective.

Farley (2005) contended that for agile projects cannot find any suitable particular leadership style while to be adaptive and flexible is the most important. Meredith and Mantel (2002) contended that traditional project management focusing on finding better methods to achieve project objectives and also perform within predefined time and cost.

COGNITIVE

"Cognitive" competency unit is broken down to "analytical thinking" and "conceptual thinking" competency clusters. "Analytical thinking" means "working through a situation by breaking it apart into smaller pieces or tracing the implications of a

situation in a step-by-step causal way”. The competency elements “analytical thinking” competency cluster are “understanding at a suitable level all issues associated with the project” and “facilitating solutions across all issues related to the project”. “Conceptual thinking” means “working through a situation or problem by putting the pieces together, seeing the large picture”. “Seeing the project in a holistic way” is the competency element of “conceptual thinking” competency cluster.

PERSONAL EFFECTIVENESS

“Personal effectiveness” competency unit is broken down to “self-control”, “self-confidence”, “flexibility”, and “organizational commitment” competency clusters. “Self-control” means “the ability to keep emotions under control and restrain negative actions when tempted, when faced with opposition or hostility from others, or when working under conditions of stress”. “Maintaining self-control” is its competency element. “Self-confidence” means “a person’s belief in one’s own capability to accomplish a task. This includes a person expressing confidence in dealing with increasingly challenging circumstances, in reaching decisions or forming options, and in handling failures constructively. The competency elements of this competency cluster are “Creating an environment of confidence” and “accepting failure positively”. “Flexibility” means “the ability to adapt to and work effectively with a variety of situations, individuals, or groups. It is the ability to understand and appreciate different and opposing perspectives on an issue, to adapt an approach as the requirements of a situation change, and to change or easily accept changes in one’s own organization or job requirements and “Changing to meet the needs of the project” is its competency element. “Organizational commitment” means “the individual’s ability and willingness to align one’s own behavior with the needs, priorities, and goals of the organization, to

act in ways that promote organizational goals or meet organizational needs.” And “demonstrating commitment to the project is its competency element.

BEHAVIORAL COMPETENCIES

In spite the fact that personal characteristics can be used for performance prediction of construction project managers, these inherent traits are defiant to change. In opposite, behavioral competencies because of changing amenity, for instance, through training (Tett, et al., 2000), can demonstrate the underlying dispositions that are required for professional development of project managers (Borman & Motowidlo, 1993; Hayes, Rose-Quire, & Allinson, 2000). Unlike inherent traits, behavioral competencies can be learned and thought (Skipper & Bell, 2006). In fact, although personality is not changeable, the behavior which is the results of personality character through training is changeable (Croft, 1996). Other researches such as Mei et al. (2005), Dainty et al. (2003; 2004; 2005), Fraser and Zakrada-Fraser (2003) addressed behavioral issues in other management functions. Skipper et al. (2006) also conducted his research using 360-technique. The behavioral competencies required for construction project managers are likely to be more sophisticated and diverse in compare to other industries (Dainty, et al., 2005).

Although behavioral competencies are very crucial, it is difficult to identify them as well as these competencies are dynamic (Fowler, King, & March, 2000). Furthermore, identification of best methodology for achieving competency-based framework has not been achieved yet (Mei, et al., 2005). In spite of the fact that behavioral measures are dynamic and sophisticated, these keys variables are still recognizable (Tett, et al., 2000), and in case of failing to identifying these measures, it would results to harmful effect on professional development of construction project managers (Mei, et al., 2005). Gadeken's research (1994) is one of the most important researches concerning

behavioral competencies of project managers. In this research, he interviewed project managers in US and UK who were working at Army, Air Force, and Navy. He identified six significant behavioral competencies, and five less important behavioral competencies to distinguish outstanding project managers from average project managers.

The importance of behavior of project manager is accentuated in other studies such as Fisher's (2006) research or Peters and Waterman (1982) research. Well communication, showing empathy and inspiring others, are considered necessary for effective project managers in Peters and Waterman (1982) research. The results of researches show that successful project manager's behaviors are significantly different from other project managers (Boyatzis, 1982; Fraser, 1999; Spencer & Spencer, 1993). In Dainty et al. (2005) research twelve behavioral competencies for construction project managers identified. They reduced these twelve behavioral competencies to two core behavioral competencies which are team leadership and self-control. As argued by (Dainty, et al., 2005) behavioral and personal competencies of project managers that are relevant to project performance are not emphasized in project management standards.

Cheng et al. (2005) in the field of construction industry proposed twelve behavioral competencies for project managers including achievement orientation, initiative, information seeking, focus on client's needs, impact and influence, directiveness, teamwork and cooperation, team leadership, analytical thinking, conceptual thinking, self-control and flexibility. In Aitken and Crawford (2008) research, they proposed behavioral competencies of successful project managers including planning and organizing, delivering results and meeting customer expectations, deciding and initiating action, leading and supervising, persuading and influencing.

Organizational project which are grown from Organizational Development field (Vaill, 1989) are significantly emphasizing on behavioral aspects of managers.

Conflict Management- in APM Competence Framework, “conflict management” competency elements is recognized under behavioral competencies and is defined as “the process of identifying and addressing differences that, if unmanaged, would affect project objectives. Effective conflict management prevents differences becoming destructive elements in a project.” The indicators of this competency element are managing the differences of opinion of stakeholders and recognizing the levels of power and influence of each view, listening to and respecting the views, anticipating and preparing for potential conflicts, identifying when conflict situations arise, identifying the root causes rather than symptoms of the conflict, implementing an agreed solution, and knowing when to escalate or engage others when conflict cannot be resolved.

Negotiation- in APM Competence Framework, negotiation is defined as “a search for agreement, seeking acceptance, consensus and alignment of view. In a project it can take place on an informal basis throughout the project life cycle or on a formal basis such as during procurement and between signatories to a contract”. And the indicators of this competency element are identifying areas for negotiation, deciding on the desired outcome, collecting and analyzing all available information, setting out a negotiation strategy, ensuring the project team and stakeholders understand the strategy, considering practical options, negotiating firmly while maintaining a positive personal relationship, exploring and evaluating responses, and ensuring the result to be documented properly.

Behavioral Characteristics- Behavioral characteristic in APM Competence Framework is defined as “the elements that separate and describe a person’s preferred way of

acting, interacting and reacting in a variety of situations. They complement knowledge and experience and are a function of values, beliefs and identity. They can be used in assessment, engagement and career advice”. The indicators of this competency element are having an open, positive attitude, identifying effective solutions, being open to new ideas, practices and methods, adapting thinking and behavior to the requirement of project, articulating innovative strategies and solutions, identifying and understanding threats and opportunities, respecting all human values and focusing on project objectives.

Professionalism and Ethics- in APM Competence Framework, “professionalism is demonstrable awareness and application of qualities and competencies covering knowledge, appropriate skills and behaviors. Ethics covers the conduct and moral principle recognized as appropriate within the project management profession”. The indicators of this competency element are honestly respecting self at the appropriate level of competency, understanding the relevant commercial and legal relationship, adopting a morally, legally and socially appropriate manner of behavior, being alert to possible unethical situations arising, encouraging a culture of openness and honesty.

Culture is defined as “collective programming” of mind that cause people in one group to be distinguished from people in another group (Hofstede, 1991). House et al. (1999) proposed two terms: etic qualities and emic qualities; etic qualities are common for all cultures and emic qualities are culture-specific. As mentioned by them by using these terms, similarities and differences in organization practices and also can be explained. As mentioned by Ayman et al. (2000) and Smith et al. (2001), individual perception and behaviors about a job is being shaped by culture. The importance of sharing beliefs and values among project members are increasingly demonstrated (Briner, et al., 1996).

Wang et al. (2005) showed that project managers' ability to share values and beliefs among project team members affect positively on project performance.

As quoted by Kendra and Taplin (2004), “for organizations to be successful with the adoption of project management, they need to establish a shared set of values and beliefs (a project management culture) that aligns with the social and technical aspects of project management to achieve the organization's business objectives”. Other researches focusing on developing a culture of shared values among all team members, a shared values which leads to decision making and team development (Christenson, 2004; Thamhain, 2004a). Helgadóttir (2008) argued that ethical dimensions for project managers are not given much attention.

Ethics is defined as “the systematic attempt to make sense of individual, group, organizational, professional, social, market and global moral experience in such a way as to determine the desirable, prioritized ends that are worth pursuing, the right rules and obligations that ought to govern human conduct, the virtuous intentions and character traits that deserve development in life, and to act accordingly” (Petrick & Quinn, 1997). In IPMA, ethics is one of the competency elements of behavioral competencies. However, it is explained generally and briefly (Caupin et al., 2006). Based on Spurgin (2004) suggestion for ethical competencies of employees, these competencies include the knowledge about ethic, to be aware about ethics issues in business, and to be able to evaluate argument on ethical issues.

Engagement and Motivation- in IPMA Competence Baseline, engagement is defined as something that keeps people as a part of the project and it bring a vision to the project team to work together behind a common goal. For motivating project team members, project manager needs to be aware about project members' intrinsic motivations, circumstances, and personal attitudes. The possible process steps to achieve this

competency element are being aware about requirements of individuals and stakeholders in the project, promptly documenting achievements, keeping project members involved through regular feedback, being aware about changes on stakeholders' interests, and documenting lessons learned to apply for future projects.

Openness- in IPMA Competence Baseline, “openness” is defined as “the ability to make others feel they are welcome to express themselves, so that the project can benefit from their input, suggestions, worries and concern”. The advantage of this competency element for project manager is that he/she can benefit from the knowledge and experience of other team members who have more knowledge and expertise than project manager. The possible process steps for this competency element are developing a policy in relation to openness, beginning working day with informal contacts, welcoming received information and giving opinion on the topic, using open questions, creating opportunities to stimulate openness, learning from each situation and continuing to improve methods.

Creativity- in IPMA Competence Baseline, “creativity” is defined as “the ability to think and act in original and imaginative ways” and the possible process steps for this competency element are recognizing situations where there is a problem to be solved, determining who can contribute to find a creative solution, using imaginations of the team to offer ideas, brainstorming ideas as many as possible, assessing the merits of each idea, discussing the feasibility of implementing the best ideas, planning and executing the chosen solutions, and documenting lessons learned.

Result Orientation- in IPMA Competence Baseline, “result orientation” means “focusing the team’s attention on key objectives to obtain the optimum outcome for all

the parties involved”. The possible process steps of this competency element are defining project results which is expected by stakeholders, clustering results, determining the critical path for project, completing project plan, managing risks, opportunities, changes and expectations, striving for continuous improvement, communicating good project performance, comparing project performance and results obtained, documenting lessons learned.

Efficiency- in IPMA Competence Baseline, “efficiency” is defined as “the ability to use time and resources cost-effectively to produce the agreed deliverables and fulfill interested parties’ expectations. It also embraces using methods, systems and procedures in the most effective way”. The possible process steps for this competency element are actively improving current methods and systems, planning necessary activities, deciding on priorities and acceptable deviations, integrating resources and energy efficient technologies, managing the execution of work, monitoring the work done and resources used, estimating the resources required to complete the project, and documenting and communicating insights for benchmarking purposes.

Consultation- in IPMA Competence Baseline, “consultation” means “the competency to reason, to present solid arguments, to listen to the other point of view, to negotiate and to find solutions. It is basically the exchange of opinions about project issues”. The possible process steps for this competency element are analyzing situation and context, identifying goals and options, listening to others’ arguments, identifying common ground and differences, diagnosing the problem, identifying solutions and taking actions to circumvent the problem, resolving differences considering consequences and documenting and communicating , and applying learning to future projects.

Reliability- in IPMA Competence Baseline, “reliability” is defined as “delivering what you have said you will do the time and quality agreed within the project specification. Being reliable builds trust in others who know that you will live up to what you have promised to do”. The possible process steps for this competency element are being well organized and using appropriate planning and scheduling techniques, collecting information on the interests of the various parties, being honest and creating openness with all individuals, ensuring that all key people participate in finding solutions, identifying and assessing risk and opportunities, getting agreements on the solution and revised plan, executing and managing the work performed and providing feedback on the lessons learned.

Contextual Competencies

Project Orientation- in IPMA Competence Baseline, “project orientation” is defined as “the term used to describe the orientation of organizations to managing by projects and the development of project management competency”. The possible process steps of this competency element are assessing the needs of the organization to perform projects, considering organization and its culture, monitoring progress, and learning from each project to apply for future projects.

Program Orientation (Strategic Perspective)- in IPMA Competence Baseline, “program orientation” is defined as “the decision to apply and manage the concept of managing by programs and the development of competency in program management. The strategic goals of an organization are achieved by means of programs and projects”. In fact, by program management a framework for implementing strategies would be provided. The possible process steps of this competency element are listing and prioritizing business improvement initiatives, quantifying essential programs and their benefits, aligning the

essential programs to strategic goals, reviewing results with appropriate management level and changing organization culture accordingly, initiate relevant programs, monitoring progress, and learning from each program to apply for future programs.

In some researches such as Boyatzis (1982) or Shnhar et al. (1997) emphasized the role of project managers' competencies to achieve organization strategic goals. Thiry (2004) argued that there is a lack of communication between organization strategies and training programs of project managers. In fact, training programs in organizations need to be aligned with organization strategies. Competency based approaches are being used in organizations succession planning in the organization and performance appraisal of employee (Draganidis & Mentzas, 2006).

Identifying and developing project manager's competency is becoming more and more important in a today competitive market. This importance also has absorbed the attention of main project management institutions such as Project Management Institute (PMI), Association for Project Management (APM), International Project Management Association (IPMA), and Australian institute of Project management (AIPM). These project management organizations in order to address the importance of project manager's competency have developed their own standards. The purpose of this paper is to compare these existing project manager's competency standards in order to identify the advantages and disadvantages of these standards to propose a comprehensive model based on this standards comparison and literature review. The findings of this research show that achieving competency is a continuous activity and competency requirements from one project to another project, and time to time varies. The proposed comprehensive model includes three main components of Job-related Competencies, Person-related Competencies and Contextual Competencies. The Job-related competencies discuss solely on job competency requirements. Person-related Competencies include two components of personal characteristics and input

competencies. Contextual competencies are related to competency requirements of the context that project is implemented.

Portfolio Orientation- in IPMA Competence Baseline, “portfolio orientation” is defined as “an ongoing function akin to line management. Its purpose is to coordinate all ongoing projects and programs for an organization or a part of it. It is applied to groups of projects and programs that may not be related in the business sense, but draw on a common pool of scarce resources”. The possible process steps of this competency element are prioritizing programs and projects in line with organization’s strategies, allocating resources to the portfolio, defining standard processes to be used in all programs, continuously monitoring and controlling the programs, deleting programs and projects when they are no longer relevant to strategy, and selecting and adding new project and programs to portfolio.

Permanent Organization- in IPMA Competence Baseline, “permanent organization” means “overcoming any resistance from within the permanent organization. The results of the project have an influence on the operations of the permanent organization. For the project, it is important to know how the policies and outputs of the operations of the permanent organization are defined, how they are controlled and what the associated risks are”. The possible process steps of this competency element are: understanding the organizational structure, considering interested parties structure, identifying and developing interface between the permanent and project based parts of organization, identifying commonalities and differences, monitoring progress, and implementing learning cycles.

Health, Security, Safety, and Environment- in IPMA Competence Baseline, this competency element “covers the activities that help ensure the organization behaves

appropriately in the context of health, security, safety and the environment, and during the planning phase of the project, its execution, and during the delivered product's lifecycle and its decommissioning and disposal". The possible process steps of this competency element are identifying applicable laws and regulations, identifying health, security, safety and environmental risks and requirement, evaluating the actual situation, developing plans and processes for health, security and safety, monitoring and controlling the effectiveness of plans, reporting issues and risks, and documenting lessons learned for future projects.

In APM Competence Framework, this competency element is defined as "the process of determining and applying appropriate standards and methods to minimize the likelihood of accidents, injuries or environmental impact both during the project and during the operation of its deliverables. The indicators of this competency element are applying appropriate laws and regulations, identifying health, safety and environmental risk and their impact on project, developing plans and implements processes to manage the impact on health, monitoring and controlling effectiveness of safety and environmental plans, reporting health and safety issues, and documenting lessons learned.

Cultural Awareness- The possibility of defining some specific competency profiles required for specific project-based industries still is unclear (Mei, et al., 2005; Tett, et al., 2000). Some conducted researches focusing on cultural differences such as Kowske and Anthony (2007) research that profiled managers in particular regions (Javidan, Dorfman, de Luque, & House, 2006). There are other profiling researches such as Dahlgaard's et al. (1997) research about role in a company, or profiling based on geographical region such conducted by Hetland and Sandal (2003), or profiling managers based on industry (Egri & Herman, 2000), or by gender (Robinson & Lipman-Blumen, 2003). Dainty et al. (2004) developed competency-based framework

for projects. Crawford et al. (2005) contended that projects different from construction industry for their management may require different approaches. Turner and Muller (2006) showed that for different project types there is a correlation between specific competency dimensions and project success.

There are some researches that show correlation between some particular competencies and project success (Geoghegan & Dulewicz, 2008; Hawkins & Dulewicz, 2007; Porthouse & Dulewicz, 2007; Wren & Dulewicz, 2005; Young & Dulewicz, 2006). All these researches show that in order to succeed in projects it is crucial to meet different competencies for different contents.

There are a lot of factors that affect project management competency. Thamhain and Wilemon (1977) contended that environmental context of projects need to be considered for identifying effectiveness of project management. Therefore, there are some critics about performance-based standards due to their general application in different organizations and regions (Kilcourse, 1994). Furthermore, even the organization culture affects what constitutes competency (Burnes, 1991; Currie & Darby, 1995; Lindsay & Stuart, 1997).

In project management literature review some project characteristics such as size of project, project region, project duration, project complexity, project type, and risk level of project are addressed which influence required competencies (Shenhar, 1996; Thamhain & Wilemon, 1977; Turner, 1996).

Organizational contexts that projects, project team, and project managers are operating in, as well as contextual variables influence project management competency (Boddy, 1993; Kastel & Witt, 1996; Larson & Gobeli, 1989; Thamhain & Wilemon, 1977). These organizational factors include factors such as authority level of project manager,

support level of top management, organizational climate, resource availability, organizational structure.

Moreover, there are some external factors such as politics, level of technology development, and economics are affecting project (Crawford, 2005). Another factor that affects project management competency is application area. As Youker (1999) contended, projects that are delivering similar products have more likely similar characteristics as well in compare to projects in particular sector. For instance, a construction company that is conducting a new information system needs competencies that are more similar to the IT project that is conducted in information system sector, even though both industries- Construction industry and information system industry- are different.

Crawford (2005) argued that in spite of the fact that there is an assumption regarding to positive relationship between existing project management standards and workplace performance, the result of empirical research show that senior management perception of effective performance in not tally with what is reflected in project management standards. Therefore, research results suggest that perception of project management competency is different between project managers and their supervisors, senior management.

Trompenaars and Hampden-Turner (1993,1997) highlighted that it is important for managers to understand different cultures of their team members- values and beliefs of people in the team. It is acknowledged that for different project types different managing people skills is required. Toor and Ogunlana (2006) in a research about leadership in mega project found that application of authority and punishment rated lowest among leadership behaviors and also they found that transformational leaders rate higher than transactional leaders. Only one leadership style cannot be applied for

different circumstances since one leadership style is not the best in all circumstances (Blake & Mouton, 1978; Fiedler, 1967). One of the factors affecting effectiveness and success of leadership style is the context (Fellows, Liu, & Fong, 2003).

Schein (1992), Trompenaars (1994), and House (2004) argued that managerial practices such as behavioral patterns affected by culture of organization and industry. The correlation between personality factors and cultural dimensions is shown in Hofstede and McCrae (2004) research. Triandis (1982) observed that some management actions can be facilitated by culturally dimensions. Boutet et al. (2000) showed a direct relationship between managerial competencies and culture. Their research revealed that managerial competencies need to be adjusted and cultural differences need to be reflected in managerial competencies. Organizational culture also affects competencies that are required for project managers (House, 2004; Schein, 1992). For instance, required competencies for project managers in private sector and public sector are different (Bozeman & Straussman, 1990; Rainey & Bozeman, 2000).

There are some researches that show organization performance is affected by project managers' leadership styles and for different context, different leadership style is required (De Vries & Florent-Treacy, 2002; Marshall, 1991; Zaccaro, Rittman, 2001). There is a research that shows for different project types different project management approaches are required (Crawford, Hobbs, & Turner, 2005). Crawford (2001) in her research proposed different types of projects, different competency profiles are suitable. The importance of organizational politics to achieve project success is highlighted in some studies. In fact, effective project managers to meet desired outputs, move across hierarchical boundaries and department boundaries.

It is recognized that some certain personality types are more suitable for certain circumstances (Müller & Turner, 2007). For instance, people who are highly detailed

and highly organized are not appropriate for chaotic situations (Berens, Ernst, & Smith, 2005). Significant literature about competency is related to the attribute-based concept which assumes that those who are performing effectively possess higher level of competencies. The existing debate regarding to attribute-based concept is because it is irrespective from organization context.

Cockerill (1989) mentioned that competencies need to be adjusted in organizations to be suited with contextual factors and competency frameworks are different from one organization to another organization. Cappelli and Singh (1992) contended that competent employees provide competitive advantage for organizations. These competencies are firm-specific and from one organization to another organization are different and are difficult to imitate.

Boon and Van Der Klink (2001) argued that most organizations are utilizing global and general list of competencies and they are not using firm-specific list of competencies. They mentioned that it is appropriate to conceptualize competencies due to the difficulty of finding detailed competencies based on context specificity. Another issue related to considering competency concept in an organization or defining firm-specific competencies is that whether the current situation priorities in organization need to be considered as a base for competency development or developing competencies need to be based on future needs and priorities of organization (Garavan & McGuire, 2001). The competency elements (dependent variables) of person-related category are shown in Figure 3.6 and Figure 3.7.

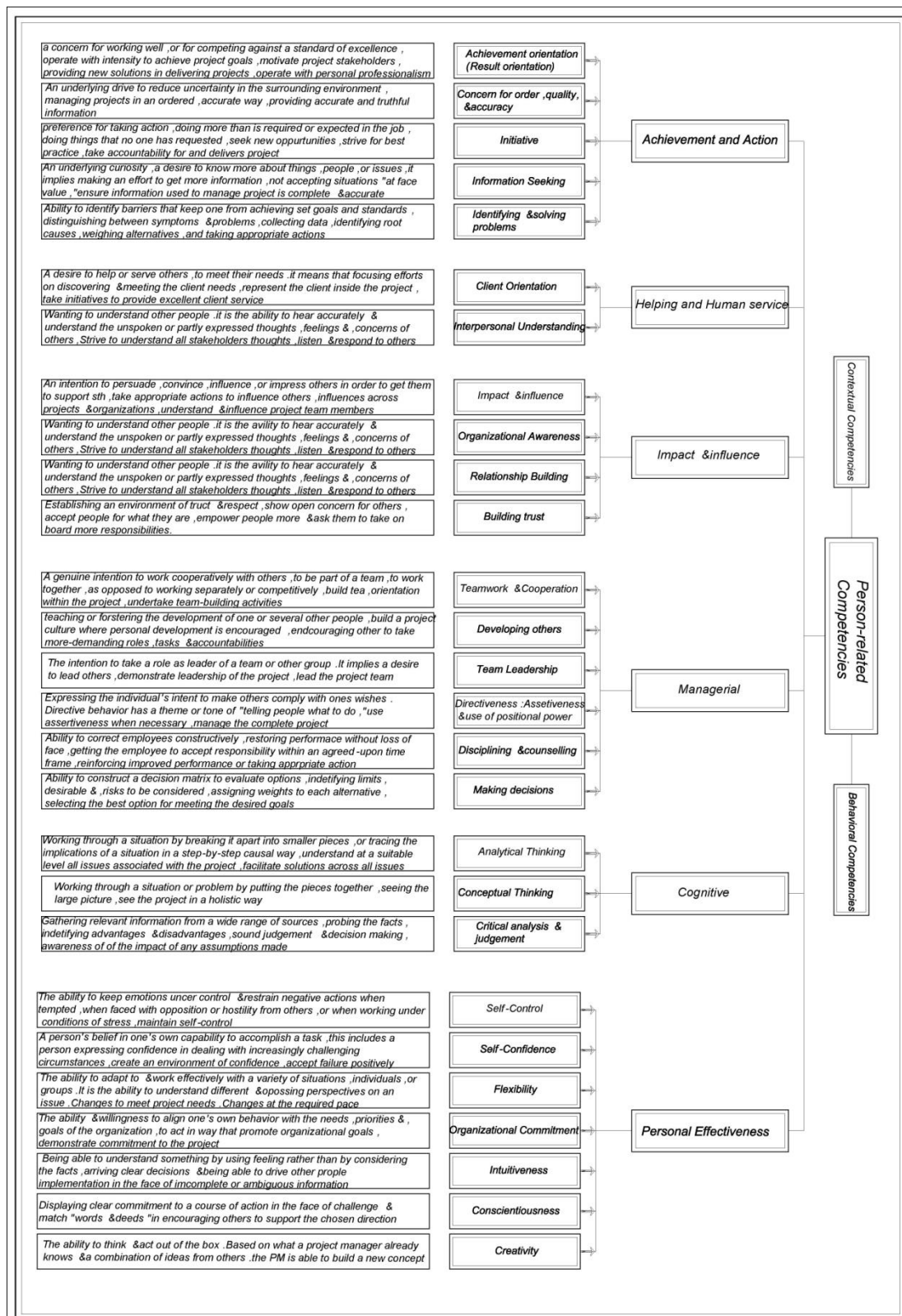


Figure 3.6: Dependent Variables (Competency Elements) of Person-related Category

Note: In order to have a better view, a bigger size of this figure is presented at Appendix G

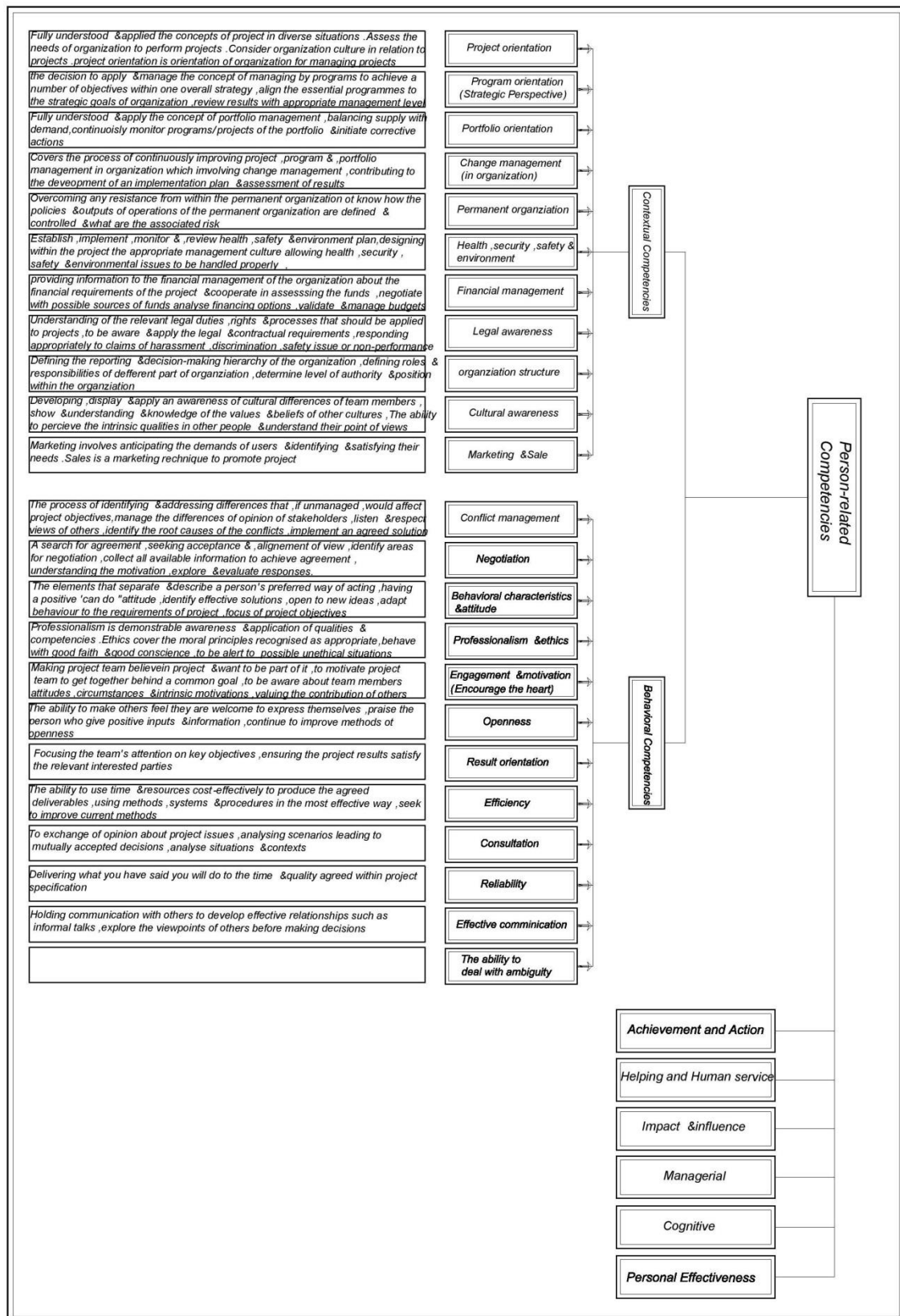


Figure 3.7: Dependent Variables (Competency Elements) of Person-related Category

Note: In order to have a better view, a bigger size of this figure is presented at Appendix H

3.3 SUMMARY

This chapter revealed that American Management Association for defining “competency” refers to Boyatzis (1982) definition as “an underlying characteristic of a person which results in effective action and/or superior performance in a job”. However, in UK “competence” terminology is being applied by Employment Department’s Standards Program and it is defined as “ a description of something which a person who works in a given occupational area should be able to do, it is a description of an action, behavior or outcome which a person should be able to demonstrate” (Training Agency, 1998, p. 5). It also discussed that for each UK and US approaches there are some criticism, so Cheng et al. (2003) proposed that the most appropriate approach is to combine to US and UK approaches. Besides, it also discussed that because of strength of both US and UK approaches, these two models are combined together for proposing a competency framework required for project managers in construction industry in Malaysia. Moreover, based on these US approach and UK approach, two main categories for project managers’ competencies identifies which are job-related and person-related competencies. Finally, each dependent variable (Competency elements) in each main competency category of proposed competency framework addressed.

In next chapter, the research methodologies, research strategies, and methods of data collection, and sampling will be presented.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 INTRODUCTION

A research can be described as the process of finding solutions to a problem after a thorough study and analysis (Sekaran, 2006). Cooper and Schindler (2001) described it as a systematic inquiry that provides information to guide decision. Sekaran (2000) stressed that a research solves problems and as a results new knowledge and theories would be developed. Furthermore, it gathers evidences to prove generalizations.

This research was designed for “identifying core project managers’ competency elements required by project managers in construction industry”. This research focusing on core competency elements and correlation between these competency elements required by project managers in construction industry from project managers’, senior project managers’, and project experts’ perspective. To achieve the specifics of the research, quantitative method is applied.

This chapter presents the research methodology in conducting the above research area. As described by Chaudhary (1991) one of the primary differences between “research methods” and “research methodology” is that research methods are the methods by which you conduct research into a subject or a topic. On the other hand research methodology explains the methods by which you may proceed with your research. Research methods involve conduct of experiments, tests, surveys and the like. On the other hand research methodology involves the learning of the various techniques that can be used in the conduct of research and in the conduct of tests, experiments, surveys and critical studies. In short it can be said that research methods aim at finding solutions to research problems. On the other hand research methodology aims at the employment of the correct procedures to find out solutions. It is thus interesting to note that research

methodology paves the way for research methods to be conducted properly. Research methodology is the beginning whereas research methods are the end of any scientific or non-scientific research.

4.2 RESEARCH PURPOSE

This study was designed to describe the importance degree of project managers' competencies from less experienced and senior project managers perspectives and identifying the core project managers' competencies from their point of views, as well as distinguishing the correlation between these project managers' competencies in Malaysia construction industry. The related research questions were:

1. What are the existing project managers' competency standards worldwide and the competency elements identified in these standards.
2. What are the differences, between project managers' competencies?
3. What is the importance degree of project managers' competencies from less experienced and senior project managers' perspective?
4. What is the correlation between project managers' competencies?
5. What is an appropriate project managers' competency framework?

4.3 RESEARCH PROBLEM AND RESEARCH QUESTIONS

One of the most important factors for conducting a research is to identify and to formulate a problem. In order to proceed with a research a problem has to be recognized first (Rani, 2004). If a research study to be formulated properly, it can be as a strong foundation of a research. A research problem can be established in different forms from very simple ones to complicated ones. Chaudhary (1991) and Kumar (1999) mentioned that formulating research problems are like "input" and "output" of a research; therefore, the research quality depends on the research questions.

A research problem does not mean that something is seriously wrong and therefore, an immediate action has to be taken to adjust the situation. In fact, a research problem is a situation that finding solutions and answer to those questions might help to improve the situation and it reduces the gap between existing situation and ideal situation (Sekaran, 2000). Chaudhary (1991) stated that for indicating of a strategy to answer research questions, the general questions can be addressed through series of specific questions.

4.4 RESEARCH DESIGN

There are various approaches to conduct a research. These approaches are experimental design, cross-sectional or survey design, longitudinal design, case study design, and comparative design. Based on implemented data and approach, the findings of the research can be analyzed (Ayob, 2005; Gill & Johnson, 1991; Sekaran, 2000).

A research design is a planned procedure which is adapted by researches to answer questions in an objective, accurate, economic, and valid way (Kumar, 1999). Yin (2002) mentioned that a research design connects research questions, conclusion, and empirical data in a logical sequence. A traditional research design is about the operating variables for measurement, collecting data and analysis, testing a hypothesis, and selecting samples; in overall a research design is a plan about how a research to be conducted (Thyer, 1993). As accentuated by Bryman and Bell (2003), a research design not only should provide a framework for collecting and analyzing data, but also it should provide an overall structure to conduct the research.

Moreover, Yin (2002) asserted that avoiding a situation which evidences are not addressing initial research questions is the main purposes of a research design. Rani (2004) argued that a research design is a plan which in order to finding solutions and also fulfilling research objectives, collects and analyses data through a planned methods and procedures.

The components of a research design are recommended by Miller and Lessard (2001) and Yin (2002). These essential components are “Research problem and research questions”, “Sampling procedures, and “Methods of data collection”.

4.4.1 THREE ELEMENTS OF AN INQUIRY

As mentioned by Creswell (2003) and shown in figure 4.1, three components of any research design are “Knowledge Claims” or “Worldviews”, “Research Strategy”, and “Research Methods”. “Knowledge Claim” means that any research is started with certain assumptions by researchers about how they are going to learn and what they are going to learn during research. Lincoln and Guba (2000) and Mertens (1998) called claims as paradigm, or Crotty (1998) called it as ontology.

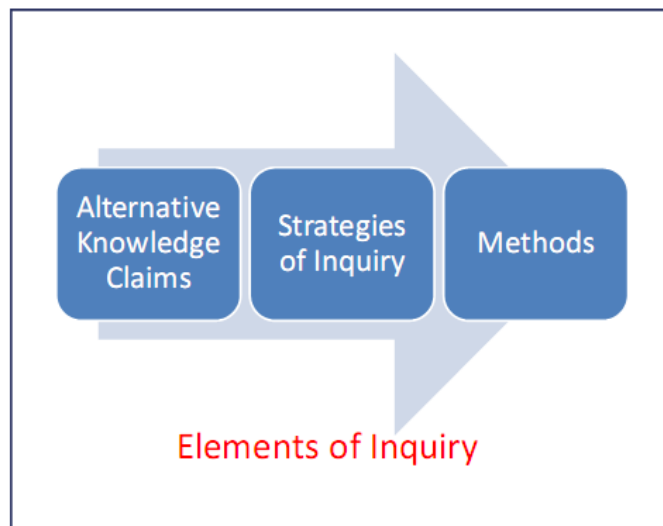


Figure 4.1: Three components of any research design

Source: Creswell (2003)

4.4.1.1 THE POST-POSITIVIST WORLDVIEW

Pollack (2007) mentioned that the term paradigm refers to “a commonly shared set of assumptions, values and concepts within a community, which constitutes a way of viewing reality”. In fact, Bailey (1984) defined paradigm as a research perspective or a

school of thought which is about research goals and methods and shows the way that a research should be conducted. Four schools of knowledge claims addressed by Creswell (2003) and shown in figure 4.2, are including: post positivism, constructivism, advocacy (participatory), and pragmatism (Table 4.1 shows the main characteristics of each knowledge claims). Based on key research questions and research phenomenon which is under consideration the type of paradigm adapted to the research would be identified (Pollack, 2007; Remenyi, Williams, Money, & Swartz, 1998). Furthermore, Miles and Huberman (1994) also addressed the conceptual model as a key factor for deciding which paradigm to be followed. The knowledge claim applied in this research is post-positivist worldwide which represents the traditional form of research. The other names for this school of knowledge claims are “scientific method”, “science research”, “positivist/post-positivist research”, and “empirical science”. In fact in post-positivist the causes influencing outcomes would be assessed. The purpose of applying post-positivist is to reduce the idea to some small and testable ideas. In this regards, numeric measures would be presented.

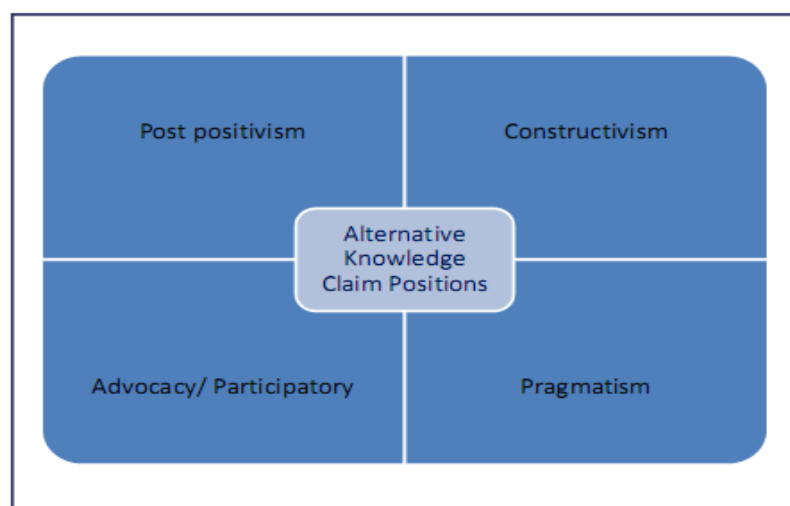


Figure 4.2: Four schools of knowledge claims

Source: Creswell (2003)

Table 4.1: Main characteristics of “Knowledge Claims”

Four Worldviews (Knowledge Claims)

Post-positivism	Constructivism
Determination	Understanding
Reductionism	Multiple participant meanings
Empirical observation and measurement	Social and historical construction
Theory verification	Theory generation
Advocacy/Participatory	Pragmatism
Political	Consequences of actions
Empowerment Issue-oriented	Problem-centered
Collaborative	Pluralistic
Change-oriented	Real-world practice oriented

Source: Creswell (2003)

4.4.1.2 STRATEGIES OF INQUIRY

Strategies of inquiry or qualitative, quantitative, and mixed methods are models that provide a direction for procedures applied in a research. Creswell (2007) called them as “approaches to inquiry” or Mertens (1998) called them as “Research Methodologies”. Wilkinson and Birmingham (2003), mentioned that for satisfying various research needs, there are many research methods, however, there is not an excellent research method. Nevertheless, for tackling specific purposes, some instruments are better suited. Denscombe (2003) accentuated that in a good research, these choices are reasonable, appropriate and explicit. In fact, ignoring these important factors lead to a poor research which open the research results to criticism and doubt. In Table 4.2, the differences of strategies of quantitative, qualitative and mixed method are highlighted.

Table 4.2: Different strategies of quantitative, qualitative, and mixed methods

Quantitative	Qualitative	Mixed Methods
<ul style="list-style-type: none"> *Experimental designs *Non-experimental designs such as Surveys 	<ul style="list-style-type: none"> *Narrative research *Phenomenology *Ethnographies *Grounded theory studies *Case study 	<ul style="list-style-type: none"> *Sequential *Concurrent *Transformative

Source: Creswell (2003)

By considering the aforementioned issues, this research is conducted in two stages with application of quantitative strategy. In first stage of research project managers' and senior project managers' perspective about importance degree of competency elements are analyzed and in second stage of study with also application of quantitative strategy, project experts perspective about importance degree of competency elements are analyzed.

In this research survey research is applied which is type of quantitative strategies. Numeric description of population is described. The questionnaire is used for data collection and these data are generalized from a sample to a population.

This research is conducted in two stages. In first stage of study, Project managers (with less than 10 years' experience in construction industry) and senior project managers (between 10 to 20 years' experience in construction industry) were asked to value the importance of competencies. In fact, based on literature review and analysis and comparing of main project managers' competency standards totally 101 competency elements identified which later a framework for these competency elements was proposed which categorized in two main categories of Job-related competencies and Person-related competencies. At first stage project managers and senior project managers valued the importance degree of these competency elements based on 5 Likert

scale from 1 to 5 which 1 means the least important and 5 means the most important. The data analyzed by application of SPSS software and the competency elements importance degree identified and categorized in three main categories: “core”, “important”, or “not important” competencies. Besides, the Pearson correlation between job-related and person-related competencies analyses and the results reported accordingly. As described in literature review, in this research the proposed framework is according to US and UK systems for competencies. In the other words, the required competencies are based on person-related competencies and job-related competencies. Based on the proposed framework, totally 51 competencies which are categorized as job-related competencies, and 50 competencies categorized as person-related competencies. In this section of research the Pearson correlation between these competencies is addressed. In fact, this section shows how job-related competencies and person-related competencies are correlated and inter-connected. The rationale for selecting Pearson correlation analysis is to identify the relation between job-related and person-related competencies. For example, by increasing job-related competencies, which other person-related competencies would be increased. By knowing this inter-relation between job-related competencies and person-related competencies and improving those competencies with more correlations with other competencies, better results for improving project managers’ competencies would be achieved.

For second stage of the study, The competencies valued as “not important” by either project managers or senior project managers omitted from the questionnaire and 10 project experts with more than 20 years' experience in construction industry (The selected PEs for this stage of research are not part of SPMs at first stage of research) was chosen to answer the questionnaire and value the importance degree of competency elements based on 5 Likert scale. By applying quantitative method in this stage and

analyzing data by using SPSS software, project experts' perspective about importance degree of competencies also identifies.

Finally in chapter seven, the results of stage one and stage two of research integrated and concluded and therefore, core and important competency elements required for project managers in Malaysian construction industry identified.

4.4.1.3 RESEARCH METHODS

Research methods are the third element of a research inquiry. Tables 4.3 and 4.4 compare some characteristic of quantitative, qualitative and mixed method. In this research, the identified competency elements based on literature review as well as comparing competency standards addressed as dependent variables and related questionnaire for these competency elements designed based on 5 Likert scale to be valued by project managers, senior project managers, as well as project experts.

Table 4.3: Comparison of Quantitative, Qualitative, and Mixed methods

Quantitative Methods	Mixed Methods	Qualitative Methods
Pre-determined	Both pre-determined and emerging methods	Emerging methods
Instrument based questions	Both open-and closed-ended questions	Open-ended questions
Performance data, attitude data, observational data, and census data	Multiple form of data drawings on all possibilities	Interview data, document data, and audio-visual data
Statistical analysis	Statistical and text analysis	Text and image analysis
Statistical interpretation	Across databases interpretation	Themes, patterns interpretation

Source: Creswell (2003)

Table 4.4: Comparison of Quantitative, Qualitative, and Mixed methods

Qualitative, Quantitative, and Mixed Methods Approaches

Tend to or Typically	Qualitative Approaches	Quantitative Approaches	Mixed Methods Approaches
*Use these philosophical assumptions	*Constructivist/advocacy/participatory knowledge claims	*Post-positivist Knowledge claims	*Pragmatic knowledge claims
*Employ these strategies of inquiry	Phenomenology, grounded theory, ethnography, case study, and narrative	*Surveys and experiments	*Sequential, concurrent, and transformative
*Employ these methods	*Open-ended questions, emerging approaches, text or image data	*Closed-ended questions, predetermined approaches, numeric data	*Both open- and closed-ended questions, both emerging and predetermined approaches, and both quantitative and qualitative data and analysis
*Use these practices of research as the researcher	<ul style="list-style-type: none"> *positions him-or herself *collects participant meanings *Focuses on a single concept or phenomenon *Brings personal values into the study *Studies the context or setting of participants *Validates the accuracy of findings *Makes interpretations of the data *Creates an agenda for change or reform *Collaborates with the participants 	<ul style="list-style-type: none"> *Test or verifies theories or explanations *Identifies variables to study *Relates variables in questions or hypothesizes *Uses standards of validity and reliability *Observes and measures information numerically *Uses unbiased approaches *Employs statistical procedures 	<ul style="list-style-type: none"> *Collects both quantitative and qualitative data *Develops a rationale for mixing *Integrates the data at different stages of inquiry *Presents visual pictures of the procedures in the study *Employs the practices of both qualitative and quantitative research

Source: Creswell (2003)

4.5 Criteria for Selecting a Research Design

As mentioned by Creswell (2007), components affecting selection of research design are worldview, strategy, methods, research problems, personal experiences of researcher, and the audience for whom the report is written.

In this research, quantitative approach is adequate for best understanding of research problems. For collecting quantitative data, a large number of individuals are questioned through questionnaire for generalizing the findings, and a few experts questioned as well by using questionnaire to achieve deeper and detailed data.

Since the research is conducted in two phases, extra time is needed for collecting and analyzing quantitative data. The structure of quantitative approach qualitative approach provides a base for better understanding of research problems.

In this research mixing, integrating, and concluding the results for stage one and stage two of research occurred at data analysis stage and interpretation stage. As mentioned by Creswell and Plano Clark (2007), how the data are mixing has absorbed recent attentions. In this research, data collection and data analysis of project managers and senior project managers is followed by data collection and data analysis of project experts. Then, results of both stages integrated to achieve findings in chapter 7 of this study.

4.6 RESEARCH VARIABLES

Variables or constructs are characteristics or attributes of individuals, can be measured and observed, and are varied from one individual to another one. Variables that are measured in this research include gender, age, education level, characteristics, behaviors, attitudes, and soft skills of project managers.

Variables include independent variables and dependent variables. Independent variables also called treatment, predictor, antecedent, and manipulated variables. Dependent variables that depend on independent variables are the results of independent variables. Dependent variables also called criterion, outcome and effect variables. Between

independent variables and dependent variable another variable standing which is called intervening or mediating variables. In fact, intervening variables mediate the effect of independent variables on dependent variables.

Two other types of variables include control variables and confounding variables. Control variables may be demographic or personal variables such as age or gender that need to be controlled. These Variables are special independent variables that influence.

4.7 METHODS OF DATA COLLECTION

There are different methods for data collection such as face to face interviews, interviews through telephone or computer-assisted; and using questionnaires which either sent through emails or mails (Sekaran, 2000). In fact, for conducting a research survey, three main data collection methods are interviewing, questionnaire, and observation. Data collection can be obtained through either primary sources or secondary sources (Ayob, 2005; Rani, 2004; Sekaran, 2000). In the primary source, researcher directly uses the opinion of the respondents while in the secondary sources the data are collected through other ways such as company archives, company records, publications, and etc.

In fact, for conducting this sequential study, first of all, quantitative data from project managers and senior project managers collected and then these data analyzed. Afterwards, quantitative data from project experts collected and then these data analyzed. The data collected by distribution of questionnaires and project managers, senior project managers, and project experts were asked to value the importance degree of competency elements, based on 5 Likert scale. The data for each stage of the study analyzed using SPSS software. Finally, in the interpretation phase of the study, the results of these two stages of quantitative methods compared and integrated.

4.8 QUANTITATIVE PORTION OF RESEARCH

4.8.1 RATIONAL FOR QUANTITATIVE DESIGN

The assumption for quantitative methods which also are known as empirical-analytical inquiry is that this method is not influenced by the researcher. As stated by Hathaway (1995), quantitative methods are independent from researcher. Mertens (1998) described that it is possible for conduct an unbiased research via quantitative methods. However, Hathaway (1995) waned that quantitative methods can overlook critical features that affect the results.

The first and second stages of this study were undertaken and using quantitative methods. In this portion in order to prevent biases any influences, the researcher tries to remain neutral. The rational for conducting quantitative methods in this portion is to obtain data addressing the competency elements required by project managers in construction industry and their importance degree, as well as the correlation between these competency elements. By applying quantitative method, project managers', and senior project managers', and project experts' perspectives about importance degree of competency elements would be identified.

4.8.2 QUANTITATIVE RESEARCH DESIGN

The design of the quantitative design was a survey which conducted in order to gather demographic data of participant as well as their point of views about competencies required for project managers in construction industry in Malaysia. Furthermore, they have been asked to mark the importance degree of these competencies so it became possible to compare project managers' and senior project managers' point of views.

Moreover, the correlation between these competencies analyzed to see how these competency elements affect one another. For second stage of this study, project experts' point of views about competencies required for project managers in construction industry in Malaysia investigated. Descriptive analysis was conducted to analyze the address core competencies and important competencies by summarizing the responses from 5-scale Likert survey instrument as well as importance degree of these competencies from project managers and senior project managers' perspectives.

4.8.3 QUANTITATIVE RESEARCH PARTICIPANTS

In this research the samples are selected based on random sample selection in which each individual in the population had an equal probability of being selected. The research participants in the quantitative portion of the study were sample of project managers, senior project managers and project experts, who were working in construction industry located in Wilayah Persekutuan. All the companies participating in the survey had a grade of G7. The reason behind choosing construction companies in grade of G7 is that since this grade includes the biggest and largest construction companies and for sure the numbers of senior project managers and project experts working in this grade is higher than lower grades. The reason behind choosing construction companies in Wilayah Persekutuan is that most G7 construction companies headquarters (HQ) are located in Wilayah Persekutuan. Therefore, samples from construction companies with grade of G7 in Wilayah Persekutuan can be the best representatives for whole population which include project managers, senior project managers, and project experts.

4.8.4 QUANTITATIVE RESEARCH METHODS OF DATA COLLECTION AND DATA ANALYSIS

A 5 Likert scale survey instrument was developed for statistically significant data in order to conduct the quantitative approach. Project managers and senior project managers in construction industry were contacted via email or face to face communication in seminars and a copy of 5 Likert scale instrument were sent to them. The competency elements of the questionnaire were prepared based on the literature review in accordance with project managers' competencies. They were asked to evaluate the importance degree of each competency element in the questionnaire in 5 Likert scale which 1 mean the least important and 5 means the most important. Besides they were asked to list additional competencies that they assumed as significant competencies and were not listed in the questionnaire.

The collected data analyzed by SPSS software and based on the results the mean and standard deviation for each competency element was being used. Competencies with the mean of 4.25 to 5 addressed as core competencies" (competencies with the mean more than 85% considered as core competencies), competencies with mean "between 3.7 to 4.25 addressed as important competencies" (competencies with the mean more than 74% and less than 85% considered as important competencies), and competencies with the mean less than 3.7 addressed as not important competencies" (competencies with the mean less than 74% considered as not important competencies).

The logic behind choosing 85% and above as core competencies and choosing percentages between 74% to 85% as important competencies come from a research conducted by Stevenson and Starkweather (2010). In their research, for selecting a competency as either core or important competency, they referred to the percentage. In fact, they addressed competencies above 80% as "Core" competencies, competencies

between 60% to 80% considered as “Important” competencies, and competencies that achieved less than 60%, addressed as “Not important” competencies. However, in this research, in order to have more rigorous and more solid results higher percentages for selection of competencies as core or important are considered. In fact competencies with the mean more than 85% considered as core competencies, competencies with the mean more than 74% and less than 85% considered as important competencies, and competencies with the means less than 74% considered as not important competencies.

4.9 PILOT STUDY

Naoum (1998) stated that it is better before conducting research, pilot study to be carried out. The advantage of pilot study is tracing of any discrepancies in questionnaire designs. Although conducting pilot study is not mandatory, it is a normal practice before actual research (Liaw & Goh, 2002).

The rationale for conducting the pilot study is to check the questionnaire as a research instrument which helps to increase the likelihood of success in main study. In fact in this research the pilot study as a small experiment carried out to test logistic and to gather information prior to the main study. Therefore, the pilot study is conducted for testing of adequacy of questionnaire, for assessing the feasibility of full study, for identifying the logistical problems which might occur, and for collecting preliminary data.

The main purposes of conducting a pilot study are as per following:

- to check the reliability of measurement scales which is used for questionnaire as well as checking of goodness of data (Sekaran, 2000), and
- to make sure that respondents totally understand the questions arranged in questionnaire and therefore, to avoid misunderstanding (Naoum, 1998)

The pilot study in this research was conducted based on a quantitative survey while data collection is carried out by questionnaire distribution among project managers in construction industry in Malaysia. The “Non-Random Convenience Sampling” method is applied. Although this method is less reliable, it is better to apply this method when the time is limited and when information is needed in faster manner (Sekaran, 2000).

For the questionnaire, 14 project managers were involved in the pilot study and reliability test was conducted on pilot study. The results of reliability test for the questionnaire is shown in Table 4.5 coefficient value of Cronbach’s Alpha for questionnaire is 0.975 and since the this number is above 0.6 (In theory, if the coefficient value of cronblach’s Alpha for a variable to be more than 0.6 means a high internal consistency and reliability), the result shows a high reliability. Therefore, it could be concluded that because of high coefficient of value of Cronbach’s Alpha, the respondents admitted that they understood the questions and the necessity of asking the questions.

Table 4.5: Reliability Test

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.975	0.975	101

4.10 SUMMARY

This research applies one methodology to achieve its research objectives_ quantitative approach. In This research at both stages of study the quantitative data collected and analyzed. At first stage, project managers (Project managers with less than 10 years’ experience in construction industry) and senior project managers (with more than 10

years' experience in construction industry), valued competency elements which addressed in proposed project managers' competency framework and also the correlation between these competency elements identified. Then, at second stage of this study, project experts (project managers with more than twenty years' experience in construction industry) valued the importance degree of these competency elements. For data analysis SPSS software is used for data analysis.

In next chapter the findings of survey of project managers and senior project managers are presented. The findings including descriptive statistics, as well as analysis of correlation present project managers and senior project managers' point of views about the importance of competency elements identified according to literature review and addressed in proposed project managers competency framework.

CHAPTER 5

SURVEY OF PROJECT MANAGERS AND SENIOR PROJECTS MANAGERS

5.1 INTRODUCTION

Chapter four discussed about the research methodologies which being used in this research study. In this research study, quantitative method is applied for achieving research objectives. The theoretical framework (Figure 3.1) which also is known as research model is constructed to list down required competencies for project managers is tested in this chapter. Based on this theoretical framework, totally, 101 competency elements are identified. These competency elements are categorized in two main clusters based on UK approach and US approach which are job-related competencies and person-related competencies. This chapter examines the importance degree of these competency elements based on project managers' (project managers with less than ten years' experience in construction industry) and senior project managers' (project managers with more than ten years' experience in construction industry) perspective. Therefore, in each category of job-related competencies and person-related competencies, core and important competencies based on project managers' and senior project managers' perceptions are presented. Then, the correlation between competencies of job-related and person-related competencies is presented. To sum up, this chapter reports the findings based on data analysis using the Statistical Package for Social Science (SPSS).

Descriptive analysis was conducted to analyze the address core competencies and important competencies by summarizing the responses from 5-scale Likert survey instrument as well as importance degree of these competencies from project managers and senior project managers' perspectives. For descriptive analysis the mean for each competency element is referred. The reason behind choosing mean for describing and

explaining importance degree of each competency element is that not only to consider those project managers and senior project managers perspective who chose importance degree of competency elements as either 4 or 5 in 5 Likert scale, but also to consider those project managers and senior project managers perspective who ranked importance degree of competency elements as either 1, 2 or 3. By only referring to percentages of competencies that ranked high (important or core), the portion of lower ranked might be ignored. However, by referring to mean, this problem will be solved.

5.2 THE RESPONDENTS PROFILE

Under regulations made by Construction Industry Development Board (CIDB), contractors are categorized in three different sectors such as “Civil Engineering Construction”, “Building Engineering Construction”, and “Mechanical and Electrical” for a minimum period of one year and maximum three years to perform construction works in Malaysia. All contractors are allowed only to perform construction works only in their registered category and working outside their categories is prohibited. There are 7 grades for registration in each category. Applicants for registration in any particular grade need to satisfy CIDB that they have enough resources to meet financial commitment.

In this research, the target respondents are project managers and senior project managers who are working in Building Construction Contractors and Civil Engineering Contractors in G7 category in Wilayah Persekutuan based on Construction Industry Development Board Malaysia (CIDB) categorization. According to data from CIDB, there are totally around one thousands of these contractors in Wilayah Persekutuan. The questionnaire distributed among these contractors via email as well as during training workshops arranged by CIDB, and by the assistance of Jabatan Kerja Raya Malaysia

(JKR). Then, totally, 187 valid responses collected. The background of the respondents who took part in the survey is presented in Table 5.1.

Table 5.1: The Background of the Respondents

Characteristic		Frequency (N)	Percentage (%)
<i>Gender</i>			
<i>Valid</i>	Male	178	95
	Female	9	5
<i>Total</i>		<i>187</i>	<i>100</i>
<i>Age</i>			
<i>Valid</i>	20-29 years	33	18
	30-39 years	79	42
	40-49 years	43	30
	> 50 years	32	17
<i>Total</i>		<i>187</i>	<i>100</i>
<i>Experience in management level</i>			
<i>Valid</i>	0-5 years	64	34
	5-10 years	48	26
	10-15 years	34	18
	15-20 years	41	22
<i>Total</i>		<i>187</i>	<i>100</i>

5.3 IMPORTANCE DEGREE OF JOB-RELATED COMPETENCIES

5.3.1 COMPETENCY ELEMENTS OF SCOPE MANAGEMENT

Defining the project context-This competency element means defining project objectives to all stakeholders, establishing deliverables, developing project acceptance criteria, and developing project charter. Table 5.2 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Defining the project context” element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.29 and approximately 89% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.53 and approximately 92% of them ranked it either 4 or 5.

Guiding development of project scope definition- This competency element means to seek agreement on measurable outcome criteria, establishing project assumption, constraints, establishing scope management plan, and developing the statement of work breakdown to work package level. Table 5.2 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Guiding development of project scope definition” element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.30 and approximately 90% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.45 and approximately 93% of them ranked it either 4 or 5.

Implementing scope controls-This competency element means implementing agreed scope management procedures & processes, using agreed key performance indicators to monitor project outcomes, managing the impact of scope changes, and regularly review & evaluate project progress and outcomes. Table 5.2 indicates that **both “less**

experienced project managers” and “senior project managers” believe that “Implementing scope controls” element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project” is 4.26 and approximately 80% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.53 and 100% of them ranked it either 4 or 5.

Table 5.2: Competency elements (Dependent variables) of “Scope Management”

Job-related Competencies							
Scope Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Defining the project context	Var. 01	4.29	0.72	85%	4.53	0.64	92%
Guiding development of project scope definition	Var. 02	4.30	0.64	90%	4.45	0.64	92%
Implementing scope controls	Var. 03	4.26	0.77	80%	4.53	0.50	100%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.2 COMPETENCY ELEMENTS OF TIME MANAGEMENT

Determining project Schedule- This competency element means determining the duration, sequence & dependencies of tasks, ensuring project schedule include all tasks, developing time management plan, obtaining agreement on the schedule and time management plan. Table 5.3 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Determining project Schedule” element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.35 and approximately

85% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.77 and 100% of them ranked it either 4 or 5.

Implementing project schedule- This competency element means implementing mechanism to measure, recording and reporting progress of activities, using project schedule as the basis for progress measurement, regularly identifying variances and forecasting impacts of changes on schedule. Table 5.3 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Implementing project schedule” element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.25 and approximately 85% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.69 and 100% of them ranked it either 4 or 5.

Assessing time management outcomes- This competency element means reviewing project progress to determine the effectiveness of time management, identifying time management lessons learned and recommending improvements. Table 5.3 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Assessing time management outcomes” element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.30 and approximately 90% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.31 and 100% of them ranked it either 4 or 5.

Table 5.3: Competency elements (Dependent variables) of “Time Management”

Job-related Competencies							
Time Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Determining project Schedule	Var. 04	4.35	0.73	85%	4.77	0.42	100%
Implementing project schedule	Var. 05	4.25	0.70	85%	4.69	0.46	100%
Assessing time management outcomes	Var. 06	4.30	0.64	90%	4.31	0.46	100%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.3 COMPETENCY ELEMENTS OF COST MANAGEMENT

Determining project budget- This competency element means determining resource requirements, estimating project costs and developing project budgets, developing a cost management plan to effectively manage project costs. Table 5.4 indicates that “**less experienced project managers**” believe that “Determining project budget” element is **important** for project manager while “**senior project managers**” think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.14 and approximately 85% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.84 and 100% of them ranked it either 4 or 5.

Monitoring & controlling project budgets & costs- This competency element means implementing budget monitoring and controlling processes, monitoring actual project

billings, analyzing budget variations and determining causes, implementing actions to maintain project budget objective. Table 5.4 indicates that “**less experienced project managers**” believe that “Monitoring & controlling project budgets and costs” element is **important** for project manager while “**senior project managers**” think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.10 and approximately 85% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.53 and 100% of them ranked it either 4 or 5.

Conducting project financial completion activities- This competency element means using appropriate project financial close-out procedures, reviewing project cost performance, identifying financial management lessons learned and recommending improvement. Table 5.4 indicates that “**less experienced project managers**” believe that “Conducting project financial completion activities” element is **important** for project manager while “**senior project managers**” think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.10 and approximately 85% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.39 and 100% of them ranked it either 4 or 5

Table 5.4: Competency elements (Dependent variables) of “Cost Management”

Job-related Competencies							
Cost Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Determining project budget	Var. 07	4.14	0.66	85%	4.84	0.37	100%
Monitoring & controlling project budgets & costs	Var. 08	4.10	0.63	85%	4.53	0.50	100%
Conducting project financial completion activities	Var. 09	4.10	0.63	85%	4.39	0.49	100%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.4 COMPETENCY ELEMENTS OF QUALITY MANAGEMENT

Determining quality requirement- This competency element means determining quality objectives, standards and levels, establishing quality management plan, selecting quality management methods, and identifying quality criteria. Table 5.5 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Determining quality requirement” element is **very important (Core competency element)** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.25 and approximately 85% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.37 and approximately 92% of them ranked it either 4 or 5.

Implementing quality assurance-This competency element means measuring and documenting results of project activities to determining their compliance with quality

standards, conducting inspections, identifying causes of unsatisfactory outcomes and submission recommendations. Table 5.5 indicates that **“less experienced project managers”** believe that “Implementing quality assurance” element is **important** for project manager while **“senior project managers”** think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.10 and approximately 90% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.37 and approximately 84% of them ranked it either 4 or 5.

Implementing project quality improvements- This competency element means reviewing quality processes and implementing agreed changes to ensure continuous improvement to quality, reviewing outcomes to determine effectiveness of quality management processes and identifying quality management lessons learned. Table 5.5 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Implementing project quality improvements” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.99 and approximately 80% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.00 and approximately 77% of them ranked it either 4 or 5.

Table 5.5: Competency elements (Dependent variables) of “Quality Management”

Job-related Competencies							
Quality Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Determining quality requirement	Var. 10	4.25	0.70	85%	4.37	0.63	92%
Implementing quality assurance	Var. 11	4.10	0.54	90%	4.37	0.75	84%
Implementing project quality improvements	Var. 12	3.99	0.79	95%	4.00	0.68	77%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.5 COMPETENCY ELEMENTS OF HUMAN RESOURCE MANAGEMENT

Implementing human resources & stakeholder planning activities-This competency element means, establishing project organization structure, allocating staff within the project, using appropriate HR method and tools to effectively managing HR systems. Table 5.6 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Implementing human resources and stakeholder planning activities” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.89 and approximately 70% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.21 and approximately 76% of them ranked it either 4 or 5.

Implementing staff training & development-This competency element means communicate designated staff responsibilities, authority and personal performance measurement criteria, identifying and taking action to rectify gaps in individuals and group skills & knowledge, and implementing staff development and training. Table 5.6 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Implementing staff training & development” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.74 and approximately 61% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.92 and approximately 61% of them ranked it either 4 or 5.

Managing the project team & stakeholders-This competency element means monitoring internal and external influences on individuals, implementing procedures for interpersonal communication, solving conflict resolutions, regularly reviewing stakeholders expectations, and maintaining the desired cultural environment. Table 5.6 indicates that **“less experienced project managers”** believe that “Managing the project team & stakeholders” element is **important** for project managers while **“senior project managers”** think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 3.79 and approximately 60% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.37 and approximately 92% of them ranked it either 4 or 5.

Assessing human resource outcomes-This competency element means reviewing project progress, issues and outcomes to determine effectiveness of HRM processes, procedures & tools, identifying HRM lessons learned and recommending improvements. Table 5.6 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Assessing human resource outcomes”

element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.75 and approximately 65% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.93 and approximately 85% of them ranked it either 4 or 5.

Table 5.6: Competency elements (Dependent variables) of “Human Resource Management”

Job-related Competencies							
Human Resource Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Implementing human resources & stakeholder planning activities	Var. 13	3.89	0.70	70%	4.21	0.99	92%
Implementing staff training & development	Var. 14	3.74	0.84	95%	3.92	1.01	92%
Managing the project team & stakeholders	Var. 15	3.79	0.75	60%	4.37	0.63	92%
Assessing human resource outcomes	Var. 16	3.75	0.62	65%	3.93	0.47	85%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.6 COMPETENCY ELEMENTS OF COMMUNICATION MANAGEMENT

Planning communications processes-This competency element means identifying, documenting and analyzing information requirements, developing and implementing the communication management plan, and establishing project management information system. Table 5.7 indicates that “less experienced project managers” believe that

“Planning communications processes” element is **important** for project managers while “**senior project managers**” think that this competency element is **very important** (**Core competency element**) for project managers. The mean of this competency element for “less experienced project managers” is 3.89 and approximately 70% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.32 and approximately 77% of them ranked it either 4 or 5.

Managing information-This competency element means managing the generation, gathering, storage, analyzing, and dissemination of information by project staff, monitoring and controlling information validation, implementing communication networks between staff, client, and stakeholders. Table 5.7 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Managing information” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.05 and approximately 90% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.08 and approximately 77% of them ranked it either 4 or 5.

Managing project reporting-This competency element means managing and validating project reporting according to standards, drafting project reports and validating their contents, and maintaining stakeholder relationship with established guidelines. Table 5.7 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Managing project reporting” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.99 and approximately 79% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.08 and approximately 77% of them ranked it either 4 or 5.

Assessing communication management outcomes-This competency element means reviewing project progress, issues and outcomes to determine the effectiveness of communication management processes, identifying communication management lessons learned and recommending improvement. Table 5.7 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Assessing communication management outcomes” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.90 and approximately 75% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.92 and approximately 61% of them ranked it either 4 or 5.

Table 5.7: Competency elements (Dependent variables) of “Communication Management”

Job-related Competencies							
Communication Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Planning communications processes	Var. 17	3.89	0.70	70%	4.32	0.82	77%
Managing Information	Var. 18	4.05	0.50	90%	4.08	0.73	77%
Managing project reporting	Var. 19	3.99	0.64	79%	4.08	0.73	77%
Assessing communication management outcomes	Var. 20	3.90	0.63	75%	3.92	0.83	61%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.7 COMPETENCY ELEMENTS OF RISK MANAGEMENT

Determining project risk events-This competency element means identifying, documenting and analyzing risks and opportunities, using established risk management techniques, developing risk management plan, and assigning risk management responsibilities to those who are in best position. Table 5.8 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Determining project risk events” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.00 and approximately 75% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.24 and approximately 85% of them ranked it either 4 or 5.

Monitoring & managing opportunities-This competency element means monitoring project opportunities, documenting opportunities and assessing against project progress, presenting opportunities to higher authority for consideration, and implementing changes when necessary to take advantage of new opportunities. Table 5.8 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Monitoring & managing opportunities” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.81 and approximately 75% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.16 and approximately 83% of them ranked it either 4 or 5.

Monitoring & managing project risks-This competency element means monitoring and managing project risks including external factors, and implementing risk management strategies. Table 5.8 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Monitoring & managing project risks” element is **important** for project manager to have. The mean of this competency

element for “less experienced project managers” is 4.11 and approximately 82% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.15 and approximately 72% of them ranked it either 4 or 5.

Assessing risk management outcomes-This competency element means reviewing project progress, issues and outcomes to determine effectiveness of risk management processes, identifying risk management lessons learned and recommending improvement to higher project authority. Table 5.8 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Assessing risk management outcomes” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.02 and approximately 82% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.85 and approximately 57% of them ranked it either 4 or 5.

Table 5.8: Competency elements (Dependent variables) of “Risk Management”

Job-related Competencies							
Risk Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Determining project risk events	Var. 21	4.00	0.85	95%	4.24	0.69	85%
Monitoring & managing opportunities	Var. 22	3.81	0.75	75%	4.16	0.70	83%
Monitoring & managing project risks	Var. 23	4.11	0.80	87%	4.15	0.83	72%
Assessing risk management outcomes	Var. 24	4.02	0.72	82%	3.85	0.83	57%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.8 COMPETENCY ELEMENTS OF PROCUREMENT MANAGEMENT

Determining procurement requirements-This competency element means identifying procurement requirements, establishing and maintaining an agreed procurement management plan. Table 5.9 indicates that “less experienced project managers” believe that “Determining procurement requirements” element is **not important** for project managers while “senior project managers” think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 3.65 and approximately 66% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.17 and approximately 91% of them ranked it either 4 or 5.

Following agreed procurement processes-This competency element means obtaining information from sources capable of fulfilling procurement requirements, adopting

established selection processes and selection criteria to choose contractors and suppliers. Table 5.9 indicates that “**less experienced project managers**” believe that “Following agreed procurement processes” element is **not important** for project managers while “**senior project managers**” think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 3.65 and approximately 67% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.13 and 100% of them ranked it either 4 or 5.

Conducting contract & procurement activities-This competency element means communicating requirements and specifications to prospective contractors, evaluating responses from potential suppliers and selecting preferred ones, conducting negotiations with preferred contractors or suppliers, and establishing a positive relationship with them. Table 5.9 indicates that “**less experienced project managers**” believe that “Conducting contract & procurement activities” element is **not important** for project managers while “**senior project managers**” think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 3.63 and approximately 63% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.07 and approximately 87% of them ranked it either 4 or 5.

Implementing contract & procurement-This competency element means implementing an established procurement management plan to ensure achievement of objectives, managing procurement issues and changes to ensure timely completion of tasks, reporting procurement issues with recommendation to higher project authority. Table 5.9 indicates that “**less experienced project managers**” believe that “Implementing contract & procurement” element is **not important** for project managers while “**senior project managers**” think that this competency element is **important** for project

managers. The mean of this competency element for “less experienced project managers” is 3.68 and approximately 68% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.00 and approximately 93% of them ranked it either 4 or 5.

Managing contract & procurement finalization procedures-This competency element means managing finalization activities to ensure contract deliverables meet contractual requirements, reviewing project progress to determine effectiveness of procurement processes, identifying procurement lessons learned and recommending improvements. Table 5.9 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Managing contract & procurement finalization procedures” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.79 and approximately 75% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.92 and approximately 92% of them ranked it either 4 or 5.

Table 5.9: Competency elements (Dependent variables) of “Procurement Management”

Job-related Competencies							
Procurement Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Determining procurement requirements	Var. 25	3.65	0.73	66%	4.17	0.58	91%
Following agreed procurement processes	Var. 26	3.65	0.64	67%	4.13	0.34	100%
Conducting contract & procurement activities	Var. 27	3.63	0.77	63%	4.07	0.58	87%
Implementing contract & procurement	Var. 28	3.68	0.66	68%	4.00	0.37	93%
Managing contract & procurement finalization procedures	Var. 29	3.79	0.78	75%	3.92	0.27	92%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.9 COMPETENCY ELEMENTS OF INTEGRATION MANAGEMENT

Agreeing & establishing life cycle reporting & measurement systems-This competency element means agreeing and implementing project life cycle, project reporting and performance management systems, determining appropriate project phases, approved points and reviewing points throughout the project life cycle. Table 5.10 indicates that both “less experienced project managers” and “senior project managers” believe that “Agreeing & establishing life cycle reporting & measurement systems” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.79 and approximately 65% of them ranked its

importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.21 and approximately 64% of them ranked it either 4 or 5.

Managing integration of all project management functions-This competency element means identifying project stakeholders and their interests, analyzing all project management functions, developing project management plan, creating a safe environment for project personnel, and displaying effective leadership. Table 5.10 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Managing integration of all project management functions” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.06 and approximately 78% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.13 and approximately 64% of them ranked it either 4 or 5.

Coordinating internal & external environment-This competency element means managing the project within an established internal working environment, maintaining established links to align project objectives with strategic organizational objectives, seeking assistance from senior personnel when necessary to solve conflicts. Table 5.10 indicates that **“less experienced project managers”** believe that “Coordinating internal & external environment” element is **important** for project managers while **“senior project managers”** think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.13 and approximately 89% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.56 and approximately 96% of them ranked it either 4 or 5.

Implementing project activities throughout life cycle-This competency element means incorporating project phases, approval points, integrated phases to monitor risks for maximizing opportunities, establishing and managing finalization plans and procedures, reviewing project plans and general project documentation. Table 5.10 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Implementing project activities throughout life cycle” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.79 and approximately 68% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.11 and approximately 63% of them ranked it either 4 or 5.

Assessing project integration outcomes-This competency element means reviewing project issues and outcomes to determine effectiveness of processes and procedures, identifying integration management lessons learned and recommending improvements. Table 5.10 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Assessing project integration outcomes” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.75 and approximately 68% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.92 and approximately 73% of them ranked it either 4 or 5.

Table 5.10: Competency elements (Dependent variables) of “Integration Management”

Job-related Competencies							
Integration Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Agreeing & establishing life cycle reporting & measurement systems	Var. 30	3.79	0.67	65%	4.21	0.95	64%
Managing integration of all project management functions	Var. 31	4.06	0.71	78%	4.13	0.92	64%
Coordinating internal & external environment	Var. 32	4.13	0.59	88%	4.56	0.58	96%
Implementing project activities throughout life cycle	Var. 33	3.79	0.62	68%	4.11	0.92	63%
Assessing project integration outcomes	Var. 34	3.75	0.83	68%	3.92	0.67	73%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.10 COMPETENCY ELEMENTS OF CONSTRUCTION WORKS (TECHNICAL EXPERTISE)

Verbal skills- Table 5.11 indicates that “less experienced project managers” believe that “Verbal skills” element is **important** for project managers while “senior project managers” think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 4.01 and approximately 79% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.68 and approximately 64% of them ranked it either 4 or 5.

Written skills- Table 5.11 indicates that “**less experienced project managers**” believe that “Written skills” element is **important** for project managers while “**senior project managers**” think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 3.83 and approximately 72% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.57 and approximately 57% of them ranked it either 4 or 5.

To know project success criteria-This competency element means to know satisfaction of stakeholder needs, and identifying critical success factors of project. Table 5.11 indicates that “**less experienced project managers**” believe that “To know project success criteria” element is **very important (Core competency element)** for project managers while “**senior project managers**” think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 4.26 and approximately 83% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.15 and approximately 79% of them ranked it either 4 or 5.

Methods & procedures-This competency element means detailing the standard practices to be used for managing projects. Methods provide a consistent framework within which project management is performed. Procedures cover individual aspects of project management. Table 5.11 indicates that “**less experienced project managers**” believe that “Methods & procedures” element is **important** for project managers while “**senior project managers**” think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.12 and approximately 83% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.31 and 100% of them ranked it either 4 or 5.

Change Control-This competency element means ensuring that all changes made to a project's baseline scopes, time, cost and quality objectives are identified, evaluated, approved, rejected or deferred. Table 5.11 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Change Control” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.95 and approximately 72% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.97 and approximately 73% of them ranked it either 4 or 5.

Technology management-This competency element means management of the relationship between available and emerging technologies, the organization and the project, management of enabling technologies used to deliver project. Table 5.11 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Technology management” element is **not important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.66 and approximately 67% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.57 and approximately 72% of them ranked it either 4 or 5.

Value management-This competency element means defining what value means to organization & project, it is a framework that allows needs, problems or opportunities to be defined, and then enable reviewing of whether the initial project objectives can be improves to optimal approach and solution. Table 5.11 indicates **both “less experienced project managers” and “senior project managers”** believe that “Value management” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.96 and approximately 83% of them ranked its importance either 4 or 5. The mean of this competency element

ranked by “senior project managers” is 3.81 and approximately 76% of them ranked it either 4 or 5.

Handover & closeout-This competency element means handing over final project deliverables to the sponsor and user, Closeout is the process of finalizing all project matters, carrying out final project reviews, archiving project information and redeploying the project team. Table 5.11 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Handover & closeout” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.13 and approximately 74% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.12 and approximately 81% of them ranked it either 4 or 5.

Documentation-This competency element means listing approved variances from organization procedures and policies, plus additional information that are unique and important to project success. Table 5.11 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Documentation” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.77 and approximately 75% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.20 and approximately 87% of them ranked it either 4 or 5.

Appraising project team members-This competency element means using tools, equipment and materials such as appraisal templates and forms, organizational structures, corporate and training policies so that appraisal system and criteria are set up and periodical appraisal is carried out. Table 5.11 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Appraising project

team members” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.91 and approximately 68% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.93 and approximately 68% of them ranked it either 4 or 5.

Administer design process-This competency element means using tools, equipment and material such as design guideline, statutory by law, design standard, so that design parameters are coordinated, design concept development is monitored, proposals is tested, design authority approvals are coordinated. Table 5.11 indicates that “**less experienced project managers**” believe that “Administer design process” element is **important** for project managers while “**senior project managers**” think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 3.76 and approximately 68% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.49 and approximately 56% of them ranked it either 4 or 5.

Administer authority liaison-This competency element means authorities and authority requirements are, liaison process flow, procedures & standard are established & teams addressing liaison requirements are organized. Table 5.11 indicates that “**less experienced project managers**” believe that “Administer authority liaison” element is **important** for project managers while “**senior project managers**” think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 3.79 and approximately 54% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.56 and approximately 56% of them ranked it either 4 or 5.

Perform post-contract evaluation-This competency element means using tools, equipment and materials such as evaluation template, project close-out reports, contract documents so that evaluation goals, purposes and term of reference are established, and information for continuous improvements for future are analyses. Table 5.11 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Perform post-contract evaluation” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.90 and approximately 68% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.76 and approximately 68% of them ranked it either 4 or 5.

Table 5.11: Competency elements (Dependent variables) of “Construction Works (Technical Expertise)”

Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Verbal skills	Var. 35	4.01	0.65	79%	3.68	0.79	64%
Written skills	Var. 36	3.83	0.60	72%	3.57	0.50	57%
To know project success criteria	Var. 37	4.26	0.73	83%	4.15	0.75	79%
Methods & procedures	Var. 38	4.12	0.67	83%	4.31	0.46	100%
Change Control	Var. 39	3.95	0.71	72%	3.97	0.72	73%
Technology management	Var. 40	3.66	0.78	67%	3.57	0.74	72%
Value management	Var. 41	3.96	0.79	83%	3.81	0.51	76%
Handover & closeout	Var. 42	4.13	0.91	74%	4.12	1.01	81%

Table 5.11, continued

Documentation	Var. 43	3.77	0.87	75%	4.20	0.66	87%
Appraising project team members	Var. 44	3.91	0.74	68%	3.93	0.76	68%
Administer design process	Var. 45	3.76	0.59	68%	3.49	0.62	56%
Administer authority liaison	Var. 46	3.79	0.99	54%	3.56	0.76	56%
Perform post-contract evaluation	Var. 47	3.90	0.89	75%	3.76	0.65	64%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.3.11 COMPETENCY ELEMENTS OF EXPERIENCE

Managing similar projects-Table 5.12 indicates that “**less experienced project managers**” believe that “Managing similar projects” element is **important** for project managers while “**senior project managers**” think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 3.79 and approximately 66% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.49 and approximately 43% of them ranked it either 4 or 5.

Number of years working in construction Industry-Table 5.12 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Number of years working in construction Industry” element is **not important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.64 and approximately 61% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.45 and approximately 55% of them ranked it either 4 or 5.

Experience variety of project types- Table 5.12 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Experience variety

of project types” element is **not important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.57 and approximately 48% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.45 and approximately 41% of them ranked it either 4 or 5.

Membership in appropriate professional body-Table 5.12 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Membership in appropriate professional body” element is **not important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.32 and approximately 33% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 2.75 and approximately 11% of them ranked it either 4 or 5.

Table 5.12: Competency elements (Dependent variables) of “Experience”

Job-related Competencies							
Experience							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Managing similar projects	Var. 48	3.79	0.91	66%	3.49	0.62	43%
Number of years working in construction Industry	Var. 49	3.64	0.99	61%	3.45	0.66	55%

Table 5.12, continued

Experience variety of project types	Var. 50	3.57	0.65	48%	3.35	0.60	41%
Membership in appropriate professional body	Var. 51	3.32	0.86	33%	2.75	0.72	11%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.4 IMPORTANCE DEGREE OF PERSON-RELATED COMPETENCIES

5.4.1 COMPETENCY ELEMENTS OF ACHIEVEMENT AND ACTION

Achievement orientation (Result orientation)-This competency element means a concern for working well, or for competing against a standard of excellence, operating with intensity to achieve project goals, motivate project stakeholders, providing new solutions in delivering projects, operate with personal professionals. Table 5.13 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Achievement orientation (Result orientation)” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.06 and approximately 76% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.21 and approximately 84% of them ranked it either 4 or 5.

Concern for order, quality, & accuracy-This competency element means underlying drive to reduce uncertainty in the surrounding environment, managing projects in an ordered, accurate way, providing accurate and truthful information. Table 5.13 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Concern for order, quality, & accuracy” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.86 and approximately 79% of them ranked its importance either 4 or 5.

The mean of this competency element ranked by “senior project managers” is 3.92 and approximately 79% of them ranked it either 4 or 5.

Initiative-This competency element means preference for taking action, doing more than is required or expected in the job, doing things that no one has requested, seek new opportunities, strive for best practice, take accountability for and delivers project. Table 5.13 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Initiative” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.24 and approximately 92% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.88 and approximately 88% of them ranked it either 4 or 5.

Information Seeking-This competency element means an underlying curiosity, a desire to know more about things, people, or issues, it implies making an effort to get more information, not accepting situations "at face value", ensuring information used to manage project is complete and accurate. Table 5.13 indicates that **“less experienced project managers”** believe that “Information Seeking” element is **important** for project managers while **“senior project managers”** think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 4.21 and approximately 96% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.57 and approximately 51% of them ranked it either 4 or 5.

Identifying & solving problems-This competency element means the ability to identify barriers that keep one from achieving set goals and standards, distinguishing between symptoms & problems, collecting data, identifying root causes, weighing alternatives, and taking appropriate actions. Table 5.13 indicates that **“less experienced project**

managers” believe that “Identifying & solving problems” element is **important** for project managers while “**senior project managers**” think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 4.23 and approximately 88% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.39 and approximately 81% of them ranked it either 4 or 5.

Table 5.13: Competency elements (Dependent variables) of “Achievement and Action”

Person-related Competencies							
Achievement and Action							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Achievement orientation (Result orientation)	Var. 52	4.06	0.74	76%	4.21	0.70	84%
Concern for order, quality, & accuracy	Var. 53	3.86	0.50	79%	3.92	0.59	79%
Initiative	Var. 54	4.24	0.59	92%	3.88	0.33	88%
Information Seeking	Var. 55	4.21	0.49	96%	3.57	0.62	51%
Identifying & solving problems	Var. 56	4.23	0.66	88%	4.39	0.79	81%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.4.2 COMPETENCY ELEMENTS OF HELPING AND HUMAN SERVICE

Client Orientation-This competency element means the desire to help or serve others, to meet their needs. It means that focusing efforts on discovering & meeting the client needs, represent the client inside the project, take initiatives to provide excellent client service. Table 5.14 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Client Orientation” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.16 and approximately 82% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.13 and approximately 72% of them ranked it either 4 or 5.

Interpersonal Understanding-This competency element means understanding other people. It is the ability to hear accurately and understand the unspoken or partly expressed thoughts, feelings, and concerns of others, strive to understand all stakeholders thoughts, listening and responding to others. Table 5.14 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Interpersonal Understanding” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.13 and approximately 87% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.80 and approximately 63% of them ranked it either 4 or 5.

Table 5.14: Competency elements (Dependent variables) of “Helping and Human Service”

Person-related Competencies							
Helping and Human Service							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Client Orientation	Var. 57	4.16	0.70	82%	4.13	0.83	72%
Interpersonal Understanding	Var. 58	4.13	0.62	87%	3.80	0.82	63%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.4.3 COMPETENCY ELEMENTS OF IMPACT AND INFLUENCE

Impact & influence-This competency element means the intention to persuade, convince, influence, or impress others in order to get them to support something, taking appropriate actions to influence others, influences across projects and organizations, understanding and influencing project team members. Table 5.15 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Impact & influence” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.94 and approximately 75% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.03 and approximately 77% of them ranked it either 4 or 5.

Organizational Awareness-This competency element means wanting to understand other people. It is the ability to hear accurately and understanding the unspoken or partly expressed thoughts, feelings, and concerns of others, striving to understand all

stakeholders' thoughts, and listening and responding to others. Table 5.15 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Organizational Awareness” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.83 and approximately 77% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.80 and approximately 73% of them ranked it either 4 or 5.

Relationship Building-This competency element means working to build or maintain positive relationship or network of contacts with people who are, or might someday be, useful in achieving work-related goals. Table 5.15 indicates **both “less experienced project managers” and “senior project managers”** believe that “Relationship Building” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.18 and approximately 92% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.05 and approximately 80% of them ranked it either 4 or 5.

Building trust-This competency element means establishing an environment of trust and respect, showing open concern for others, accepting people for what they are, empower people more & ask them to take on board more responsibilities. Table 5.15 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Building trust” element is **very important (Core competency element)** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.29 and approximately 97% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.29 and approximately 96% of them ranked it either 4 or 5.

Table 5.15: Competency elements (Dependent variables) of “Impact and Influence”

Person-related Competencies							
Impact and Influence							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Impact & influence	Var. 59	3.94	0.66	75%	4.03	0.70	77%
Organizational Awareness	Var. 60	3.83	0.52	77%	3.80	0.55	73%
Relationship Building	Var. 61	4.18	0.56	92%	4.05	0.68	80%
Building trust	Var. 62	4.29	0.51	97%	4.29	0.54	96%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.4.4 COMPETENCY ELEMENTS OF MANAGEMENT

Teamwork & Cooperation-This competency element is a genuine intention to work cooperatively with others, to be part of a team, to work together, as opposed to working separately or competitively, building team, orientation within the project, undertaking team-building activities. Table 5.16 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Teamwork & Cooperation” element is **very important (Core competency element)** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.50 and 100% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.68 and 100% of them ranked it either 4 or 5.

Developing others-This competency element means teaching or fostering the development of one or several other people, building a project culture where personal development is encouraged, encouraging other to take more-demanding roles, tasks and accountabilities. Table 5.16 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Developing others” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.10 and approximately 88% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.73 and approximately 60% of them ranked it either 4 or 5.

Team Leadership-This competency element means the intention to take a role as leader of a team or other group. It implies a desire to lead others, demonstrating leadership of the project, leading the project team. Table 5.16 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Team Leadership” element is **very important (Core competency element)** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.65 and 100% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.64 and 100% of them ranked it either 4 or 5.

Being Directive: Assertiveness & use of positional power-This competency element means expressing the individual's intent to make others comply with ones wishes. Directive behavior has a theme or tone of "telling people what to do", using assertiveness when necessary, managing the complete project. Table 5.16 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Being Directive: Assertiveness & use of positional power” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.21 and approximately 80% of them ranked its

importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.91 and approximately 84% of them ranked it either 4 or 5.

Disciplining &counseling-This competency element means ability to correct employees constructively, restoring performance without loss of face, getting the employee to accept responsibility within an agreed-upon time frame, reinforcing improved performance or taking appropriate action. Table 5.16 indicates that “**less experienced project managers**” believe that “Disciplining &counseling” element is **important** for project managers while “**senior project managers**” think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 4.10 and approximately 86% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.64 and approximately 64% of them ranked it either 4 or 5.

Making decisions-This competency element means ability to construct a decision matrix to evaluate options, identifying limits, desirable, and risks to be considered, assigning weights to each alternative, and selecting the best option for meeting the desired goals. Table 5.16 indicates that “**less experienced project managers**” believe that “Making decisions” element is **very important (Core competency element)** for project managers while “**senior project managers**” think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 4.65 and 100% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.17 and approximately 87% of them ranked it either 4 or 5.

Table 5.16: Competency elements (Dependent variables) of “Management”

Person-related Competencies							
Management							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Teamwork & Cooperation	Var. 63	4.50	0.50	100%	4.68	0.47	100%
Developing others	Var. 64	4.10	0.57	88%	3.73	0.68	60%
Team Leadership	Var. 65	4.65	0.48	100%	4.64	0.48	100%
Being Directive: Assertiveness & use of positional power	Var. 66	4.21	0.75	80%	3.91	0.47	84%
Disciplining and counseling	Var. 67	4.10	0.61	86%	3.64	0.48	64%
Making decisions	Var. 68	4.65	0.48	100%	4.17	0.64	87%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.4.5 COMPETENCY ELEMENTS OF COGNITIVE

Analytical Thinking-This competency element means working through a situation by breaking it apart into smaller pieces, or tracing the implications of a situation in a step-by-step causal way, understanding all issues associated with the project at a suitable level, facilitating solutions across all issues. Table 5.17 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Analytical Thinking” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.21 and approximately 92% of them ranked its importance either 4 or 5. The mean of this

competency element ranked by “senior project managers” is 4.19 and approximately 85% of them ranked it either 4 or 5.

Conceptual Thinking-This competency element means working through a situation or problem by putting the pieces together, seeing the large picture, and seeing the project in a holistic way. Table 5.17 indicates that “**less experienced project managers**” believe that “Conceptual Thinking” element is **very important (Core competency element)** for project managers while “**senior project managers**” think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 4.25 and approximately 93% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.83 and approximately 69% of them ranked it either 4 or 5.

Critical analysis & judgment-This competency element means gathering relevant information from a wide range of sources, probing the facts, identifying advantages and disadvantages, sound judgment and decision making, awareness of the impact of any assumptions made. Table 5.17 indicates that “**less experienced project managers**” believe that “Critical analysis & judgment” element is **very important (Core competency element)** for project managers while “**senior project managers**” think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 4.34 and approximately 87% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.84 and approximately 67% of them ranked it either 4 or 5.

Table 5.17: Competency elements (Dependent variables) of “Cognitive”

Person-related Competencies							
Cognitive							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Analytical Thinking	Var. 69	4.21	0.57	92%	4.19	0.67	85%
Conceptual Thinking	Var. 70	4.25	0.58	93%	3.83	0.83	83%
Critical analysis & judgment	Var. 71	4.34	0.69	88%	3.84	0.70	67%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.4.6 COMPETENCY ELEMENTS OF PERSONAL EFFECTIVENESS

Self-Control-This competency element means the ability to keep emotions under control and restrain negative actions when tempted, when faced with opposition or hostility from others, or when working under conditions of stress, maintain self-control. Table 5.18 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Self-Control” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.21 and approximately 89% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.12 and approximately 88% of them ranked it either 4 or 5.

Self-Confidence-This competency element means a person's belief in one's own capability to accomplish a task, this includes a person expressing confidence in dealing with increasingly challenging circumstances, creating an environment of confidence, and accepting failure positively. Table 5.18 indicates that **both “less experienced**

project managers” and “senior project managers” believe that “Self-Confidence” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.23 and approximately 88% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.04 and approximately 77% of them ranked it either 4 or 5.

Flexibility-This competency element means the ability to adapt to and work effectively with a variety of situations, individuals, or groups. It is the ability to understand different & opposing perspectives on an issue. It means changes to meet project needs, and changes at the required pace. Table 5.18 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Flexibility” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.91 and approximately 77% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.08 and approximately 88% of them ranked it either 4 or 5.

Organizational Commitment-This competency element means the ability and willingness to align one's own behavior with the needs, priorities, and goals of the organization, to act in way that promote organizational goals, and demonstrate commitment to the project. Table 5.18 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Organizational Commitment” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.06 and approximately 88% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.77 and approximately 77% of them ranked it either 4 or 5.

Intuitiveness-This competency element means being able to understand something by using feeling rather than by considering the facts, arriving clear decisions and being able to drive other people implementation in the face of incomplete or ambiguous information. Table 5.18 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Intuitiveness” element is important for project manager to have. The mean of this competency element for “less experienced project managers” is 3.91 and approximately 84% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.81 and approximately 68% of them ranked it either 4 or 5.

Conscientiousness-This competency element means displaying clear commitment to a course of action in the face of challenge and match "words and deeds" in encouraging others to support the chosen direction. Table 5.18 indicates that **“less experienced project managers”** believe that “Conscientiousness” element is important for project managers while **“senior project managers”** think that this competency element is very important (Core competency element) for project managers. The mean of this competency element for “less experienced project managers” is 3.79 and approximately 67% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.28 and approximately 87% of them ranked it either 4 or 5.

Creativity-This competency element means the ability to think and act out of the box. Based on what a project manager already knows and a combination of ideas from others. The project manager is able to build a new concept. Table 5.18 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Creativity” element is important for project manager to have. The mean of this competency element for “less experienced project managers” is 4.04 and approximately

86% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.16 and 100% of them ranked it either 4 or 5.

Table 5.18: Competency elements (Dependent variables) of “Personal Effectiveness”

Person-related Competencies							
Personal Effectiveness							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Self-Control	Var. 72	4.21	0.62	89%	4.12	0.59	88%
Self-Confidence	Var. 77	4.23	0.64	88%	4.04	0.71	77%
Flexibility	Var. 74	3.91	0.61	77%	4.08	0.56	88%
Organizational Commitment	Var. 75	4.06	0.54	88%	3.77	0.42	77%
Intuitiveness	Var. 76	3.91	0.48	84%	3.81	0.65	68%
Conscientiousness	Var. 77	3.79	0.81	67%	4.28	0.69	87%
Creativity	Var. 78	4.04	0.58	86%	4.16	0.37	100%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.4.7 COMPETENCY ELEMENTS OF BEHAVIORAL

Conflict management-This competency element means the process of identifying and addressing differences that, if unmanaged, would affect project objectives, managing the differences of opinions of stakeholders, listening and respecting views of others, identifying the root causes of the conflicts, and implementing an agreed solution. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Conflict management” element is **important** for project manager to have. The mean of this competency element for “less experienced project

managers” is 4.00 and approximately 79% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.07 and approximately 89% of them ranked it either 4 or 5.

Negotiation-This competency element means a search for agreement, seeking acceptance, and alignment of views, identifying areas for negotiation, collecting all available information to achieve agreement, understanding the motivation, and exploring and evaluating responses. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Negotiation” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.14 and approximately 95% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.75 and approximately 93% of them ranked it either 4 or 5.

Behavioral characteristics & attitude-This competency element is the element that separates and describes a person's preferred way of acting, having a positive “can do” attitude, identifying effective solutions, opening to new ideas, adapting behavior to the requirements of project, and focusing of project objectives. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Behavioral characteristics & attitude” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.03 and approximately 77% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.71 and approximately 55% of them ranked it either 4 or 5.

Professionalism & ethics-This competency element means professionalism is demonstrable awareness and application of qualities and competencies. Ethics cover the

moral principles recognized as appropriate; behaving with good faith and good conscience, and to be alert to possible unethical situations. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Team Leadership” element is **very important (Core competency element)** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.37 and approximately 95% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “Professionalism & ethics” is 4.37 and approximately 93% of them ranked it either 4 or 5.

Engagement & motivation (Encourage the heart)-This competency element means displaying clear commitment to a course of action in the face of challenge and match "words and deeds" in encouraging others to support the chosen direction. Table 5.19 indicates that **“less experienced project managers”** believe that “Engagement & motivation (Encourage the heart)” element is **important** for project managers while **“senior project managers”** think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 3.99 and approximately 86% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.33 and 100% of them ranked it either 4 or 5.

Openness-This competency element means the ability to make others feel, they are welcome to express themselves, praise the person who gives positive inputs and information, continuing to improve methods of openness. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Openness” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.81 and approximately 80% of them ranked its importance either 4 or 5. The mean of this competency element

ranked by “senior project managers” is 3.92 and approximately 76% of them ranked it either 4 or 5.

Result orientation-This competency element means focusing the team's attention on key objectives, ensuring the project results satisfy the relevant interested parties. Table 5.19 indicates that “**less experienced project managers**” believe that “Result orientation” element is **important** for project managers while “**senior project managers**” think that this competency element is **very important (Core competency element)** for project managers. The mean of this competency element for “less experienced project managers” is 3.95 and approximately 79% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.48 and approximately 96% of them ranked it either 4 or 5.

Efficiency-This competency element means the ability to use time and resources cost-effectively to produce the agreed deliverables, using methods, systems and procedures in the most effective way, and seeking to improve current methods. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Efficiency” element is **very important (Core competency element)** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.39 and 100% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “Professionalism & ethics” is 4.59 and 100% of them ranked it either 4 or 5.

Consultation-This competency element means to exchange of opinion about project issues, analyzing scenarios leading to mutually accepted decisions, and analyzing situations and contexts. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Consultation” element is **important** for project manager to have. The mean of this competency element for “less

experienced project managers” is 3.94 and approximately 89% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.01 and approximately 80% of them ranked it either 4 or 5.

Reliability-This competency element means delivering what you have said and you will do to the time and quality agreed within project specification. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Reliability” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.14 and approximately 92% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.24 and approximately 97% of them ranked it either 4 or 5.

Effective communication-This competency element means holding communication with others to develop effective relationships such as informal talks, and exploring the viewpoints of others before making decisions. Table 5.19 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Effective communication” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.17 and approximately 92% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.24 and approximately 81% of them ranked it either 4 or 5.

The ability to deal with ambiguity-Table 5.19 indicates that **“less experienced project managers”** believe that “The ability to deal with ambiguity” element is **important** for project managers while **“senior project managers”** think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 3.90 and approximately 79% of them ranked its

importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.48 and approximately 45% of them ranked it either 4 or 5.

Table 5.19: Competency elements (Dependent variables) of “Behavioral”

Person-related Competencies							
Behavioral							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Conflict management	Var. 79	4.00	0.66	79%	4.07	0.53	89%
Negotiation	Var. 80	4.14	0.48	95%	3.75	0.57	81%
Behavioral characteristics & attitude	Var. 81	4.03	0.70	77%	3.71	0.73	55%
Professionalism & ethics	Var. 82	4.37	0.59	95%	4.37	0.61	93%
Engagement & motivation (Encourage the heart)	Var. 83	3.99	0.53	86%	4.33	0.47	100%
Openness	Var. 84	3.81	0.65	80%	3.92	0.63	76%
Result orientation	Var. 85	3.95	0.61	79%	4.48	0.58	96%
Efficiency	Var. 86	4.39	0.49	100%	4.59	0.50	100%
Consultation	Var. 87	3.94	0.39	89%	4.01	0.65	80%
Reliability	Var. 88	4.14	0.53	92%	4.24	0.49	97%
Effective communication	Var. 89	4.17	0.55	92%	4.24	0.75	81%
The ability to deal with ambiguity	Var. 90	3.90	0.57	79%	3.48	0.55	45%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.4.8 COMPETENCY ELEMENTS OF CONTEXTUAL

Project orientation-This competency element means fully understanding and applying the concepts of project in diverse situations, assessing the needs of organization to perform projects, and considering organization culture in relation to projects. “Project orientation” is orientation of organization for managing projects. Table 5.20 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Project orientation” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.00 and approximately 83% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.16 and approximately 81% of them ranked it either 4 or 5.

Program orientation (Strategic Perspective)-This competency element means the decision to apply and manage the concept of managing by programs to achieve a number of objectives within one overall strategy, aligning the essential programs to the strategic goals of organization, and reviewing results with appropriate management level. Table 5.20 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Program orientation (Strategic Perspective)” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.88 and approximately 79% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.84 and approximately 67% of them ranked it either 4 or 5.

Portfolio orientation-This competency element means fully understood and apply the concept of portfolio management, balancing supply with demand continuously, monitoring programs and projects of the portfolio, and initiating corrective actions. Table 5.20 indicates that **both “less experienced project managers” and “senior**

project managers” believe that “Portfolio orientation” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.89 and approximately 73% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.72 and approximately 65% of them ranked it either 4 or 5.

Change management (in organization)-This competency element covers the process of continuously improving project, program, and portfolio management in organization which involving change management, contributing to the development of an implementation plan and assessment of results. Table 5.20 indicates that **“less experienced project managers”** believe that “Change management (in organization)” element is **important** for project managers while **“senior project managers”** think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 3.76 and approximately 70% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.63 and approximately 52% of them ranked it either 4 or 5.

Permanent organization-This competency element means overcoming any resistance from within the permanent organization and to know how the policies and outputs of operations of the permanent organization are defined and controlled, and what the associated risks are. Table 5.20 indicates that **“less experienced project managers”** believe that “Permanent organization” element is **not important** for project managers while **“senior project managers”** think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 3.66 and approximately 62% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.96 and approximately 77% of them ranked it either 4 or 5.

Health, security, safety & environment-This competency element means Establishing, implementing, monitoring, and reviewing health, safety and environment plan within the project, and allowing health, security, safety and environmental issues to be handled properly. Table 5.20 indicates that **“less experienced project managers”** believe that “Health, security, safety & environment” element is **very important (Core competency element)** for project managers while **“senior project managers”** think that this competency element is **important** for project managers. The mean of this competency element for “less experienced project managers” is 4.27 and approximately 95% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.80 and approximately 79% of them ranked it either 4 or 5.

Financial management-This competency element means to provide information to the financial management of the organization about the financial requirements of the project and cooperate in assessing the funds, negotiating with possible sources of funds, analyzing financing options, and validating & managing budgets. Table 5.20 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Financial management” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.79 and approximately 74% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.11 and approximately 85% of them ranked it either 4 or 5.

Legal awareness-This competency element means understanding of the relevant legal duties, rights and processes that should be applied to projects, to be aware and apply the legal and contractual requirements, responding appropriately to claims of harassment, discrimination, safety issue or non-performance. Table 5.4.8 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Legal

awareness” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.96 and approximately 83% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.12 and approximately 83% of them ranked it either 4 or 5.

Organization structure-This competency element means defining the reporting and decision-making hierarchy of the organization, defining roles and responsibilities of different part of organization, determine level of authority and position within the organization. Table 5.20 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Organization structure” element is **important** for project manager to have. The mean of this competency element for “less experienced project managers” is 4.04 and approximately 78% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 4.05 and approximately 80% of them ranked it either 4 or 5.

Cultural awareness-This competency element means developing, displaying and applying an awareness of cultural differences of team members, showing and understanding of the values and beliefs of other cultures, the ability to perceive the intrinsic qualities in other people and understanding their point of views. Table 5.20 indicates that **“less experienced project managers”** believe that “Cultural awareness” element is **important** for project managers while **“senior project managers”** think that this competency element is **not important** for project managers. The mean of this competency element for “less experienced project managers” is 3.78 and approximately 69% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.53 and approximately 49% of them ranked it either 4 or 5.

Marketing & Sales-Marketing involves anticipating the demands of users and identifying and satisfying their needs. “Sales” is a marketing technique to promote project. Table 5.20 indicates that **both “less experienced project managers” and “senior project managers”** believe that “Marketing & Sales” element is **not important** for project manager to have. The mean of this competency element for “less experienced project managers” is 3.26 and approximately 37% of them ranked its importance either 4 or 5. The mean of this competency element ranked by “senior project managers” is 3.21 and approximately 41% of them ranked it either 4 or 5.

Table 5.20: Competency elements (Dependent variables) of “Contextual”

Person-related Competencies							
Contextual							
Dependent Variable (DV) Title	DV No.	Less Experienced Project Managers (PMs)			Senior Project Managers (SPMs)		
		Mean	Std. Dev.	CP of 4 & 5	Mean	Std. Dev.	CP of 4 & 5
Project orientation	Var. 91	4.00	0.66	79%	4.07	0.53	89%
Program orientation (Strategic Perspective)	Var. 92	4.14	0.48	95%	3.75	0.57	81%
Portfolio orientation	Var. 93	4.03	0.70	77%	3.71	0.73	55%
Change management (in organization)	Var. 94	4.37	0.59	95%	4.37	0.61	93%
Permanent organization	Var. 95	3.99	0.53	86%	4.33	0.47	100%
Health, security, safety & environment	Var. 96	3.81	0.65	80%	3.92	0.63	76%
Financial management	Var. 97	3.95	0.61	79%	4.48	0.58	96%

Table 5.20, continued

Legal awareness	Var. 98	4.39	0.49	100%	4.59	0.50	100%
Organization structure	Var. 99	3.81	0.65	80%	3.92	0.63	76%
Cultural awareness	Var. 100	3.95	0.61	79%	4.48	0.58	96%
Marketing & Sales	Var. 101	4.39	0.49	100%	4.59	0.50	100%

CP of 4 & 5: Cumulative Percentage of 4 & 5

5.5 CORRELATION ANALYSIS BETWEEN JOB-RELATED AND PERSON-RELATED COMPETENCIES

5.5.1 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “SCOPE MANAGEMENT” AND COMPETENCY ELEMENTS OF “IMPACT AND INFLUENCE”

As described in literature review, in this research the proposed framework is according to US and UK systems for competencies. In the other words, the required competencies are based on person-related competencies and job-related competencies. Based on the proposed framework, totally 51 competencies which are categorized as job-related competencies, and 50 competencies categorized as person-related competencies. In this section of research the Pearson correlation between these competencies is addressed. In fact, this section shows how job-related competencies and person-related competencies are correlated and inter-connected. The rationale for selecting Pearson correlation analysis is to identify the relation between job-related and person-related competencies. For example, by increasing job-related competencies, which other person-related competencies would be increased. By knowing this inter-relation between job-related competencies and person-related competencies and improving those competencies with

more correlations with other competencies, better results for improving project managers' competencies would be achieved.

As shown in Table 5.21, the results for Pearson correlation showed a positive relationship exists between "Implement scope controls" (Var03) and "Impact and Influence" (Var59) ($r=0.172$, $N=187$, $p=0.009$). Furthermore, the relationship between "Implement scope controls" (Var03) and "Building trust" (Var62) was found positively correlated ($r=0.190$, $N=187$, $p=0.005$). However, correlation between "Implement scope controls" (Var03) and "Building trust" (Var62) showed to be more substantial, in compare to the correlation between "Implement scope controls" (Var03) and "Impact and Influence".

Table 5.21: Correlation analysis between competency elements of "Scope Management" and competency elements of "Impact and Influence"

The relationship between "Scope Management" Competency elements and "Impact and influence" competency elements					Person-Related Competencies			
					Impact & influence			
					VAR59	VAR60	VAR61	VAR62
					Impact & influence	Organizational Awareness	Relationship Building	Building trust
Job-Related Competencies	Scope Management	VAR01	Define the project context	Pearson Correlation	0.057	-0.054	-0.068	0.111
				Sig. (1-tailed)	0.221	0.23	0.178	0.065
				N	187	187	187	187
		VAR02	Guiding development of project scope definition	Pearson Correlation	.158*	0.069	.141*	0.112
				Sig. (1-tailed)	0.015	0.174	0.027	0.064
				N	187	187	187	187
		VAR03	Implement scope controls	Pearson Correlation	.172**	0.023	0.053	.190**
				Sig. (1-tailed)	0.009	0.378	0.234	0.005
				N	187	187	187	187

5.5.2 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “SCOPE MANAGEMENT” AND COMPETENCY ELEMENTS OF “MANAGERIAL”

As shown in Table 5.22, the relationship between “Implement scope controls” (Var03) and “Team Leadership” (Var65) was found positively correlated ($r=0.267$, $N=187$, $p=0$). The data indicated that as “Implement scope controls” (Var03) competency level increased, project manager’s “Team Leadership” (Var65) competency level increased as well.

Table 5.22: Correlation analysis between competency elements of “Scope Management” and competency elements of “Managerial”

The relationship between "Scope Management" Competency elements and "Managerial" competency elements				Person-Related Competencies						
				Managerial						
				VAR63	VAR64	VAR65	VAR66	VAR67	VAR68	
				Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counseling	Making decisions	
Job-Related Competencies	Scope Management	VAR01	Define the project context	Pearson Correlation	-0.043	-0.042	-0.004	0.02	0.041	-.123*
				Sig. (1-tailed)	0.279	0.285	0.479	0.391	0.288	0.046
				N	187	187	187	187	187	187
		VAR02	Guiding development of project scope	Pearson Correlation	0.018	-0.048	0.052	0.027	0.066	0.01
				Sig. (1-tailed)	0.402	0.255	0.239	0.355	0.184	0.445
				N	187	187	187	187	187	187
		VAR03	Implement scope controls	Pearson Correlation	0.119	-0.094	.267**	0.06	-0.014	-0.062
				Sig. (1-tailed)	0.053	0.101	0	0.208	0.424	0.199
				N	187	187	187	187	187	187

5.5.3 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “SCOPE MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Table 5.23, the relationship between “Define the project context” (Var01) and “Encouragement and motivation (Encourage the heart)” (Var83) was found positively correlated ($r=0.183$, $N=187$, $p=0.006$). The data indicated that as “Define the project context” (Var01) competency level increased, the project manager’s “Encouragement and motivation (Encourage the heart)” (Var83) competency level increased as well.

Table 5.23: Correlation analysis between competency elements of “Scope Management” and competency elements of “Behavioral”

The relationship between "Scope Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the heart)	Openness
Job-Related Competencies	Scope Management	VAR01	Define the project context	Pearson Correlation	.127 [*]	0.002	-0.07	0.105	.183 ^{**}	.126 [*]
				Sig. (1-tailed)	0.041	0.487	0.172	0.077	0.006	0.043
				N	187	187	187	187	187	187
		VAR02	Guiding development of project scope	Pearson Correlation	0.071	0.032	0.01	0.111	0.036	0.024
				Sig. (1-tailed)	0.167	0.334	0.444	0.065	0.315	0.374
				N	187	187	187	187	187	187
		VAR03	Implement scope controls	Pearson Correlation	0.066	0.016	-0.032	-0.032	0.076	.121 [*]
				Sig. (1-tailed)	0.183	0.416	0.331	0.33	0.152	0.049
				N	187	187	187	187	187	187

5.5.4 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “SCOPE MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Table 5.24, the relationship between “Define the project context” (Var01) and “Encouragement and motivation (Encourage the heart)” (Var83) was found positively correlated ($r=0.183$, $N=187$, $p=0.006$). The data indicated that as “Define the project context” (Var01) competency level increased, the project manager’s “Encouragement and motivation (Encourage the heart)” (Var83) competency level increased as well.

Table 5.24: Correlation analysis between competency elements of “Scope Management” and competency elements of “Behavioral”

The relationship between "Scope Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Scope Management	VAR01	Define the project context	Pearson Correlation	.133*	-0.005	0.051	-0.034	0.031	-0.096
				Sig. (1-tailed)	0.034	0.471	0.245	0.323	0.337	0.095
				N	187	187	187	187	187	187
		VAR02	Guiding development of project scope	Pearson Correlation	0.116	-0.017	0.052	-0.086	0.02	-0.067
				Sig. (1-tailed)	0.057	0.41	0.238	0.12	0.392	0.181
				N	187	187	187	187	187	187
		VAR03	Implement scope controls	Pearson Correlation	.143*	.243**	0.019	0.022	0.078	-0.06
				Sig. (1-tailed)	0.025	0	0.399	0.382	0.144	0.209
				N	187	187	187	187	187	187

5.5.5 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TIME MANAGEMENT” AND COMPETENCY ELEMENTS OF “ACHIEVEMENT AND ACTION”

As shown in Table 5.25, the results from Pearson correlation showed a positive relationship exists between “Implement project schedule” (Var05) and “Identifying and solving problems” (Var56) ($r=0.235$, $N=187$, $p=0.001$). The data indicated that as “Implement project schedule” (Var05) competency level increased, the project manager’s “Identifying and solving problems” (Var56) competency level increased as well.

Table 5.25: Correlation analysis between competency elements of “Time Management” and competency elements of “Achievement and Action”

The relationship between "Time Management" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Time Management	VAR04	Determining project Schedule	Pearson Correlation	.147*	.159*	-0.082	-.148*	0.028
				Sig. (1-tailed)	0.022	0.015	0.132	0.022	0.351
				N	187	187	187	187	187
		VAR05	Implement project schedule	Pearson Correlation	0.07	-0.055	-0.073	-.160*	.235**
				Sig. (1-tailed)	0.172	0.227	0.161	0.015	0.001
				N	0.172	187	187	187	187
		VAR06	Assess time management outcomes	Pearson Correlation	0.172	.134*	0.009	0.041	0.016
				Sig. (1-tailed)	0.172	0.033	0.451	0.289	0.413
				N	0.172	187	187	187	187

5.5.6 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TIME MANAGEMENT” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in Table 5.26, the results from Pearson correlation showed a positive relationship exists between “Implement project schedule” (Var05) and “Conscientiousness” (Var77) ($r=0.280$, $N=187$, $p=0.0$). The data indicated that as “Implement project schedule” (Var05) competency level increased, the project manager’s “Conscientiousness” (Var77) competency level increased as well. In the other words, as project manager’s competency level for determining the duration, sequence and dependencies of tasks, ensuring project schedule include all tasks, developing time management plan, obtaining agreement on the schedule and time management plan increased, his competency level for displaying clear commitment to a course of action in the face of challenge and match "words and deeds" in encouraging others to support the chosen direction increased as well.

Table 5.26: Correlation analysis between competency elements of “Time Management” and competency elements of “Personal Effectiveness”

The relationship between "Time Management" Competency elements and "Personal Effectiveness" competency elements					Person-Related Competencies						
					Personal Effectiveness						
					VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78
					Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity
Job-Related Competencies	Time Management	VAR04	Determining project Schedule	Pearson Correlation	0.065	-0.013	.166*	0.019	0.051	0.098	0.051
				Sig. (1-tailed)	0.187	0.432	0.012	0.399	0.245	0.092	0.242
				N	187	187	187	187	187	187	187
		VAR05	Implement project schedule	Pearson Correlation	-0.042	-0.005	0.037	-0.091	0.048	.280**	0.109
				Sig. (1-tailed)	0.284	0.473	0.306	0.108	0.255	0	0.068
				N	187	187	187	187	187	187	187
		VAR06	Assess time management outcomes	Pearson Correlation	0.106	0.03	0.003	0.001	0.022	-0.013	-.133*
				Sig. (1-tailed)	0.074	0.342	0.481	0.495	0.381	0.432	0.035
				N	187	187	187	187	187	187	187

5.5.7 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TIME MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Table 5.27, the results for Pearson correlation showed a negative relationship exists between “Determining project schedule” (Var04) and “Negotiation” (Var80) ($r = -0.213$, $N = 187$, $p = 0.002$). In fact, as project manager’s competency level for determining the duration, sequence and dependencies of tasks, ensuring project schedule include all tasks, developing time management plan, obtaining agreement on the schedule and time management plan increase, his competency level for searching for agreement, seeking acceptance, and alignment of views, identifying areas for negotiation, collecting all available information to achieve agreement, understanding the motivation, and exploring and evaluating responses decreased. Furthermore, the relationship between “Implement project schedule” (Var05) and “openness” (Var84) was found positively correlated ($r = 0.173$, $N = 187$, $p = 0.009$). The correlation between “Determining project schedule” (Var04) and “Negotiation” (Var80) showed to be more substantial, in compare to the correlation between “Implement project schedule” (Var05) and “openness” (Var84).

Table 5.27: Correlation analysis between competency elements of “Time Management” and competency elements of “Behavioral”

The relationship between "Time Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the heart)	Openness
Job-Related Competencies	Time Management	VAR04	Determining project Schedule	Pearson Correlation	0.019	-.213**	0.021	0.017	0.024	0.076
				Sig. (1-tailed)	0.399	0.002	0.389	0.411	0.374	0.15
				N	187	187	187	187	187	187
		VAR05	Implement project schedule	Pearson Correlation	-0.002	-.144*	0.035	-0.021	0.119	.173**
				Sig. (1-tailed)	0.49	0.025	0.316	0.388	0.052	0.009
				N	187	187	187	187	187	187
	VAR06	Assess time management outcomes		Pearson Correlation	-.162*	-0.001	-0.028	-0.079	0.029	-0.026
				Sig. (1-tailed)	0.014	0.492	0.35	0.141	0.344	0.364
				N	187	187	187	187	187	187

5.5.8 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TIME MANAGEMENT” AND COMPETENCY ELEMENTS OF “CONTEXTUAL”

As shown in Table 5.28 and Table 5.29, the results for Pearson correlation showed a positive relationship exists between “Implement project schedule” (Var05) and “Permanent organization” (Var95) ($r=0.245$, $N=187$, $p=0.0$). In the other words, as project manager’s competency for implementing mechanism to measure, recording and reporting progress of activities, using project schedule as the basis for progress measurement, regularly identifying variances and forecasting impacts of changes on schedule increased, his competency for overcoming any resistance from within the permanent organization and knowing how the policies and outputs of operations of the permanent organization are defined and controlled increased as well. Furthermore, the relationship between “Implement project schedule” (Var05) and “Legal awareness”

(Var98) was found positively correlated ($r=0.187$, $N=187$, $p=0.005$). In fact, as project manager's competency for understanding of the relevant legal duties, rights and processes that should be applied to projects, applying legal and contractual requirements, responding appropriately to claims of harassment, discrimination, safety issue or non-performance increased, his competency for implementing mechanism to measure, recording and reporting progress of activities, using project schedule as the basis for progress measurement, regularly identifying variances and forecasting impacts of changes on schedule increased as well.

Table 5.28: Correlation analysis between competency elements of "Time Management" and competency elements of "Contextual"

The relationship between "Time Management" Competency elements and "Contextual" competency elements					Person-Related Competencies					
					Contextual					
					VAR91	VAR92	VAR93	VAR94	VAR95	VAR96
					Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment
Job-Related Competencies	Time Management	VAR04	Determining project Schedule	Pearson Correlation	0.042	0.04	0.015	0.006	0.003	-0.099
				Sig. (1-tailed)	0.285	0.293	0.422	0.47	0.486	0.088
				N	187	187	187	187	187	187
		VAR05	Implement project schedule	Pearson Correlation	0.054	0.023	0.028	0.038	.245**	-.153*
				Sig. (1-tailed)	0.231	0.377	0.353	0.305	0	0.018
				N	187	187	187	187	187	187
		VAR06	Assess time management outcomes	Pearson Correlation	0.068	0.056	-0.103	-0.039	0.038	0.024
				Sig. (1-tailed)	0.179	0.223	0.08	0.297	0.302	0.373
				N	187	187	187	187	187	187

Table 5.29: Correlation analysis between competency elements of “Time Management” and competency elements of “Contextual”

The relationship between "Time Management" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Time Management	VAR04	Determining project Schedule	Pearson Correlation	0.024	0.059	0.11	-0.026	-.040
				Sig. (1-tailed)	0.372	0.211	0.066	0.364	.292
				N	187	187	187	187	187
		VAR05	Implement project schedule	Pearson Correlation	0.072	.187**	0.014	0.037	-.049
				Sig. (1-tailed)	0.163	0.005	0.426	0.31	.253
				N	187	187	187	187	187
		VAR06	Assess time management outcomes	Pearson Correlation	0.011	-0.085	-0.01	-0.027	.067
				Sig. (1-tailed)	0.443	0.124	0.446	0.358	.182
				N	187	187	187	187	187

5.5.9 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COST MANAGEMENT” AND COMPETENCY ELEMENTS OF “ACHIEVEMENT AND ACTION”

As shown in Table 5.30, the results for Pearson correlation showed a negative relationship exists between “Determining project budget” (Var07) and “Information Seeking” (Var55) ($r = -0.187$, $N = 187$, $p = 0.005$). In fact, as project manager’s competency level for determining resource requirements, estimating project costs and developing project budgets, developing a cost management plan to effectively manage project costs increase, his competency level for underlying curiosity, having desire to know more about things, people, or issues, making an effort to get more information, not accepting situations "at face value", ensuring information used to manage project is complete and accurate decreased. Furthermore, the relationship between “Determining

project budget” (Var07) and “Identifying and solving problems” (Var56) was found positively correlated ($r=0.193$, $N=187$, $p=0.004$). In the other words, as project manager’s competency level for identifying barriers that keep one from achieving set goals and standards, distinguishing between symptoms and problems, collecting data, identifying root causes, weighing alternatives, and taking appropriate actions increased, his competency level for determining resource requirements, estimating project costs and developing project budgets, developing a cost management plan to effectively manage project costs increased as well. The correlation between “Determining project schedule” (Var04) and “Negotiation” (Var80) showed to be more substantial, in compare to the correlation between “Implement project schedule” (Var05) and “openness” (Var84).

Table 5.30: Correlation analysis between competency elements of “Cost Management” and competency elements of “Achievement and Action”

The relationship between "Cost Management" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Cost Management	VAR07	Determining project budget	Pearson Correlation	0.071	0.112	-0.102	-.187**	.193**
				Sig. (1-tailed)	0.167	0.064	0.082	0.005	0.004
				N	187	187	187	187	187
		VAR08	Monitoring & controlling project budgets & costs	Pearson Correlation	-0.039	0.097	-0.113	-0.091	0.012
				Sig. (1-tailed)	0.297	0.092	0.061	0.107	0.434
				N	187	187	187	187	187
		VAR09	Conducting project financial completion activities	Pearson Correlation	0.113	0.097	-0.049	-0.074	0.079
				Sig. (1-tailed)	0.061	0.094	0.254	0.158	0.141
				N	187	187	187	187	187

5.5.10 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COST MANAGEMENT” AND COMPETENCY ELEMENTS OF “MANAGERIAL”

As shown in the Table 5.31, the correlation between “Determining project budget” (Var07) and “Making decision” (Var68) ($r = -0.307$, $N=187$, $p=0.0$) received the highest correlation rating followed by correlation between “Determining project budget” (Var07) and “Developing others” (Var64) ($r = -0.246$, $N=187$, $p=0.0$). Correlation between “Determining project budget” (Var07) and “Disciplining and counseling” (Var67) received the lowest correlation rating ($r = -0.206$, $N=187$, $p=0.002$). The results showed a negative relationship in the aforementioned correlations. In the other words, as project manager’s competency level for “Determining project budget” increased, his competency level for “Developing others”, “Disciplining and counseling”, and “Making decision” decreased.

Table 5.31: Correlation analysis between competency elements of “Cost Management” and competency elements of “Managerial”

The relationship between "Cost Management" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counseling	Making decisions
Job-Related Competencies	Cost Management	VAR07	Determining project budget	Pearson Correlation	0.079	-.246**	0.049	-0.071	-.206**	-.307**
				Sig. (1-tailed)	0.14	0	0.251	0.167	0.002	0
				N	187	187	187	187	187	187
		VAR08	Monitoring & controlling project budgets & costs	Pearson Correlation	.137*	0.06	-0.018	-0.083	-.124*	-.123*
				Sig. (1-tailed)	0.031	0.206	0.403	0.129	0.046	0.047
				N	187	187	187	187	187	187
		VAR09	Conducting project financial completion activities	Pearson Correlation	0.093	-0.114	-0.017	-0.074	-0.068	-0.097
				Sig. (1-tailed)	0.102	0.06	0.41	0.158	0.176	0.093
				N	187	187	187	187	187	187

5.5.11 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COST MANAGEMENT” AND COMPETENCY ELEMENTS OF “COGNITIVE”

As shown in Table 5.32, the results for Pearson correlation showed a negative relationship exists between “Determining project budget” (Var07) and “Conceptual thinking” (Var70) ($r = -0.176$, $N=187$, $p=0.008$). Furthermore, the relationship between “Monitoring and controlling project budgets and costs” (Var08) and “Critical analysis and judgment” (Var71) was found negatively correlated ($r = -0.202$, $N=187$, $p=0.003$). However, correlation between “Monitoring and controlling project budgets and costs” (Var08) and “Critical analysis and judgment” (Var71) showed to be more substantial, in compare to the correlation between “Determining project budget” (Var07) and “Conceptual thinking” (Var70).

Table 5.32: Correlation analysis between competency elements of “Cost Management” and competency elements of “Cognitive”

The relationship between "Cost Management" Competency elements and "Cognitive" competency elements					Person-Related Competencies		
					Cognitive		
					VAR69	VAR70	VAR71
					Analytical Thinking	Conceptual Thinking	Critical analysis & judgement
Job-Related Competencies	Cost Management	VAR07	Determining project budget	Pearson Correlation	-.156*	-.176**	-.156*
				Sig. (1-tailed)	0.016	0.008	0.016
				N	187	187	187
		VAR08	Monitoring & controlling project budgets & costs	Pearson Correlation	0.056	-0.001	-.202**
				Sig. (1-tailed)	0.225	0.494	0.003
				N	187	187	187
		VAR09	Conducting project financial completion activities	Pearson Correlation	0.12	-0.028	0.018
				Sig. (1-tailed)	0.051	0.352	0.405
				N	187	187	187

5.5.12 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COST MANAGEMENT” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in Table 5.33, the results for Pearson correlation showed a negative relationship exists between “Determining project budget” (Var07) and “Organizational commitment” (Var75) ($r = -0.251$, $N = 187$, $p = 0.0$). In fact, as project manager’s competency level for determining resource requirements, estimating project costs and developing project budgets, developing a cost management plan to effectively manage project costs increase, his ability and willingness to align one's own behaviour with the needs, priorities, and goals of the organization, to act in way that promote organizational goals, and demonstrate commitment to the project decreased. Furthermore, the relationship between “Determining project budget” (Var07) and “Conscientiousness” (Var77) was found positively correlated ($r = 0.188$, $N = 187$, $p = 0.005$).

Table 5.33: Correlation analysis between competency elements of “Cost Management” and competency elements of “Personal Effectiveness”

The relationship between "Cost Management" Competency elements and "Personal Effectiveness" competency elements				Person-Related Competencies							
				Personal Effectiveness							
				VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78	
				Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity	
Job-Related Competencies	Cost Management	VAR07	Determining project budget	Pearson Correlation	-0.12	0.034	0.023	-.251**	-0.087	.188**	.127*
				Sig. (1-tailed)	0.05	0.324	0.376	0	0.118	0.005	0.041
				N	187	187	187	187	187	187	
		VAR08	Monitoring & controlling project budgets & costs	Pearson Correlation	.128*	0.001	0.104	-0.055	-0.023	.161*	0.041
				Sig. (1-tailed)	0.04	0.494	0.079	0.227	0.378	0.014	0.29
				N	187	187	187	187	187	187	
		VAR09	Conducting project financial completion activities	Pearson Correlation	0.044	0.011	0.074	-0.05	0.019	0.007	0.042
				Sig. (1-tailed)	0.276	0.442	0.157	0.247	0.4	0.461	0.282
				N	187	187	187	187	187	187	

5.5.13 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COST MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Table 5.34 and Table 5.35, the results for Pearson correlation showed a positive relationship exists between “Determining project budget” (Var07) and “Engagement and motivation (Encourage the heart)” (Var83) ($r= 0.244$, $N=187$, $p=0.0$), “Conducting project financial completion activities” (Var09) and “Engagement and motivation (Encourage the heart)” (Var83) ($r= 0.185$, $N=187$, $p=0.006$), and also between “Monitoring and controlling project budget and costs” (Var08) and “Result orientation” (Var85) ($r= 0.237$, $N=187$, $p=0.001$). However, the relationship between “Determining project budget” (Var07) and “The ability to deal with ambiguity” (Var90) was found negatively correlated ($r= -0.245$, $N=187$, $p=0.0$).

Table 5.34: Correlation analysis between competency elements of “Cost Management” and competency elements of “Behavioral”

The relationship between "Cost Management" Competency elements and "Behavioural" competency elements				Person-Related Competencies						
				Behavioural						
				VAR79	VAR80	VAR81	VAR82	VAR83	VAR84	
				Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the heart)	Openness	
Job-Related Competencies	Cost Management	VAR07	Determining project budget	Pearson Correlation	0.066	-.130*	-.157*	-0.071	.244**	0.107
				Sig. (1-tailed)	0.185	0.038	0.016	0.166	0	0.072
				N	187	187	187	187	187	187
		VAR08	Monitoring & controlling project budgets & costs	Pearson Correlation	0.038	-0.097	0.062	0.091	0.024	0.018
				Sig. (1-tailed)	0.304	0.093	0.201	0.109	0.374	0.401
				N	187	187	187	187	187	187
		VAR09	Conducting project financial completion activities	Pearson Correlation	-0.001	-0.055	-.123*	0.034	.185**	0.095
				Sig. (1-tailed)	0.494	0.227	0.046	0.321	0.006	0.097
				N	187	187	187	187	187	187

Table 5.35: Correlation analysis between competency elements of “Cost Management” and competency elements of “Behavioral”

The relationship between "Cost Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Cost Management	VAR07	Determining project budget	Pearson Correlation	.168*	.128*	.122*	0.058	-0.047	-.245**
				Sig. (1-tailed)	0.011	0.04	0.048	0.216	0.262	0
				N	187	187	187	187	187	187
		VAR08	Monitoring & controlling project budgets & costs	Pearson Correlation	.237**	.139*	0.08	-0.072	0.04	-0.078
				Sig. (1-tailed)	0.001	0.029	0.14	0.164	0.295	0.145
				N	187	187	187	187	187	187
		VAR09	Conducting project financial completion activities	Pearson Correlation	0.119	.130*	.130*	.135*	0.044	0.011
				Sig. (1-tailed)	0.052	0.038	0.038	0.032	0.276	0.443
				N	187	187	187	187	187	187

5.5.14 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COST MANAGEMENT” AND COMPETENCY ELEMENTS OF “CONTEXTUAL”

As shown in Table 5.36 and Table 5.37, the results for Pearson correlation showed a negative relationship exists between “Conducting project financial completion activities” (Var09) and “Portfolio orientation” (Var93) ($r = -0.173$, $N=187$, $p=0.009$). Furthermore, the relationship between “Determining project budget” (Var07) and “Cultural awareness” (Var100) was found negatively correlated ($r = -0.283$, $N=187$, $p=0.0$). However, correlation between “Determining project budget” (Var07) and “Cultural awareness” (Var100) showed to be more substantial, in compare to the correlation between “Conducting project financial completion activities” (Var09) and “Portfolio orientation” (Var93).

Table 5.36: Correlation analysis between competency elements of “Cost Management” and competency elements of “Contextual”

The relationship between "Cost Management" Competency elements and "Contextual" competency elements					Person-Related Competencies					
					Contextual					
					VAR91	VAR92	VAR93	VAR94	VAR95	VAR96
					Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment
Job-Related Competencies	Cost Management	VAR07	Determining project budget	Pearson Correlation	0.044	0.089	-0.027	0.098	0.118	-.152*
				Sig. (1-tailed)	0.276	0.112	0.357	0.09	0.053	0.019
				N	187	187	187	187	187	187
		VAR08	Monitoring & controlling project budgets & costs	Pearson Correlation	0.068	0.026	-0.028	-0.023	.154*	-0.033
				Sig. (1-tailed)	0.179	0.361	0.353	0.38	0.017	0.329
				N	187	187	187	187	187	187
		VAR09	Conducting project financial completion activities	Pearson Correlation	0.079	0.05	-.173**	-0.038	.157*	-0.101
				Sig. (1-tailed)	0.141	0.247	0.009	0.303	0.016	0.085
				N	187	187	187	187	187	187

Table 5.37: Correlation analysis between competency elements of “Cost Management” and competency elements of “Contextual”

The relationship between "Cost Management" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Cost Management	VAR07	Determining project budget	Pearson Correlation	0.071	0.08	0.05	-.283**	.028
				Sig. (1-tailed)	0.166	0.14	0.248	0	.352
				N	187	187	187	187	187
		VAR08	Monitoring & controlling project budgets & costs	Pearson Correlation	.127*	0.066	-0.006	-0.009	.027
				Sig. (1-tailed)	0.042	0.184	0.469	0.45	.357
				N	187	187	187	187	187
		VAR09	Conducting project financial completion activities	Pearson Correlation	0.086	0.059	.145*	-0.003	.107
				Sig. (1-tailed)	0.12	0.213	0.023	0.486	.073
				N	187	187	187	187	187

5.5.15 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “QUALITY MANAGEMENT” AND COMPETENCY ELEMENTS OF “IMPACT AND INFLUENCE”

As shown in Table 5.38, the results from Pearson correlation showed a positive relationship exists between “Implementing quality assurance” (Var11) and “Organizational awareness” (Var60) ($r=0.176$, $N=187$, $p=0.008$). The data indicated that as project manager’s ability to hear accurately and understanding the unspoken or partly expressed thoughts, feelings, and concerns of others, striving to understand all stakeholders’ thoughts, and listening and responding to others increased, his competency level for measuring and documenting results of project activities to determining their compliance with quality standards, conducting inspections, identifying causes of unsatisfactory outcomes and submission recommendations increased as well.

Table 5.38: Correlation analysis between competency elements of “Quality Management” and competency elements of “Impact and influence”

The relationship between "Quality Management" Competency elements and "Impact & influence" competency elements					Person-Related Competencies			
					Impact & influence			
					VAR59	VAR60	VAR61	VAR62
					Impact & influence	Organizational Awareness	Relationship Building	Building trust
Job-Related Competencies	Quality Management	VAR10	Determining quality requirement	Pearson Correlation	-0.065	.138*	0.102	-0.083
				Sig. (1-tailed)	0.189	0.03	0.083	0.129
				N	187	187	187	187
		VAR11	Implementing quality assurance	Pearson Correlation	0.062	.176**	.124*	0.088
				Sig. (1-tailed)	0.198	0.008	0.046	0.114
				N	187	187	187	187
		VAR12	Implementing project quality improvements	Pearson Correlation	-0.032	.121*	0.073	0.018
				Sig. (1-tailed)	0.33	0.05	0.161	0.404
				N	187	187	187	187

5.5.16 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “QUALITY MANAGEMENT” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in Table 5.39, the results from Pearson correlation showed a positive relationship exists between “Implementing project quality improvements” (Var12) and “Self-control” (Var72) ($r=0.203$, $N=187$, $p=0.003$). The data indicated that as project manager’s the ability to keep emotions under control and restrain negative actions when tempted, when faced with opposition or hostility from others increased, his competency level for reviewing quality processes and implementing agreed changes to ensure continuous improvement to quality, reviewing outcomes to determine effectiveness of quality management processes and identifying quality management lessons learned increased as well.

Table 5.39: Correlation analysis between competency elements of “Quality Management” and competency elements of “Personal Effectiveness”

The relationship between "Quality Management" Competency elements and "Personal Effectiveness" competency elements					Person-Related Competencies						
					Personal Effectiveness						
					VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78
					Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity
Job-Related Competencies	Quality Management	VAR10	Determining quality requirement	Pearson Correlation	0.08	0.051	0.029	0.031	0.06	.148*	.124*
				Sig. (1-tailed)	0.139	0.245	0.345	0.338	0.207	0.022	0.045
				N	187	187	187	187	187	187	187
		VAR11	Implementing quality assurance	Pearson Correlation	-0.026	0.074	0.11	-.161*	-.136*	.132*	0.024
				Sig. (1-tailed)	0.363	0.158	0.067	0.014	0.032	0.036	0.372
				N	187	187	187	187	187	187	187
		VAR12	Implementing project quality improvements	Pearson Correlation	.203**	-0.009	.133*	-0.029	0.064	-0.1	0.044
				Sig. (1-tailed)	0.003	0.451	0.035	0.348	0.193	0.088	0.274
				N	187	187	187	187	187	187	187

5.5.17 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “QUALITY MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in the Table 5.40 and Table 5.41, the correlation between “Determining quality requirement” (Var10) and “Professionalism and ethics” (Var82) ($r= 0.205$, $N=187$, $p=0.002$) received the highest correlation rating followed by correlation between “Implementing project quality improvements” (Var12) and “Result orientation” (Var85) ($r= 0.190$, $N=187$, $p=0.005$). Correlation between “Determining quality requirement” (Var10) and “Conflict management” (Var79) received the lowest correlation rating ($r= 0.189$, $N=187$, $p=0.005$). The results showed a positive relationship in the aforementioned correlations.

Table 5.40: Correlation analysis between competency elements of “Quality Management” and competency elements of “Behavioral”

The relationship between "Quality Management" Competency elements and "Behavioral" competency elements				Person-Related Competencies						
				Behavioral						
				VAR79	VAR80	VAR81	VAR82	VAR83	VAR84	
				Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the	Openness	
Job-Related Competencies	Quality Management	VAR10	Determining quality requirement	Pearson Correlation	.189**	0.027	0.105	.205**	-0.062	.161*
				Sig. (1-tailed)	0.005	0.356	0.075	0.002	0.198	0.014
				N	187	187	187	187	187	187
		VAR11	Implementing quality assurance	Pearson Correlation	-0.069	0.085	0.022	-0.02	-0.016	0.047
				Sig. (1-tailed)	0.173	0.124	0.38	0.395	0.415	0.261
				N	187	187	187	187	187	187
		VAR12	Implementing project quality improvements	Pearson Correlation	0.06	0.078	0.058	0.065	0.097	-0.091
				Sig. (1-tailed)	0.209	0.144	0.214	0.187	0.094	0.107
				N	187	187	187	187	187	187

Table 5.41: Correlation analysis between competency elements of “Quality Management” and competency elements of “Behavioral”

The relationship between "Quality Management" Competency elements and "Behavioral" competency elements					Person-Related Competencies					
					Behavioral					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Quality Management	VAR10	Determining quality requirement	Pearson Correlation	0.073	0.074	.138*	0.013	-0.013	0
				Sig. (1-tailed)	0.16	0.158	0.03	0.432	0.428	0.498
				N	187	187	187	187	187	187
		VAR11	Implementing quality assurance	Pearson Correlation	.151*	-0.006	0.037	0.095	-0.023	0.034
				Sig. (1-tailed)	0.02	0.468	0.307	0.097	0.38	0.322
				N	187	187	187	187	187	187
		VAR12	Implementing project quality improvements	Pearson Correlation	.190**	0.079	0.099	.142*	0.082	-0.039
				Sig. (1-tailed)	0.005	0.141	0.088	0.026	0.134	0.296
				N	187	187	187	187	187	187

5.5.18 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “HUMAN RESOURCE MANAGEMENT” AND COMPETENCY ELEMENTS OF “ACHIEVEMENT AND ACTION”

As shown in Table 5.42, the results for Pearson correlation showed a positive relationship exists between “Assessing human resource outcomes” (Var16) and “Concern for order, quality, and accuracy” (Var53) ($r = 0.194$, $N = 187$, $p = 0.004$). In fact, as project manager’s competency for reviewing project progress, issues and outcomes to determine effectiveness of HRM processes, procedures and tools increased, his competency for underlying drive to reduce uncertainty in the surrounding environment, managing projects in an ordered, accurate way, providing accurate and truthful information increased as well. However, the relationship between “Managing the project team and stakeholders” (Var15) and “Information seeking” (Var55) was found negatively correlated ($r = -0.247$, $N = 187$, $p = 0.0$).

Table 5.42: Correlation analysis between competency elements of “Human Resource Management” and competency elements of “Achievement and Action”

The relationship between "Human Resource Management" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Human Resource Management	VAR13	Implementing human resources & stakeholder planning activities	Pearson Correlation	.136*	.149*	-.161*	-0.008	.133*
				Sig. (1-tailed)	0.031	0.021	0.014	0.455	0.035
				N	187	187	187	187	187
		VAR14	Implementing staff training & development	Pearson Correlation	-0.062	0.076	-0.007	0.012	.126*
				Sig. (1-tailed)	0.198	0.151	0.462	0.433	0.042
				N	187	187	187	187	187
		VAR15	Managing the project team & stakeholders	Pearson Correlation	0.111	.167*	-0.033	-.247**	.134*
				Sig. (1-tailed)	0.065	0.011	0.326	0	0.033
				N	187	187	187	187	187
		VAR16	Assessing human resource outcomes	Pearson Correlation	0.039	.194**	0.109	-0.024	0.075
				Sig. (1-tailed)	0.296	0.004	0.068	0.373	0.154
				N	187	187	187	187	187

5.5.19 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “HUMAN RESOURCE MANAGEMENT” AND COMPETENCY ELEMENTS OF “IMPACT AND INFLUENCE”

As shown in the Table 5.43, the correlation between “Implementing staff training and development” (Var14) and “Organizational awareness” (Var60) ($r = 0.231$, $N = 187$, $p = 0.001$) received the highest correlation rating followed by correlation between “Assessing human resource outcomes” (Var16) and “Building trust” (Var62) ($r = 0.192$, $N = 187$, $p = 0.004$). Correlation between “Implementing human resources and stakeholders planning activities” (Var13) and “Impact and influence” (Var59) received

the lowest correlation rating ($r= 0.190$, $N=187$, $p=0.005$). The results showed a positive relationship in the aforementioned correlations.

Table 5.43: Correlation analysis between competency elements of “Human Resource Management” and competency elements of “Impact and influence”

The relationship between "Human Resource Management" Competency elements and "Impact & influence" competency elements					Person-Related Competencies			
					Impact & influence			
					VAR59	VAR60	VAR61	VAR62
					Impact & influence	Organizational Awareness	Relationship Building	Building trust
Job-Related Competencies	Human Resource Management	VAR13	Implementing human resources & stakeholder planning activities	Pearson Correlation	.190**	-0.064	0.005	0.071
				Sig. (1-tailed)	0.005	0.193	0.472	0.167
				N	187	187	187	187
		VAR14	Implementing staff training & development	Pearson Correlation	0.079	.231**	0.053	0.06
				Sig. (1-tailed)	0.141	0.001	0.235	0.208
				N	187	187	187	187
		VAR15	Managing the project team & stakeholders	Pearson Correlation	0.096	0.026	-0.031	0.007
				Sig. (1-tailed)	0.096	0.364	0.338	0.461
				N	187	187	187	187
		VAR16	Assessing human resource outcomes	Pearson Correlation	-0.04	0.053	-0.012	.192**
				Sig. (1-tailed)	0.293	0.234	0.436	0.004
				N	187	187	187	187

5.5.20 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “HUMAN RESOURCE MANAGEMENT” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in Table 5.44, the results for Pearson correlation showed a positive relationship exists between “Implementing human resources and stakeholders planning activities” (Var13) and “Self-control” (Var72) ($r= 0.171$, $N=187$, $p=0.001$).

Furthermore, the relationship between “Implementing human resources and stakeholders planning activities” (Var13) and “Conscientiousness” (Var77) was found positively correlated ($r= 0.224$, $N=187$, $p=0.001$). However, correlation between “Implementing human resources and stakeholders planning activities” (Var13) and “Conscientiousness” (Var77) showed to be more substantial, in compare to the correlation between “Implementing human resources and stakeholders planning activities” (Var13) and “Self-control” (Var72).

Table 5.44: Correlation analysis between competency elements of “Human Resource Management” and competency elements of “Personal Effectiveness”

The relationship between "Human Resource Management" Competency elements and "Impact & influence" competency elements					Person-Related Competencies						
					Personal Effectiveness						
					VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78
					Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity
Job-Related Competencies	Human Resource Management	VAR13	Implementing human resources & stakeholder planning activities	Pearson Correlation	.171**	-0.006	0.065	0.003	-0.04	.224**	0.021
				Sig. (1-tailed)	0.01	0.468	0.187	0.486	0.292	0.001	0.389
				N	187	187	187	187	187	187	187
		VAR14	Implementing staff training & development	Pearson Correlation	0.05	0.012	0.082	0.001	-0.08	0.084	0.002
				Sig. (1-tailed)	0.248	0.433	0.133	0.492	0.138	0.125	0.488
				N	187	187	187	187	187	187	187
		VAR15	Managing the project team & stakeholders	Pearson Correlation	-0.068	-0.082	0.073	-0.065	0.072	.125*	0.064
				Sig. (1-tailed)	0.176	0.133	0.161	0.188	0.163	0.044	0.193
				N	187	187	187	187	187	187	187
		VAR16	Assessing human resource outcomes	Pearson Correlation	0.013	0.113	-0.027	0.113	-.140*	.123*	0.111
				Sig. (1-tailed)	0.432	0.062	0.358	0.061	0.028	0.047	0.065
				N	187	187	187	187	187	187	187

5.5.21 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “HUMAN RESOURCE MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Table 5.45, the results for Pearson correlation showed a positive relationship exists between “Managing the project team and stakeholders” (Var15) and

“Result orientation” (Var85) ($r= 0.198$, $N=187$, $p=0.003$). Furthermore, the relationship between “Assessing human resource outcomes” (Var16) and “Result orientation” (Var85) was found positively correlated ($r= 0.177$, $N=187$, $p=0.008$). However, correlation between “Managing the project team and stakeholders” (Var15) and “Result orientation” (Var85) showed to be more substantial, in compare to the correlation between “Assessing human resource outcomes” (Var16) and “Result orientation” (Var85).

Table 5.45: Correlation analysis between competency elements of “Human Resource Management” and competency elements of “Behavioral”

The relationship between "Human Resource Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Human Resource Management	VAR13	Implementing human resources & stakeholder planning activities	Pearson Correlation	0.092	0.053	0.077	0.028	-0.068	0.022
				Sig. (1-tailed)	0.106	0.238	0.147	0.352	0.178	0.382
				N	187	187	187	187	187	187
		VAR14	Implementing staff training & development	Pearson Correlation	0.024	0.041	.161*	0.061	-0.001	-0.004
				Sig. (1-tailed)	0.374	0.289	0.014	0.203	0.496	0.481
				N	187	187	187	187	187	187
		VAR15	Managing the project team & stakeholders	Pearson Correlation	.198**	0.009	0.058	.125*	0.011	-.126*
				Sig. (1-tailed)	0.003	0.45	0.214	0.045	0.439	0.042
				N	187	187	187	187	187	187
		VAR16	Assessing human resource outcomes	Pearson Correlation	.177**	.122*	0.11	0.018	0.111	0.034
				Sig. (1-tailed)	0.008	0.048	0.067	0.403	0.066	0.322
				N	187	187	187	187	187	187

5.5.22 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “HUMAN RESOURCE MANAGEMENT” AND COMPETENCY ELEMENTS OF “CONTEXTUAL”

As shown in Table 5.46 and Table 5.47, the results for Pearson correlation showed a positive relationship exists between “Implementing human resources and stakeholder planning activities” (Var13) and “Program orientation (Strategic perspective)” (Var92) ($r= 0.228$, $N=187$, $p=0.001$). Furthermore, the relationship between “Managing the project team and stakeholders” (Var15) and “Legal awareness” (Var98) was found positively correlated ($r= 0.177$, $N=187$, $p=0.008$).

Table 5.46: Correlation analysis between competency elements of “Human Resource Management” and competency elements of “Contextual”

The relationship between "Human Resource Management" Competency elements and "Contextual" competency elements					Person-Related Competencies					
					Contextual					
					VAR91	VAR92	VAR93	VAR94	VAR95	VAR96
					Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment
Job-Related Competencies	Human Resource Management	VAR13	Implementing human resources & stakeholder planning activities	Pearson Correlation	0.093	.228**	-0.003	-0.04	-0.001	-0.038
				Sig. (1-tailed)	0.103	0.001	0.484	0.294	0.495	0.303
				N	187	187	187	187	187	187
		VAR14	Implementing staff training & development	Pearson Correlation	0.066	0.042	-0.02	0.097	-0.053	0.072
				Sig. (1-tailed)	0.185	0.283	0.39	0.093	0.236	0.164
				N	187	187	187	187	187	187
		VAR15	Managing the project team & stakeholders	Pearson Correlation	0.045	-0.039	0.044	-0.023	.125*	-0.056
				Sig. (1-tailed)	0.27	0.297	0.275	0.376	0.044	0.223
				N	187	187	187	187	187	187
		VAR16	Assessing human resource outcomes	Pearson Correlation	0.078	0.009	0.092	0.076	0.118	0.061
				Sig. (1-tailed)	0.145	0.451	0.104	0.149	0.054	0.202
				N	187	187	187	187	187	187

Table 5.47: Correlation analysis between competency elements of “Human Resource Management” and competency elements of “Contextual”

The relationship between "Human Resource Management" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Human Resource Management	VAR13	Implementing human resources & stakeholder planning activities	Pearson Correlation	0.118	0.041	0.063	-0.018	-.007
				Sig. (1-tailed)	0.054	0.289	0.196	0.402	.462
				N	187	187	187	187	187
		VAR14	Implementing staff training & development	Pearson Correlation	0.076	0.009	-0.037	0.017	.036
				Sig. (1-tailed)	0.151	0.451	0.308	0.406	.311
				N	187	187	187	187	187
		VAR15	Managing the project team & stakeholders	Pearson Correlation	.132*	.243**	0.028	0.007	.006
				Sig. (1-tailed)	0.036	0	0.35	0.461	.465
				N	187	187	187	187	187
		VAR16	Assessing human resource outcomes	Pearson Correlation	0.074	.152*	0.049	0.022	.021
				Sig. (1-tailed)	0.156	0.019	0.254	0.382	.389
				N	187	187	187	187	187

5.5.23 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COMMUNICATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “IMPACT AND INFLUENCE”

As shown in Table 5.48, the results for Pearson correlation showed a positive relationship exists between “Managing information” (Var18) and “Organizational awareness” (Var60) ($r = 0.206$, $N = 187$, $p = 0.002$). Furthermore, the relationship between “Managing project reporting” (Var19) and “Organizational awareness” (Var60) was found positively correlated ($r = 0.195$, $N = 187$, $p = 0.004$).

Table 5.48: Correlation analysis between competency elements of “Communication Management” and competency elements of “Impact and influence”

The relationship between "Communication Management" Competency elements and "Impact & influence" competency elements					Person-Related Competencies			
					Impact & influence			
					VAR59	VAR60	VAR61	VAR62
					Impact & influence	Organizational Awareness	Relationship Building	Building trust
Job-Related Competencies	Communication Management	VAR17	Plan communications processes	Pearson Correlation	.156*	0.055	-0.006	.164*
				Sig. (1-tailed)	0.016	0.229	0.467	0.012
				N	187	187	187	187
		VAR18	Managing information	Pearson Correlation	0.004	.206**	.154*	0.042
				Sig. (1-tailed)	0.477	0.002	0.018	0.283
				N	187	187	187	187
		VAR19	Managing project reporting	Pearson Correlation	0.049	.195**	0.109	0.084
				Sig. (1-tailed)	0.254	0.004	0.068	0.126
				N	187	187	187	187
		VAR20	Assessing communication management outcomes	Pearson Correlation	0.084	0.056	-0.022	0.029
				Sig. (1-tailed)	0.127	0.225	0.38	0.348
				N	187	187	187	187

5.5.24 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COMMUNICATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “MANAGERIAL”

As shown in Table 5.49, the results for Pearson correlation showed a positive relationship exists between “Assessing communication management outcomes” (Var20) and “Teamwork & Cooperation” (Var63) ($r = 0.177$, $N = 187$, $p = 0.008$). In fact, as project manager’s genuine intention to work cooperatively with others, to be part of a team, to work together, as opposed to working separately or competitively, building team, orientation within the project, and undertaking team-building activities increased, his

competency for reviewing project progress, issues and outcomes to determine the effectiveness of communication management processes increased as well. However, the relationship between “Planning communications processes” (Var17) and “Making decisions” (Var68) was found negatively correlated ($r = -0.190$, $N = 187$, $p = 0.005$).

Table 5.49: Correlation analysis between competency elements of “Communication Management” and competency elements of “Managerial”

The relationship between "Communication Management" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counselling	Making decisions
Job-Related Competencies	Communication Management	VAR17	Plan communications processes	Pearson Correlation	0.03	0.017	0.09	-0.021	-0.011	-.190**
				Sig. (1-tailed)	0.344	0.409	0.111	0.388	0.44	0.005
				N	187	187	187	187	187	187
		VAR18	Managing information	Pearson Correlation	0.093	-0.048	.135*	0.026	0.118	0.052
				Sig. (1-tailed)	0.104	0.258	0.033	0.36	0.054	0.239
				N	187	187	187	187	187	187
		VAR19	Managing project reporting	Pearson Correlation	0.115	0.077	0.029	.126*	0.097	0.116
				Sig. (1-tailed)	0.059	0.146	0.345	0.043	0.093	0.057
				N	187	187	187	187	187	187
		VAR20	Assessing communication management outcomes	Pearson Correlation	.177**	.131*	-0.047	0.05	-0.104	-0.002
				Sig. (1-tailed)	0.008	0.037	0.262	0.248	0.077	0.488
				N	187	187	187	187	187	187

5.5.25 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COMMUNICATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in Table 5.50, the results from Pearson correlation showed a negative relationship exists between “Planning communications processes” (Var17) and “Intuitiveness” (Var76) ($r = -0.205$, $N = 187$, $p = 0.002$). The data indicated that as project manager’s ability for identifying, documenting and analyzing information requirements, developing and implementing the communication management plan, and establishing

project management information system increased, his competency level for being able to understand something by using feeling rather than by considering the facts, arriving clear decisions and being able to drive other people implementation in the face of incomplete or ambiguous information decreased.

Table 5.50: Correlation analysis between competency elements of “Communication Management” and competency elements of “Personal Effectiveness”

The relationship between "Communication Management" Competency elements and "Personal Effectiveness" competency elements					Person-Related Competencies						
					Personal Effectiveness						
					VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78
					Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity
Job-Related Competencies	Communication Management	VAR17	Plan communications processes	Pearson Correlation	-0.001	0.001	0.072	0.022	-.205**	.165*	0.094
				Sig. (1-tailed)	0.493	0.492	0.162	0.383	0.002	0.012	0.1
				N	187	187	187	187	187	187	187
		VAR18	Managing information	Pearson Correlation	0.086	0.055	0.004	0.08	-0.024	0.092	0.087
				Sig. (1-tailed)	0.12	0.228	0.479	0.137	0.374	0.106	0.118
				N	187	187	187	187	187	187	187
		VAR19	Managing project reporting	Pearson Correlation	.132*	-0.033	0.015	-0.027	0.067	0.031	-0.007
				Sig. (1-tailed)	0.036	0.328	0.42	0.358	0.182	0.339	0.461
				N	187	187	187	187	187	187	187
		VAR20	Assessing communication management outcomes	Pearson Correlation	0.037	0.074	.147*	-0.013	.147*	-0.087	-0.066
				Sig. (1-tailed)	0.308	0.157	0.023	0.429	0.023	0.118	0.184
				N	187	187	187	187	187	187	187

5.5.26 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “COMMUNICATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Tables 5.51 and 5.52, the results for Pearson correlation showed a negative relationship exists between “Planning communications processes” (Var17) and “The ability to deal with ambiguity” (Var90) ($r = -0.216$, $N = 187$, $p = 0.001$). However, the relationship between “Planning communications processes” (Var17) and “Engagement & motivation (Encourage the heart)” (Var83) was found positively correlated ($r = 0.174$,

N=187, p=0.009). Moreover, the relationship between “Managing information” (Var18) and “Effective communication” (Var89) was found positively correlated (r=0.205, N=187, p=0.002).

Table 5.51: Correlation analysis between competency elements of “Communication Management” and competency elements of “Behavioral”

The relationship between "Communication Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the	Openness
Job-Related Competencies	Communication Management	VAR17	Plan communications processes	Pearson Correlation	.166*	0.052	0.03	0.041	.174**	0.061
				Sig. (1-tailed)	0.011	0.239	0.34	0.287	0.009	0.202
				N	187	187	187	187	187	187
		VAR18	Managing information	Pearson Correlation	0.054	-.142*	0.076	.144*	0.108	0.024
				Sig. (1-tailed)	0.231	0.026	0.15	0.024	0.07	0.372
				N	187	187	187	187	187	187
		VAR19	Managing project reporting	Pearson Correlation	0.09	0.001	0.016	0.083	-0.039	0.021
				Sig. (1-tailed)	0.111	0.494	0.412	0.131	0.296	0.386
				N	187	187	187	187	187	187
		VAR20	Assessing communication management outcomes	Pearson Correlation	0.067	-0.031	0.106	0.117	0.003	.135*
				Sig. (1-tailed)	0.18	0.338	0.075	0.055	0.486	0.033
				N	187	187	187	187	187	187

Table 5.52: Correlation analysis between competency elements of “Communication Management” and competency elements of “Behavioral”

The relationship between "Communication Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the	Openness
Job-Related Competencies	Communication Management	VAR17	Plan communications processes	Pearson Correlation	.166*	0.052	0.03	0.041	.174**	0.061
				Sig. (1-tailed)	0.011	0.239	0.34	0.287	0.009	0.202
				N	187	187	187	187	187	187
		VAR18	Managing information	Pearson Correlation	0.054	-.142*	0.076	.144*	0.108	0.024
				Sig. (1-tailed)	0.231	0.026	0.15	0.024	0.07	0.372
				N	187	187	187	187	187	187
		VAR19	Managing project reporting	Pearson Correlation	0.09	0.001	0.016	0.083	-0.039	0.021
				Sig. (1-tailed)	0.111	0.494	0.412	0.131	0.296	0.386
				N	187	187	187	187	187	187
		VAR20	Assessing communication management outcomes	Pearson Correlation	0.067	-0.031	0.106	0.117	0.003	.135*
				Sig. (1-tailed)	0.18	0.338	0.075	0.055	0.486	0.033
				N	187	187	187	187	187	187

5.5.27 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “RISK MANAGEMENT” AND COMPETENCY ELEMENTS OF “ACHIEVEMENT AND ACTION”

As shown in the Table 5.53, the correlation between “Determining project risk events” (Var21) and “Achievement orientation (Result orientation)” (Var52) ($r = 0.211$, $N = 187$, $p = 0.002$) received the highest correlation rating followed by correlation between “Monitoring & managing project risks” (Var23) and “Information Seeking” (Var55) ($r = 0.203$, $N = 187$, $p = 0.003$). Correlation between “Assessing risk management outcomes” (Var24) and “Achievement orientation (Result orientation)” (Var52) received the lowest correlation rating ($r = 0.174$, $N = 187$, $p = 0.009$). The results showed a positive relationship in the aforementioned correlations.

Table 5.53: Correlation analysis between competency elements of “Risk Management” and competency elements of “Achievement and Action”

The relationship between "Risk Management" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Risk Management	VAR21	Determining project risk events	Pearson Correlation	.211**	0.064	0.003	-0.023	0.092
				Sig. (1-tailed)	0.002	0.191	0.482	0.377	0.106
				N	187	187	187	187	187
		VAR22	Monitoring & managing opportunities	Pearson Correlation	0.09	0.053	0.012	-0.016	0.087
				Sig. (1-tailed)	0.111	0.237	0.437	0.412	0.119
				N	187	187	187	187	187
		VAR23	Monitoring & managing project risks	Pearson Correlation	0.02	0.108	.135*	.203**	0.067
				Sig. (1-tailed)	0.394	0.071	0.033	0.003	0.18
				N	187	187	187	187	187
		VAR24	Assessing risk management outcomes	Pearson Correlation	.174**	.168*	0.09	.163*	.124*
				Sig. (1-tailed)	0.009	0.011	0.109	0.013	0.046
				N	187	187	187	187	187

5.5.28 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “RISK MANAGEMENT” AND COMPETENCY ELEMENTS OF “IMPACT & INFLUENCE”

As shown in Table 5.54, the results from Pearson correlation showed a positive relationship exists between “Assessing risk management outcomes” (Var24) and “Organizational Awareness” (Var60) ($r=0.177$, $N=187$, $p=0.008$). The data indicated that as project manager’s the ability for understanding other people and his ability to hear accurately and understanding the unspoken or partly expressed thoughts, feelings, and concerns of others and understanding all stakeholders’ thoughts, and listening and responding to others increased, his competency level for reviewing project progress,

issues and outcomes to determine effectiveness of risk management processes increased as well.

Table 5.54: Correlation analysis between competency elements of “Risk Management” and competency elements of “Impact & influence”

The relationship between "Risk Management" Competency elements and "Impact & influence" competency elements					Person-Related Competencies			
					Impact & influence			
					VAR59	VAR60	VAR61	VAR62
					Impact & influence	Organizational Awareness	Relationship Building	Building trust
Job-Related Competencies	Risk Management	VAR21	Determining project risk events	Pearson Correlation	0.075	0.093	0.118	0.009
				Sig. (1-tailed)	0.155	0.103	0.053	0.451
				N	187	187	187	187
		VAR22	Monitoring & managing opportunities	Pearson Correlation	.146*	0.114	.143*	0.119
				Sig. (1-tailed)	0.023	0.061	0.025	0.053
				N	187	187	187	187
		VAR23	Monitoring & managing project risks	Pearson Correlation	-0.043	0.027	0.12	0.016
				Sig. (1-tailed)	0.279	0.355	0.05	0.416
				N	187	187	187	187
		VAR24	Assessing risk management outcomes	Pearson Correlation	-0.044	.177**	0.116	-0.031
				Sig. (1-tailed)	0.276	0.008	0.056	0.335
				N	187	187	187	187

5.5.29 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “RISK MANAGEMENT” AND COMPETENCY ELEMENTS OF “MANAGERIAL”

As shown in the Table 5.55, the correlation between “Monitoring & managing opportunities” (Var22) and “Teamwork & Cooperation” (Var63) ($r= 0.233$, $N=187$, $p=0.001$) received the highest correlation rating followed by correlation between “Assessing risk management outcomes” (Var24) and “Developing others” (Var64) ($r=$

0.180, N=187, p=0.007). Correlation between “Assessing risk management outcomes” (Var24) and “Teamwork & Cooperation” (Var63) received the lowest correlation rating (r= 0.171, N=187, p=0.01). The results showed a positive relationship in the aforementioned correlations.

Table 5.55: Correlation analysis between competency elements of “Risk Management” and competency elements of “Managerial”

The relationship between "Risk Management" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counselling	Making decisions
Job-Related Competencies	Risk Management	VAR21	Determining project risk events	Pearson Correlation	0.037	-.138*	0.061	0.045	0.084	-0.093
				Sig. (1-tailed)	0.309	0.03	0.202	0.27	0.127	0.102
				N	187	187	187	187	187	187
		VAR22	Monitoring & managing opportunities	Pearson Correlation	.233**	-0.038	.132*	0.03	0.038	-.142*
				Sig. (1-tailed)	0.001	0.301	0.036	0.343	0.302	0.026
				N	187	187	187	187	187	187
		VAR23	Monitoring & managing project risks	Pearson Correlation	.132*	0.104	.140*	.140*	0.065	-0.018
				Sig. (1-tailed)	0.036	0.077	0.028	0.028	0.188	0.406
				N	187	187	187	187	187	187
		VAR24	Assessing risk management outcomes	Pearson Correlation	.171**	.180**	0.012	0.102	0.026	0.002
				Sig. (1-tailed)	0.01	0.007	0.435	0.082	0.364	0.491
				N	187	187	187	187	187	187

5.5.30 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “RISK MANAGEMENT” AND COMPETENCY ELEMENTS OF “COGNITIVE”

As shown in Table 5.56, the results from Pearson correlation showed a positive relationship exists between “Monitoring & managing opportunities” (Var22) and “Analytical Thinking” (Var69) (r=0.185, N=187, p=0.006). The data indicated that as project manager’s ability for working through a situation by breaking it apart into

smaller pieces, or tracing the implications of a situation in a step-by-step causal way, understanding all issues associated with the project at a suitable level, facilitating solutions across all issues increased, his competency level for monitoring project opportunities, documenting opportunities and assessing against project progress, presenting opportunities to higher authority for consideration, and implementing changes when necessary to take advantage of new opportunities increased as well.

Table 5.56: Correlation analysis between competency elements of “Risk Management” and competency elements of “Cognitive”

The relationship between "Risk Management" Competency elements and "Cognitive" competency elements					Person-Related Competencies		
					Cognitive		
					VAR69	VAR70	VAR71
					Analytical Thinking	Conceptual Thinking	Critical analysis & judgement
Job-Related Competencies	Risk Management	VAR21	Determining project risk events	Pearson Correlation	0.005	-0.032	-0.078
				Sig. (1-tailed)	0.474	0.33	0.144
				N	187	187	187
		VAR22	Monitoring & managing oppurtunities	Pearson Correlation	.185**	-0.013	-0.095
				Sig. (1-tailed)	0.006	0.431	0.098
				N	187	187	187
		VAR23	Monitoring & managing project risks	Pearson Correlation	0.081	-0.008	0.034
				Sig. (1-tailed)	0.136	0.458	0.32
				N	187	187	187
		VAR24	Assessing risk management outcomes	Pearson Correlation	0.032	-0.003	0.107
				Sig. (1-tailed)	0.333	0.485	0.073
				N	187	187	187

5.5.31 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “RISK MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Table 5.57 and Table 5.58 , the results from Pearson correlation showed a positive relationship exists between “Determining project risk events” (Var21) and

“Conflict management” (Var79) ($r=0.194$, $N=187$, $p=0.004$). The data indicated that as project manager’s ability for identifying and addressing differences that, if unmanaged, would affect project objectives, managing the differences of opinions of stakeholders, listening and respecting views of others, identifying the root causes of the conflicts, and implementing an agreed solution increased, his competency level for identifying, documenting and analyzing risks and opportunities, using established risk management techniques, developing risk management plan, and assigning risk management responsibilities to those who are in best position increased as well.

Table 5.57: Correlation analysis between competency elements of “Risk Management” and competency elements of “Behavioral”

The relationship between "Risk Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the	Openness
Job-Related Competencies	Risk Management	VAR21	Determining project risk events	Pearson Correlation	.194**	-0.033	0.072	0.015	.122*	-0.078
				Sig. (1-tailed)	0.004	0.327	0.163	0.417	0.047	0.146
				N	187	187	187	187	187	187
		VAR22	Monitoring & managing opportunities	Pearson Correlation	0.109	-.131*	0.05	-0.02	0.042	0.075
				Sig. (1-tailed)	0.069	0.036	0.249	0.391	0.282	0.155
				N	187	187	187	187	187	187
		VAR23	Monitoring & managing project risks	Pearson Correlation	.146*	0.016	.121*	0.017	-0.074	0.065
				Sig. (1-tailed)	0.023	0.412	0.049	0.409	0.157	0.188
				N	187	187	187	187	187	187
		VAR24	Assessing risk management outcomes	Pearson Correlation	0.026	-0.027	-0.057	-0.067	-0.037	0.051
				Sig. (1-tailed)	0.364	0.357	0.221	0.182	0.307	0.244
				N	187	187	187	187	187	187

Table 5.58: Correlation analysis between competency elements of “Risk Management” and competency elements of “Behavioral”

The relationship between "Risk Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Risk Management	VAR21	Determining project risk events	Pearson Correlation	0.032	0.061	.141 *	.153 *	0.057	-0.058
				Sig. (1-tailed)	0.331	0.203	0.027	0.018	0.217	0.213
				N	187	187	187	187	187	187
		VAR22	Monitoring & managing opportunities	Pearson Correlation	.148 *	.147 *	.123 *	-0.005	0.009	-0.029
				Sig. (1-tailed)	0.022	0.023	0.046	0.473	0.453	0.348
				N	187	187	187	187	187	187
		VAR23	Monitoring & managing project risks	Pearson Correlation	0.074	0.042	.127 *	0.075	0.005	0.002
				Sig. (1-tailed)	0.156	0.284	0.041	0.155	0.475	0.491
				N	187	187	187	187	187	187
		VAR24	Assessing risk management outcomes	Pearson Correlation	-.156 *	0.017	0.092	0.036	-0.09	0.054
				Sig. (1-tailed)	0.017	0.408	0.104	0.315	0.111	0.233
				N	187	187	187	187	187	187

5.5.32 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “RISK MANAGEMENT” AND COMPETENCY ELEMENTS OF “CONTEXTUAL”

As shown in the Tables 5.59 and 5.60, the correlation between “Determining project risk events” (Var21) and “Organization structure” (Var99) ($r = 0.177$, $N = 187$, $p = 0.008$) received the highest correlation rating followed by correlation between “Monitoring & managing opportunities” (Var22) and “Permanent organization” (Var95) ($r = 0.176$, $N = 187$, $p = 0.008$). Correlation between “Assessing risk management outcomes” (Var24) and “Health, security, safety & environment” (Var96) received the lowest correlation rating ($r = 0.172$, $N = 187$, $p = 0.009$). The results showed a positive relationship in the aforementioned correlations.

Table 5.59: Correlation analysis between competency elements of “Risk Management” and competency elements of “Contextual”

The relationship between "Risk Management" Competency elements and "Contextual" competency elements					Person-Related Competencies					
					Contextual					
					VAR91	VAR92	VAR93	VAR94	VAR95	VAR96
					Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment
Job-Related Competencies	Risk Management	VAR21	Determining project risk events	Pearson Correlation	-0.001	-0.007	-0.02	.125*	0.039	-.126*
				Sig. (1-tailed)	0.492	0.464	0.395	0.044	0.298	0.042
				N	187	187	187	187	187	187
		VAR22	Monitoring & managing opportunities	Pearson Correlation	0.113	0.069	0.085	0.068	.176**	-0.042
				Sig. (1-tailed)	0.063	0.174	0.124	0.176	0.008	0.283
				N	187	187	187	187	187	187
		VAR23	Monitoring & managing project risks	Pearson Correlation	0.077	0.012	0.075	0.075	.132*	0.002
				Sig. (1-tailed)	0.149	0.436	0.155	0.153	0.036	0.49
				N	187	187	187	187	187	187
		VAR24	Assessing risk management outcomes	Pearson Correlation	0.072	.160*	0.027	0.112	0.033	.172**
				Sig. (1-tailed)	0.165	0.015	0.358	0.064	0.328	0.009
				N	187	187	187	187	187	187

Table 5.60: Correlation analysis between competency elements of “Risk Management” and competency elements of “Contextual”

The relationship between "Risk Management" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Risk Management	VAR21	Determining project risk events	Pearson Correlation	0.013	0.039	.177**	-.126*	-.003
				Sig. (1-tailed)	0.428	0.298	0.008	0.042	.486
				N	187	187	187	187	187
		VAR22	Monitoring & managing oppurtunities	Pearson Correlation	-0.099	-0.009	.160*	-0.07	-.031
				Sig. (1-tailed)	0.088	0.452	0.014	0.169	.336
				N	187	187	187	187	187
		VAR23	Monitoring & managing project risks	Pearson Correlation	0.119	0.004	0.114	0.104	-.064
				Sig. (1-tailed)	0.052	0.477	0.06	0.079	.191
				N	187	187	187	187	187
		VAR24	Assessing risk management outcomes	Pearson Correlation	-0.088	.140*	.146*	0.106	-.102
				Sig. (1-tailed)	0.117	0.028	0.023	0.074	.083
				N	187	187	187	187	187

5.5.33 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “PROCUREMENT MANAGEMENT” AND COMPETENCY ELEMENTS OF “ACHIEVEMENT AND ACTION”

As shown in Table 5.61, the results for Pearson correlation showed a negative relationship exists between “Determining procurement requirements” (Var25) and “Information Seeking” (Var55) ($r = -0.170$, $N=187$, $p=0.01$). However, the relationship between “Determining procurement requirements” (Var25) and “Concern for order, quality, & accuracy” (Var53) was found positively correlated ($r=0.208$, $N=187$, $p=0.002$). Moreover, the relationship between “Following agreed procurement processes” (Var26) and “Concern for order, quality, & accuracy” (Var53) was found positively correlated ($r=0.205$, $N=187$, $p=0.002$).Table 5-109-01-

Table 5.61: Correlation analysis between competency elements of “Procurement Management” and competency elements of “Achievement and Action”

The relationship between "Procurement Management" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Procurement Management	VAR25	Determining procurement requirements	Pearson Correlation	0.053	.208**	0.021	-.170**	0.08
				Sig. (1-tailed)	0.234	0.002	0.387	0.01	0.138
				N	187	187	187	187	187
		VAR26	Following agreed procurement processes	Pearson Correlation	0.12	.180**	-0.107	-0.108	0.058
				Sig. (1-tailed)	0.051	0.007	0.073	0.07	0.216
				N	187	187	187	187	187
		VAR27	Conducting contracting & procurement activities	Pearson Correlation	0.004	.162*	-0.091	-0.02	.161*
				Sig. (1-tailed)	0.477	0.014	0.108	0.391	0.014
				N	187	187	187	187	187
		VAR28	Implementing contract &/or procurement	Pearson Correlation	.145*	0.117	0.026	-0.055	0.072
				Sig. (1-tailed)	0.024	0.056	0.364	0.227	0.163
				N	187	187	187	187	187
		VAR29	Managing contract & procurement finalisation procedures	Pearson Correlation	0.103	0.024	.128*	-0.047	0.01
				Sig. (1-tailed)	0.081	0.375	0.041	0.26	0.447
				N	187	187	187	187	187

5.5.34 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “PROCUREMENT MANAGEMENT” AND COMPETENCY ELEMENTS OF “MANAGERIAL”

As shown in Table 5.62, the results from Pearson correlation showed a positive relationship exists between “Implementing contract & procurement” (Var28) and “Teamwork & Cooperation” (Var63) ($r=0.197$, $N=187$, $p=0.003$). The data indicated that as project manager’s ability to work cooperatively with others, to be part of a team, to work together, as opposed to working separately or competitively, building team, orientation within the project, undertaking team-building activities increased, his

competency level for implementing an established procurement management plan to ensure achievement of objectives, managing procurement issues and changes to ensure timely completion of tasks, reporting procurement issues with recommendation to higher project authority increased as well.

Table 5.62: Correlation analysis between competency elements of “Procurement Management” and competency elements of “Managerial”

The relationship between "Procurement Management" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counseling	Making decisions
Job-Related Competencies	Procurement Management	VAR25	Determining procurement requirements	Pearson Correlation	0.088	0.02	-0.034	-0.087	-0.027	-0.113
				Sig. (1-tailed)	0.114	0.391	0.322	0.118	0.355	0.062
				N	187	187	187	187	187	187
		VAR26	Following agreed procurement processes	Pearson Correlation	0.103	-0.006	-0.004	-0.021	-0.097	-.132*
				Sig. (1-tailed)	0.08	0.47	0.476	0.389	0.092	0.036
				N	187	187	187	187	187	187
		VAR27	Conducting contracting & procurement activities	Pearson Correlation	0.024	0.015	0.035	-0.032	0.023	-0.092
				Sig. (1-tailed)	0.374	0.422	0.316	0.331	0.376	0.106
				N	187	187	187	187	187	187
		VAR28	Implementing contract &/or procurement	Pearson Correlation	.197**	-0.039	0.044	0.07	-0.092	-0.022
				Sig. (1-tailed)	0.003	0.297	0.274	0.169	0.104	0.381
				N	187	187	187	187	187	187
		VAR29	Managing contract & procurement finalisation procedures	Pearson Correlation	0.107	-0.046	0.061	-0.006	.133*	-.132*
				Sig. (1-tailed)	0.073	0.266	0.203	0.47	0.035	0.036
				N	187	187	187	187	187	187

5.5.35 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “PROCUREMENT MANAGEMENT” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in the Table 5.63, the correlation between “Following agreed procurement processes” (Var26) and “Conscientiousness” (Var77) ($r= 0.223$, $N=187$, $p=0.001$)

received the highest correlation rating followed by correlation between “Conducting contract & procurement activities” (Var27) and “Conscientiousness” (Var77) ($r= 0.207$, $N=187$, $p=0.002$) and then correlation between “Implementing contract & procurement” (Var28) and “Conscientiousness” (Var77) ($r= 0.190$, $N=187$, $p=0.005$) . Correlation between “Determining procurement requirements” (Var25) and “Conscientiousness” (Var77) received the lowest correlation rating ($r= 0.183$, $N=187$, $p=0.006$). The results showed a positive relationship in the aforementioned correlations.

Table 5.63: Correlation analysis between competency elements of “Procurement Management” and competency elements of “Personal Effectiveness”

The relationship between "Procurement Management" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counseling	Making decisions
Job-Related Competencies	Procurement Management	VAR25	Determining procurement requirements	Pearson Correlation	0.088	0.02	-0.034	-0.087	-0.027	-0.113
				Sig. (1-tailed)	0.114	0.391	0.322	0.118	0.355	0.062
				N	187	187	187	187	187	187
		VAR26	Following agreed procurement processes	Pearson Correlation	0.103	-0.006	-0.004	-0.021	-0.097	-.132*
				Sig. (1-tailed)	0.08	0.47	0.476	0.389	0.092	0.036
				N	187	187	187	187	187	187
		VAR27	Conducting contracting & procurement activities	Pearson Correlation	0.024	0.015	0.035	-0.032	0.023	-0.092
				Sig. (1-tailed)	0.374	0.422	0.316	0.331	0.376	0.106
				N	187	187	187	187	187	187
		VAR28	Implementing contract &/or procurement	Pearson Correlation	.197**	-0.039	0.044	0.07	-0.092	-0.022
				Sig. (1-tailed)	0.003	0.297	0.274	0.169	0.104	0.381
				N	187	187	187	187	187	187
		VAR29	Managing contract & procurement finalisation procedures	Pearson Correlation	0.107	-0.046	0.061	-0.006	.133*	-.132*
				Sig. (1-tailed)	0.073	0.266	0.203	0.47	0.035	0.036
				N	187	187	187	187	187	187

5.5.36 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “PROCUREMENT MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Tables 5.64 and 5.65, the results from Pearson correlation showed a positive relationship exists between “Determining procurement requirements” (Var25) and “Engagement & motivation (Encourage the heart)” (Var83) ($r=0.201$, $N=187$, $p=0.003$), between “Conducting contract & procurement activities” (Var27) and “Engagement & motivation (Encourage the heart)” (Var83) ($r=0.202$, $N=187$, $p=0.003$), between “Following agreed procurement processes” (Var26) and “Achievement orientation (Result orientation)” (Var85) ($r=0.289$, $N=187$, $p=0.0$), between “Conducting contract & procurement activities” (Var27) and “Achievement orientation (Result orientation)” (Var85) ($r=0.201$, $N=187$, $p=0.003$), and between “Implementing contract & procurement” (Var28) and “Achievement orientation (Result orientation)” (Var85) ($r=0.223$, $N=187$, $p=0.001$). However, the Pearson correlation showed a negative relationship exists between “Following agreed procurement processes” (Var26) and “Negotiation” (Var80) ($r=-0.173$, $N=187$, $p=0.009$).

Table 5.64: Correlation analysis between competency elements of “Procurement Management” and competency elements of “Behavioral”

The relationship between "Procurement Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioural characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the heart)	Openness
Job-Related Competencies	Procurement Management	VAR25	Determining procurement requirements	Pearson Correlation	0.07	-.141*	0.004	0.108	.201**	0.107
				Sig. (1-tailed)	0.171	0.027	0.48	0.07	0.003	0.072
				N	187	187	187	187	187	187
		VAR26	Following agreed procurement processes	Pearson Correlation	.162*	-.173**	0.063	0.072	.132*	0.097
				Sig. (1-tailed)	0.014	0.009	0.195	0.163	0.036	0.094
				N	187	187	187	187	187	187
		VAR27	Conducting contracting & procurement activities	Pearson Correlation	-0.037	-0.061	-0.057	0.103	.202**	0.078
				Sig. (1-tailed)	0.309	0.204	0.219	0.081	0.003	0.145
				N	187	187	187	187	187	187
		VAR28	Implementing contract &/or procurement	Pearson Correlation	-0.046	0.007	0.03	0.098	0.028	0.112
				Sig. (1-tailed)	0.266	0.462	0.344	0.092	0.352	0.064
				N	187	187	187	187	187	187
		VAR29	Managing contract & procurement finalisation procedures	Pearson Correlation	-0.101	-0.007	-0.071	0.015	.158*	0.062
				Sig. (1-tailed)	0.084	0.46	0.167	0.417	0.015	0.199
				N	187	187	187	187	187	187

Table 5.65: Correlation analysis between competency elements of “Procurement Management” and competency elements of “Behavioral”

The relationship between "Procurement Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Procurement Management	VAR25	Determining procurement requirements	Pearson Correlation	0.071	0.048	0.106	0.054	-0.022	-0.062
				Sig. (1-tailed)	0.168	0.256	0.075	0.232	0.384	0.2
				N	187	187	187	187	187	187
		VAR26	Following agreed procurement processes	Pearson Correlation	.289**	-0.061	.145*	0.075	.125*	-0.012
				Sig. (1-tailed)	0	0.203	0.024	0.153	0.044	0.438
				N	187	187	187	187	187	187
		VAR27	Conducting contracting & procurement activities	Pearson Correlation	.201**	0.073	0.027	-0.063	-0.033	-0.082
				Sig. (1-tailed)	0.003	0.161	0.358	0.194	0.326	0.134
				N	187	187	187	187	187	187
		VAR28	Implementing contract &/or procurement	Pearson Correlation	.223**	-0.038	0.106	-.169*	0.103	0.114
				Sig. (1-tailed)	0.001	0.303	0.074	0.011	0.08	0.061
				N	187	187	187	187	187	187
		VAR29	Managing contract & procurement finalisation procedures	Pearson Correlation	0.037	0.053	0.068	0.024	0.053	-0.043
				Sig. (1-tailed)	0.308	0.234	0.177	0.372	0.236	0.278
				N	187	187	187	187	187	187

5.5.37 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “PROCUREMENT MANAGEMENT” AND COMPETENCY ELEMENTS OF “CONTEXTUAL”

As shown in Tables 5.66 and 5.67, the results from Pearson correlation showed a positive relationship exists between “Implementing contract & procurement” (Var28) and “Permanent organization” (Var95) ($r=0.185$, $N=187$, $p=0.006$) followed by correlation between “Implementing contract & procurement” (Var28) and “Organization structure” (Var99) ($r=0.170$, $N=187$, $p=0.01$).

Table 5.66: Correlation analysis between competency elements of “Procurement Management” and competency elements of “Contextual”

The relationship between "Procurement Management" Competency elements and "Contextual" competency elements				Person-Related Competencies						
				Contextual						
				VAR91	VAR92	VAR93	VAR94	VAR95	VAR96	
				Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment	
Job-Related Competencies	Procurement Management	VAR25	Determining procurement requirements	Pearson Correlation	0.057	0.044	0.088	0.052	0.116	-0.026
				Sig. (1-tailed)	0.218	0.277	0.115	0.241	0.057	0.364
				N	187	187	187	187	187	187
		VAR26	Following agreed procurement processes	Pearson Correlation	.159*	0.017	0.1	0.006	0.082	-.126*
				Sig. (1-tailed)	0.015	0.409	0.086	0.47	0.133	0.043
				N	187	187	187	187	187	187
		VAR27	Conducting contracting & procurement activities	Pearson Correlation	0.103	0.076	.125*	-0.015	0.104	0.038
				Sig. (1-tailed)	0.08	0.152	0.044	0.418	0.078	0.302
				N	187	187	187	187	187	187
		VAR28	Implementing contract &/or procurement	Pearson Correlation	0.029	0.018	0.039	0.113	.185**	-0.018
				Sig. (1-tailed)	0.347	0.403	0.298	0.063	0.006	0.401
				N	187	187	187	187	187	187
		VAR29	Managing contract & procurement finalisation procedures	Pearson Correlation	-0.012	0.057	-0.031	0.035	0.094	-0.025
				Sig. (1-tailed)	0.433	0.22	0.335	0.316	0.099	0.37
				N	187	187	187	187	187	187

Table 5.67: Correlation analysis between competency elements of “Procurement Management” and competency elements of “Contextual”

The relationship between "Procurement Management" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Procurement Management	VAR25	Determining procurement requirements	Pearson Correlation	-0.002	0.094	0.035	0.008	.070
				Sig. (1-tailed)	0.488	0.099	0.316	0.456	.170
				N	187	187	187	187	187
		VAR26	Following agreed procurement processes	Pearson Correlation	.147*	.147*	0.071	0.026	.052
				Sig. (1-tailed)	0.022	0.023	0.166	0.363	.241
				N	187	187	187	187	187
		VAR27	Conducting contracting & procurement activities	Pearson Correlation	.141*	0.084	0.104	.165*	.106
				Sig. (1-tailed)	0.027	0.126	0.079	0.012	.074
				N	187	187	187	187	187
		VAR28	Implementing contract &/or procurement	Pearson Correlation	0.07	0.106	.170**	0.053	.028
				Sig. (1-tailed)	0.17	0.075	0.01	0.235	.352
				N	187	187	187	187	187
		VAR29	Managing contract & procurement finalisation procedures	Pearson Correlation	-0.028	0.011	0.03	0.12	.090
				Sig. (1-tailed)	0.35	0.439	0.34	0.051	.111
				N	187	187	187	187	187

5.5.38 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “INTEGRATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “ACHIEVEMENT AND ACTION”

As shown in Table 5.68, the relationship between “Implementing project activities throughout life cycle” (Var33) and “Concern for order, quality, & accuracy” (Var53) was found positively correlated ($r=0.197$, $N=187$, $p=0.003$). The data indicated that as project manager’s competency level for underlying drive to reduce uncertainty in the

surrounding environment, managing projects in an ordered, accurate way, providing accurate and truthful information increased, his competency level for incorporating project phases, approval points, integrated phases to monitor risks for maximizing opportunities, establishing and managing finalization plans and procedures, reviewing project plans and general project documentation increased as well.

Table 5.68: Correlation analysis between competency elements of “Integration Management” and competency elements of “Achievement and Action”

The relationship between "Integration Management" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	0.107	.125*	-0.066	-0.046	-0.045
				Sig. (1-tailed)	0.072	0.045	0.185	0.268	0.268
				N	187	187	187	187	187
		VAR31	Managing integration of all project management functions	Pearson Correlation	-0.056	.125*	0.005	-0.045	0.019
				Sig. (1-tailed)	0.222	0.044	0.475	0.271	0.399
				N	187	187	187	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	.169*	0.042	-0.072	-0.116	0.055
				Sig. (1-tailed)	0.01	0.284	0.164	0.058	0.227
				N	187	187	187	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	0.048	.197**	0.02	-0.042	0.017
				Sig. (1-tailed)	0.259	0.003	0.392	0.284	0.411
				N	187	187	187	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	0.059	0.104	-0.049	0.048	0.117
				Sig. (1-tailed)	0.211	0.079	0.254	0.255	0.056
				N	187	187	187	187	187

5.5.39 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “INTEGRATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “HELPING AND HUMAN SERVICE”

As shown in Table 5.69, the relationship between “Assessing project integration outcomes” (Var34) and “Client Orientation” (Var57) was found positively correlated ($r=0.221$, $N=187$, $p=0.001$). The data indicated that as project manager’s desire to focus on discovering and meeting the client needs, and representing the client inside the project increased, his competency for reviewing project issues and outcomes to determine effectiveness of processes and procedures, identifying integration management lessons learned increased as well.

Table 5.69: Correlation analysis between competency elements of “Integration Management” and competency elements of “Helping and Human Service”

The relationship between "Integration Management" Competency elements and "Helping and Human service" competency elements					Person-Related Competencies	
					Helping and Human service	
					VAR57	VAR58
					Client Orientation	Interpersonal Understanding
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	0.018	-0.036
				Sig. (1-tailed)	0.404	0.312
				N	187	187
		VAR31	Managing integration of all project management functions	Pearson Correlation	.146*	0.12
				Sig. (1-tailed)	0.023	0.051
				N	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	.122*	-0.072
				Sig. (1-tailed)	0.048	0.164
				N	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	0.059	-0.029
				Sig. (1-tailed)	0.211	0.348
				N	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	.221**	0.067
				Sig. (1-tailed)	0.001	0.182
				N	187	187

5.5.40 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “INTEGRATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “IMPACT AND INFLUENCE”

As shown in Table 5.70, the relationship between “Coordinating internal & external environment” (Var32) and “Building trust” (Var62) was found positively correlated ($r=0.258$, $N=187$, $p=0.0$). The data indicated that as project manager’s competency for establishing an environment of trust and respect, showing open concern for others, accepting people for what they are, empowering people more and asking them to take on board more responsibilities increased, his competency for managing the project within an established internal working environment, maintaining established links to align project objectives with strategic organizational objectives, seeking assistance from senior personnel when necessary to solve conflicts increased as well.

Table 5.70: Correlation analysis between competency elements of “Integration Management” and competency elements of “Impact and Influence”

The relationship between "Integration Management" Competency elements and "Impact & influence" competency elements					Person-Related Competencies			
					Impact & influence			
					VAR59	VAR60	VAR61	VAR62
					Impact & influence	Organizational Awareness	Relationship Building	Building trust
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	0.037	0.109	.139*	0.051
				Sig. (1-tailed)	0.307	0.07	0.029	0.244
				N	187	187	187	187
		VAR31	Managing integration of all project management functions	Pearson Correlation	0.084	0.065	0.075	0.103
				Sig. (1-tailed)	0.127	0.189	0.153	0.081
				N	187	187	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	0.032	0.118	0.012	.258**
				Sig. (1-tailed)	0.331	0.054	0.437	0
				N	187	187	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	0.027	.146*	0.092	0.063
				Sig. (1-tailed)	0.359	0.023	0.105	0.197
				N	187	187	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	0.083	0.116	0.061	0.013
				Sig. (1-tailed)	0.129	0.057	0.203	0.429
				N	187	187	187	187

5.5.41 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “INTEGRATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “MANAGERIAL”

As shown in Table 5.71, the results from Pearson correlation showed a positive relationship exists between “Agreeing & establishing life cycle reporting & measurement systems” (Var30) and “Teamwork & Cooperation” (Var63) ($r=0.212$, $N=187$, $p=0.002$), between “Implementing project activities throughout life cycle” (Var33) and “Teamwork & Cooperation” (Var63) ($r=0.171$, $N=187$, $p=0.01$), between “Assessing project integration outcomes” (Var34) and “Teamwork & Cooperation” (Var63) ($r=0.202$, $N=187$, $p=0.003$), between “Conducting contract & procurement activities” (Var27) and “Achievement orientation (Result orientation)” (Var85) ($r=0.201$, $N=187$, $p=0.003$), and between “Assessing project integration outcomes” (Var34) and “Team Leadership” (Var65) ($r=0.174$, $N=187$, $p=0.009$). However, the Pearson correlation showed a negative relationship exists between “Coordinating internal & external environment” (Var32) and “Developing others” (Var64) ($r=-0.194$, $N=187$, $p=0.004$) and a negative relationship between “Implementing project activities throughout life cycle” (Var33) and “Being Directive: Assertiveness & use of positional power” (Var66) ($r=-0.174$, $N=187$, $p=0.009$)

Table 5.71: Correlation analysis between competency elements of “Integration Management” and competency elements of “Managerial”

The relationship between "Integration Management" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counselling	Making decisions
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	.212**	0.037	0.021	-0.073	-0.061	-0.096
				Sig. (1-tailed)	0.002	0.305	0.388	0.161	0.205	0.095
				N	187	187	187	187	187	187
		VAR31	Managing integration of all project management functions	Pearson Correlation	0.112	-0.012	0.07	.126*	0.016	0.013
				Sig. (1-tailed)	0.064	0.433	0.171	0.043	0.414	0.429
				N	187	187	187	187	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	0.052	-.194**	0.05	-0.049	-.160*	-.127*
				Sig. (1-tailed)	0.241	0.004	0.248	0.251	0.014	0.041
				N	187	187	187	187	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	.171**	-0.008	0.063	-.174**	0.007	-0.077
				Sig. (1-tailed)	0.01	0.455	0.195	0.009	0.461	0.146
				N	187	187	187	187	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	.202**	0.058	.174**	0.009	0.07	-0.109
				Sig. (1-tailed)	0.003	0.215	0.009	0.449	0.172	0.069
				N	187	187	187	187	187	187

5.5.42 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “INTEGRATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in the Table 5.72, the correlation between “Coordinating internal & external environment” (Var32) and “Conscientiousness” (Var77) ($r = 0.238$, $N=187$, $p=0.001$) received the highest correlation rating followed by correlation between “Coordinating internal & external environment” (Var32) and “Flexibility” (Var74) ($r = 0.207$, $N=187$, $p=0.002$). Correlation between “Implementing project activities throughout life cycle”

(Var33) and “Conscientiousness” (Var77) received the lowest correlation rating ($r=0.198$, $N=187$, $p=0.003$). The results showed a positive relationship in the aforementioned correlations.

Table 5.72: Correlation analysis between competency elements of “Integration Management” and competency elements of “Personal Effectiveness”

The relationship between "Integration Management" Competency elements and "Personal Effectiveness" competency elements					Person-Related Competencies						
					Personal Effectiveness						
					VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78
					Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	0.024	0.03	0.065	-0.03	-0.023	.163*	0.06
				Sig. (1-tailed)	0.372	0.342	0.19	0.341	0.38	0.013	0.206
				N	187	187	187	187	187	187	187
		VAR31	Managing integration of all project management functions	Pearson Correlation	-0.077	0.014	0.027	.129*	-0.022	0.069	0.033
				Sig. (1-tailed)	0.147	0.427	0.359	0.039	0.382	0.173	0.329
				N	187	187	187	187	187	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	0.002	-0.047	.207**	-0.051	0.003	.238**	0.102
				Sig. (1-tailed)	0.491	0.259	0.002	0.246	0.484	0.001	0.083
				N	187	187	187	187	187	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	.135*	0.005	-0.004	0.029	-.164*	.198**	0.117
				Sig. (1-tailed)	0.033	0.473	0.478	0.347	0.012	0.003	0.056
				N	187	187	187	187	187	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	0.068	0.013	0.085	-0.024	-0.017	.134*	0.015
				Sig. (1-tailed)	0.177	0.429	0.125	0.37	0.408	0.034	0.419
				N	187	187	187	187	187	187	187

5.5.43 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “INTEGRATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Tables 5.73 and 5.74, the results from Pearson correlation showed a positive relationship exists between “Agreeing & establishing life cycle reporting & measurement systems” (Var30) and “Conflict management” (Var79) ($r=0.175$, $N=187$,

p=0.008), between “Assessing project integration outcomes” (Var34) and “Conflict management” (Var79) (r=0.215, N=187, p=0.002), between “Coordinating internal & external environment” (Var32) and “Result orientation” (Var85) (r=0.213, N=187, p=0.002), between “Assessing project integration outcomes” (Var34) and “Effective communication” (Var89) (r=0.171, N=187, p=0.01). However, the Pearson correlation showed a negative relationship exists between “Agreeing & establishing life cycle reporting & measurement systems” (Var30) and “Negotiation” (Var80) (r=-0.191, N=187, p=0.004).

Table 5.73: Correlation analysis between competency elements of “Integration Management” and competency elements of “Behavioral”

The relationship between "Integration Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the heart)	Openness
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	.175**	-.191**	0.039	.139*	.134*	.122*
				Sig. (1-tailed)	0.008	0.004	0.3	0.029	0.034	0.048
				N	187	187	187	187	187	187
		VAR31	Managing integration of all project management functions	Pearson Correlation	-0.016	0.003	0.071	-.127*	0.111	-0.027
				Sig. (1-tailed)	0.414	0.482	0.167	0.041	0.065	0.359
				N	187	187	187	187	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	.136*	-0.08	-.147*	0.063	.127*	0.082
				Sig. (1-tailed)	0.032	0.138	0.023	0.194	0.041	0.132
				N	187	187	187	187	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	0.062	0.085	0.09	0.105	0.053	0.094
				Sig. (1-tailed)	0.199	0.124	0.111	0.077	0.236	0.1
				N	187	187	187	187	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	.215**	-0.107	-0.09	0.041	0.044	.152*
				Sig. (1-tailed)	0.002	0.072	0.111	0.287	0.276	0.019
				N	187	187	187	187	187	187

Table 5.74: Correlation analysis between competency elements of “Integration Management” and competency elements of “Behavioral”

The relationship between "Integration Management" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	.162*	0.056	0.101	0.105	0.055	-0.075
				Sig. (1-tailed)	0.013	0.222	0.085	0.076	0.226	0.153
				N	187	187	187	187	187	187
		VAR31	Managing integration of all project management functions	Pearson Correlation	0.116	-0.013	-.165*	0.077	0.091	0.04
				Sig. (1-tailed)	0.057	0.428	0.012	0.149	0.108	0.295
				N	187	187	187	187	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	.213**	0.098	-0.089	0.064	.149*	-0.117
				Sig. (1-tailed)	0.002	0.091	0.112	0.192	0.021	0.056
				N	187	187	187	187	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	.166*	0.091	0.062	0.093	0.111	-0.038
				Sig. (1-tailed)	0.011	0.108	0.201	0.103	0.065	0.302
				N	187	187	187	187	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	.132*	.139*	.136*	.136*	.171**	-0.001
				Sig. (1-tailed)	0.035	0.029	0.032	0.031	0.01	0.494
				N	187	187	187	187	187	187

5.5.44 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “INTEGRATION MANAGEMENT” AND COMPETENCY ELEMENTS OF “CONTEXTUAL”

As shown in Tables 5.75 and 5.76, the results from Pearson correlation showed a positive relationship exists between “Coordinating internal & external environment” (Var32) and “Project orientation” (Var91) ($r=0.181$, $N=187$, $p=0.006$), between “Managing integration of all project management functions” (Var31) and “Permanent organization” (Var95) ($r=0.170$, $N=187$, $p=0.01$), between “Implementing project

activities throughout life cycle” (Var33) and “Intuitiveness” (Var76) ($r=0.176$, $N=187$, $p=0.008$), between “Managing integration of all project management functions” (Var31) and “Legal awareness” (Var98) ($r=0.182$, $N=187$, $p=0.006$). However, the Pearson correlation showed a negative relationship exists between “Implementing project activities throughout life cycle” (Var33) and “Cultural awareness” (Var100) ($r=-0.184$, $N=187$, $p=0.006$).

Table 5.75: Correlation analysis between competency elements of “Integration Management” and competency elements of “Contextual”

The relationship between "Integration Management" Competency elements and "Contextual" competency elements					Person-Related Competencies					
					Contextual					
					VAR91	VAR92	VAR93	VAR94	VAR95	VAR96
					Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	0.075	0.012	-0.023	0.042	0.057	-0.017
				Sig. (1-tailed)	0.153	0.437	0.375	0.284	0.218	0.409
				N	187	187	187	187	187	187
		VAR31	Managing integration of all prjct management fuctions	Pearson Correlation	-0.064	0.025	0.043	.165*	.170**	0.056
				Sig. (1-tailed)	0.19	0.366	0.28	0.012	0.01	0.224
				N	187	187	187	187	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	.181**	0.065	-0.002	.152*	.135*	-0.086
				Sig. (1-tailed)	0.006	0.19	0.491	0.019	0.033	0.122
				N	187	187	187	187	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	0.047	0.056	0.058	0.003	0.077	-0.009
				Sig. (1-tailed)	0.259	0.222	0.217	0.486	0.146	0.452
				N	187	187	187	187	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	.152*	-0.052	0.077	.153*	0.086	0.034
				Sig. (1-tailed)	0.019	0.239	0.146	0.018	0.122	0.322
				N	187	187	187	187	187	187

Table 5.76: Correlation analysis between competency elements of “Integration Management” and competency elements of “Contextual”

The relationship between "Integration Management" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Integration Management	VAR30	Agreeing & establishing life cycle reporting & measurement systems	Pearson Correlation	.121*	0.056	.127*	-0.003	.057
				Sig. (1-tailed)	0.049	0.223	0.042	0.485	.218
				N	187	187	187	187	187
		VAR31	Managing integration of all project management functions	Pearson Correlation	-0.039	.182**	0.002	0.016	.015
				Sig. (1-tailed)	0.297	0.006	0.49	0.412	.422
				N	187	187	187	187	187
		VAR32	Coordinating internal & external environment	Pearson Correlation	0.098	0.107	0.042	-0.029	-.015
				Sig. (1-tailed)	0.091	0.072	0.286	0.344	.422
				N	187	187	187	187	187
		VAR33	Implementing project activities throughout life cycle	Pearson Correlation	.176**	0.097	-.184**	0.01	-.025
				Sig. (1-tailed)	0.008	0.094	0.006	0.446	.367
				N	187	187	187	187	187
		VAR34	Assessing project integration outcomes	Pearson Correlation	0.028	0.056	0.047	0.117	-.006
				Sig. (1-tailed)	0.354	0.223	0.263	0.056	.465
				N	187	187	187	187	187

5.5.45 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TECHNICAL EXPERTISE” AND COMPETENCY ELEMENTS OF “ACHIEVEMENT AND ACTION”

As shown in Tables 5.77 and 5.78, the results from Pearson correlation showed a positive relationship exists between “Written skills” (Var36) and “Achievement orientation (Result orientation)” (Var52) ($r=0.210$, $N=187$, $p=0.002$), between “Value management” (Var41) and “Concern for order, quality, & accuracy” (Var53) ($r=0.330$,

N=187, $p=0.0$), between “Administer authority liaison” (Var46) and “Initiative” (Var54) ($r=0.229$, N=187, $p=0.001$). However, the Pearson correlation showed a negative relationship exists between “Verbal skills” (Var35) and “Identifying & solving problems” (Var56) ($r=-0.199$, N=187, $p=0.003$). The Pearson correlation showed a negative relationship between “Appraising project team members” (Var44) and “Concern for order, quality, & accuracy” (Var53) ($r=-0.212$, N=187, $p=0.002$) as well.

Table 5.77: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Achievement and Action”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	0.059	0.032	0.115	0.094	-.199**
				Sig. (1-tailed)	0.21	0.333	0.059	0.102	0.003
				N	187	187	187	187	187
		VAR36	Written skills	Pearson Correlation	.210**	0.053	0.105	0.083	-.131*
				Sig. (1-tailed)	0.002	0.238	0.077	0.129	0.037
				N	187	187	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	-0.009	-0.004	0.112	-0.013	-0.089
				Sig. (1-tailed)	0.45	0.478	0.064	0.432	0.112
				N	187	187	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	-0.03	0.071	0.026	-0.004	0.08
				Sig. (1-tailed)	0.342	0.168	0.362	0.479	0.137
				N	187	187	187	187	187
		VAR39	Change Control	Pearson Correlation	0.083	.142*	.125*	0.044	-0.039
				Sig. (1-tailed)	0.129	0.026	0.044	0.276	0.299
				N	187	187	187	187	187
		VAR40	Technology management	Pearson Correlation	0.045	0.023	0.063	0.052	-0.004
				Sig. (1-tailed)	0.271	0.376	0.195	0.238	0.478
				N	187	187	187	187	187
		VAR41	Value management	Pearson Correlation	-0.061	.330**	0.025	.162*	0.025
				Sig. (1-tailed)	0.202	0	0.366	0.013	0.368
				N	187	187	187	187	187

Table 5.78: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Achievement and Action”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	0.078	0.083	0.082	.147*	0.103
				Sig. (1-tailed)	0.143	0.13	0.131	0.022	0.081
				N	187	187	187	187	187
		VAR43	Documentation	Pearson Correlation	-0.006	0.119	-0.086	-0.048	-0.007
				Sig. (1-tailed)	0.468	0.052	0.121	0.258	0.462
				N	187	187	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	0.117	-.212**	0.074	0.049	-0.046
				Sig. (1-tailed)	0.055	0.002	0.157	0.251	0.265
				N	187	187	187	187	187
		VAR45	Administer design process	Pearson Correlation	-0.048	.153*	0.12	.124*	-.133*
				Sig. (1-tailed)	0.256	0.019	0.051	0.045	0.035
				N	187	187	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	0.041	0.036	.229**	0.097	-0.101
				Sig. (1-tailed)	0.29	0.311	0.001	0.093	0.084
				N	187	187	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	-0.013	0.032	0.035	0.081	-0.061
				Sig. (1-tailed)	0.429	0.331	0.316	0.134	0.205
				N	187	187	187	187	187

5.5.46 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TECHNICAL EXPERTISE” AND COMPETENCY ELEMENTS OF “HELPING AND HUMAN SERVICE”

As shown in Tables 5.79 and 5.80, the relationship between “Change Control” (Var39) and “Interpersonal Understanding” (Var58) was found positively correlated ($r=0.198$, $N=187$, $p=0.003$). The data indicated that as project manager’s ability to hear accurately and understand the unspoken or partly expressed thoughts, feelings, and concerns of

others increased, his competency level for ensuring that all changes made to a project's baseline scopes, time, cost and quality objectives are identified, evaluated, approved, rejected or deferred, increased as well.

Table 5.79: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Helping and Human service”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Helping and Human service" competency elements					Person-Related Competencies	
					Helping and Human service	
					VAR57	VAR58
					Client Orientation	Interpersonal Understanding
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	0.053	0.102
				Sig. (1-tailed)	0.234	0.083
				N	187	187
		VAR36	Written skills	Pearson Correlation	-0.092	0.052
				Sig. (1-tailed)	0.106	0.241
				N	187	187
		VAR37	To know project success criteria	Pearson Correlation	0.019	0.09
				Sig. (1-tailed)	0.396	0.11
				N	187	187
		VAR38	Methods & procedures	Pearson Correlation	0.114	-0.049
				Sig. (1-tailed)	0.06	0.251
				N	187	187
		VAR39	Change Control	Pearson Correlation	0.062	.198**
				Sig. (1-tailed)	0.199	0.003
				N	187	187
		VAR40	Technology management	Pearson Correlation	-0.014	-0.029
				Sig. (1-tailed)	0.423	0.346
				N	187	187
		VAR41	Value management	Pearson Correlation	0.058	-0.064
				Sig. (1-tailed)	0.214	0.193
				N	187	187

Table 5.80: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Helping and Human service”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Helping and Human service" competency elements					Person-Related Competencies	
					Helping and Human service	
					VAR57	VAR58
					Client Orientation	Interpersonal Understanding
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	0.108	.141 *
				Sig. (1-tailed)	0.07	0.027
				N	187	187
		VAR43	Documentation	Pearson Correlation	-0.021	-0.009
				Sig. (1-tailed)	0.39	0.451
				N	187	187
		VAR44	Appraising project team members	Pearson Correlation	0.002	0.059
				Sig. (1-tailed)	0.487	0.209
				N	187	187
		VAR45	Administer design process	Pearson Correlation	0.055	0.06
				Sig. (1-tailed)	0.228	0.207
				N	187	187
		VAR46	Administer authority liaison	Pearson Correlation	0.083	0.114
				Sig. (1-tailed)	0.13	0.06
				N	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	-0.086	0
				Sig. (1-tailed)	0.122	0.5
				N	187	187

5.5.47 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TECHNICAL EXPERTISE” AND COMPETENCY ELEMENTS OF “IMPACT AND INFLUENCE”

As shown in the Tables 5.81 and 5.82, the correlation between “Handover & closeout” (Var42) and “Organizational Awareness” (Var60) ($r = 0.208$, $N = 187$, $p = 0.002$) received the highest correlation rating followed by correlation between “Administer authority liaison” (Var46) and “Organizational Awareness” (Var60) ($r = 0.198$, $N = 187$, $p = 0.003$)

and then followed by correlation between “Verbal skills” (Var35) and “Relationship Building” (Var61) ($r= 0.182$, $N=187$, $p=0.006$) . Correlation between “Appraising project team members” (Var44) and “Impact & influence” (Var59) received the lowest correlation rating ($r= 0.177$, $N=187$, $p=0.008$). The results from Pearson correlation showed a positive relationship exists in aforementioned competency elements.

Table 5.81: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Impact and Influence”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Impact & Influence" competency elements					Person-Related Competencies			
					Impact & Influence			
					VAR59	VAR60	VAR61	VAR62
					Impact & influence	Organizational Awareness	Relationship Building	Building trust
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	0.092	-0.003	.182**	0.096
				Sig. (1-tailed)	0.106	0.486	0.006	0.096
				N	187	187	187	187
		VAR36	Written skills	Pearson Correlation	0.078	-0.058	.132*	.144*
				Sig. (1-tailed)	0.143	0.215	0.036	0.025
				N	187	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	-0.032	.169*	-0.026	-0.011
				Sig. (1-tailed)	0.334	0.01	0.364	0.442
				N	187	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	0.039	.162*	0.064	-0.027
				Sig. (1-tailed)	0.297	0.013	0.191	0.356
				N	187	187	187	187
		VAR39	Change Control	Pearson Correlation	-0.07	0.094	.137*	-0.024
				Sig. (1-tailed)	0.172	0.1	0.031	0.373
				N	187	187	187	187
		VAR40	Technology management	Pearson Correlation	.148*	.124*	0.058	-0.006
				Sig. (1-tailed)	0.022	0.045	0.216	0.47
				N	187	187	187	187
		VAR41	Value management	Pearson Correlation	-0.04	0.025	0.004	0.049
				Sig. (1-tailed)	0.294	0.366	0.479	0.254
				N	187	187	187	187

Table 5.82: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Impact and Influence”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Impact & Influence" competency elements					Person-Related Competencies			
					Impact & Influence			
					VAR59	VAR60	VAR61	VAR62
					Impact & influence	Organizational Awareness	Relationship Building	Building trust
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	.123 *	.208 **	0.027	0.032
				Sig. (1-tailed)	0.047	0.002	0.356	0.332
				N	187	187	187	187
		VAR43	Documentation	Pearson Correlation	0.085	.162 *	-0.082	0.066
				Sig. (1-tailed)	0.124	0.013	0.132	0.185
				N	187	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	.177 **	0.086	0.082	.143 *
				Sig. (1-tailed)	0.008	0.122	0.133	0.025
				N	187	187	187	187
		VAR45	Administer design process	Pearson Correlation	0.107	0.02	0.019	0.086
				Sig. (1-tailed)	0.073	0.395	0.397	0.122
				N	187	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	-0.022	.198 **	0.091	-0.014
				Sig. (1-tailed)	0.382	0.003	0.109	0.425
				N	187	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	0.071	.123 *	-0.025	0.007
				Sig. (1-tailed)	0.166	0.047	0.367	0.463
				N	187	187	187	187

5.5.48 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TECHNICAL EXPERTISE” AND COMPETENCY ELEMENTS OF “MANAGERIAL”

As shown in Tables 5.83 and 5.84, the results from Pearson correlation showed a positive relationship exists between “Verbal skills” (Var35) and “Making decisions”

(Var68) ($r=0.230$, $N=187$, $p=0.001$), between “Technology management” (Var40) and “Developing others” (Var64) ($r=0.205$, $N=187$, $p=0.002$), between “Handover & closeout” (Var42) and “Teamwork & Cooperation” (Var63) ($r=0.209$, $N=187$, $p=0.002$), between “Value management” (Var41) and “Disciplining & counseling” (Var67) ($r=0.184$, $N=187$, $p=0.006$), between “Perform post-contract evaluation” (Var47) and “Teamwork & Cooperation” (Var63) ($r=0.183$, $N=187$, $p=0.006$), between “Administer authority liaison” (Var46) and “Disciplining & counseling” (Var67) ($r=0.176$, $N=187$, $p=0.008$), between “Administer design process” (Var45) and “Making decisions” (Var68) ($r=0.188$, $N=187$, $p=0.005$).

Table 5.83: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Managerial”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counseling	Making decisions
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	-0.042	0.022	0.045	0.033	.134*	.230**
				Sig. (1-tailed)	0.282	0.383	0.273	0.327	0.033	0.001
				N	187	187	187	187	187	187
		VAR36	Written skills	Pearson Correlation	0.041	.154*	-0.02	0.118	0.01	0.054
				Sig. (1-tailed)	0.288	0.018	0.395	0.054	0.447	0.231
				N	187	187	187	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	.148*	0.067	0.078	0.083	0.017	-0.114
				Sig. (1-tailed)	0.021	0.18	0.145	0.13	0.408	0.059
				N	187	187	187	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	.170*	.164*	.125*	-0.068	0.016	0.037
				Sig. (1-tailed)	0.01	0.013	0.044	0.177	0.414	0.309
				N	187	187	187	187	187	187
		VAR39	Change Control	Pearson Correlation	.146*	0.043	0.066	.144*	0.079	0.021
				Sig. (1-tailed)	0.023	0.281	0.185	0.024	0.142	0.386
				N	187	187	187	187	187	187
		VAR40	Technology management	Pearson Correlation	0.043	.205**	0.093	0.021	.163*	0.097
				Sig. (1-tailed)	0.277	0.002	0.103	0.387	0.013	0.094
				N	187	187	187	187	187	187
		VAR41	Value management	Pearson Correlation	.129*	.122*	.155*	.145*	.184**	0.107
				Sig. (1-tailed)	0.039	0.048	0.017	0.024	0.006	0.073
				N	187	187	187	187	187	187

Table 5.84: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Managerial”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counselling	Making decisions
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	.209**	-0.007	0.077	0.068	0.029	-0.038
				Sig. (1-tailed)	0.002	0.46	0.149	0.179	0.349	0.301
				N	187	187	187	187	187	187
		VAR43	Documentation	Pearson Correlation	0.083	-0.036	-0.04	0.009	-0.043	-0.032
				Sig. (1-tailed)	0.128	0.312	0.295	0.45	0.281	0.33
				N	187	187	187	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	.139*	-0.008	-0.049	0.003	0.008	0.035
				Sig. (1-tailed)	0.029	0.456	0.251	0.483	0.454	0.318
				N	187	187	187	187	187	187
		VAR45	Administer design process	Pearson Correlation	-0.014	.148*	0.056	0.112	0.093	.188**
				Sig. (1-tailed)	0.423	0.022	0.224	0.063	0.104	0.005
				N	187	187	187	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	-.160*	.159*	-0.113	0.026	.176**	0.111
				Sig. (1-tailed)	0.015	0.015	0.063	0.364	0.008	0.065
				N	187	187	187	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	.183**	0.09	cc	0.085	0.094	0.026
				Sig. (1-tailed)	0.006	0.111	0.211	0.124	0.101	0.361
				N	187	187	187	187	187	187

5.5.49 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TECHNICAL EXPERTISE” AND COMPETENCY ELEMENTS OF “COGNITIVE”

As shown in the Tables 5.85 and 5.86, the correlation between “Written skills” (Var36) and “Critical analysis & judgment” (Var71) ($r = 0.231$, $N = 187$, $p = 0.001$) received the highest correlation rating followed by correlation between “Written skills” (Var36) and “Analytical Thinking” (Var69) ($r = 0.216$, $N = 187$, $p = 0.001$). Correlation between “Verbal skills” (Var35) and “Conceptual Thinking” (Var70) received the lowest

correlation rating ($r= 0.174$, $N=187$, $p=0.009$). The results from Pearson correlation showed a positive relationship exists in aforementioned competency elements.

Table 5.85: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Cognitive”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Cognitive" competency elements					Person-Related Competencies		
					Cognitive		
					VAR69	VAR70	VAR71
					Analytical Thinking	Conceptual Thinking	Critical analysis & judgement
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	0.055	.174**	.153*
				Sig. (1-tailed)	0.227	0.009	0.018
				N	187	187	187
		VAR36	Written skills	Pearson Correlation	.216**	.158*	.231**
				Sig. (1-tailed)	0.001	0.015	0.001
				N	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	0.06	0.018	.133*
				Sig. (1-tailed)	0.205	0.403	0.035
				N	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	-0.031	-0.011	-0.012
				Sig. (1-tailed)	0.337	0.44	0.434
				N	187	187	187
		VAR39	Change Control	Pearson Correlation	0.069	-0.025	-0.009
				Sig. (1-tailed)	0.174	0.368	0.451
				N	187	187	187
		VAR40	Technology management	Pearson Correlation	0.114	0.065	-0.012
				Sig. (1-tailed)	0.061	0.188	0.434
				N	187	187	187
		VAR41	Value management	Pearson Correlation	0.007	0.059	0.089
				Sig. (1-tailed)	0.462	0.213	0.112
				N	187	187	187

Table 5.86: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Cognitive”

<p>The relationship between "Construction Works (Technical expertise)" Competency elements and "Cognitive" competency elements</p>					Person-Related Competencies		
					Cognitive		
					VAR69	VAR70	VAR71
					Analytical Thinking	Conceptual Thinking	Critical analysis & judgement
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	0.104	-0.094	0.044
				Sig. (1-tailed)	0.078	0.1	0.276
				N	187	187	187
		VAR43	Documentation	Pearson Correlation	0.077	-0.093	-0.076
				Sig. (1-tailed)	0.147	0.103	0.151
				N	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	.141*	.122*	0.06
				Sig. (1-tailed)	0.027	0.048	0.209
				N	187	187	187
		VAR45	Administer design process	Pearson Correlation	.141*	0.1	0.072
				Sig. (1-tailed)	0.027	0.087	0.164
				N	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	-0.017	.128*	0.064
				Sig. (1-tailed)	0.411	0.04	0.193
				N	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	0.052	0.059	0.028
				Sig. (1-tailed)	0.241	0.212	0.354
				N	187	187	187

5.5.50 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TECHNICAL EXPERTISE” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in Tables 5.87 and 5.88, the results from Pearson correlation showed a positive relationship exists between “Verbal skills” (Var35) and “Self-Control” (Var72) ($r=0.183$, $N=187$, $p=0.006$), between “Methods & procedures” (Var38) and “Conscientiousness” (Var77) ($r=0.174$, $N=187$, $p=0.008$), between “Methods & procedures” (Var38) and “Creativity” (Var78) ($r=0.172$, $N=187$, $p=0.009$), between “Change Control” (Var39) and “Self-Confidence” (Var73) ($r=0.194$, $N=187$, $p=0.004$), between “Technology management” (Var40) and “Self-Control” (Var72) ($r=0.201$, $N=187$, $p=0.003$), between “Value management” (Var41) and “Self-Control” (Var72) ($r=0.205$, $N=187$, $p=0.002$), between “Technology management” (Var40) and “Intuitiveness” (Var76) ($r=0.204$, $N=187$, $p=0.003$), between “Documentation” (Var43) and “Conscientiousness” (Var77) ($r=0.319$, $N=187$, $p=0.0$), between “Documentation” (Var43) and “Creativity” (Var78) ($r=0.182$, $N=187$, $p=0.006$), between “Administer authority liaison” (Var46) and “Self-Confidence” (Var73) ($r=0.253$, $N=187$, $p=0.0$), between “Perform post-contract evaluation” (Var47) and “Self-Control” (Var72) ($r=0.187$, $N=187$, $p=0.005$), between “Perform post-contract evaluation” (Var47) and “Organizational Commitment” (Var75) ($r=0.174$, $N=187$, $p=0.009$).

Table 5.87: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Personal Effectiveness”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Personal Effectiveness" competency elements					Person-Related Competencies						
					Personal Effectiveness						
					VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78
					Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	.183**	.138*	0.044	0.04	-0.013	0.024	-0.072
				Sig. (1-tailed)	0.006	0.03	0.277	0.295	0.431	0.37	0.164
				N	187	187	187	187	187	187	187
		VAR36	Written skills	Pearson Correlation	0.108	0.013	0.046	0.06	-0.026	-0.021	-.137*
				Sig. (1-tailed)	0.071	0.432	0.267	0.209	0.361	0.386	0.031
				N	187	187	187	187	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	0.119	-0.024	-0.038	0.115	-0.064	0.015	-0.024
				Sig. (1-tailed)	0.053	0.373	0.301	0.059	0.192	0.42	0.374
				N	187	187	187	187	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	0.068	0.085	-0.049	-0.071	0.026	.174**	.172**
				Sig. (1-tailed)	0.177	0.123	0.255	0.168	0.361	0.008	0.009
				N	187	187	187	187	187	187	187
		VAR39	Change Control	Pearson Correlation	0.117	.194**	0.011	0.067	0.109	0.075	0.011
				Sig. (1-tailed)	0.055	0.004	0.443	0.18	0.068	0.155	0.441
				N	187	187	187	187	187	187	187
		VAR40	Technology management	Pearson Correlation	.201**	0.03	.125*	0.086	.204**	0.034	-0.023
				Sig. (1-tailed)	0.003	0.342	0.045	0.122	0.003	0.321	0.378
				N	187	187	187	187	187	187	187
		VAR41	Value management	Pearson Correlation	.205**	0.066	0.06	0.001	0.01	0.113	-0.021
				Sig. (1-tailed)	0.002	0.184	0.208	0.497	0.448	0.062	0.389
				N	187	187	187	187	187	187	187

Table 5.88: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Personal Effectiveness”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Personal Effectiveness" competency elements					Person-Related Competencies						
					Personal Effectiveness						
					VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78
					Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	0.119	0.12	0.1	0.091	-0.02	0.045	0.065
				Sig. (1-tailed)	0.053	0.051	0.086	0.107	0.395	0.269	0.187
				N	187	187	187	187	187	187	187
		VAR43	Documentation	Pearson Correlation	0.075	0.075	0.108	-0.033	-0.052	.319**	.182**
				Sig. (1-tailed)	0.154	0.153	0.071	0.327	0.238	0	0.006
				N	187	187	187	187	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	-0.004	.121*	0.044	0.017	0.014	0.106	0.019
				Sig. (1-tailed)	0.477	0.05	0.273	0.41	0.425	0.075	0.396
				N	187	187	187	187	187	187	187
		VAR45	Administer design process	Pearson Correlation	0.107	-0.025	0.009	.127*	-0.037	-0.044	0.102
				Sig. (1-tailed)	0.072	0.368	0.452	0.041	0.308	0.274	0.082
				N	187	187	187	187	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	0.078	.253**	-0.062	0.022	0.082	0.038	0.084
				Sig. (1-tailed)	0.144	0	0.2	0.38	0.132	0.305	0.126
				N	187	187	187	187	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	.187**	0.074	0.105	.174**	-0.105	.121*	-0.018
				Sig. (1-tailed)	0.005	0.156	0.076	0.009	0.076	0.049	0.403
				N	187	187	187	187	187	187	187

5.5.51 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TECHNICAL EXPERTISE” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in Tables 5.89, 5.90, 5.91, and 5.92, the results from Pearson correlation showed a positive relationship exists between “Verbal skills” (Var35) and “Professionalism & ethics” (Var82) ($r=0.181$, $N=187$, $p=0.007$), between “Written skills” (Var36) and “Negotiation” (Var80) ($r=0.223$, $N=187$, $p=0.001$), between “Handover & closeout” (Var42) and “Conflict management” (Var79) ($r=0.218$, $N=187$, $p=0.001$), between “Handover & closeout” (Var42) and “Consultation” (Var87)

($r=0.255$, $N=187$, $p=0.0$) , between “Administer design process” (Var45) and “The ability to deal with ambiguity” (Var90) ($r=0.184$, $N=187$, $p=0.006$)

Table 5.89: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Behavioral”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the heart)	Openness
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	0.02	0.089	0.098	.181**	-0.098	-0.05
				Sig. (1-tailed)	0.395	0.114	0.091	0.007	0.092	0.25
				N	187	187	187	187	187	187
		VAR36	Written skills	Pearson Correlation	-0.01	.223**	0.062	0.108	-0.061	0.009
				Sig. (1-tailed)	0.447	0.001	0.2	0.071	0.204	0.45
				N	187	187	187	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	0.035	0.087	0.08	-0.071	-0.084	0.077
				Sig. (1-tailed)	0.317	0.117	0.137	0.168	0.127	0.149
				N	187	187	187	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	0.104	-0.088	0.082	0.071	0.107	0.017
				Sig. (1-tailed)	0.079	0.116	0.133	0.167	0.072	0.41
				N	187	187	187	187	187	187
		VAR39	Change Control	Pearson Correlation	.152*	0.026	0.064	0.076	-0.014	.163*
				Sig. (1-tailed)	0.019	0.364	0.191	0.151	0.426	0.013
				N	187	187	187	187	187	187
		VAR40	Technology management	Pearson Correlation	0.01	0.037	0.076	.141*	-0.04	-0.056
				Sig. (1-tailed)	0.445	0.309	0.15	0.027	0.294	0.223
				N	187	187	187	187	187	187
		VAR41	Value management	Pearson Correlation	0.006	-0.018	0.065	0.06	0.019	0.113
				Sig. (1-tailed)	0.467	0.404	0.187	0.206	0.398	0.062
				N	187	187	187	187	187	187

Table 5.90: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Behavioral”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	0.042	0.101	-0.011	-0.026	0.006	.159*
				Sig. (1-tailed)	0.285	0.085	0.442	0.362	0.465	0.015
				N	187	187	187	187	187	187
		VAR36	Written skills	Pearson Correlation	-0.026	-0.056	0.025	0.059	.134*	0.053
				Sig. (1-tailed)	0.361	0.222	0.366	0.21	0.034	0.237
				N	187	187	187	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	-0.083	0.032	-0.025	0.038	0.001	-0.04
				Sig. (1-tailed)	0.13	0.334	0.369	0.301	0.495	0.292
				N	187	187	187	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	0.113	0.108	0.109	0.025	0.026	0.069
				Sig. (1-tailed)	0.062	0.07	0.069	0.366	0.36	0.173
				N	187	187	187	187	187	187
		VAR39	Change Control	Pearson Correlation	0.119	0.087	0.101	0.065	-0.017	0.062
				Sig. (1-tailed)	0.052	0.117	0.085	0.188	0.41	0.201
				N	187	187	187	187	187	187
		VAR40	Technology management	Pearson Correlation	-0.073	-0.015	0.066	-.127*	0.009	0.027
				Sig. (1-tailed)	0.159	0.42	0.184	0.042	0.449	0.357
				N	187	187	187	187	187	187
		VAR41	Value management	Pearson Correlation	-0.025	0.007	0.067	0.034	0.055	.144*
				Sig. (1-tailed)	0.367	0.461	0.18	0.323	0.227	0.024
				N	187	187	187	187	187	187

Table 5.91: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Behavioral”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the heart)	Openness
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	.218**	0.107	0.089	-0.037	0.074	0.057
				Sig. (1-tailed)	0.001	0.073	0.113	0.308	0.158	0.219
				N	187	187	187	187	187	187
		VAR43	Documentation	Pearson Correlation	0.003	-.121*	.161*	0.023	.141*	0.014
				Sig. (1-tailed)	0.483	0.05	0.014	0.378	0.027	0.422
				N	187	187	187	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	0.005	0.049	-0.005	0.031	-0.001	-0.013
				Sig. (1-tailed)	0.474	0.253	0.472	0.338	0.495	0.43
				N	187	187	187	187	187	187
		VAR45	Administer design process	Pearson Correlation	-0.09	0.062	0.053	0.059	0.088	-0.032
				Sig. (1-tailed)	0.11	0.198	0.237	0.213	0.117	0.33
				N	187	187	187	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	-0.024	-0.02	0.099	.170*	-0.03	-0.03
				Sig. (1-tailed)	0.372	0.39	0.089	0.01	0.343	0.343
				N	187	187	187	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	0.096	0.103	.129*	0.109	-0.066	-0.033
				Sig. (1-tailed)	0.095	0.08	0.04	0.068	0.184	0.327
				N	187	187	187	187	187	187

Table 5.92: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Behavioral”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	-0.007	0.076	.255**	0.084	-0.007	0.023
				Sig. (1-tailed)	0.46	0.15	0	0.127	0.464	0.378
				N	187	187	187	187	187	187
		VAR43	Documentation	Pearson Correlation	.159*	-0.05	0.034	0.013	.126*	-0.01
				Sig. (1-tailed)	0.015	0.247	0.32	0.431	0.043	0.444
				N	187	187	187	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	0.038	0.058	-0.035	0.052	0.09	-0.048
				Sig. (1-tailed)	0.305	0.214	0.316	0.241	0.111	0.256
				N	187	187	187	187	187	187
		VAR45	Administer design process	Pearson Correlation	0.033	0.028	.136*	-0.02	0.08	.184**
				Sig. (1-tailed)	0.329	0.353	0.031	0.393	0.137	0.006
				N	187	187	187	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	-0.089	-0.038	0.025	-0.019	0.003	0.037
				Sig. (1-tailed)	0.112	0.305	0.365	0.4	0.486	0.307
				N	187	187	187	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	0.078	0.035	0.054	-0.074	0.112	.126*
				Sig. (1-tailed)	0.143	0.316	0.233	0.157	0.063	0.043
				N	187	187	187	187	187	187

5.5.52 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “TECHNICAL EXPERTISE” AND COMPETENCY ELEMENTS OF “CONTEXTUAL”

As shown in Tables 5.93, 5.94, 5.95, and 5.96, the results from Pearson correlation showed a positive relationship exists between “Verbal skills” (Var35) and “Program orientation (Strategic Perspective)” (Var92) ($r=0.171$, $N=187$, $p=0.01$), between “Written skills” (Var36) and “Program orientation (Strategic Perspective)” (Var92) ($r=0.221$, $N=187$, $p=0.001$), between “Change Control” (Var39) and “Program orientation (Strategic Perspective)” (Var92) ($r=0.225$, $N=187$, $p=0.001$), between

“Change Control” (Var39) and “Organization structure” (Var99) ($r=0.191$, $N=187$, $p=0.004$), between “Technology management” (Var40) and “Cultural awareness” (Var100) ($r=0.219$, $N=187$, $p=0.001$), between “Handover & closeout” (Var42) and “Project orientation” (Var91) ($r=0.219$, $N=187$, $p=0.001$), between “Handover & closeout” (Var42) and “Permanent organization” (Var95) ($r=0.360$, $N=187$, $p=0.0$), between “Appraising project team members” (Var44) and “Portfolio orientation” (Var93) ($r=0.176$, $N=187$, $p=0.008$), between “Administer design process” (Var45) and “Change management (in organization)” (Var94) ($r=0.202$, $N=187$, $p=0.003$), between “Perform post-contract evaluation” (Var47) and “Health, security, safety & environment” (Var96) ($r=0.196$, $N=187$, $p=0.004$).

Table 5.93: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Contextual”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Contextual" competency elements				Person-Related Competencies						
				Contextual						
				VAR91	VAR92	VAR93	VAR94	VAR95	VAR96	
				Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment	
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	-0.065	.171**	0.07	0.031	-0.07	0.104
				Sig. (1-tailed)	0.187	0.01	0.17	0.337	0.172	0.078
				N	187	187	187	187	187	187
		VAR36	Written skills	Pearson Correlation	0.067	.221**	0.105	0.073	0.009	.153*
				Sig. (1-tailed)	0.181	0.001	0.077	0.161	0.451	0.018
				N	187	187	187	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	0.093	0.052	-0.023	.168*	0.049	.167*
				Sig. (1-tailed)	0.103	0.238	0.38	0.011	0.252	0.011
				N	187	187	187	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	-0.004	0.071	-.152*	0.065	0.02	-0.03
				Sig. (1-tailed)	0.48	0.166	0.019	0.189	0.394	0.34
				N	187	187	187	187	187	187
		VAR39	Change Control	Pearson Correlation	0.098	.225**	0.092	0.095	0.038	-0.018
				Sig. (1-tailed)	0.092	0.001	0.106	0.099	0.305	0.401
				N	187	187	187	187	187	187
		VAR40	Technology management	Pearson Correlation	-0.005	-0.016	0.075	-0.005	0.096	0.084
				Sig. (1-tailed)	0.474	0.414	0.154	0.471	0.095	0.127
				N	187	187	187	187	187	187
		VAR41	Value management	Pearson Correlation	-0.03	.136*	-0.039	0.097	-0.045	0.075
				Sig. (1-tailed)	0.343	0.032	0.298	0.093	0.272	0.153
				N	187	187	187	187	187	187

Table 5.94: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Contextual”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Construction Works (Technical expertise)	VAR35	Verbal skills	Pearson Correlation	0.095	-0.053	0.033	.156*	.156*
				Sig. (1-tailed)	0.097	0.234	0.325	0.017	.017
				N	187	187	187	187	187
		VAR36	Written skills	Pearson Correlation	0.032	0.036	0.061	0.057	.088
				Sig. (1-tailed)	0.333	0.31	0.205	0.219	.115
				N	187	187	187	187	187
		VAR37	To know project success criteria	Pearson Correlation	-0.08	-0.001	0.001	0.071	-.030
				Sig. (1-tailed)	0.137	0.495	0.496	0.167	.342
				N	187	187	187	187	187
		VAR38	Methods & procedures	Pearson Correlation	0.093	0.03	0.016	0.008	.034
				Sig. (1-tailed)	0.103	0.342	0.412	0.455	.322
				N	187	187	187	187	187
		VAR39	Change Control	Pearson Correlation	0.003	-0.072	.191**	-0.07	-.121*
				Sig. (1-tailed)	0.483	0.164	0.004	0.169	.049
				N	187	187	187	187	187
		VAR40	Technology management	Pearson Correlation	0.009	-0.036	0.096	.219**	.103
				Sig. (1-tailed)	0.45	0.311	0.096	0.001	.080
				N	187	187	187	187	187
		VAR41	Value management	Pearson Correlation	-0.075	0.031	0.054	0.093	.126*
				Sig. (1-tailed)	0.155	0.334	0.23	0.103	.043
				N	187	187	187	187	187

Table 5.95: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Contextual”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Contextual" competency elements				Person-Related Competencies						
				Contextual						
				VAR91	VAR92	VAR93	VAR94	VAR95	VAR96	
				Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment	
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	.219**	0.021	0.029	0.03	.360**	0.052
				Sig. (1-tailed)	0.001	0.389	0.345	0.343	0	0.241
				N	187	187	187	187	187	187
		VAR43	Documentation	Pearson Correlation	.131 *	0.006	0.053	0.083	0.112	-0.108
				Sig. (1-tailed)	0.037	0.469	0.236	0.129	0.063	0.071
				N	187	187	187	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	0.087	0.024	.176**	0.052	.124*	0.106
				Sig. (1-tailed)	0.117	0.373	0.008	0.239	0.046	0.075
				N	187	187	187	187	187	187
		VAR45	Administer design process	Pearson Correlation	0.026	.149 *	0.021	.202**	0.12	0.05
				Sig. (1-tailed)	0.363	0.021	0.386	0.003	0.051	0.247
				N	187	187	187	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	-0.035	0.072	.160 *	.124 *	-0.031	-0.026
				Sig. (1-tailed)	0.318	0.162	0.014	0.045	0.336	0.363
				N	187	187	187	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	0.089	0.024	0.063	0.117	0.099	.196**
				Sig. (1-tailed)	0.112	0.375	0.197	0.056	0.089	0.004
				N	187	187	187	187	187	187

Table 5.96: Correlation analysis between competency elements of “Technical Expertise” and competency elements of “Contextual”

The relationship between "Construction Works (Technical expertise)" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Construction Works (Technical expertise)	VAR42	Handover & closeout	Pearson Correlation	-.124*	0.087	0.056	0.026	.040
				Sig. (1-tailed)	0.046	0.117	0.222	0.364	.293
				N	187	187	187	187	187
		VAR43	Documentation	Pearson Correlation	0.051	.165*	0.091	0.005	-.018
				Sig. (1-tailed)	0.243	0.012	0.108	0.472	.406
				N	187	187	187	187	187
		VAR44	Appraising project team members	Pearson Correlation	0.09	0.099	0.101	0.038	.021
				Sig. (1-tailed)	0.111	0.088	0.084	0.301	.386
				N	187	187	187	187	187
		VAR45	Administer design process	Pearson Correlation	-0.062	-0.032	.154*	0.104	.016
				Sig. (1-tailed)	0.198	0.329	0.018	0.078	.412
				N	187	187	187	187	187
		VAR46	Administer authority liaison	Pearson Correlation	0.047	-0.034	.126*	0.066	.099
				Sig. (1-tailed)	0.263	0.323	0.042	0.184	.089
				N	187	187	187	187	187
		VAR47	Perform post-contract evaluation	Pearson Correlation	-0.09	0.052	0.014	0.075	-.008
				Sig. (1-tailed)	0.11	0.238	0.427	0.155	.458
				N	187	187	187	187	187

5.5.53 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “EXPERIENCE” AND COMPETENCY ELEMENTS OF “ACHIEVEMENT AND ACTION”

As shown in Table 5.97, the relationship between “Membership in appropriate professional body” (Var51) and “Initiative” (Var54) was found positively correlated ($r=0.183$, $N=187$, $p=0.006$).

Table 5.97: Correlation analysis between competency elements of “Experience” and competency elements of “Achievement and Action”

The relationship between "Experience" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	0.041	0.035	0.06	0.116	0.018
				Sig. (1-tailed)	0.29	0.319	0.206	0.057	0.404
				N	187	187	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	-0.068	-0.052	0.021	0.06	0.033
				Sig. (1-tailed)	0.179	0.241	0.389	0.208	0.328
				N	187	187	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	.161*	0.087	-0.074	.152*	-0.111
				Sig. (1-tailed)	0.014	0.117	0.158	0.019	0.065
				N	187	187	187	187	187
		VAR51	Membership in appropriate professional body	Pearson Correlation	-0.061	0.082	.183**	.170*	-0.053
				Sig. (1-tailed)	0.202	0.131	0.006	0.01	0.236
				N	187	187	187	187	187

5.5.54 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “EXPERIENCE” AND “HELPING AND COMPETENCY ELEMENTS OF “HUMAN SERVICE”

As shown in Table 5.98, the relationship between “Experience variety of project types” (Var50) and “Interpersonal Understanding” (Var58) was found positively correlated ($r=0.173$, $N=187$, $p=0.009$).

Table 5.98: Correlation analysis between competency elements of “Experience” and “Helping and competency elements of “Human Service”

The relationship between "Experience" Competency elements and "Achievement and Action" competency elements					Person-Related Competencies				
					Achievement and Action				
					VAR52	VAR53	VAR54	VAR55	VAR56
					Achievement orientation (Result orientation)	Concern for order, quality, & accuracy	Initiative	Information Seeking	Identifying & solving problems
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	0.041	0.035	0.06	0.116	0.018
				Sig. (1-tailed)	0.29	0.319	0.206	0.057	0.404
				N	187	187	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	-0.068	-0.052	0.021	0.06	0.033
				Sig. (1-tailed)	0.179	0.241	0.389	0.208	0.328
				N	187	187	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	.161*	0.087	-0.074	.152*	-0.111
				Sig. (1-tailed)	0.014	0.117	0.158	0.019	0.065
				N	187	187	187	187	187
		VAR51	Membership in appropriate professional body	Pearson Correlation	-0.061	0.082	.183**	.170*	-0.053
				Sig. (1-tailed)	0.202	0.131	0.006	0.01	0.236
				N	187	187	187	187	187

5.5.55 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “EXPERIENCE” AND COMPETENCY ELEMENTS OF “MANAGERIAL”

As shown in Table 5.99, the results from Pearson correlation showed a positive relationship exists between “Managing similar projects” (Var48) and “Making decisions” (Var68) ($r=0.187$, $N=187$, $p=0.005$), between “Number of years working in construction Industry” (Var49) and “Making decisions” (Var68) ($r=0.187$, $N=187$, $p=0.005$), between “Membership in appropriate professional body” (Var51) and

“Developing others” (Var64) ($r=0.224$, $N=187$, $p=0.001$), between “Membership in appropriate professional body” (Var51) and “Team Leadership” (Var65) ($r=0.197$, $N=187$, $p=0.003$), between “Membership in appropriate professional body” (Var51) and “Making decisions” (Var68) ($r=0.181$, $N=187$, $p=0.001$).

Table 5.99: Correlation analysis between competency elements of “Experience” and competency elements of “Managerial”

The relationship between "Experience" Competency elements and "Managerial" competency elements					Person-Related Competencies					
					Managerial					
					VAR63	VAR64	VAR65	VAR66	VAR67	VAR68
					Teamwork & Cooperation	Developing others	Team Leadership	Being Directive: Assertiveness & use of positional power	Disciplining & counselling	Making decisions
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	-0.001	.144*	0.034	0.041	0.041	.187**
				Sig. (1-tailed)	0.493	0.025	0.323	0.286	0.29	0.005
				N	187	187	187	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	0.029	-0.066	.133*	0.018	0.021	.187**
				Sig. (1-tailed)	0.347	0.186	0.035	0.405	0.389	0.005
				N	187	187	187	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	-0.008	0.03	.136*	.142*	0.106	.135*
				Sig. (1-tailed)	0.455	0.34	0.032	0.026	0.074	0.033
				N	187	187	187	187	187	187
		VAR51	Membership in appropriate professional body	Pearson Correlation	-0.06	.224**	.197**	0.052	.243**	.181**
				Sig. (1-tailed)	0.207	0.001	0.003	0.238	0	0.007
				N	187	187	187	187	187	187

5.5.56 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “EXPERIENCE” AND COMPETENCY ELEMENTS OF “COGNITIVE”

As shown in Table 5.100, the results for Pearson correlation showed a positive relationship exists between “Number of years working in construction Industry” (Var49) and “Critical analysis & judgment” (Var71) ($r=0.285$, $N=187$, $p=0.0$). Furthermore, the relationship between “Experience variety of project types” (Var50)

and “Conceptual Thinking” (Var70) was found positively correlated ($r=0.207$, $N=187$, $p=0.002$).

Table 5.100: Correlation analysis between competency elements of “Experience” and competency elements of “Cognitive”

The relationship between "Experience" Competency elements and "Cognitive" competency elements					Person-Related Competencies		
					Cognitive		
					VAR69	VAR70	VAR71
					Analytical Thinking	Conceptual Thinking	Critical analysis & judgement
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	0.065	0.063	0.076
				Sig. (1-tailed)	0.188	0.196	0.152
				N	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	0.07	0.098	.285**
				Sig. (1-tailed)	0.17	0.091	0
				N	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	0.057	.207**	0.028
				Sig. (1-tailed)	0.218	0.002	0.35
				N	187	187	187
		VAR51	Membership in appropriate professional body	Pearson Correlation	-0.024	0.076	0.074
				Sig. (1-tailed)	0.371	0.151	0.157
				N	187	187	187

5.5.57 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “EXPERIENCE” AND COMPETENCY ELEMENTS OF “PERSONAL EFFECTIVENESS”

As shown in the Table 5.101, the correlation between “Membership in appropriate professional body” (Var51) and “Organizational Commitment” (Var75) ($r= 0.207$, $N=187$, $p=0.002$) received the highest correlation rating followed by correlation between “Membership in appropriate professional body” (Var51) and “Self-Confidence” (Var73) ($r= 0.181$, $N=187$, $p=0.007$). Correlation between “Experience variety of project types” (Var50) and “Self-Confidence” (Var73) received the lowest correlation rating ($r= 0.174$, $N=187$, $p=0.008$). The results showed a positive relationship in the aforementioned correlations.

Table 5.101: Correlation analysis between competency elements of “Experience” and competency elements of “Personal Effectiveness”

The relationship between "Experience" Competency elements and "Personal Effectiveness" competency elements					Person-Related Competencies						
					Personal Effectiveness						
					VAR72	VAR73	VAR74	VAR75	VAR76	VAR77	VAR78
					Self-Control	Self-Confidence	Flexibility	Organizational Commitment	Intuitiveness	Conscientiousness	Creativity
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	0.094	0.073	0.03	0.035	0.026	-0.033	-0.058
				Sig. (1-tailed)	0.1	0.162	0.343	0.318	0.363	0.329	0.216
				N	187	187	187	187	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	0.083	-0.004	0.013	0.032	-0.093	-0.041	.125*
				Sig. (1-tailed)	0.129	0.478	0.43	0.334	0.103	0.291	0.044
				N	187	187	187	187	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	0.07	.174**	-0.085	0.111	-0.052	0.015	0.03
				Sig. (1-tailed)	0.17	0.008	0.122	0.066	0.239	0.419	0.341
				N	187	187	187	187	187	187	187
		VAR51	Membership in appropriate proffesional body	Pearson Correlation	0.093	.181**	-0.06	.207**	.150*	-0.014	-0.007
				Sig. (1-tailed)	0.103	0.007	0.209	0.002	0.02	0.427	0.463
				N	187	187	187	187	187	187	187

5.5.58 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “EXPERIENCE” AND COMPETENCY ELEMENTS OF “BEHAVIORAL”

As shown in the Tables 5.102 and 5.103, the results showed a positive correlation between “Experience variety of project types” (Var50) and “Conflict management” (Var79) ($r= 0.187$, $N=187$, $p=0.005$). Furthermore, there is a positive correlation between “Experience variety of project types” (Var50) and “Negotiation” (Var80) ($r= 0.203$, $N=187$, $p=0.003$). However, Correlation between “Membership in appropriate professional body” (Var51) and “Result orientation” (Var85) ($r= -0.190$, $N=187$, $p=0.005$) is a negative correlation.

Table 5.102: Correlation analysis between competency elements of “Experience” and competency elements of “Behavioral”

The relationship between "Experience" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR79	VAR80	VAR81	VAR82	VAR83	VAR84
					Conflict management	Negotiation	Behavioral characteristics & attitude	Professionalism & ethics	Engagement & motivation (Encourage the heart)	Openness
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	0.104	-0.106	0.115	0.094	-0.039	-0.09
				Sig. (1-tailed)	0.079	0.074	0.059	0.1	0.298	0.111
				N	187	187	187	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	-0.069	0.096	-.153*	0.04	0.119	0.003
				Sig. (1-tailed)	0.175	0.095	0.018	0.293	0.052	0.484
				N	187	187	187	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	.187**	.203**	.139*	0.068	-0.119	0.039
				Sig. (1-tailed)	0.005	0.003	0.029	0.179	0.053	0.298
				N	187	187	187	187	187	187
		VAR51	Membership in appropriate professional body	Pearson Correlation	-0.015	0.117	.127*	0.093	-0.038	-0.015
				Sig. (1-tailed)	0.419	0.055	0.041	0.104	0.305	0.419
				N	187	187	187	187	187	187

Table 5.103: Correlation analysis between competency elements of “Experience” and competency elements of “Behavioral”

The relationship between "Experience" Competency elements and "Behavioural" competency elements					Person-Related Competencies					
					Behavioural					
					VAR85	VAR86	VAR87	VAR88	VAR89	VAR90
					Result orientation	Efficiency	Consultation	Reliability	Effective communication	The ability to deal with ambiguity
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	-0.042	0.075	0.026	-0.062	0.103	0.084
				Sig. (1-tailed)	0.283	0.155	0.36	0.199	0.079	0.126
				N	187	187	187	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	-0.038	0.099	-0.007	0.079	0.01	0.055
				Sig. (1-tailed)	0.305	0.089	0.461	0.14	0.447	0.229
				N	187	187	187	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	-0.018	-0.073	0.048	.156*	-0.05	.155*
				Sig. (1-tailed)	0.401	0.161	0.258	0.017	0.248	0.017
				N	187	187	187	187	187	187
		VAR51	Membership in appropriate professional body	Pearson Correlation	-.190**	-0.013	-0.031	0.06	-0.013	.153*
				Sig. (1-tailed)	0.005	0.432	0.339	0.208	0.427	0.018
				N	187	187	187	187	187	187

5.5.59 CORRELATION ANALYSIS BETWEEN COMPETENCY ELEMENTS OF “EXPERIENCE” AND COMPETENCY ELEMENTS OF “CONTEXTUAL”

As shown in the Tables 5.104 and 5.105, the results showed a positive correlation between “Membership in appropriate professional body” (Var51) and “Portfolio orientation” (Var93) ($r = 0.211$, $N = 187$, $p = 0.002$). Furthermore, there is a positive correlation between “Experience variety of project types” (Var50) and “Health, security, safety & environment” (Var96) ($r = 0.207$, $N = 187$, $p = 0.002$). However, Correlation between “Number of years working in construction Industry” (Var49) and “Organization structure” (Var99) ($r = -0.231$, $N = 187$, $p = 0.001$) is a negative correlation.

Table 5.104: Correlation analysis between competency elements of “Experience” and competency elements of “Contextual”

The relationship between "Experience" Competency elements and "Contextual" competency elements					Person-Related Competencies					
					Contextual					
					VAR91	VAR92	VAR93	VAR94	VAR95	VAR96
					Project orientation	Program orientation (Strategic Perspective)	Portfolio orientation	Change management (in organization)	Permanent organization	Health, security, safety & environment
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	0.079	0.085	0.034	.153*	-.126*	0.081
				Sig. (1-tailed)	0.141	0.123	0.323	0.018	0.043	0.135
				N	187	187	187	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	-0.023	0.083	-0.071	0.065	-.191**	0.093
				Sig. (1-tailed)	0.376	0.13	0.167	0.189	0.004	0.102
				N	187	187	187	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	-0.032	0.084	.159*	0.027	-0.042	.207**
				Sig. (1-tailed)	0.334	0.127	0.015	0.358	0.285	0.002
				N	187	187	187	187	187	187
		VAR51	Membership in appropriate proffesional body	Pearson Correlation	0.008	-0.102	.211**	.139*	-0.002	.154*
				Sig. (1-tailed)	0.458	0.083	0.002	0.029	0.489	0.018
				N	187	187	187	187	187	187

Table 5.105: Correlation analysis between competency elements of “Experience” and competency elements of “Contextual”

The relationship between "Experience" Competency elements and "Contextual" competency elements					Person-Related Competencies				
					Contextual				
					VAR97	VAR98	VAR99	VAR100	VAR101
					Financial management	Legal awareness	Organization structure	Cultural awareness	Marketing & Sale
Job-Related Competencies	Experience	VAR48	Managing Similar projects	Pearson Correlation	0.007	0.007	0.028	.125*	.013
				Sig. (1-tailed)	0.464	0.463	0.352	0.044	.433
				N	187	187	187	187	187
		VAR49	Number of years working in construction Industry	Pearson Correlation	-0.031	-0.069	-.231**	0.041	-.010
				Sig. (1-tailed)	0.337	0.175	0.001	0.289	.443
				N	187	187	187	187	187
		VAR50	Experience variety of project types	Pearson Correlation	0.072	0.036	.129*	0.012	.127*
				Sig. (1-tailed)	0.163	0.314	0.039	0.434	.042
				N	187	187	187	187	187
		VAR51	Membership in appropriate proffesional body	Pearson Correlation	-0.102	-0.067	0.075	.131*	.085
				Sig. (1-tailed)	0.083	0.182	0.155	0.037	.123
				N	187	187	187	187	187

5.6 SUMMARY

In this chapter the results of data analysis for quantitative methodology of research study is addressed. Project managers and senior project managers valued the importance degree of each competency element and from their perspective the core and important competency elements identified. The core and important competencies which value by both project managers and senior project managers are listed in Table 5.106 and Table 5.107.

Table 5.106: Core Competencies Valued by Project Managers and Senior Project Managers in Quantitative Approach

Competency Elements	Variable	Quantitative Approach	
		Project Managers	Senior Project Managers
Defining the project context	Var01	Core	Core
Guiding development of project scope definition	Var02	Core	Core
Implementing scope controls	Var03	Core	Core
Determining project Schedule	Var04	Core	Core
Implementing project schedule	Var05	Core	Core
Assessing time management outcomes	Var06	Core	Core
Determining quality requirement	Var10	Core	Core
Building trust	Var62	Core	Core
Teamwork & Cooperation	Var63	Core	Core
Team Leadership	Var65	Core	Core
Professionalism & ethics	Var82	Core	Core
Efficiency	Var86	Core	Core

Table 5.107: Important Competencies Valued by Project Managers and Senior Project Managers in Quantitative Approach

Competency Elements	Variable	Quantitative Approach	
		Project Managers	Senior Project Managers
Implementing project quality improvements	Var12	Important	Important
Implementing human resources & stakeholder planning activities	Var13	Important	Important
Implementing staff training & development	Var14	Important	Important
Assessing human resource outcomes	Var16	Important	Important
Managing information	Var18	Important	Important
Managing project reporting	Var19	Important	Important
Assessing communication management outcomes	Var20	Important	Important
Determining project risk events	Var21	Important	Important
Monitoring & managing opportunities	Var22	Important	Important
Monitoring & managing project risks	Var23	Important	Important
Assessing risk management outcomes	Var24	Important	Important
Managing contract & procurement finalization procedures	Var29	Important	Important
Agreeing & establishing life cycle reporting & measurement systems	Var30	Important	Important
Managing integration of all project management functions	Var31	Important	Important
Implementing project activities throughout life cycle	Var33	Important	Important
Assessing project integration outcomes	Var34	Important	Important
Change control	Var39	Important	Important
Value management	Var41	Important	Important

Table 5.107, continued

Handover and closeout	Var42	Important	Important
Documentation	Var43	Important	Important
Appraising project team members	Var44	Important	Important
Perform post-contract evaluation	Var47	Important	Important
Achievement orientation (Result orientation)	Var52	Important	Important
Concern for order, quality, & accuracy	Var53	Important	Important
Initiative	Var54	Important	Important
Client Orientation	Var57	Important	Important
Interpersonal Understanding	Var58	Important	Important
Impact & influence	Var59	Important	Important
Organizational Awareness	Var60	Important	Important
Relationship Building	Var61	Important	Important
Developing others	Var64	Important	Important
Being Directive: Assertiveness & use of positional power	Var66	Important	Important
Analytical Thinking	Var69	Important	Important
Self-Control	Var72	Important	Important
Self-Confidence	Var73	Important	Important
Flexibility	Var74	Important	Important
Organizational Commitment	Var75	Important	Important
Intuitiveness	Var76	Important	Important
Creativity	Var78	Important	Important
Conflict management	Var79	Important	Important
Negotiation	Var80	Important	Important
Behavioral characteristics & attitude	Var81	Important	Important
Openness	Var84	Important	Important
Consultation	Var87	Important	Important
Reliability	Var88	Important	Important
Effective communication	Var89	Important	Important
Project orientation	Var91	Important	Important
Program orientation (Strategic Perspective)	Var92	Important	Important
Portfolio orientation	Var93	Important	Important
Financial management	Var97	Important	Important
Legal awareness	Var98	Important	Important
Organization structure	Var99	Important	Important

Besides the correlation between job-related competencies and person-related competencies are also addressed in this chapter. In next chapter, the importance degree of job-related and person-related competencies from senior project managers' (with more the 20 years experiences in construction industry known as project experts) perspective are analyzed. The applied methodology for next chapter is quantitative method.

CHAPTER 6

SURVEY OF PROJECT EXPERTS

6.1 INTRODUCTION

This study seeks to explore the core and important competencies required for project managers in construction industry in Malaysia. In previous chapter (Quantitative method of the study), the importance degree of competency elements examined by project managers and senior project managers in construction industry in Malaysia, and core and important competencies based on their perspectives identified. This chapter presents the results of quantitative method of the study in relation to core and important competency elements required for project managers in construction industry in Malaysia. This chapter also attempts to answer the second objective of research i.e. to distinguish core and important competency elements valued by project experts (PEs) in Malaysia construction industry. Senior project managers with more than twenty years experiences in construction industry in Malaysia are selected to value these competencies.

Based on the results of quantitative approach of the study, there are some competency elements which valued as “not important” competencies either by project managers or senior project managers. These competency elements are: “Determining procurement requirements”, “Following agreed procurement processes”, “Conducting contract & procurement activities”, “Implementing contract & procurement”, “Verbal skills”, “Written skills”, “Technology management”, “Administer design process”, “Administer authority liaison”. “Managing similar projects”, “Number of years working in construction industry”, “Experience variety of project types”, “Membership in appropriate professional body”, “Information Seeking”, “Disciplining & counseling”, “The ability to deal with ambiguity”, “Change management (in organization)”, “Permanent organization”, “Cultural awareness”, and “Marketing& Sales”. The

aforementioned competencies which received “not important” by either project managers or senior project managers omitted from the list of competencies valued by PEs. Project experts were being asked to value the importance of competencies based on 5 Likert scale from 1 to 5 which 1 means the least important and 5 means the most important. Then the data analyzed by SPSS software. Competencies with the means “between 4.25 to 5” (85% and above) considered as “core” competencies and competencies with means “between 3.7 to 4.24” (above 74% and below 85%) considered as “important” competencies.

6.2 PROJECT EXPERTS DEMOGRAPHIC DATA

This portion of the study investigated the core and important competencies required for project managers in construction industry in Malaysia. The research participants participated in this stage of study, were project managers with more than twenty years experiences in construction industry. Based on quantitative research results at first stage of study, core and important competency elements identified by project managers and senior project managers and listed. These competency elements were given to selected project experts with more than 20 years' experience in construction industry. The ten research participants had a mean of 22 years' experience in construction industry with maximum 25 years and a minimum of 20 years.

The background of the respondents who took part in the survey is presented in Table 6.1.

Table 6.1: The Background of the Respondents

Characteristic		Frequency (N)	Percentage (%)
<i>Gender</i>			
<i>Valid</i>	Male	10	100
	Female	0	0
<i>Total</i>		<i>10</i>	<i>100</i>
<i>Age</i>			
<i>Valid</i>	20-29 years	0	0
	30-39 years	0	0
	40-49 years	4	40
	> 50 years	6	60
<i>Total</i>		<i>10</i>	<i>100</i>
<i>Experience in management level</i>			
<i>Valid</i>	20years	2	20
	21years	3	30
	22years	2	20
	23years	0	0
	24years	2	20
	25years	1	10
<i>Total</i>		<i>10</i>	<i>100</i>

6.3 RESEARCH FINDINGS FOR SURVEY OF PROJECT EXPERTS

This portion of the research was conducted with questions which were developed using the data from quantitative portion of the study. In fact, based on the quantitative method, core and important competency elements required for project managers in construction industry in Malaysia which were addressed by project managers and senior project managers identified. In order to have an in-depth research and for knowing how senior project managers with more than twenty years' experience in construction industry value these competency elements, survey of project experts (quantitative method) of the research conducted accordingly. The research explained to the research participants and the results of the quantitative research explained to them as well. They have been asked to mark the importance of competencies identified in quantitative portion of the study based on 5 Likert scales which 1 means the least important and 5 means the most important. Then, they have been asked to add any other competency elements that they believe are important for project managers in construction industry.

6.3.1 IMPORTANCE DEGREE OF JOB-RELATED COMPETENCIES

6.3.1.1 COMPETENCY ELEMENTS OF SCOPE MANAGEMENT

Table 6.2 indicates that “Defining the project context” (Mean=4.60), “Guiding development of project scope definition” (Mean=4.60), and “Implementing scope controls” (Mean=4.60) valued as “core” competencies.

Table 6.2: Results of survey of project experts for competency elements of scope management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Defining the project context	Var01	4.60	0.70	Core
Guiding development of project scope definition	Var02	4.60	0.70	Core
Implementing scope controls	Var03	4.60	0.52	Core

6.3.1.2 COMPETENCY ELEMENTS OF TIME MANAGEMENT

Table 6.3 indicates that “Determining project Schedule” (Mean=4.90), “Implementing project schedule” (Mean=4.60), and “Assessing time management outcomes” (Mean=4.40) valued as “core” competencies.

Table 6.3: Results of survey of project experts for competency elements of time management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Determining project Schedule	Var04	4.90	0.32	Core
Implementing project schedule	Var05	4.60	0.52	Core
Assessing time management outcomes	Var06	4.40	0.52	Core

6.3.1.3 COMPETENCY ELEMENTS OF COST MANAGEMENT

Table 6.4 indicates that “Determining project budget” (Mean=4.90), “Monitoring & controlling project budgets & costs” (Mean=4.760), and “Conducting project financial completion activities” (Mean=4.40) valued as “core” competencies.

Table 6.4: Results of survey of project experts for competency elements of cost management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Determining project budget	Var07	4.90	0.32	Core
Monitoring & controlling project budgets & costs	Var08	4.70	0.48	Core
Conducting project financial completion activities	Var09	4.40	0.52	Core

6.3.1.4 COMPETENCY ELEMENTS OF QUALITY MANAGEMENT

Table 6.5 indicates that “Determining quality requirement” (Mean=4.60) and “Implementing quality assurance” (Mean=4.40) valued as “core” competencies while “Implementing project quality improvements” (Mean=4.10) valued as “important” competency.

Table 6.5: Results of survey of project experts for competency elements of quality management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Determining quality requirement	Var10	4.60	0.70	Core
Implementing quality assurance	Var11	4.40	0.84	Core
Implementing project quality improvements	Var12	4.10	0.74	Important

6.3.1.5 COMPETENCY ELEMENTS OF HUMAN RESOURCE MANAGEMENT

Table 6.6 indicates that “Implementing HR & stakeholder planning activities” (Mean=4.20), “Implementing staff training & development” (Mean=4.00), and “Assessing human resource outcomes” (Mean=4.10) valued as “important” competencies while “Managing the project team & stakeholders” (Mean=4.30) valued as “core” competency.

Table 6.6: Results of survey of project experts for competency elements of human resource management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Implementing HR & stakeholder planning activities	Var13	4.20	1.03	Important
Implementing staff training & development	Var14	4.00	1.05	Important
Managing the project team & stakeholders	Var15	4.30	0.67	Core
Assessing human resource outcomes	Var16	4.10	0.57	Important

6.3.1.6 COMPETENCY ELEMENTS OF COMMUNICATION MANAGEMENT

Table 6.7 indicates that “Planning communications processes” (Mean=4.20), and “Assessing communication management outcomes” (Mean=4.00) valued as “important” competencies while “Managing information” (Mean=4.30) and “Managing project reporting” (Mean=4.30) valued as “core” competencies.

Table 6.7: Results of survey of project experts for competency elements of communication management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Planning communications processes	Var17	4.20	0.79	Important
Managing information	Var18	4.30	0.67	Core
Managing project reporting	Var19	4.30	0.67	Core
Assessing communication management outcomes	Var20	4.00	0.67	Important

6.3.1.7 COMPETENCY ELEMENTS OF RISK MANAGEMENT

Table 6.8 indicates that “Determining project risk events” (Mean=4.40), “Monitoring & managing opportunities” (Mean=4.40), and “Monitoring & managing project risks” (Mean=4.50) valued as “core” competencies while “Assessing risk management outcomes” (Mean=4.20) valued as “important” competency.

Table 6.8: Results of survey of project experts for competency elements of risk management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Determining project risk events	Var21	4.40	0.70	Core
Monitoring & managing opportunities	Var22	4.40	0.70	Core
Monitoring & managing project risks	Var23	4.50	0.71	Core
Assessing risk management outcomes	Var24	4.20	0.79	Important

6.3.1.8 COMPETENCY ELEMENTS OF PROCUREMENT MANAGEMENT

Table 6.9 indicates that “Managing contract & procurement final procedures” (Mean=4.10) valued as “important” competency.

Table 6.9: Results of survey of project experts for competency elements of procurement management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Managing contract & procurement final procedures	Var29	4.10	0.32	Important

6.3.1.9 COMPETENCY ELEMENTS OF INTEGRATION MANAGEMENT

Table 6.10 indicates that “Agreeing & establishing life cycle reporting & measurement systems” (Mean=4.30), “Managing integration of all project management functions” (Mean=4.40), “Coordinating internal & external environment” (Mean=4.70), and “Implementing project activities throughout life cycle” (Mean=4.30) valued as “core” competencies while “Assessing project integration outcomes” (Mean=4.10) valued as “important” competency.

Table 6.10: Results of survey of project experts for competency elements of integration management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Agreeing & establishing life cycle reporting & measurement systems	Var30	4.30	0.95	Core
Managing integration of all project management functions	Var31	4.40	0.84	Core
Coordinating internal & external environment	Var32	4.70	0.48	Core
Implementing project activities throughout life cycle	Var33	4.30	0.95	Core
Assessing project integration outcomes	Var34	4.10	0.74	Important

6.3.1.10 COMPETENCY ELEMENTS OF CONSTRUCTION WORKS (TECHNICAL EXPERTISE)

Table 6.11 indicates that “To know project success criteria” (Mean=4.60), “Methods and procedures” (Mean=4.50), “Documentation” (Mean=4.30), and “Appraising project team members” (Mean=4.30) valued as “core” competencies while “Change control” (Mean=3.90), “Value management” (Mean=4.00), “Handover and closeout” (Mean=4.20), and “Perform post-contract evaluation” (Mean=4.10) valued as “important” competencies.

Table 6.11: Results of survey of project experts for competency elements of Construction Works (Technical Expertise)

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
To know project success criteria	Var37	4.60	0.70	Core
Methods and procedures	Var38	4.50	0.53	Core
Change control	Var39	3.90	0.57	Important
Value management	Var41	4.00	0.47	Important
Handover and closeout	Var42	4.20	1.03	Important
Documentation	Var43	4.30	0.67	Core
Appraising project team members	Var44	4.30	0.67	Core
Perform post-contract evaluation	Var47	4.10	0.57	Important

6.3.2 IMPORTANCE DEGREE OF PERSON-RELATED COMPETENCIES

6.3.2.1 COMPETENCY ELEMENTS OF ACHIEVEMENT AND ACTION

Table 6.12 indicates that “Achievement orientation (Result orientation)” (Mean=4.40), and “Identifying & solving problems” (Mean=4.40) valued as “core” competencies while “Concern for order, quality, & accuracy” (Mean=4.20), and “Initiative” (Mean=4.20) valued as “important” competencies.

Table 6.12: Results of survey of project experts for competency elements of achievement and action

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Achievement orientation (Result orientation)	Var52	4.40	0.70	Core
Concern for order, quality, & accuracy	Var53	4.20	0.63	Important
Initiative	Var54	4.20	0.42	Important
Identifying & solving problems	Var56	4.40	0.84	Core

6.3.2.2 COMPETENCY ELEMENTS OF HELPING AND HUMAN SERVICE

Table 6.13 indicates that “Client Orientation” (Mean=4.10), and “Client Orientation” (Mean=3.90) valued as “important” competencies.

Table 6.13: Results of survey of project experts for competency elements of helping and human service

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Client Orientation	Var57	4.10	0.88	Important
Interpersonal Understanding	Var58	3.90	1.10	Important

6.3.2.3 COMPETENCY ELEMENTS OF IMPACT AND INFLUENCE

Table 6.14 indicates that “Impact & influence” (Mean=4.10), “Organizational Awareness” (Mean=4.00), and “Relationship Building” (Mean=4.20) valued as “important” competencies while “Building trust” (Mean=4.50) valued as “core” competency.

Table 6.14: Results of survey of project experts for competency elements of impact and influence

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Impact & influence	Var59	4.10	0.74	Important
Organizational Awareness	Var60	4.00	0.67	Important
Relationship Building	Var61	4.20	0.63	Important
Building trust	Var62	4.50	0.53	Core

6.3.2.4 COMPETENCY ELEMENTS OF MANAGEMENT

Table 6.15 indicates that “Teamwork & Cooperation” (Mean=4.90), “Making decisions” (Mean=4.40), and “Team Leadership” (Mean=4.70) valued as “core” competencies while “Developing others” (Mean=4.10), and “Being Directive: Assertiveness & use of positional power” (Mean=4.20) valued as “important” competencies.

Table 6.15: Results of survey of project experts for competency elements of management

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Teamwork & Cooperation	Var63	4.90	0.32	Core
Developing others	Var64	4.10	0.74	Important
Team Leadership	Var65	4.70	0.48	Core
Being Directive: Assertiveness & use of positional power	Var66	4.20	0.63	Important
Making decisions	Var68	4.40	0.70	Core

6.3.2.5 COMPETENCY ELEMENTS OF COGNITIVE

Table 6.16 indicates that “Critical analysis & judgment” (Mean=4.20), and “Conceptual Thinking” (Mean=4.20) valued as “important” competencies while “Analytical Thinking” (Mean=4.30) valued as “core” competency.

Table 6.16: Results of survey of project experts for competency elements of cognitive

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Analytical Thinking	Var69	4.30	0.67	Core
Conceptual Thinking	Var70	4.20	0.63	Important
Critical analysis & judgment	Var71	4.20	0.79	Important

6.3.2.6 COMPETENCY ELEMENTS OF PERSONAL EFFECTIVENESS

Table 6.17 indicates that “Flexibility” (Mean=4.40), “Conscientiousness” (Mean=4.40), and “Creativity” (Mean=4.30) valued as “core” competencies while “Self-Control” (Mean=4.10), “Self-Confidence” (Mean=4.00), “Organizational Commitment” (Mean=4.00), and “Intuitiveness” (Mean=3.80) valued as “important” competencies.

Table 6.17: Results of survey of project experts for competency elements of personal effectiveness

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Self-Control	Var72	4.10	0.57	Important
Self-Confidence	Var73	4.00	0.67	Important
Flexibility	Var74	4.40	0.52	Core
Organizational Commitment	Var75	4.00	0.47	Important
Intuitiveness	Var76	3.80	0.63	Important
Conscientiousness	Var77	4.40	0.70	Core
Creativity	Var78	4.30	0.48	Core

6.3.2.7 COMPETENCY ELEMENTS OF BEHAVIORAL

Table 6.18 indicates that “Professionalism & ethics” (Mean=4.30), “Engagement & motivation” (Mean=4.40), “Result orientation” (Mean=4.60), “Efficiency” (Mean=4.60), “Reliability” (Mean=4.30), and “Effective communication” (Mean=4.30) valued as “core” competencies while “Conflict management” (Mean=4.20), “Behavioral characteristics & attitude” (Mean=3.80), “Openness” (Mean=4.10), “Negotiation” (Mean=3.90), and “Consultation” (Mean=4.20) valued as “important” competencies.

Table 6.18: Results of survey of project experts for competency elements of behavioral

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Conflict management	Var79	4.20	0.63	Important
Negotiation	Var80	3.90	0.74	Important
Behavioral characteristics & attitude	Var81	3.80	0.79	Important
Professionalism & ethics	Var82	4.30	0.67	Core
Engagement & motivation	Var83	4.40	0.52	Core
Openness	Var84	4.10	0.57	Important
Result orientation	Var85	4.60	0.52	Core
Efficiency	Var86	4.60	0.52	Core
Consultation	Var87	4.20	0.63	Important
Reliability	Var88	4.30	0.48	Core
Effective communication	Var89	4.30	0.67	Core

6.3.2.8 COMPETENCY ELEMENTS OF CONTEXTUAL

Table 6.19 indicates that “Project orientation” (Mean=4.40), “Legal awareness” (Mean=4.40), and “Organization structure” (Mean=4.30) valued as “core” competencies while “Program orientation (Strategic Perspective)” (Mean=4.10), “Portfolio

orientation” (Mean=4.00), “Health, security, safety & environment” (Mean=4.10), and “Financial management” (Mean=4.10) valued as “important” competencies.

Table 6.19: Results of survey of project experts for competency elements of contextual

Competency Elements	Variable	Mean	Std. Deviation	Importance degree
Project orientation	Var91	4.40	0.70	Core
Program orientation (Strategic Perspective)	Var92	4.10	0.74	Important
Portfolio orientation	Var93	4.00	0.67	Important
Health, security, safety & environment	Var96	4.10	0.57	Important
Financial management	Var97	4.10	1.20	Important
Legal awareness	Var98	4.40	0.70	Core
Organization structure	Var99	4.30	0.67	Core

6.4 SUMMARY

Based on the results for survey of project experts, senior project managers with more than 20 years’ experience in construction industry recognized 43 competency elements as shown in the Table 6.20 as “core” competencies which 25 competencies among them are job-related competencies while 15 competencies are person-related competencies. Furthermore, Table 6.21 shows that project experts identified 28 competencies as “important competencies which 13 competencies among them are job-related competencies and 25 competencies are person-related competencies.

Table 6.20: Job-related and Person-related competencies valued as “core” competencies by project experts

Job-related Competencies valued as “core” competencies by PEs		Person-related Competencies valued as “core” competencies by PEs	
Defining the project context	Var01	Achievement orientation (Result orientation)	Var52
Guiding development of project scope definition	Var02	Identifying & solving problems	Var56
Implementing scope controls	Var03	Building trust	Var62
Determining project Schedule	Var04	Teamwork & Cooperation	Var63
Implementing project schedule	Var05	Team Leadership	Var65
Assessing time management outcomes	Var06	Making decisions	Var68
Determining project budget	Var07	Analytical Thinking	Var69
Monitoring & controlling project budgets & costs	Var08	Flexibility	Var74
Conducting project financial completion activities	Var09	Conscientiousness	Var77
Determining quality requirement	Var10	Creativity	Var78
Implementing quality assurance	Var11	Professionalism & ethics	Var82
Managing the project team & stakeholders	Var15	Engagement & motivation	Var83
Managing information	Var18	Result orientation	Var85
Managing project reporting	Var19	Efficiency	Var86
Determining project risk events	Var21	Reliability	Var88
Monitoring & managing opportunities	Var22	Effective communication	Var89
Monitoring & managing project risks	Var23	Legal awareness	Var98
Agreeing & establishing life cycle reporting & measurement systems	Var30	Organization structure	Var99
Managing integration of all project management functions	Var31	-----	-----
Coordinating internal & external environment	Var32	-----	-----
Implementing project activities throughout life cycle	Var33	-----	-----

Table 6.20, continued

To know project success criteria	Var37	-----	-----
Methods and procedures	Var38	-----	-----
Documentation	Var43	-----	-----
Appraising project team members	Var44	-----	-----

Table 6.21: Job-related and Person-related competencies valued as “important” competencies by project experts

Job-related Competencies valued as “important” competencies by PEs		Person-related Competencies valued as “important” competencies by PEs	
Implementing project quality improvements	Var12	Concern for order, quality, & accuracy	Var53
Implementing HR & stakeholder planning activities	Var13	Initiative	Var54
Implementing staff training & development	Var14	Client Orientation	Var57
Assessing human resource outcomes	Var16	Interpersonal Understanding	Var58
Planning communications processes	Var17	Impact & influence	Var59
Assessing communication management outcomes	Var20	Organizational Awareness	Var60
Assessing risk management outcomes	Var24	Relationship Building	Var61
Managing contract & procurement final procedures	Var29	Developing others	Var64
Assessing project integration outcomes	Var34	Being Directive: Assertiveness & use of positional power	Var66
Change control	Var39	Conceptual Thinking	Var70
Value management	Var41	Critical analysis & judgment	Var71
Handover and closeout	Var42	Self-Control	Var72
Perform post-contract evaluation	Var47	Self-Confidence	Var73
-----	-----	Organizational Commitment	Var75
-----	-----	Intuitiveness	Var76

Table 6.21, continued

-----	-----	Conflict management	Var79
-----	-----	Negotiation	Var80
-----	-----	Behavioral characteristics & attitude	Var81
-----	-----	Openness	Var84
-----	-----	Consultation	Var87
-----	-----	Project orientation	Var91
-----	-----	Program orientation (Strategic Perspective)	Var92
-----	-----	Portfolio orientation	Var93
-----	-----	Health, security, safety & environment	Var96
-----	-----	Financial management	Var97

The following chapter provides the comparison, and integration of the results of survey of project managers, senior project managers, and project experts and concludes the core and important competencies based on the results of the study and a framework that addresses these core and important competencies are established from the results of this research and recommendations for the scope of further research are suggested as well.

CHAPTER 7

DISCUSSION

7.1 INTRODUCTION

Following the quantitative analysis in chapters five and six, the purpose of this chapter is to address the core competency elements and to develop a substantive model for project managers in construction industry.

Drawing from quantitative analysis of collected data from project managers and senior project managers, core competency elements, and important competency elements valued by both project managers and senior project managers is first addressed. Thereafter, the competency elements which ranked differently by project managers and senior project managers is addressed. Subsequently, in chapter six by quantitative analysis of collected data from project experts, the core, and important competency elements required by project managers in construction industry in Malaysia identified.

To this effect, a competency framework of core competency elements and important competency elements required for project managers and also the correlation of these competency elements is provided. Subsequently, the chapter closes with an in-depth discussion of significance of these competency elements identified in the model.

As shown in Table 7.1 the total respondent for this research were 197 which 112 of these respondent were project managers (PMs), 75 were senior project managers, and 10 were project experts. In fact, 57% of respondents participate in this research were project managers, 38 % were senior project managers, and 5% were project experts.

For deciding whether a competency element to be considered as core or important, the results of research for project managers, senior project managers, and project experts put together. For each competency, if two groups out of three (Project managers, senior

project managers, and project experts) have a same perspective that the competency is either core or important, that would be considered as final decision for addressing competency element as core or important.

The percentage of project managers who participated in this research is 57%, while senior project managers' percentage is 38%, and project experts' percentage is 5%. However, the experience of project experts is the highest experience, followed with senior project managers' experience, and project managers' experience. Therefore, due to consideration of higher quantity of project managers and higher experience of project experts, same weight considered for each category results. Besides, for AIPM competency standard, the duties for project managers and project directors are addressed. As mentioned in this standard, project experts are normally focusing on directing of the project rather than managing projects. Their daily activities are more on program management and portfolio management. They are normally based on companies HQ and direct projects. In order to have a holistic perspective for importance degree of competency elements, not only project experts evaluation shall be considered, but also project managers' and senior project managers' evaluation about importance degree of competency elements shall be considered too. In the other words, the weight of the results for project managers', senior project managers', and project experts' perspective about importance degree of competencies shall be same.

Furthermore, as addressed earlier in chapter 1 of this research, this research is trying to identify the importance degree of competency elements from project managers, senior project managers, and project experts. Therefore, even though for competencies which both project managers and senior project managers, agree on its importance degree, already can finalize its importance degree and there is no need to ask project experts to value them (because 2 out of 3, agree on its importance degree level), still project experts were asked to evaluate the importance degree of those competency elements to

see whether project experts agree with project managers and senior project managers or they have different evaluation. This will help to notice the issue that if project managers' and senior project managers' experience increased and as they are moving from project managers and senior project managers to become project experts, they evaluation and perspective about importance degree of competency elements will be changed or not.

Table 7.1: the numbers of participant in the research

	Project managers (PMs)	Senior Project mangers (SPMs)	Project Experts (PEs)	Total
Respondents	112	75	10	197
Percentage	57%	38%	5%	100%

7.2 JOB-RELATED COMPETENCIES

As mentioned before this competency is also known as functional competency (Martin and Staines, 1994) or task-specific competency (Bergenhengouwen, 1996) or job-focused (Holmes & Joyce, 1993). Elkin (1990) addressed this competency as “micro competencies”. Some researchers have defined competency just in terms of work-related areas, for instance, Armstrong (2001) defined competency as the work-related concept, Pettersen (1991) stated that in selecting project managers, they are identified based on task-related aspects.

7.2.1 COMPETENCY ELEMENTS OF SCOPE MANAGEMENT

In APM Competence Framework, scope management is a competency under technical category. In this standard, this competency is defined as “the process by which the deliverables and work to produce them are identified and defined”. Identification and definition of the scope must describe what the project will include and what it will not

include, i.e. what is in and out of scope.” The indicators of this competency are identification and definition of objectives and interested parties requirements, agreeing with relevant stakeholders about appropriate deliverables, documenting the project scope, updating the project scope document while the changes are happening during project.

In AIPM Professional Competency Standards for Project Management, the elements of planning and managing scope are identified as “defining the project context”, “guiding the development of project scope definition activities”, and “Implementing scope control”. In the “defining the project context” project authorization with higher authority would be confirmed, project objectives would be defined and communicated to all stakeholders, deliverables for each stage of project would be established, project acceptance criteria would be developed, and finally project charter would be developed. In second element of scope management which is “guiding the development of project scope definition activities”, lessons learned from previous projects would be examined, the project context communicated with project stakeholders, the outcome criteria for evaluating the achievements would be established, scope management plan would be established, and work breakdown to task and work packages would be developed. The third element of scope management in AIPM Professional Competency Standards is “Implementing scope controls” that in this stage agreed scope management procedures implemented, for monitoring project outcomes agreed key performance indicators would be used, the impact of scope changes would be managed, and finally project progress and outcomes would be regularly reviewed and evaluated.

In IPMA Competence Baseline, “Scope and Deliverables” competency is under technical category and its possible process steps are defining interested parties requirements and objectives, agreeing on deliverables with interested parties, defining project scope in all project phases, updating project scope based on changes happening,

controlling quality of the deliverables, handing over the deliverables to stakeholders formally, and finally documenting lessons learned for applying to future projects.

In Project Manager Competency Development (PMCD) Framework, competency elements are defined based on different phases of project consisting initiating, planning, executing, monitoring, and closing. For initiating stage, “preparing project charter” is identified which means project charter formally documented, responsibilities of project manager and other organization managers would be defined, the interface of budget with resource availability would be identified, project stakeholders would be identified, project purpose and description would be established, and critical success factors would be defined. In the second stage of project- planning stage- identified competency elements are “conducting scope planning” and “conducting scope definition”. In “conducting scope planning”, project scope statement would be further defined, scope statement would be utilized, scope management plan would be developed, components of scope management plan would be identified, and criteria for classifying project scope changes would be identified and evaluated. In “conducting scope definition” appropriate level of decomposition of WBS would be determined, WBS would be developed, the inputs of project scope definition processes would be determined. In the executing stage with “executing scope” element, the WBS would be utilized, and work scope according to plans would be conducted, and approval process for project deliverables would be established. “Conducting scope verification” and “conducting scope change control” are the two elements of scope management in controlling stage which project inspections, reviews, audits would be conducted, product acceptance by stakeholders documented, the degree to which changes affect the project scope evaluated, scope change control system implemented, and approved changes implemented. In closing stage as the last stage of scope management, with “conducting project closure with regards to scope”

element, caused of variances of project scope identified, lessons learned with regards to scope determined and finally post-project review would be performed.

Brill, Bishop, and Walker (2006; Stevenson & Starkweather, 2010) and Stevenson and Starweather (2010), identified top 10 competencies and characteristics required for effective project managers which one on these competencies was “to know the scope of project”. Crawford and Nahmias (2010) identified scope planning and scope monitoring as important competencies for project managers.

Defining the project context-

The importance of this competency element is accentuated in AIPM Professional Competency Standards for Project Management. Besides, in APM Competence Framework, the importance of analyzing and understanding the project and its context is highlighted as well. Ives (2005) argued that there is a need to develop project managers who understand context of projects. Thamhain and Wilemon (1977) contended that environmental context of projects need to be considered for identifying effectiveness of project management. Even some studies show that for different project contexts, project managers need different leadership styles required (De Vries & Florent-Treacy, 2002; Marshall, 1991; Zaccaro, et al., 2001).

As shown in Table 7.2, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on survey of project experts, they valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Guiding development of project scope definition-

Brill, Bishop, and Walker (2006), addressed this competency element as an important competency required for effective project managers. As shown in Table 7.2, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on survey of project experts, they valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Implementing scope controls-

The importance of this competency element is highlighted in Crawford & Nahmias’s (2010) research. As shown in Table 7.2, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on survey of project experts, they valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Table 7.2: Results of survey of project managers, senior project managers, and project experts for competency elements of scope management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Defining the project context	Var01	Core	Core	Core
Guiding development of project scope definition-	Var02	Core	Core	Core
Implementing scope controls	Var03	Core	Core	Core

7.2.2 COMPETENCY ELEMENTS OF TIME MANAGEMENT

Planning and controlling of time are addressed in Crawford & Nahmias (2010) research. Traditionally, for performance measuring of construction project managers, only time, cost and quality were being hired (Divine Kwaku Ahadzie, et al., 2008). Wickramasinghe & Kumara (2009) and Chong (2008) addressed time management as important competency required by project managers. In IPMA Competence Baseline, “time and project phase” competency is defined under technical category. In Project Manager Competency Development (PMCD) Framework, for time management in every stage of project, including initiating, planning, controlling, executing and closing stages the performance criteria are identified.

As shown in Table 7.3, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Determining project Schedule-

In APM Competence Framework, “scheduling” and is defined as “the process to determine the overall project duration and when activities and events are planned to happen”. “Determining project schedule” is also addressed in AIPM Professional Competency Standards. The performance criteria for “Determining project schedule” in this standard are determining project duration and efforts, sequencing and dependencies of tasks, ensuring that project schedule includes all activities, Ensuring the appropriate scheduling software are being used, applying techniques and tools for resource

allocation, developing time management plan, and obtaining agreement on schedule and time management plan from higher project authority.

As shown in Table 7.3, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Implementing project schedule-

The performance criteria for “implementing project schedule” in AIPM Professional Competency Standard consists of using mechanisms for measurement and reporting progress of activities, forecasting the effect of changes on project schedule, developing responses to schedule changes, and obtaining approval for changes.

As shown in Table 7.3, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Assessing time management outcomes-

Performance criteria for “assessing time management outcomes” in AIPM Professional Competency Standard consists of review project progress for determining the

effectiveness of time management processes, identifying time management lessons learned, and recommending improvement to apply for future projects.

As shown in Table 7.3, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Table 7.3: Results of survey of project managers, senior project managers, and project experts for competency elements of time management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Determining project Schedule	Var04	Core	Core	Core
Implementing project schedule	Var05	Core	Core	Core
Assessing time management outcomes	Var06	Core	Core	Core

7.2.3 COMPETENCY ELEMENTS OF COST MANAGEMENT

Traditionally, for performance measuring of construction project managers, only time, cost and quality were being hired (Divine Kwaku Ahadzie, et al., 2008). Wickramasinghe & Kumara (2009) addressed “Cost Consciousness” as important competency for project managers. Cost planning and cost controlling are addressed in Crawford & Nahmias (2010) research.

In APM Competence Framework, “budgeting and cost management” competency is under technical competencies category and it is defined as “the estimating of costs and the setting of an agreed budget and the management of actual and forecast costs against that budget”. In IPMA Competence Baseline, under technical competency category, “cost and finance” competency element is recognized and the possible cost management process steps are identified as analyzing and deciding on project, program and portfolio

cost management system, estimating the costs of each work packages including overhead costs, establishing cost monitoring, defining cost objectives, calculating actual resources usages, taking all changes into account, analyzing variances and causes, forecasting final costs, developing corrective actions, updating cost estimates with regards to changes, documenting lessons learned to apply for future projects.

Determining project budget-

In AIPM Professional Competency Standards, the performance criteria for “determining project budget” element are determining resource requirement, estimating project costs, developing project budget, and implementing a cost management plan. In Project Manager Competency Development (PMCD) Framework, “high-level budget development preparation” competency element is identified for cost management in initiating stage of project which means developing a cost benefit analysis, identifying budget constraints, and developing business case.

As shown in Table 7.4, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued it as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Monitoring & controlling project budgets & costs-

”Monitoring and controlling project budget and costs” in AIPM Professional Competency Standards consists of implementing project budget control processes, monitoring actual project billings against project budget forecasts, analyzing budget

variations, and determining the causes to recommend actions, implementing actions to maintain project budget objectives. In Project Manager Competency Development (PMCD) Framework, “Conducting cost control” is the competency element for controlling stage of project which consists of implementing a cost change control system, integrating cost changes within overall change control system, defining and evaluating factors that cause cost changes, revising cost estimates, integrating approved cost changes, and determining modifications needed to estimates for completion.

As shown in Table 7.4, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued it as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Conducting project financial completion activities-

In AIPM Professional Competency Standards, performance criteria for “conducting project financial completion activities” are using appropriate project close-out procedures, reviewing project performance to determine the effectiveness of processes, and identifying financial management lessons learned and recommending improvements to apply for future projects. In Project Manager Competency Development (PMCD) Framework, the competency element identified for closing stage is “conducting project closure with regard to cost” that lessons learned documented, the causes of cost changes and type of cost changes and also reason for selecting specific corrective actions documented for future further analysis.

As shown in Table 7.4, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued it as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Table 7.4: Results of survey of project managers, senior project managers, and project experts for competency elements of cost management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Determining project budget	Var07	Important	Core	Core
Monitoring & controlling project budgets & costs-	Var08	Important	Core	Core
Conducting project financial completion activities-	Var09	Important	Core	Core

7.2.4 COMPETENCY ELEMENTS OF QUALITY MANAGEMENT

Traditionally, for performance measuring of construction project managers, only time, cost and quality were being hired (Divine Kwaku Ahadzie, et al., 2008). Atkinson (1999) argued that quality is based on peoples’ attitude and over project life-cycle changes. Wickramasinghe & Kumara (2009) addressed quality focus as an important competency for project managers. Planning and monitoring of quality is also accentuated in Crawford & Nahmias (2010) research.

In APM Competence Framework, “project quality management” competency is recognized in technical competency category and is defined as “the discipline that is applied to ensure that both the outputs of the project and the processes by which the outputs are delivered meet the required needs of stakeholders. Quality is broadly defined as fitness for purpose or more narrowly as the degree of conformance of the

outputs and processes.” And the indicators of this competency element are discussing and agreeing the quality expectations and quality criteria with stakeholders, developing quality approaches including key activities, developing project quality plan, executing the project quality plan, carrying out quality assurance, recommending and applying corrective actions and continuous improvements.

In AIPM Professional Competency Standards, the identified competency elements for planning and managing quality are “determining quality requirements”, “implementing quality assurance”, and “implementing project quality improvements”.

In IPMA Competency Baseline, “quality” competency elements is suggested under technical competency category and possible process steps of this competency element are developing quality plan, getting approval and test for final product, carrying out quality assurance and quality control, recommending and applying corrective actions, documenting the lesson learned.

In Project Manager Competency Development (PMCD) Framework, in regards of quality management at first stage of project-initiating stage-, “determining quality requirements” is identified. “Conducting quality planning” is the competency element for planning stage of project. The competency element of executing stage is “conducting quality assurance. “Conducting quality control” is the competency element for controlling stage of project; and finally, in the closing stage of project “conducting project closure with regard to quality” competency element is identified.

Determining quality requirement-

In AIPM Professional Competency Standards, the performance criteria for “determining quality requirement” competency element are determining quality objectives and standards, using quality management methods and techniques, identifying quality criteria and establishing project performance measurement systems.

As shown in Table 7.5, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Implementing quality assurance-

In AIPM Professional Competency Standards, the performance criteria for “implementing quality assurance” competency element are measuring and documenting project activities, conducting inspections of quality processes, identifying the causes of unsatisfactory outcomes, and maintaining a quality management system.

As shown in Table 7.5, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued it as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Implementing project quality improvements-

In AIPM Professional Competency Standards, for “implementing project quality improvement” competency element the identified performance criteria are reviewing quality processes, ensuring continuous quality improvement, reviewing project progress, determining the effectiveness of quality management processes, and identifying quality management lessons learned to apply for future projects.

As shown in Table 7.5, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. Besides based on qualitative approach of the study, project experts valued this competency as “important” competency as well. Therefore, based on the results of this research, this competency is a “important” competency for project managers.

Table 7.5: Results of survey of project managers, senior project managers, and project experts for competency elements of quality management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Determining quality requirement	Var10	Core	Core	Core
Implementing quality assurance	Var11	Important	Core	Core
Implementing project quality improvements	Var12	Important	Important	Important

7.2.5 COMPETENCY ELEMENTS OF HUMAN RESOURCE MANAGEMENT

In APM Competence Framework, “human resource management” competency element is recognized under behavioral competencies and is defined as “the understanding and application of the policy and procedures that directly affect the people working within the project team and working group”.

In AIPM Professional Competency Standards, four competency elements are identified for human resource management which are “implementing human resource and stakeholder planning activities”, “implementing staff training and development”, “managing the project team and stakeholders”, and “assessing human resource outcomes”.

In IPMA Competence Baseline, “personnel management” competency element is defined under contextual competency category and it covers the aspects of human resource which are related to the project or program such as planning, selection of

human resource, training, retention, performance assessment and motivating human resource

In Project Manager Competency Development (PMCD) Framework, the identified competency element for human resource management in initiating phase of project is “conducting organizational definition”. “Conducting organizational planning” and “conducting staff acquisition” are the competency elements of planning stage of project. In the executing stage of project “conducting team development” competency element is identified, and “Managing human resource” is the competency element identified in controlling stage of project. In closing stage of project the identified competency element is “conducting project closure with regard to human resource management”.

Implementing human resources & stakeholder planning activities

Cooke-Davies (2002) conceded the importance of human resource role to accomplish the project. Project managers in order to be successful need to properly manage their relationship with groups and individual who are affected by their actions and behaviors simultaneously. Therefore, in order to manage them, they first need to know the expectations of the stakeholders including their peers, subordinated, clients, and superiors (Fraser & Zarkada-Fraser, 2003). According to Kaplan and Norton (1996) and Winterton and Winterton (1999), for performance measurement and planning systems, the knowledge of stakeholders’ needs and attitude can be applied. Hartle (1995) argued that for understanding project stakeholders and their expectations more researches must be conducted.

As shown in Table 7.6, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. Besides based on qualitative approach of the study, project experts valued

this competency as “important” competency as well. Therefore, based on the results of this research, this competency is a “important” competency for project managers.

Implementing staff training & development

McBer’s Scaled Competency Dictionary (1996), David Arditi & Balci (2009), and Ralf Muller and Rodney Turner (2010) addressed this competency as an important competency element for project managers. In the human resource management (HRM) practice, establishing individuals’ competencies is considered as a powerful tool (Collin, 1997). Most companies in order to achieve competitive advantages have concentrated on importance of employee development (Bratton & Gold, 1999).

As shown in Table 7.6, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. Besides based on qualitative approach of the study, project experts valued this competency as “important” competency as well. Therefore, based on the results of this research, this competency is a “important” competency for project managers.

Managing the project team & stakeholders

Charkhanv (1992) defined the stakeholders whom construction project managers are dealing with as professionals such as consultant, project managers’ subordinators, client, and external authorities, and their project managers’ immediate superiors. Lynn Crawford & Nahmias (2010) addressed “stakeholders management” as an important competency required for project managers. Stevenson and Starkweather (2010) argued that lack of managing stakeholders results to project failure. Project managers need effectively negotiate with variety of project stakeholders(Elmes & Wileman, 1988; White & Fortune, 2002).

As shown in Table 7.6, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued it as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Assessing human resource outcomes

It is critical to assess competencies, skills, knowledge, and personal characteristics of team members to assure choosing a team which is capable to succeed (Morris & Pinto, 2007). Nowadays, performance management is replaced performance appraisal (Torrington & Hall, 1995). This performance management means continuous performance planning, assessment of employees’ performance and then taking corrective actions (Ainsworth & Smith, 1993).

As shown in Table 7.6, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. Besides based on qualitative approach of the study, project experts valued this competency as “important” competency as well. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Table 7.6: Results of survey of project managers, senior project managers, and project experts for competency elements of human resource management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Implementing human resources & stakeholder planning activities	Var13	Important	Important	Important
Implementing staff training & development	Var14	Important	Important	Important
Managing the project team & stakeholders	Var15	Important	Core	Core
Assessing human resource outcomes	Var16	Important	Important	Important

7.2.6 COMPETENCY ELEMENTS OF COMMUNICATION MANAGEMENT

In APM Competence Framework, “communication” competency is under behavioral category and is defined as “the giving, receiving, processing and interpretation of information. Information can be conveyed verbally, non-verbally, actively, passively, formally, informally, consciously or unconsciously.” In AIPM Professional Competency Standards, the competency elements of planning and managing communication are “planning communication processes”, “managing information”, “managing project reporting”, and “assessing communication management outcomes”.

In IPMA Competence Baseline, “communication” competency is under technical category and the possible process steps of this competency are setting out the communication plan, identifying the target population for communication, determining what needs to be communicated, choosing the means of communication, planning the communication process and material, seeking feedback on the effectiveness of the communication, evaluating and taking appropriate action, and documenting lessons learned to apply for future projects.

In Project Manager Competency Development (PMCD) Framework, for the first project phase- initiating- regarding to communication management, “preliminary communication planning” competency element is identified. “Conducting communication planning” is the competency element of planning stage of project. For executing stage of project “conducting information distribution” and “implementing project time reporting” competency elements are identified. “Conducting project performance reporting” is the competency element of controlling stage of project. For closing stage of project, “conducting administrative closeout” competency element is identified.

In Krahn and Hartment’s (2006) research findings, listening and verbal communication is listed in top 10 most important competencies required by project managers. Although communication processes such as feedback(Pinto & Slevin, 1987; White & Fortune, 2002), influencing other people (Sotiriou & Wittmer, 2001), and getting agreements(Pinto & Pinto, 1991) have received more attention, communication competency has received less attention(Henderson, 2008). There is a point of view in regards of communication competency that some research efforts support the idea that communication competency of communicators is tied up to their intention and abilities(Argyris, 1965; Bochner & Kelly, 1974; Spitzberg & Cupach, 1984; wiemann, 1977). Later Parks(1994) supported previous researches that competent communicators not only fulfill their goals through communication, but also they also try to consider future goals as well.

One of the important key factors for individual’s communication competency is relating to the behavior of communicator which addressed by Jablin and Sias (2001). Two components of this behavioral factor are encoding and decoding of message. Encoding means sending messages actively, and decoding means receiving and listening messages actively. There are several researches that investigate relation of goal achievement,

encoding and decoding behavioral factors such as (Alexander, et al., 1992; Monge, et al., 1982; Scudder & Guinan, 1989). In a research conducted by Henderson(2004) project manager's communication –e.g. encoding and decoding of project manager- was significantly associated to satisfaction level of team members. On the other hand, researches about emotional intelligence conducted by Dulewicz & Higgs (2000), Salovey and Mayer (1990) and Goleman (1995) also reflecting importance of effective communication with others in workplace. For instance, interpersonal sensitivity and responsiveness in Dulewicz and Higgs (2000), Leban and Zulauf (2004) researches, reflect importance of communication competencies in workplace.

The importance of communication in other aspects of project also is investigated in several researches. For example, Pinto and Pinto(1991)highlighted the importance of communication for establishing shared agreements, or importance of communicating project goals with project managers is accentuated in Ammeter and Dukerich (2002) research or Sotiriou and Wittmer (2001) showed the importance of communication for project managers to apply influence methods.

Project managers in projects are facing different challenges. They, with high accountability and low authority (Henderson, 2004), need effectively negotiate with variety of project stakeholders (Elmes & Wileman, 1988; White & Fortune, 2002). Therefore, project managers in order to be successful in responding effectively to these challenges need to be competent communicators. Communication competency is defined by several researches such as Wiemann (1977) and O'Hair et al. (1997) researches. For example, O'Hair et al. (1997) defined communication competency as the ability of choosing among communication behaviors by a communicator who needs to accomplish his/her interpersonal goals. Spitzberg and Cupach (1984) and Morreale et al. (2001) asserted that in order to a competent communication to be occurred, individuals must be motivated to communicate and also they must be capable to express

their knowledge and skills about the context that interpersonal communication is occurring.

Communication competency refers to the ability of application of language skills in a situation. Some researches such as Wiemann (1977), Larson et al. (1978), and Spitzberg (1983) in their definition of communication competency expressed on situational and functional dimension of it. In fact, its purpose of applying communication competency is to achieve goals effectively. Although some researches such as Spitzberg and Cupach (1984) and Roloff (1987), mentioned that communication competency is related to goal accomplishment, some other researches such as Argyris (1965), Bochner and Kelley (1974), and Phillips (1983) referred to communication competency as behavioral output.

To be aware about stakeholders expectations result project managers to adapt their actions and behaviors and also communication skills to achieve highest level of stakeholders satisfaction (Fraser & Zarkada-Fraser, 2003). Some researches highlighted the importance of communication skill for project managers such as Wateridge (1998) research that pointed out importance of communication for achieving project stakeholders agreement on project success criteria, or Clarke (1999) research that emphasized communication skill of project managers results to eliminate unnecessary changes of project, or Wateridge (1997) research that emphasized importance of communication skill for project managers for gaining acceptance between organization, client and all involved parties about project outcomes. The importance of communication skills for project managers to effectively communicate with team members, different levels of management in organization, and stakeholder is also emphasized in Zeilinski's (2005) research.

Planning communications processes-

In AIPM Professional Competency Standards, the performance criteria for “planning communication processes” competency element are identifying and analyzing the information requirements, developing and implementing communication management plan, establishing and applying a project management information system.

As shown in Table 7.7, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued it as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “important” competency. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Managing information-

In AIPM Professional Competency Standards, “Managing information” consists of managing the generation, gathering, analyzing and dissemination of information by project staff, implementing and monitoring information validation, maintaining agreed communication networks, and ensuring appropriate information transferred to relevant stakeholders.

As shown in Table 7.7, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. However, based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Managing project reporting-

In AIPM Professional Competency Standards, the performance criteria for “managing project reporting” competency element are establishing and managing project reporting, managing information management system, drafting project reports, and maintaining stakeholder relationships.

As shown in Table 7.7, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. However, based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Assessing communication management outcomes-

In AIPM Professional Competency Standards, “Assessing communication management outcomes” as the last competency element of communication management means reviewing project progress, determining the effectiveness of communication management, and identifying communication management lessons learned.

As shown in Table 7.7, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, based on qualitative approach of the study, project experts valued this competency as “important” competency as well. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Table 7.7: Results of survey of project managers, senior project managers, and project experts for competency elements of communication management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Planning communications processes-	Var17	Important	Core	Important
Managing information	Var18	Important	Important	Core
Managing project reporting	Var19	Important	Important	Core
Assessing communication management outcomes	Var20	Important	Important	Important

7.2.7 COMPETENCY ELEMENTS OF RISK MANAGEMENT

In APM Competence Framework, “project risk management” competency element is under technical competency category and it is defined as “a structured process that allows individual risk events and overall project risk to be understood and managed proactively, optimizing project success by minimizing threats and maximizing opportunities”. In AIPM Professional Competency Standards, the competency elements of planning and managing risk are “determining project risk events”, “monitoring and managing opportunities”, “monitoring and managing project risk”, and “assessing risk management outcomes”.

In IPMA Competence Baseline, “risk and opportunity” competency element is recognized under technical competency category and the possible process steps for this competency element are identifying and assessing risk and opportunities, developing risk and opportunity response plan, assessing the probability of attaining time and cost objective, continuously identifying new risks, and planning responses, controlling the risk and opportunity response plan, and documenting lesson learned and applying for future projects. In Project Manager Competency Development (PMCD) Framework, for project risk management for initiating phase of project, “conducting preliminary risk

planning” competency element is suggested. The recognized competency elements of risk management in the planning stage of project are “developing risk management plan”, “conducting risk identification”, “conducting qualitative risk analysis”, “conducting quantitative risk analysis”, and “conducting risk response planning”. “Conducting risk monitoring and control” is the competency element of risk management in the controlling stage of project. In this standard in regards of risk management for closing stage of project “conducting project closure with regard to risk management” and “preliminary procurement planning” competency elements are suggested. The importance of risk management also is accentuated in Chong (2008) and Lynn Crawford & Nahmias (2010) researches.

Determining project risk events-

In AIPM Professional Competency Standards, the performance criteria for “determining project risk events” are identifying and analyzing risk and opportunities, using established risk management techniques, developing risk management plan, establishing risk management processes and procedures to enable effective management of risk, and assigning risk management responsibility to deal with the risks.

As shown in Table 7.8, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. However, based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Monitoring & managing opportunities-

In AIPM Professional Competency Standards, for “Monitoring and managing opportunities” competency element, the performance criteria are monitoring project opportunities, documenting opportunities and assessing against project progress, presenting opportunities to higher authority for consideration, and implementing changes when necessary to take advantages of new opportunities.

As shown in Table 7.8, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. However, based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Monitoring & managing project risks-

In AIPM Professional Competency Standards, monitoring and managing project risks and implementing risk management strategies are performance criteria of “monitoring and managing project risk” competency elements.

As shown in Table 7.8, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. However, based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Assessing risk management outcomes-

In AIPM Professional Competency Standards, the performance criteria for “assessing risk management outcomes” competency elements are reviewing project progress,

issues and outcomes to determine the effectiveness of risk management processes and identifying risk management lesson learned.

As shown in Table 7.8, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, based on qualitative approach of the study, project experts valued this competency as “important” competency as well. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Table 7.8: Results of survey of project managers, senior project managers, and project experts for competency elements of risk management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Determining project risk events	Var21	Important	Important	Core
Monitoring & managing opportunities	Var22	Important	Important	Core
Monitoring & managing project risks	Var23	Important	Important	Core
Assessing risk management outcomes	Var24	Important	Important	Important

7.2.8 COMPETENCY ELEMENTS OF PROCUREMENT MANAGEMENT

In APM Competence Framework, “procurement” competency element is defined under technical competency category and is defined as “the process by which the resources (goods and services) required by a project are acquired. It includes development of the procurement strategy, preparation of contracts, selection and acquisition of suppliers, and management of the contracts”.

In AIPM Professional Competency Standards, the competency elements of planning and managing procurement are identified as “determining procurement requirements”, “following agreed procurement processes”, “conducting contracting and procurement activities”, “implementing contract and/or procurement”, and “managing contract and procurement finalization procedures”.

In IPMA Competence Baseline, “procurement and contract” competency element is categorized under technical category and the possible process steps of this competency element are identifying and defining what needs to be procured, putting bid out to tender, selecting suppliers, establishing contract administrations, executing contracts, managing changes, accepting contract completion, closing contracts, and documenting the lesson learned to apply for future projects.

In Project Manager Competency Development (PMCD) Framework, for procurement management in initiating phase of project “preliminary procurement planning” competency element is recognized. “Conducting procurement planning” and “conducting solicitation planning” are competency elements of planning stage.. The competency elements of procurement management in executing phase of project are “conducting solicitation”, “conducting source selection/contract development”, and “conducting contract administration”. “Managing and reviewing contract performance” is the competency element of procurement management in controlling phase. “Conducting contract closeout” is the competency element of procurement management in closing phase of project.

Determining procurement requirements-

In AIPM Professional Competency Standards, the performance criteria of “determining procurement requirements” competency element are identifying procurement requirements, and establishing agreed procurement management plan.

As shown in Table 7.9, results of quantitative approach of study showed that project managers valued this competency as “not important” competency. However, senior project managers valued this competency as “important” competency. Therefore, this competency omitted from the competency lists to be asked from project experts and its importance addressed as “not important” competency.

Following agreed procurement processes-

In AIPM Professional Competency Standards, obtaining information from sources, and adopting established selection criteria for selecting suppliers and contractors are performance criteria of “following agreed procurement processes” competency element. As shown in Table 7.9, results of quantitative approach of study showed that project managers valued this competency as “not important” competency. However, senior project managers valued this competency as “important” competency. Therefore, this competency omitted from the competency lists to be asked from project experts and its importance addressed as “not important” competency.

Conducting contract & procurement activities-

In AIPM Professional Competency Standards, the performance criteria of “conducting contracting and procurement activities” competency element are communicating requirement to contractors and suppliers, selecting preferred suppliers, conducting negotiations with preferred contractors and suppliers, and establishing a positive working relationship with contractors and suppliers.

As shown in Table 7.9, results of quantitative approach of study showed that project managers valued this competency as “not important” competency. However, senior project managers valued this competency as “important” competency. Therefore, this competency omitted from the competency lists to be asked from project experts and its importance addressed as “not important” competency.

Implementing contract & procurement-

In AIPM Professional Competency Standards, “Implementing contract and/or procurement” competency element consists of implementing an established procurement management plan, and managing procurement issues and changes.

As shown in Table 7.9, results of quantitative approach of study showed that project managers valued this competency as “not important” competency. However, senior project managers valued this competency as “important” competency. Therefore, this competency omitted from the competency lists to be asked from project experts and its importance addressed as “not important” competency.

Managing contract & procurement finalization procedures-

In AIPM Professional Competency Standards, the performance criteria of “managing contract and procurement finalization procedures” competency element are managing finalization activities of contract deliverables and contracts, reviewing project progress and issues to determine the effectiveness of procurement processes. Identifying procurement lessons learned and recommending improvement to apply for future projects.

As shown in Table 7.9, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “important” competency. Besides based on qualitative approach of the study, project experts valued this competency as “important” competency as well. Therefore, based on the results of this research, this competency is an “important” competency for project managers.

Table 7.9: Results of survey of project managers, senior project managers, and project experts for competency elements of procurement management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Determining procurement requirements	Var25	Not Important	Important	----
Following agreed procurement processes	Var26	Not Important	Important	----
Conducting contract & procurement activities	Var27	Not Important	Important	----
Implementing contract & procurement	Var28	Not Important	Important	----
Managing contract & procurement finalization procedures	Var29	Important	Important	Important

7.2.9 COMPETENCY ELEMENTS OF INTEGRATION MANAGEMENT

Agreeing & establishing life cycle reporting & measurement systems-

As shown in Table 7.10, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Managing integration of all project management functions-

As shown in Table 7.10, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Coordinating internal & external environment-

As shown in Table 7.10, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued its importance as “core” competency. Besides, the results of qualitative approach showed that this competency is a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Implementing project activities throughout life cycle-

As shown in Table 7.10, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Assessing project integration outcomes-

As shown in Table 7.10, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Table 7.10: Results of survey of project managers, senior project managers, and project experts for competency elements of integration management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Agreeing & establishing life cycle reporting & measurement systems	Var30	Important	Important	Core
Managing integration of all project management functions	Var31	Important	Important	Core
Coordinating internal & external environment	Var32	Important	Core	Core
Implementing project activities throughout life cycle	Var33	Important	Important	Core
Assessing project integration outcomes	Var34	Important	Important	Important

7.2.10 COMPETENCY ELEMENTS OF CONSTRUCTION WORKS (TECHNICAL EXPERTISE)

El-Sabaa (2001) suggested technical expertise are the least important competencies required by project managers and instead of these in-depth technical skill, cross-functional skills and broader range of functional roles is critical for project managers. Rosenau (1998) contended that project managers need effective people skills rather than technical skills. Today's construction companies are looking for professionals with better management and leadership skills rather than technical expertise (Dulaimi, 2005). Stevenson and Starkweather (2010) in their research identified important and critical competencies for project managers which technical expertise categorized as important competencies in their research.

According to IPMA and APM standards, a competent manager is the one who has enough knowledge and experience in three categories of Technical, Behavioral, and Contextual Competencies. By developing project team, skills and technical competencies of team members as well as project performance enhance (Morris & Pinto, 2007). "Job analysis" also known as work-oriented concept, emphasizes on work

independently of worker which includes technical requirements of job-tasks (Armstrong, 1991; Ferris, et al., 1990; Holmes & Joyce, 1993). Project managers in order to be effective in changing environment, need to develop their both technical and social competencies (Thamhain, 2004a, 2004b). In IPMA Competence Baseline standard, competency is defined within the perimeter of technical, behavioral and contextual competencies, and based on these three, 46 competency elements are defined. They are 20 technical competency elements, 15 behavioral competency elements, and 11 contextual competency elements. Technical competencies dealing with project deliverables. In APM Competence Framework, competency elements are defined within these three domains: technical competencies, behavioral competencies, and contextual competencies. Technical competencies contain 30 functional project management competency elements. Some other researchers believe that managers for change project should come from the fields with less focus on technical issues and more focus on interpersonal skills such as psychology or organizational development fields (Caluwe' & Vermaak, 2003; Connor & Lake, 1994; Cummings & Worley, 2001; French & Bell, 1999; Kanter, et al., 1992).

Boyatzis and Kolb (1995) mentioned that characteristics which are being used to predict managers' success cannot be used to predict success of managers who are working in technical and engineering sectors. Dulaimi (2005) contended that the importance of management and leadership skills overweigh the importance of technical expertise.

Verbal skills-

In Krahn and Hartment's (2006) research findings, listening and verbal communication is listed in top 10 most important competencies required by project managers. The importance of this competency element is addressed in other researches (Brill, et al., 2006; Stevenson & Starkweather, 2010).

As shown in Table 7.11, quantitative approach of the study showed that project managers valued this competency as "important" competency; however, senior project managers valued it as "not important" competency. Therefore, this competency omitted from list of competencies in qualitative approach of the study. Hence, according to the results of this study, this competency is a "not important" competency for project managers.

Written skills-

Wickramasinghe & Kumara (2009) addressed the importance of this competency element. As shown in Table 7.11, quantitative approach of the study showed that project managers valued this competency as "important" competency; however, senior project managers valued it as "not important" competency. Therefore, this competency omitted from list of competencies in qualitative approach of the study. Hence, according to the results of this study, this competency is a "not important" competency for project managers.

To know project success criteria-

As suggested by Wateridge (1995), for managing project first of all important success criteria should be identified by project managers, then the success factor that deliver those success criteria should be identified, and finally based on those success factors, all

tools and techniques to be chosen. In a research conducted by Cooke-Davies (2002), success factors for “project success” that focusing on business result and success factors for “project management success” which focusing on cost, quality and other management aspects identified. Muller and Turner (2007) in their research measured project managers’ level of achievement based on applying ten success criteria and 7 Likert scale and showed that there is a correlation between project success and project managers competencies.

For defining project success criteria there is a lack of agreement (Baccarini, 1999; Freeman & Beale, 1992; Pinto & Slevin, 1988; Shenhar, 1997). Crawford (2000) contended that based on literature review there is an agreement on Baker, Murphy, and Fisher (1988) definition of project success. Project success is defined by Baker, Murphy, and Fisher (1988) as: “The project meets the technical performance specifications and /or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people on the project team, and key users or clientele of the project effort”

Murphy, Baker and Fisher (Murphy, et al., 1974) conducted a research concerning factors of project success. In this research they used 650 completed projects, in aerospace industry, construction industry and some other projects. They identified ten factors strongly related to project success and project failure; and identified twenty three project management characteristics that even though are necessary for project success, these factors are not sufficient conditions to be considered success (Baker, et al., 1988).

Other researches pertaining to project success are Pinto and Slevin (1987; 1988) research and Morris and Hough (1993) research. Pinto and Slevin (1987; 1988) used sample of 418 PMI members. These PMI members were asked to rate ten crucial success factors which are relevant to project success. Morris and Hough (1993) identified project success factors based on literature review as well as case study of major projects.

Further researches related to project success factors are (Ashley, et al., 1987; Geddes, 1990; Jiang, et al., 1996; Whittaker, 1999; Zimmerer & Yasin, 1998). In all these researches similar method of Pinto and Slevin were used- rating project success factors by project personnel, and professionals. Beale and Freeman(1992)by reviewing twenty nine papers identified fourteen factors that affect project success. Wateridge (1996) identified eight most mentioned success factors.

Christenson and Walker (2004) in a study referred to “project vision” as pivotal contribution for project success.” They also found that communication and also maintaining of project vision also affect project outcomes. Turner and Muller (2006) in their research concluded that emotional competencies such as self-awareness, resilience, motivation, influence and conscientiousness are the most contributors for project success. In fact, results of their study show that emotional competencies are more important than technical competencies to achieve project success.

In APM Competence Framework, project success is defined as “the satisfaction of stakeholder, needs and is measured by success criteria as identified and agreed at the start of the project”. The indicators of this competency element are analyzing and understanding the project and its context, agreeing success criteria for the project, identifying critical success factors, executing and controlling PM plans and change, collecting results and preparing project performance reports, and ensuring that benchmark data is captured.

As shown in Table 7.11, quantitative approach of the study showed that project managers valued this competency as “core” competency; however, senior project managers valued its importance as “important” competency. Besides, the results of qualitative approach showed that this competency is a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Methods and procedures-

Performances of projects are affected by several factors such as human-resource factors, external environments, project management actions, and project procedures (Chan, et al., 2004; Söderlund & Bredin, 2006).

In APM Competence Framework, “methods and procedures” mean “detailing the standard practices to be used for managing projects throughout a life cycle. Methods provide a consistent framework within which project management is performed. Procedures cover individual aspects of project management practice and form an integral part of a method”. The indicators of this competency element are: understanding the organization’s project management methods and processes, complementing the organization’s methods and procedures, ensuring the methods and procedures adopted to organization’s reporting structure, ensuring all project members understand the methods and procedures, and ensuring improvements to the organization’s methods and procedures.

As shown in Table 7.11, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued its importance as “core” competency. Besides, the results of qualitative approach showed that this competency is a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Change Control-

In APM Competence Framework, “change control” means “the process that ensures that all changes made to a project’s baseline scope, time, cost and quality objectives or agreed benefits are identified, evaluated, approved, rejected or deferred”. The indicators

of this competency element are agreeing and implementing a change control policy, capturing and logging all proposed changes, conducting an analysis on the consequences of proposed changes, defining various responsibilities and authority levels, getting changes accepted or rejected, controlling and closing approved changes, and reporting the status of changes throughout the project.

In IPMA, the importance of change control competency element is highlighted and project manager must update project scope based on changes happening. In Project Manager Competency Development (PMCD) Framework, project scope changes would be identified and evaluated. Lynn Crawford and Nahmias (2010) identified change control as an important competency for project managers.

As shown in Table 7.11, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Technology management-

In APM Competence Framework, “technology management” is defined as “the management of the relationship between available and emerging technologies, the organization and the project. It also includes management of the enabling technologies used to deliver the project, technologies used to manage the project and the technology of the project deliverables”. The indicators of this competency element are discussing, defining and agreeing about technology management strategy, ensuring the risks of adopting any new technology, ensuring that the deployment of new technologies is compatible with existing technologies, calculating the cost of the technology

management strategy, and monitoring the adoption and implementation of the technology management strategy.

Moreover, there are some external factors such as politics, level of technology development, and economics which are affecting project (Crawford, 2005). Adapting to changing industry conditions in order to be successful in delivering project is accentuated by Ahmad (1997). For instance, he highlighted the importance of information technology for project managers.

As shown in Table 7.11, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “not important” competency. So, this competency omitted from list of competencies in qualitative approach. Therefore, based on results of this study, this competency is a “not important” competency for project managers.

Value management-

In APM Competence Framework, “value management” is defined as “a structured approach to defining that value means to the organization and the project. It is a framework that allows needs, problems or opportunities to be defined and then enables review of whether the initial project objectives can be improved to determine the optimal approach and solution”. The indicators of this competency element consist of understanding and communicating the concept of value management, understanding and communicating the benefits of value management, understanding the key principles of value management, understanding and applying the role of value manager, understanding and applying value management problem solving, and maintaining audit trails and recording of implementation.

As shown in Table 7.11, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Handover & closeout-

In APM Competence Framework, this competency element is defined as “final phase in project life cycle. During this phase final project deliverables are handed over to sponsor and users. Closeout is the process of finalizing all project matters, carrying out final project reviews, archiving project information and redeploying the project team”. The indicators of this competency element are formalizing the project completion process, undertaking an assessment of the readiness of project, ensuring all required deliverables are delivered and accepted by stakeholders, obtaining appropriate sign-off certificates and agreements on handover, closing contracts with contractors, obtaining formal project closedown, conducting a post project review, releasing human resources and other assets, and archiving project records.

In IPMA Competence Baseline, For closing stage of project, “conducting administrative closeout” competency element is identified and the performance criteria for this competency element are, verifying all project results, documenting performance measures, reviewing final specifications, and analyzing project success, documenting the final project scope, documenting lessons learned, formalizing the acceptance of the product, performing final appraisal reviews and archiving relevant project documentations.

In Project Manager Competency Development (PMCD) Framework, The performance criteria for “conducting contract closeout” as the competency element of procurement

management in closing phase of project, are determining the quality and completeness of the contract file, updating records based upon final contract results, verifying contract documentation, and obtaining formal acceptance from customer regarding to contract completion. The importance of “hand over and close-out” competency is also addressed in Lynn Crawford and Nahmias (2010) research.

As shown in Table 7.11, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Documentation-

In APM Competence Framework, documentation competency element is addressed for updating the project scope and changes happening during project. In Project Manager Competency Development (PMCD) Framework, documentation is happening in different project phases such as formally documentation of project charter or product acceptance by stakeholders in initiating stage, documentation of types of interactivity dependencies, documentation of lessons learned. In IPMA Competence Baseline, documentation of lesson learned are addressed as well. The importance of this competency is also identified in Lynn Crawford and Nahmias (2010) research.

As shown in Table 7.11, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Appraising project team members-

Most companies in order to achieve competitive advantages have concentrated on importance of employee development (Bratton & Gold, 1999). In order to achieve this goal, nowadays, performance management is replaced performance appraisal (Torrington & Hall, 1995). Performance appraisal is the key component of any performance management system (Banks & May, 1999; Burgler, 1995; Mohrman & Mohrman, 1995). Therefore, it is crucial for organizations as a part of their performance management system, they appraise their managerial competencies. In a research conducted by Abraham et al. (2001), they found that many of organizations are not considering managerial competencies for appraising their managers. Therefore, the effectiveness of managerial appraisal system effectiveness in those organizations reduces. In their research, they also identified six critical competency elements for project managers which were leadership, customer focus, results oriented, problem solver, communication skills and team worker. Therefore, organization that are willing to achieve a high performance not only need to identify the competencies required by their project managers, but also need to make sure that for their managerial appraisal processes they apply same identified competencies (Abraham, et al., 2001).

Cardy and Dobbins (1994) observed three types of appraisal systems for field of performance appraisal including traits, behaviors, and outcomes. Among these three types behavior is changeable, so it is suitable for training purposes. Therefore, it is very crucial for project-based organizations to define an excellence behavioral term as targets that can be used for professional development of their project managers (Fulmer, et al., 2000; Heffernan & Flood, 2000; Latham, et al., 1979). Bank and May (1999), Burgle (1995), and Mohrman and Mohrman (1995) argued that performance appraisal is the key component of any performance management system. Abraham et al. (2001) contended that organizations that are willing to achieve a high performance not only

need to identify the competencies required by their project managers, but also need to make sure that they apply same identified competencies for their managerial appraisal processes. Appraising the performance of team members is also addressed in Chong (2008) research.

As shown in Table 7.11, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Administer design process-

As shown in Table 7.11, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued it as “not important” competency. Therefore, this competency omitted from list of competencies in qualitative approach of the study. Hence, according to the results of this study, this competency is a “not important” competency for project managers.

Administer authority liaison-

As shown in Table 7.11, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued it as “not important” competency. Therefore, this competency omitted from list of competencies in qualitative approach of the study. Hence, according to the

results of this study, this competency is a “not important” competency for project managers.

Perform post-contract evaluation-

As shown in Table 7.11, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Table 7.11: Results of survey of project managers, senior project managers, and project experts for competency elements of Construction Works (Technical Expertise)

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Verbal skills	Var35	Important	Not Important	----
Written skills	Var36	Important	Not Important	----
To know project success criteria	Var37	Core	Important	Core
Methods and procedures	Var38	Important	Core	Core
Change control	Var39	Important	Important	Important
Technology management	Var40	Not Important	Not Important	----
Value management	Var41	Important	Important	Important
Handover and closeout	Var42	Important	Important	Important
Documentation	Var43	Important	Important	Core
Appraising project team members	Var44	Important	Important	Core
Administer design process	Var45	Important	Not Important	----
Administer authority liaison	Var46	Important	Not Important	----
Perform post-contract evaluation	Var47	Important	Important	Important

7.2.11 COMPETENCY ELEMENTS OF EXPERIENCE

Gokhale (2005) emphasized the importance of experience for competency achievement. Attribute-based inference of competency includes skills, experience, knowledge, personality traits and behaviors (Heywood, et al., 1992). Stevenson and Starkweather (2010) and Ahadzie, Proverbs, and Olomolaiye (2008) addressed experience as an important competency for project managers. Turner and Crawford (1994) classified competencies in two categories: “personal competencies” which include knowledge, skills, experience, and personality of an individual and “corporate competencies” which is referred to processes and structures in the organization.

George (2003) argued that even though project managers can learn from others’ experiences (George, 2004), every individual is unique with personal values, personal experiences, and motivation. Therefore, project managers need to have a unique leadership style which is aligned with their personality and personal values (B. George, 2003).

As shown in Table 7.12, quantitative approach of the study showed that either project managers or senior project managers valued competency elements of experience as “not important” competencies. Therefore, these competencies are concluded as “not important” competencies for project managers.

Table 7.12: Results of survey of project managers, senior project managers, and project experts for competency elements of experience

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Managing similar projects	Var48	Important	Not Important	----
Number of years working in construction industry	Var49	Not Important	Not Important	----
Experience variety of project types	Var50	Not Important	Not Important	----
Membership in appropriate professional body	Var51	Not Important	Not Important	----

7.3 PERSON-RELATED COMPETENCIES

As mentioned before, Woodruffe (1991) defined this competency as a dimension of behavior. Robert (1997) defined it as input-based criteria, which means personal behavior, traits, and characteristics that a person brings to projects. Garavan and McGuine (2001) believe that this competency is more popular in US rather than in Europe. Gadeken (1994) in his research distinguished six behavioral competencies for effective project managers. According to the American Management Association, competency is defined as the characteristics of a person whose performance is superior (Boyatzis, 1982). This aspect is the result of research done by McBer Associates, who started in 1970s in order to distinguish characteristics between superior managers and average managers. This competency is also known as “macro competency” (Cheng and Dainty, 2003). Brown (1993), Spencer and Spencer (1993) mentioned that personal competency for project managers is more pivotal when dealing with complex situations. This approach relies on superior effective managers (Jones and Connolly, 2001). Lyle and Signe Spencer (1993) developed required personal competencies for project managers. They organized these competencies in six competency units consisting achievement and action, helping and human service, impact and influence, managerial, cognitive, and personal effectiveness. “Achievement and action” is broken down to “achievement orientation”, “concern for order, quality, and accuracy”, “initiative”, “information seeking”, and “identifying and solving problems” clusters.

7.3.1 COMPETENCY ELEMENTS OF ACHIEVEMENT AND ACTION

Achievement orientation (Result orientation)-

In IPMA Competence Baseline, “result orientation” means “focusing the team’s attention on key objectives to obtain the optimum outcome for all the parties involved”.

The importance of this competency element is addressed in the following researches

(Abraham, et al., 2001; Arditi & Balci, 2009 ; Andrew R. J. Dainty, et al., 2005; V. Dulewicz, 1989; Hafeez & Essmail; McBer, 1996; JR. Turner, 1999; Wickramasinghe & Kumara, 2009)

As shown in Table 7.13, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Concern for order, quality, & accuracy-

As shown in Table 7.13, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Initiative-

“Initiative” means “the preference for taking action. It is doing more than is required or expected in the job, doing things that no one has requested, which will improve or enhance project results and avoid problems, or findings or creative new opportunities.” It is expected from project manager “to take initiative when required. The importance of this competency is addressed in some researches (Arditi & Balci, 2009 ; Dainty, et al., 2005; McBer, 1996; Pries, et al., 2004; Wickramasinghe & Kumara, 2009).

As shown in Table 7.13, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important”

competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Information Seeking-

Information seeking” means “an underlying curiosity, a desire to know more about things, people, or issues. It implies making an effort to get more information, not accepting situations at face value.” Regarding to “information seeking”, it is expected from project manager “to ensure information used to manage project is complete and accurate”. Spencer and Spencer(1993), McBer’s (1996), and Dainty et al. (2005) highlighted the importance of this competency element.

As shown in Table 7.13, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued this competency as “not important” competency. So, this competency omitted from the competency lists of qualitative approach. Therefore, based on the results of the research, this competency is a “not important” competency for project managers.

Identifying & solving problems-

Chong (2008), Lynn Crawford & Nahmias (2010), Hafeez & Essmail (2007), Abraham et al. (2001); and Rosenau (1998) addressed the importance of this competency. Belzer (2001) identified several soft skills that are crucial for successful project management which problem solving was one of them. Turner (1999) identified problem solving as one of the seven traits of effective project managers.

As shown in Table 7.13, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued it as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Table 7.13: Results of survey of project managers, senior project managers, and project experts for competency elements of achievement and action

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Achievement orientation (Result orientation)	Var52	Important	Important	Core
Concern for order, quality, & accuracy	Var53	Important	Important	Important
Initiative	Var54	Important	Important	Important
Information Seeking	Var55	Important	Not Important	----
Identifying & solving problems	Var56	Important	Core	Core

7.3.2 COMPETENCY ELEMENTS OF HELPING AND HUMAN SERVICE

Client Orientation-

Dainty et al. (2005) pointed out for this changing environment of projects, project managers need to develop their client-orientation, flexibility, and self-control competencies as the most crucial competencies required by them. Fraser and Zakaria-Fraser (2003) mentioned that for managing project stakeholders including clients the first need is to know their expectations. As contended by George (2003), authentic

leaders are courage to move forward, have a sense of understanding of clients' demands, and try their best to fulfill these demands.

As shown in Table 7.14, quantitative approach of the study showed that both project managers and senior project managers valued this competency as "important" competency. Besides, the results of qualitative approach showed that project experts valued this competency as an "important" competency. Therefore, based on results of this study, this competency is an "important" competency for project managers.

Interpersonal Understanding-

Thornton and Byham (1982) listed competencies for top management and addressed interpersonal skills as one of the important competencies required for them. Dulewicz (1989) identified required competencies for middle managers. He categorized these competencies in four clusters as: Intellectual competencies, Interpersonal competencies, Adaptability, and Result orientation. Honey (1988) suggested that in order to achieve desirable outcomes with the help of other people, it is important to utilize interpersonal skills. Kliem and Ludin (1992) suggested that project managers need to apply interpersonal skills such as being able to see things from team members' perspective, showing empathy, and respecting others. The importance of this competency is also addressed in other researches (Ahadzie, Proverbs, & Olomolaiye, 2008; Arditi & Balci, 2009 ; McBer, 1996).

The idea of competency in human resource literature is proposed by David McClelland in 1970. In a case study for selection of Foreign Service Information Officers, he found that superior Information Officer are differentiated from average Information Officers through competencies such as interpersonal sensitivity (Dubois, 1993). Some other researchers believe that managers for change project should come from the fields with

less focus on technical issues and more focus on interpersonal skills such as psychology or organizational development fields (Caluwe & Vermaak, 2003; Connor & Lake, 1994; Cummings & Worley, 2001; French & Bell, 1999; Kanter, et al., 1992).

As shown in Table 7.14, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Table 7.14: Results of survey of project managers, senior project managers, and project experts for competency elements of helping and human service

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Client Orientation	Var57	Important	Important	Important
Interpersonal Understanding	Var58	Important	Important	Important

7.3.3 COMPETENCY ELEMENTS OF IMPACT AND INFLUENCE

Impact & influence-

The importance of this competency is identified in some researches (Dulewicz & Higgs, 2005; Fisher, 2010; McBer, 1996; Muller & Turner, 2010). Turner and Muller (2006) in their research concluded that emotional competencies such as self-awareness, resilience, motivation, influence and conscientiousness are the most contributors for project success.

In addressing the personal competencies' structures, the PMCD framework is based on the competency dictionary by Lyne and Singe Spencer (1993). There are six units of competencies in this dictionary. They are achievement and action, helping and human

service, impact and influence, and managerial competencies. Spencer and Spencer (1993) Developed required personal competencies for project managers. They organized these competencies in six competency units consisting achievement and action, helping and human service, impact and influence, managerial, cognitive, and personal effectiveness.

As shown in Table 7.15, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Organizational Awareness-

“Organizational awareness” means “individual’s ability to understand the power relationship in one’s own organization or in other organizations (customers, suppliers, and so on). Belzer (2001) identified several soft skills that are crucial for successful project management. These factors include: to understand culture of organization and team members that project manager is working with. The importance of this competency is also highlighted in McBer’s Scaled Competency Dictionary (1996).

There are some researches that argued that authenticity of leadership depends on several factors such as organizational context, external environment (Avolio & Luthans, 2006; Gardner, et al., 2005; Luthans & Avolio, 2003). Organizational contexts that projects, project team, and project managers are operating in, as well as contextual variables influence project management competency (Boddy, 1993; Kastel & Witt, 1996; Larson & Gobeli, 1989; Thamhain & Wilemon, 1977).

As shown in Table 7.15, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Relationship Building-

“Relationship building “means “working to build or maintain positive relationship or network of contacts with people who are, or might someday be, useful in achieving work-related goals.”Keegan and Den Hartog (2004) argued that due to temporary nature of projects and as a results the complexity of projects, there is a need to more emphasize on dynamic relationships. Consequently, project managers to be effective in changing environment, need to develop both technical and social competencies (Thamhain, 2004a, 2004b).

Walker and Kalinowski (1994) explained importance of low task and high relationship attitude for projects in Asia. Ogunlana et al. (2002) in another study about project managers in Thailand found that for project managers relationship- oriented leadership is more important than task-oriented leadership. The importance of project managers who are capable to develop their relationship effectively is accentuated in some researches (Goleman and Boyatzis, 2004; Zohar and Marshall, 2001; Arditi & Balci (2009)).

As shown in Table 7.15, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts

valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Building trust-

Early literature review of effective project managers show that effective project managers try to build trust, and try to involve team members’ emotions (Blake & Mouton, 1964; Likert & Hayes, 1957; Mc Gregor, 1967). Kadehors (2004) considered that trust building is a crucial competency needed by project managers. They must boost level of loyalty in a way that both parties show respect for that. Barkley (2006) suggested that effective project managers create a trust, honesty, and commitment environment. They motivate team members to perform and improve.

Belzer (2001) identified several soft skills that are crucial for successful project management. These factors include: to understand culture of organization and team members that project manager is working with, decision making, leadership, problem solving, team building, to be flexible, to be creative, and trustworthiness. Barkley (2006) suggested that effective project managers create a trust, honesty, and commitment environment. They motivate team members to perform and improve. The importance of this competency is also highlighted in Fisher (2010) research.

As shown in Table 7.15, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “core” competency. Besides, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Table 7.15: Results of survey of project managers, senior project managers, and project experts for competency elements of impact and influence

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Impact & influence	Var59	Important	Important	Important
Organizational Awareness	Var60	Important	Important	Important
Relationship Building	Var61	Important	Important	Important
Building trust	Var62	Core	Core	Core

7.3.4 COMPETENCY ELEMENTS OF MANAGEMENT

Teamwork & Cooperation-

In a research by Yang et al. (2011), it contended that project performance is highly influenced by teamwork. Hogl and Gemunden (2001) argued that teamwork has a complex and multifaceted concept that included task-oriented activities and also interaction between team members. The importance of this competency is highlighted in some other researches (Arditi & Balci, 2009 ; Dainty, et al., 2005; McBer, 1996).

As shown in Table 7.16, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “core” competency. Besides, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Developing others-

By developing project team, skills and technical competencies of team members as well as project performance enhance (Morris & Pinto, 2007). Ng & Tang (2010) and Sung Ho (2009), mentioned in order to achieve project success need to develop project team. Morris & Pinto (2000) mentioned that developing project team, results to improvement

of skills, technical competencies, and performance of project team. The importance of this competency is accentuated in other researches.

As shown in Table 7.16, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Team Leadership-

Turner and Muller (Turner & Muller, 2006) pointed out project managers competency is one of the contributors of project success; they also confirmed that for different project types, different leadership styles are appropriate. Chan and Chan (2005) found that in order to achieve employee greater performance and satisfaction, professionals should apply transformational leadership for interacting with employees. Required skills for project managers in Meredith et al.(1995) research is categorized in six groups named, communication, organizational, team building, leadership, coping and technological skills.

Dulewicz and Higgs (2003) proposed the concept of Emotional Intelligence in project management and showed that for leadership performance this competency accounts for 36% while Intellectual competencies account 27%, and Managerial competencies account 16%. Thamhain (2004a) emphasized the importance of leadership for project managers. Thornton and Byham (1982) listed competencies for top management including required management skills, leadership skills, interpersonal skills, creativity, communication skills, and personality traits.

The importance of this competency is addressed in other researches (Arditi & Balci, 2009 ; Crawford & Nahmias, 2010; Dainty, et al., 2005; McBer, 1996; Stevenson & Starkweather, 2010; Wickramasinghe & Kumara, 2009).

As shown in Table 7.16, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “core” competency. Besides, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Being Directive: Assertiveness & use of positional power -

“Directiveness: assertiveness and use of positional power” means “the individual’s intent to make others comply with one’s wishes. Directive behavior has a theme or tone of “telling people what to do”. “Using assertiveness when necessary” and “managing the complete project” are the competency elements of this competency. The importance of this competency is addressed in McBer’s Scaled Competency Dictionary (1996) research.

Cheng et al.(2005) in the field of construction industry proposed twelve behavioral competencies for project managers including achievement orientation, initiative, information seeking, focus on client’s needs, impact and influence, directiveness, teamwork and cooperation, team leadership, analytical thinking, conceptual thinking, self-control and flexibility.

As shown in Table 7.16, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts

valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Disciplining & counseling-

As quoted by George (2004) leadership style of authentic leaders is consistent to their personality and characteristics and is totally unique. These authentic project leaders show a high level of self-discipline (George, 2003) in their workplace. Some of the characters of “authentic leadership” are sense of integration, positive energy, morality, having self-discipline, to be optimistic, to be resilient and to be hopeful (Avolio & Gardner, 2005; George, 2003; George & Sims, 2007; Luthans & Avolio, 2003). Chong (2008) also accentuated the importance of this competency.

As shown in Table 7.16, results of quantitative approach of study showed that project managers valued this competency as “important” competency. However, senior project managers valued this competency as “not important” competency. So, this competency omitted from the competency lists of qualitative approach. Therefore, based on the results of study, this competency is a “not important” competency for project managers.

Making decisions-

The importance of this competency is accentuated in several researches (Arditi & Balci, 2009 ; Belzer, 2001; Chong, 2008; Crawford & Nahmias, 2010; McBer, 1996; Wickramasinghe & Kumara, 2009).

As shown in Table 7.16, results of quantitative approach of study showed that project managers valued this competency as “core” competency. However, senior project

managers valued it as “important” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Table 7.16: Results of survey of project managers, senior project managers, and project experts for competency elements of management

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Teamwork & Cooperation	Var63	Core	Core	Core
Developing others	Var64	Important	Important	Important
Team Leadership	Var65	Core	Core	Core
Being Directive: Assertiveness & use of positional power	Var66	Important	Important	Important
Disciplining & counseling	Var67	Important	Not Important	----
Making decisions	Var68	Core	Important	Core

7.3.5 COMPETENCY ELEMENTS OF COGNITIVE

Analytical Thinking-

“Analytical thinking” means “working through a situation by breaking it apart into smaller pieces or tracing the implications of a situation in a step-by-step causal way”. This competency identified as important competency for project managers in several researches (Arditi & Balci, 2009 ; Belzer, 2001; Chong, 2008; Crawford & Nahmias, 2010; Dainty, et al., 2005; McBer, 1996; Wickramasinghe & Kumara, 2009)

As shown in Table 7.17, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts

valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Conceptual Thinking-

“Conceptual thinking” means “working through a situation or problem by putting the pieces together, seeing the large picture”. This importance of this competency is accentuated in some researches (Arditi & Balci, 2009 ; Belzer, 2001; Chong, 2008; Crawford & Nahmias, 2010; Dainty, et al., 2005; McBer, 1996; Wickramasinghe & Kumara, 2009) .

As shown in Table 7.17, quantitative approach of the study showed that project managers valued this competency as “core” competency; however, senior project managers valued its importance as “important” competency. Besides, the results of qualitative approach showed that this competency is an “important” competency. Therefore, based on the results of this study, this competency is an “important” competency for project managers.

Critical analysis & judgment-

This competency element means gathering relevant information from a wide range of sources, probing the facts, identifying advantages and disadvantages, sound judgment and decision making, awareness of the impact of any assumptions made.

As shown in Table 7.17, quantitative approach of the study showed that project managers valued this competency as “core” competency; however, senior project managers valued its importance as “important” competency. Besides, the results of qualitative approach showed that this competency is an “important” competency. Therefore, based on the results of this study, this competency is an “important” competency for project managers.

Table 7.17: Results of survey of project managers, senior project managers, and project experts for competency elements of cognitive

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Analytical Thinking	Var69	Important	Important	Core
Conceptual Thinking	Var70	Core	Important	Important
Critical analysis & judgment	Var71	Core	Important	Important

7.3.6 COMPETENCY ELEMENTS OF PERSONAL EFFECTIVENESS

Self-Control-

“Self-control” means “the ability to keep emotions under control and restrain negative actions when tempted, when faced with opposition or hostility from others, or when working under conditions of stress”. In Dainty et al. (2005) research twelve behavioral competencies for construction project managers identified. They reduced these twelve behavioral competencies to two core behavioral competencies which are team leadership and self-control. Nineteen leadership competencies that was grouped in four categorizes identified by Goleman et al. (2002) including self-awareness, self-management, social awareness, and relationship management. The importance of this competency is also addressed in some other researches (Dulewicz & Higgs, 2005; Muller & Turner, 2010).

As shown in Table 7.18, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Self-Confidence-

“Self-confidence” means “a person’s belief in one’s own capability to accomplish a task. This includes a person expressing confidence in dealing with increasingly challenging circumstances, in reaching decisions or forming options, and in handling failures constructively. The important role of self-confidence and self-belief to achieve project success is accentuated in lee-Kelly’s and Leong’s (2003) research. In some other researches this competency addressed as well (McBer, 1996; Turner, 1999; Zika-Viktorsson & Ritze, 2005).

As shown in Table 7.18, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Flexibility-

Competency approaches are widely being utilized by organizations for enabling employees with more learning and flexibility capabilities in organizations (Lei & Hitt, 1996; Spangenberg, et al., 1999). In order to increase organizational competitiveness, softer qualities like flexibility and sensitivity that help for better coordination of activities are more crucial than functional expertise (Jacobs, 1989). Dainty et al. (2005) pointed out for this changing environment of projects, project managers need to develop their client-orientation, flexibility, and self-control competencies as the most crucial competencies required by them. The importance of this competency is also addressed in some other researches (Arditi & Balci, 2009 ; Belzer, 2001; Chong, 2008;

Crawford & Nahmias, 2010; Dainty, et al., 2005; McBer, 1996; Wickramasinghe & Kumara, 2009).

As shown in Table 7.18, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Organizational Commitment-

“Organizational commitment” means “the individual’s ability and willingness to align one’s own behavior with the needs, priorities, and goals of the organization, to act in ways that promote organizational goals or meet organizational needs.” And “demonstrating commitment to the project is its competency element. Barkley (2006) suggested that effective project managers create a trust, honesty, and commitment environment. Mcber’s (1996) also highlighted the importance of this competency.

As shown in Table 7.18, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Intuitiveness-

“Initiative” means “the preference for taking action. It is doing more than is required or expected in the job, doing things that no one has requested, which will improve or enhance project results and avoid problems, or findings or creative new opportunities.”. Seven traits of effective project managers identified by Turner (1999) are: problem

solving ability, result orientation, energy and initiative, self-confidence, perspective, communication, and negotiating ability. Spencer and Spencer (1993) developed required personal competencies for project managers. They organized these competencies in six competency units consisting achievement and action, helping and human service, impact and influence, managerial, cognitive, and personal effectiveness. “Achievement and action” is broken down to “achievement orientation”, “concern for order, quality, and accuracy”, “initiative”, “information seeking”, and “identifying and solving problems” clusters. The importance of this competency is highlighted in other researches (Arditi & Balci, 2009 ; Belzer, 2001; Chong, 2008; Crawford & Nahmias, 2010; Dainty, et al., 2005; McBer, 1996; Wickramasinghe & Kumara, 2009).

As shown in Table 7.18, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Conscientiousness-

Turner and Muller (2006) in their research concluded that emotional competencies such as self-awareness, resilience, motivation, influence and conscientiousness are the most contributors for project success. Some other researcher also addressed the importance of this competency (Dulewicz & Higgs, 2005; Muller & Turner, 2010).

As shown in Table 7.18, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued its importance as “core” competency. Besides, the results of qualitative approach showed that this competency is a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Creativity-

In IPMA Competence Baseline, “creativity” is defined as “the ability to think and act in original and imaginative ways”. Thornton and Byham (1982) listed competencies for top management including required management skills, leadership skills, interpersonal skills, creativity, communication skills, and personality traits. Wickramasinghe & Kumara (2009) also accentuated the importance of this competency.

As shown in Table 7.18, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Table 7.18: Results of survey of project managers, senior project managers, and project experts for competency elements of personal effectiveness

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Self-Control	Var72	Important	Important	Important
Self-Confidence	Var73	Important	Important	Important
Flexibility	Var74	Important	Important	Core
Organizational Commitment	Var75	Important	Important	Important
Intuitiveness	Var76	Important	Important	Important
Conscientiousness	Var77	Important	Core	Core
Creativity	Var78	Important	Important	Core

7.3.7 COMPETENCY ELEMENTS OF BEHAVIORAL

Conflict management-

As mentioned by Wateridge (1997) initial training programs need to focusing of processes and tools while later training programs should address conflicts, leadership and strategy. Verma (1996) proposed that project managers need to adapt their behavior

to the existing conflicts existing in different levels. Jiang et al. (1999) suggested that effective project managers are capable to show empathy, understand how to motivate others, capable to manage conflict, when dealing with others they are diplomatic, being able to accentuating messages to others through facial expressions.

In APM Competence Framework, “conflict management” competency elements is recognized under behavioral competencies and is defined as “the process of identifying and addressing differences that, if unmanaged, would affect project objectives. Effective conflict management prevents differences becoming destructive elements in a project.” The importance of this competency is also addressed in other researches (Fisher, 2010; Zika-Viktorsson & Ritze, 2005).

As shown in Table 7.19, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Negotiation-

In APM Competence Framework, negotiation is defined as “a search for agreement, seeking acceptance, consensus and alignment of view. In a project it can take place on an informal basis throughout the project life cycle or on a formal basis such as during procurement and between signatories to a contract”. The importance of this competency is also accentuated in other researches (Turner, 1999; Zika-Viktorsson & Ritze, 2005)

As shown in Table 7.19, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts

valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Behavioral characteristics & attitude-

Guest and Neil (2007) indicated that workplace performance is associated to HRM and also employee attitudes. Walker and Kalinowski (1994) explained importance of low task and high relationship attitude for projects in Asia. As mentioned by Klink and Boon (2000) characteristics such as attitude, emotion and cognition are innate and cannot be learned; they only can be developed. Thornley (2006) research findings suggest that effectiveness of planning process is affected and influenced by having positive attitude about it. The importance of this competency is also addressed in Stevenson and Starkweather (2010) research.

As shown in Table 7.19, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Professionalism & ethics

In APM Competence Framework, “professionalism is demonstrable awareness and application of qualities and competencies covering knowledge, appropriate skills and behaviors. Ethics covers the conduct and moral principle recognized as appropriate within the project management profession”. In IPMA, ethics is one of the competency elements of behavioral competencies. However, it is explained generally and briefly (Caupin, et al., 2006). Based on Spurgin (2004) suggestion for ethical competencies of

employees, these competencies include the knowledge about ethic, to be aware about ethics issues in business, and to be able to evaluate argument on ethical issues.

Toor and Ofori (2006) in their research mentioned about existing challenges in construction industry which is comprised of general business challenges, industry specific challenges, and environmental challenges (such as cultural, economic, ethical, and legal and regulatory challenges. The importance of this competency is addressed in other researches (Brill, et al., 2006; Wickramasinghe & Kumara, 2009).

As shown in Table 7.19, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Engagement & motivation (Encourage the heart)-

In several researches the importance of this competency is accentuated (Arditi & Balci, 2009 ; Dulewicz & Higgs, 2005; Fisher, 2010; Müller & Turner, 2010; Stevenson & Starkweather, 2010). Dulaimi and Langford (1999) argued that in construction industry most conducted researches addressing personal characteristics and motivational factors of project managers and less researches focusing on leadership development in construction industry.

Project managers need to fulfill some roles such as facilitator, coordinator, motivator and politician (Briner, et al., 1996). Turner and Muller (2006) in their research concluded that emotional competencies such as self-awareness, resilience, motivation, influence and conscientiousness are the most contributors for project success. Barkley

(2006) suggested that effective project managers motivate team members to perform and improve.

Jiang et al. (1999) suggested that effective project managers are capable to show empathy, understand how to motivate others, capable to manage conflict, when dealing with others they are diplomatic, being able to accentuating messages to others through facial expressions.

In IPMA Competence Baseline, engagement is defined as something that keeps people as a part of the project and it bring a vision to the project team to work together behind a common goal. For motivating project team members, project manager needs to be aware about project members' intrinsic motivations, circumstances, and personal attitudes.

As shown in Table 7.19, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued its importance as “core” competency. Besides, the results of qualitative approach showed that this competency is a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Openness-

In IPMA Competence Baseline, “openness” is defined as “the ability to make others feel they are welcome to express themselves, so that the project can benefit from their input, suggestions, worries and concern”. The advantage of this competency element for project manager is that he/she can benefit from the knowledge and experience of other team members who have more knowledge and expertise than project manager.

As shown in Table 7.19, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important”

competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Result orientation-

As shown in Table 7.19, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued its importance as “core” competency. Besides, the results of qualitative approach showed that this competency is a “core” competency. Therefore, based on results of this study, this competency is a “core” competency for project managers.

Efficiency-

Improving efficiency and increasing production has led to development of competency approaches (Grugulis, 1997; Raelin & Cooledge, 1995; Sandberg, 2000). In IPMA Competence Baseline, “efficiency” is defined as “the ability to use time and resources cost-effectively to produce the agreed deliverables and fulfill interested parties’ expectations. It also embraces using methods, systems and procedures in the most effective way”.

As shown in Table 7.19, results of quantitative approach of study showed that both project managers and senior project managers valued this competency as “core” competency. Besides based on qualitative approach of the study, project experts valued this competency as “core” competency as well. Therefore, based on the results of this research, this competency is a “core” competency for project managers.

Consultation-

In IPMA Competence Baseline, “consultation” means “the competency to reason, to present solid arguments, to listen to the other point of view, to negotiate and to find solutions. It is basically the exchange of opinions about project issues”.

As shown in Table 7.19, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Reliability-

In IPMA Competence Baseline, “reliability” is defined as “delivering what you have said you will do the time and quality agreed within the project specification. Being reliable builds trust in others who know that you will live up to what you have promised to do”.

As shown in Table 7.19, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Effective communication-

Seven traits of effective project managers identified by Turner (1999) are: problem solving ability, result orientation, energy and initiative, self-confidence, perspective, communication, and negotiating ability. Well communication, showing empathy and inspiring others, are considered necessary for effective project managers in Peters and Waterman (1982) research. Successful project managers in order to manage changes in

changing environment, use formal and informal communication skills (HÄLLgren, 2005). O'Brochta (2008) in a macro level study investigated 5000 project managers and project stakeholder in order to identify successful project managers and the contributors to their success. Findings of his research show that successful project managers, have more authority, more planning, and more communications.

In a research conducted by Abraham et al. (2001), they found that many of organizations are not considering managerial competencies for appraising their managers. Therefore, the effectiveness of managerial appraisal system effectiveness in those organizations reduces. In their research, they also identified six critical competency elements for project managers which were leadership, customer focus, results oriented, problem solver, communication skills and team worker.

Required skills for project managers in Meredith et al. (1995) research is categorized in six groups named, communication, organizational, team building, leadership, coping and technological skills. Thornton and Byham (1982) listed competencies for top management including required management skills, leadership skills, interpersonal skills, creativity, communication skills, and personality traits.

The importance of communication skills is accentuated in other researches such as (Brill, et al., 2006; Christenson, 2004; Crawford & Nahmias, 2010; Dulewicz & Higgs, 2005; Hafeez & Essmail; Thornton & Byham, 1982; Wickramasinghe & Kumara, 2009).

As shown in Table 7.19, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

The ability to deal with ambiguity-

Stevenson and Starkweather (2010) accentuated the importance of this competency. As shown in Table 7.19, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued it as “not important” competency. Therefore, this competency omitted from list of competencies in qualitative approach of the study. Hence, according to the results of this study, this competency is a “not important” competency for project managers.

Table 7.19: Results of survey of project managers, senior project managers, and project experts competency elements of behavioral

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Conflict management	Var79	Important	Important	Important
Negotiation	Var80	Important	Important	Important
Behavioral characteristics & attitude	Var81	Important	Important	Important
Professionalism & ethics	Var82	Core	Core	Core
Engagement & motivation	Var83	Important	Core	Core
Openness	Var84	Important	Important	Important
Result orientation	Var85	Important	Core	Core
Efficiency	Var86	Core	Core	Core
Consultation	Var87	Important	Important	Important
Reliability	Var88	Important	Important	Core
Effective communication	Var89	Important	Important	Core
The ability to deal with ambiguity	Var90	Important	Not Important	----

7.3.8 COMPETENCY ELEMENTS OF CONTEXTUAL

Project orientation-

Belzer (2001) identified several soft skills that are crucial for successful project management. One of these factors is to understand culture of organization and team members that project manager is working with. Besides, one of the reasons recognized for project failure is project manager’s inability to communicate effectively, and work

within the organization's culture, motivate the project team, manage stakeholder expectations, understand the business objectives, solve problems effectively, and make clear and knowledgeable decisions (Stevenson & Starkweather, 2010). Kendra and Taplin (2004) argued that organizations in order to be successful for achieving their objectives need to have a shared set of values which is aligned with social and technical aspects of project management. In other researches such as (Burnes, 1991; Currie & Darby, 1995; Kilcourse, 1994; Lindsay & Stuart, 1997) the importance of organization culture for achieving project success is addressed.

As shown in Table 7.20, quantitative approach of the study showed that both project managers and senior project managers valued this competency as "important" competency. However, the results of qualitative approach showed that project experts valued this competency as a "core" competency. Therefore, based on results of this study, this competency is an "important" competency for project managers.

Program orientation (Strategic Perspective)-

In Dulewicz & Higgs (2005) and Ralf Muller and Rodney Turner (2010) researches this competency element is identified as important competency required for project managers. Bredillet (2005), argued that project management is grown from project oriented function to the strategic-oriented function." In fact, by program management a framework for implementing strategies would be provided. The possible process steps of this competency element are listing and prioritizing business improvement initiatives, quantifying essential programs and their benefits, aligning the essential programs to strategic goals, reviewing results with appropriate management level and changing organization culture accordingly, initiate relevant programs, monitoring progress, and learning from each program to apply for future programs. In some researches such as

Boyatzis (1982) or Shnhar et al. (1997) emphasized the role of project managers' competencies to achieve organization strategic goals. Thiry (2004) argued that there is a lack of communication between organization strategies and training programs of project managers. In fact, training programs in organizations need to be aligned with organization strategies. Competency based approaches are being used in organizations succession planning in the organization and performance appraisal of employee (Draganidis & Mentzas, 2006).

As shown in Table 7.20, quantitative approach of the study showed that both project managers and senior project managers valued this competency as "important" competency. Besides, the results of qualitative approach showed that project experts valued this competency as an "important" competency. Therefore, based on results of this study, this competency is an "important" competency for project managers.

Portfolio orientation-

This competency element means fully understood and apply the concept of portfolio management, balancing supply with demand continuously, monitoring programs and projects of the portfolio, and initiating corrective actions.

As shown in Table 7.20, quantitative approach of the study showed that both project managers and senior project managers valued this competency as "important" competency. Besides, the results of qualitative approach showed that project experts valued this competency as an "important" competency. Therefore, based on results of this study, this competency is an "important" competency for project managers.

Change management (in organization)-

Organizational change projects have absorbed research interest in project management field (Bresnen, 2006; Crawford, et al., 2003; Lehtonen & Martinsuo, 2008; Levene & Braganza, 1996; Leybourne, 2006; Nieminen & Lehtonen, 2008; Pellegrinelli, 1997). This competency element covers the process of continuously improving project, program, and portfolio management in organization which involving change management, contributing to the development of an implementation plan and assessment of results. Partington et al. (2005) believed that for change projects in organizations project managers with different skills are required. Therefore, they proposed that project managers and program managers need to learn required skills and capabilities which are beyond required competencies for projects, to be suited for change projects in organizations. Organizations have reached to the point that for organization changes, competent and knowledgeable project team is required (Adams & Thomas, 1991). The importance of this competency is also addressed in Stevenson and Starkweather (2010) research.

As shown in Table 7.20, quantitative approach of the study showed that project managers valued this competency as “important” competency; however, senior project managers valued it as “not important” competency. Therefore, this competency omitted from list of competencies in qualitative approach of the study. Hence, according to the results of this study, this competency is a “not important” competency for project managers.

Permanent organization-

This competency element means overcoming any resistance from within the permanent organization and to know how the policies and outputs of operations of the permanent organization are defined and controlled, and what the associated risks are.

As shown in Table 7.20, results of quantitative approach of study showed that project managers valued this competency as “not important” competency. However, senior project managers valued this competency as “important” competency. Therefore, this competency omitted from the competency lists to be asked from project experts and its importance addressed as “not important” competency.

Health, security, safety & environment-

In IPMA Competence Baseline, this competency element “covers the activities that help ensure the organization behaves appropriately in the context of health, security, safety and the environment, and during the planning phase of the project, its execution, and during the delivered product’s lifecycle and its decommissioning and disposal”. In APM Competence Framework, this competency element is defined as “the process of determining and applying appropriate standards and methods to minimize the likelihood of accidents, injuries or environmental impact both during the project and during the operation of its deliverables.”

As shown in Table 7.20, quantitative approach of the study showed that project managers valued this competency as “core” competency; however, senior project managers valued its importance as “important” competency. Besides, the results of qualitative approach showed that this competency is an “important” competency. Therefore, based on the results of this study, this competency is an “important” competency for project managers.

Financial management-

This competency element means to provide information to the financial management of the organization about the financial requirements of the project and cooperate in

assessing the funds, negotiating with possible sources of funds, analyzing financing options, and validating & managing budgets.

As shown in Table 7.20, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. Besides, the results of qualitative approach showed that project experts valued this competency as an “important” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Legal awareness-

Toor and Ofori (2006) in their research mentioned about existing challenges in construction industry which comprised of general business challenges, industry specific challenges, and environmental challenges (such as cultural, economic, ethical, and legal and regulatory challenges.)

As shown in Table 7.20, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Organization structure-

Turner and Crawford (1994) classified competencies in two categories: “personal competencies” which include knowledge, skills, experience, and personality of an individual and “corporate competencies” which is referred to processes and structures in the organization. In Project Manager Competency Development (PMCD) Framework,

the identified competency element for human resource management in initiating phase of project is “conducting organizational definition” and it means completing stakeholders need analysis, identifying the organizational structure and identifying specific organizational role/responsibility assignment process. In IPMA Competence Baseline, “permanent organization” means “overcoming any resistance from within the permanent organization. The results of the project have an influence on the operations of the permanent organization. For the project, it is important to know how the policies and outputs of the operations of the permanent organization are defined, how they are controlled and what the associated risks are”. The possible process steps of this competency element are “understanding the organizational structure, considering interested parties structure, identifying and developing interface between the permanent and project based parts of organization, identifying commonalities and differences, monitoring progress, and implementing learning cycles.” Organizational contexts that projects, project team, and project managers are operating in, as well as contextual variables influence project management competency (Boddy, 1993; Kastel & Witt, 1996; Larson & Gobeli, 1989; Thamhain & Wilemon, 1977). These organizational factors include factors such as authority level of project manager, support level of top management, organizational climate, resource availability, organizational structure.

As shown in Table 7.20, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “important” competency. However, the results of qualitative approach showed that project experts valued this competency as a “core” competency. Therefore, based on results of this study, this competency is an “important” competency for project managers.

Cultural awareness-

One of the criticisms to US approach is pertaining to its ignorance of context of organization, marketplace, and culture due to only focusing on managers' characteristics (Stuart & Lindsay, 1997). Culture is defined as "collective programming" of mind that cause people in one group to be distinguished from people in another group (Hofstede, 1991). As quoted by Kendra and Taplin (2004), "for organizations to be successful with the adoption of project management, they need to establish a shared set of values and beliefs (a project management culture) that aligns with the social and technical aspects of project management to achieve the organization's business objectives". Trompenaars and Hampden-Turner (1993,1997) highlighted that it is important for managers to understand different cultures of their team members- values and beliefs of people in the team. Belzer (2001) identified several soft skills that are crucial for successful project management. These factors include: to understand culture of organization and team members that project manager is working with.

As shown in Table 7.20, quantitative approach of the study showed that project managers valued this competency as "important" competency; however, senior project managers valued it as "not important" competency. Therefore, this competency omitted from list of competencies in qualitative approach of the study. Hence, according to the results of this study, this competency is a "not important" competency for project managers.

Marketing & Sales-

As defined in APM Competence Framework, Marketing involves anticipating the demands of users and identifying and satisfying their needs. "Sales" is a marketing technique to promote project.

As shown in Table 7.20, quantitative approach of the study showed that both project managers and senior project managers valued this competency as “not important” competency. Therefore, this competency omitted from list of competencies in qualitative approach of the study. Hence, according to the results of this study, this competency is a “not important” competency for project managers

Table 7.20: Results of survey of project managers, senior project managers, and project experts for competency elements of contextual

Competency Elements	Variable	Survey of PMs and SPMs		Survey of PEs
		Project Managers	Senior Project Managers	Project Experts
Project orientation	Var91	Important	Important	Core
Program orientation (Strategic Perspective)	Var92	Important	Important	Important
Portfolio orientation	Var93	Important	Important	Important
Change management (in organization)	Var94	Important	Not Important	----
Permanent organization	Var95	Not Important	Important	----
Health, security, safety & environment	Var96	Core	Important	Important
Financial management	Var97	Important	Important	Important
Legal awareness	Var98	Important	Important	Core
Organization structure	Var99	Important	Important	Core
Cultural awareness	Var100	Important	Not Important	----
Marketing& Sales	Var101	Not Important	Not Important	----

CHAPTER 8

CONCLUSION

8.1 INTRODUCTION

This chapter focuses on summarizing the works undertaken in this research to order to answer research questions and to achieve research objectives. Then, it follows by highlighting research findings.

In this research, quantitative approach applied. In fact, at first stage of the study quantitative methodology conducted to survey project managers and senior project managers , and in second stage of study also quantitative approach applied to survey project experts in order to collect relevant data in regards of require competencies for project managers in construction industry in Malaysia. This information is very important and significant because based on this information, core and important competency elements for project managers identified.

In this chapter overall summary of research (conclusion), important research findings, recommendations, significant contribution to knowledge, limitation for conducting research, and suggestions for future work are discussed.

8.2 SUMMARY OF THE RESEARCH

Addressing and identifying the key competencies for project managers in project is very crucial because these competencies not only affect achieving project success, but also can be a basis for performance measurement of project managers as well as performance prediction of project managers. Moreover, these competencies can acting

as a basis for succession planning, can set goals among project managers, and can find training and development needs for project managers in organizations.

Although CIDB as the lead organization in construction industry in Malaysia has developed a framework of required competencies for project managers identified by some experts in construction industry, still there is a need to evaluate and develop a framework with considering competency standards developed by main project management organizations such as PMI, APM, AIPM, and IPMA as well as from perspective of project managers, senior project managers and project experts in Malaysian construction industry.

The purpose of this research is to identify core and important competencies for project managers in construction industry in Malaysia from project managers', senior project managers', and project experts' perspectives. Therefore, in this regards, this research tries to answer the following questions:

- What are the competency elements identified in competency standards and literature review?
- What are the differences of competency standards and their competency elements?
- What are the core and important competency elements valued by project managers and senior project managers?
- What are the core and important competency elements valued by project experts?
- What are the core and important competencies required for project managers in construction industry?
- How is the correlation between competency elements identified in this research?

Therefore, based on aforementioned research questions this research seeks to achieve the following objectives.

- To identify competency elements required for project managers according to competency standards and literature review.
- To distinguish core and important competency elements valued by project managers (PMs), senior project managers (SPMs), and project Experts (PEs) in Malaysia construction industry.
- To examine correlation between project managers' competency elements.

8.3 IMPORTANT FINDINGS

8.3.1 IDENTIFYING COMPETENCY ELEMENTS ACCORDING TO LITERATURE REVIEW AND COMPETENCY STANDARDS AND CATEGORIZING THEM IN TWO MAIN CLUSTER OF JOB-RELATED AND PERSON-RELATED COMPETENCIES

Based on comparison of competency standards as well as literature review in regards of project managers competencies, totally 101 competency elements identified. There are two points of views about competency. The first one which is a UK-based perspective for identifying competencies for project managers only analyzes the job, regardless the person who is doing the job. On the other side, there is a US-based system which only considers the person who is doing the job, and the focus is not to the job. This person-related competency analyses successful project managers in order to identify core and important competency elements. At first stage of this research, for answering the first two research questions and for achieving first research objective, APM competency standard, PMCD competency framework, IMPA Competency standard, and AIPM competency standard compared with other literature review pertaining to project managers competencies and finally a competency framework based on two main

categories of job-related and person-related competencies proposed. According to this proposed competency framework, totally 51 competencies identified and categorized as job-related (UK-Based Approach) competencies while totally 50 competencies identified and categorized as person related (US-Based Approach) competencies.

8.3.2 COMPETENCIES VALUED BY BOTH PROJECT MANAGERS AND SENIOR PROJECT MANAGERS AS CORE COMPETENCIES IN QUANTITATIVE APPROACH

Second phase of this research includes two stages. At first stage quantitative methodologies was applied and based on that, core and important competencies valued by project managers and senior project managers identified. As shown in Table 8.3.1, and Table 8.3.2 the competencies valued by both project managers and senior project managers as core competencies are: Defining the project context (Var01), Guiding development of project scope definition (Var02), Implementing scope controls (Var03), Determining project Schedule (Var04), Implementing project schedule (Var05), Assessing time management outcomes (Var06), Determining quality requirement (Var10), Building trust (Var62), Teamwork & Cooperation (Var63), Team Leadership (Var65), Professionalism & ethics (Var82), and Efficiency (Var86).

Table 8.1: Core Competencies Valued by Project Managers and Senior Project Managers in Quantitative Approach

Competency Elements	Variable	Quantitative Approach	
		Project Managers	Senior Project Managers
Defining the project context	Var01	Core	Core
Guiding development of project scope definition	Var02	Core	Core
Implementing scope controls	Var03	Core	Core
Determining project Schedule	Var04	Core	Core
Implementing project schedule	Var05	Core	Core
Assessing time management outcomes	Var06	Core	Core
Determining quality requirement	Var10	Core	Core
Building trust	Var62	Core	Core
Teamwork & Cooperation	Var63	Core	Core
Team Leadership	Var65	Core	Core
Professionalism & ethics	Var82	Core	Core
Efficiency	Var86	Core	Core

8.3.3 COMPETENCIES VALUED BY BOTH PROJECT MANAGERS AND SENIOR PROJECT MANAGERS AS IMPORTANT COMPETENCIES IN QUANTITATIVE APPROACH

Besides, there are totally 51 competency elements which both project managers and senior project managers valued them as important competencies. These competency elements are: Implementing project quality improvements(Var12), Implementing human resources & stakeholder planning activities(Var13), Implementing staff training & development(Var14), Assessing human resource outcomes(Var16), Managing information(Var18), Managing project reporting(Var19), Assessing communication management outcomes(Var20), Determining project risk events(Var21), Monitoring & managing opportunities(Var22), Monitoring & managing project risks(Var23), Assessing risk management outcomes(Var24), Managing contract & procurement finalization procedures(Var29), Agreeing & establishing life cycle reporting & measurement systems(Var30), Managing integration of all project management

functions(Var31), Implementing project activities throughout life cycle (Var33), Assessing project integration outcomes (Var34), Change control (Var39), Value management (Var41), Handover and closeout (Var42), Documentation (Var43), Appraising project team members (Var44), Performing post-contract evaluation (Var47), Achievement orientation (Result orientation) (Var52), Concern for order, quality, & accuracy (Var53), Initiative (Var54), Client Orientation (Var57), Interpersonal Understanding (Var58), Impact & influence (Var59), Organizational Awareness (Var60), Relationship Building (Var61), Developing others (Var64), Being Directive: Assertiveness & use of positional power (Var66), Self-Control (Var72), Self-Confidence (Var73), Flexibility (Var74), Organizational Commitment (Var75), Intuitiveness (Var76), Creativity (Var78), Conflict management (Var79), Negotiation (Var80), Behavioral characteristics & attitude (Var81), Openness (Var84), Consultation (Var87), Reliability (Var88), Effective communication (Var89), Project orientation (Var91), Program orientation (Strategic Perspective) (Var92), Portfolio orientation (Var93), Financial management (Var97), Legal awareness (Var98), Organization structure (Var99).

Table 8.2: Important Competencies Valued by Project Managers and Senior Project Managers in Quantitative Approach

Competency Elements	Variable	Quantitative Approach	
		Project Managers	Senior Project Managers
Implementing project quality improvements	Var12	Important	Important
Implementing human resources & stakeholder planning activities	Var13	Important	Important
Implementing staff training & development	Var14	Important	Important
Assessing human resource outcomes	Var16	Important	Important
Managing information	Var18	Important	Important
Managing project reporting	Var19	Important	Important
Assessing communication management outcomes	Var20	Important	Important
Determining project risk events	Var21	Important	Important
Monitoring & managing opportunities	Var22	Important	Important
Monitoring & managing project risks	Var23	Important	Important
Assessing risk management outcomes	Var24	Important	Important
Managing contract & procurement finalization procedures	Var29	Important	Important
Agreeing & establishing life cycle reporting & measurement systems	Var30	Important	Important
Managing integration of all project management functions	Var31	Important	Important
Implementing project activities throughout life cycle	Var33	Important	Important
Assessing project integration outcomes	Var34	Important	Important
Change control	Var39	Important	Important
Value management	Var41	Important	Important
Handover and closeout	Var42	Important	Important
Documentation	Var43	Important	Important
Appraising project team members	Var44	Important	Important
Perform post-contract evaluation	Var47	Important	Important
Achievement orientation (Result orientation)	Var52	Important	Important
Concern for order, quality, & accuracy	Var53	Important	Important
Initiative	Var54	Important	Important
Client Orientation	Var57	Important	Important
Interpersonal Understanding	Var58	Important	Important
Impact & influence	Var59	Important	Important
Organizational Awareness	Var60	Important	Important
Relationship Building	Var61	Important	Important
Developing others	Var64	Important	Important
Being Directive: Assertiveness & use of positional power	Var66	Important	Important
Analytical Thinking	Var69	Important	Important
Self-Control	Var72	Important	Important

Table 8.2, continued

Self-Confidence	Var73	Important	Important
Flexibility	Var74	Important	Important
Organizational Commitment	Var75	Important	Important
Intuitiveness	Var76	Important	Important
Creativity	Var78	Important	Important
Conflict management	Var79	Important	Important
Negotiation	Var80	Important	Important
Behavioral characteristics & attitude	Var81	Important	Important
Openness	Var84	Important	Important
Consultation	Var87	Important	Important
Reliability	Var88	Important	Important
Effective communication	Var89	Important	Important
Project orientation	Var91	Important	Important
Program orientation (Strategic Perspective)	Var92	Important	Important
Portfolio orientation	Var93	Important	Important
Financial management	Var97	Important	Important
Legal awareness	Var98	Important	Important
Organization structure	Var99	Important	Important

8.3.4 COMPETENCIES VALUED DIFFERENTLY BY PROJECT MANAGERS AND SENIOR PROJECT MANAGERS IN QUANTITATIVE APPROACH

However, there are some competency elements that project managers and senior project managers valued their importance differently. On the other words, either project managers or senior project managers valued them as core competencies while the other one valued them as important competencies. As shown in Table 8.3.3 These competencies are: Determining project budget(Var07), Monitoring & controlling project budgets & costs(Var08), Conducting project financial completion activities(Var09), Implementing quality assurance(Var11), Managing the project team & stakeholders(Var15), Planning communications processes(Var17), Coordinating internal & external environment(Var32), To know project success criteria(Var37), Methods and procedures(Var38), Identifying & solving problems(Var56), Making decisions(Var68), Conceptual Thinking(Var70), Critical analysis & judgment(Var71),

Conscientiousness(Var77), Engagement & motivation(Var83), Result orientation(Var85), Health, security, safety & environment (Var96).

Table 8.3: Competencies valued differently by project managers and senior project managers in quantitative approach

Competency Elements	Variable	Quantitative Approach	
		Project Managers	Senior Project Managers
Determining project budget	Var07	Important	Core
Monitoring & controlling project budgets & costs	Var08	Important	Core
Conducting project financial completion activities	Var09	Important	Core
Implementing quality assurance	Var11	Important	Core
Managing the project team & stakeholders	Var15	Important	Core
Planning communications processes	Var17	Important	Core
Coordinating internal & external environment	Var32	Important	Core
To know project success criteria	Var37	Core	Important
Methods and procedures	Var38	Important	Core
Identifying & solving problems	Var56	Important	Core
Making decisions	Var68	Core	Important
Conceptual Thinking	Var70	Core	Important
Critical analysis & judgment	Var71	Core	Important
Conscientiousness	Var77	Important	Core
Engagement & motivation	Var83	Important	Core
Result orientation	Var85	Important	Core
Health, security, safety & environment	Var96	Core	Important

8.3.5 COMPETENCIES VALUED BY PROJECT EXPERTS AS CORE COMPETENCIES

Table 8.3.4 shows the job-related and person related competencies valued by project experts as core competencies. As shown in this Table totally 25 competencies are valued as core job-related competencies and 18 competencies are valued as core person-relate competencies by project experts.

Table 8.4: Job-related and Person-related competencies valued as “core” competencies by project experts

Job-related Competencies valued as “core” competencies by PEs		Person-related Competencies valued as “core” competencies by PEs	
Defining the project context	Var01	Achievement orientation (Result orientation)	Var52
Guiding development of project scope definition	Var02	Identifying & solving problems	Var56
Implementing scope controls	Var03	Building trust	Var62
Determining project Schedule	Var04	Teamwork & Cooperation	Var63
Implementing project schedule	Var05	Team Leadership	Var65
Assessing time management outcomes	Var06	Making decisions	Var68
Determining project budget	Var07	Analytical Thinking	Var69
Monitoring & controlling project budgets & costs	Var08	Flexibility	Var74
Conducting project financial completion activities	Var09	Conscientiousness	Var77
Determining quality requirement	Var10	Creativity	Var78
Implementing quality assurance	Var11	Professionalism & ethics	Var82
Managing the project team & stakeholders	Var15	Engagement & motivation	Var83
Managing information	Var18	Result orientation	Var85
Managing project reporting	Var19	Efficiency	Var86
Determining project risk events	Var21	Reliability	Var88
Monitoring & managing opportunities	Var22	Effective communication	Var89
Monitoring & managing project risks	Var23	Legal awareness	Var98
Agreeing & establishing life cycle reporting & measurement systems	Var30	Organization structure	Var99
Managing integration of all project management functions	Var31	-----	-----
Coordinating internal & external environment	Var32	-----	-----
Implementing project activities throughout life cycle	Var33	-----	-----

Table 8.4, continued

To know project success criteria	Var37	-----	-----
Methods and procedures	Var38	-----	-----
Documentation	Var43	-----	-----
Appraising project team members	Var44	-----	-----

8.3.6 COMPETENCIES VALUED BY PROJECT EXPERTS AS IMPORTANT COMPETENCIES

Table 8.3.5 shows the job-related and person related competencies valued by project experts as important competencies. As shown in this Table totally 13 competencies are valued as important job-related competencies and 25 competencies are valued as important person-related competencies by project experts.

Table 8.5: Job-related and Person-related competencies valued as “important” competencies by project experts

Job-related Competencies valued as “important” competencies by PEs		Person-related Competencies valued as “important” competencies by PEs	
Implementing project quality improvements	Var12	Concern for order, quality, & accuracy	Var53
Implementing HR & stakeholder planning activities	Var13	Initiative	Var54
Implementing staff training & development	Var14	Client Orientation	Var57
Assessing human resource outcomes	Var16	Interpersonal Understanding	Var58
Planning communications processes	Var17	Impact & influence	Var59
Assessing communication management outcomes	Var20	Organizational Awareness	Var60
Assessing risk management outcomes	Var24	Relationship Building	Var61

Table 8.5, continued

Managing contract & procurement final procedures	Var29	Developing others	Var64
Assessing project integration outcomes	Var34	Being Directive: Assertiveness & use of positional power	Var66
Change control	Var39	Conceptual Thinking	Var70
Value management	Var41	Critical analysis & judgment	Var71
Handover and closeout	Var42	Self-Control	Var72
Perform post-contract evaluation	Var47	Self-Confidence	Var73
-----	-----	Organizational Commitment	Var75
-----	-----	Intuitiveness	Var76
-----	-----	Conflict management	Var79
-----	-----	Negotiation	Var80
-----	-----	Behavioral characteristics & attitude	Var81
-----	-----	Openness	Var84
-----	-----	Consultation	Var87
-----	-----	Project orientation	Var91
-----	-----	Program orientation (Strategic Perspective)	Var92
-----	-----	Portfolio orientation	Var93
-----	-----	Health, security, safety & environment	Var96
-----	-----	Financial management	Var97

8.3.7 CORE AND IMPORTANT COMPETENCIES FRAMEWORK FOR PROJECT MANAGERS IN CONSTRUCTION INDUSTRY IN MALAYSIA

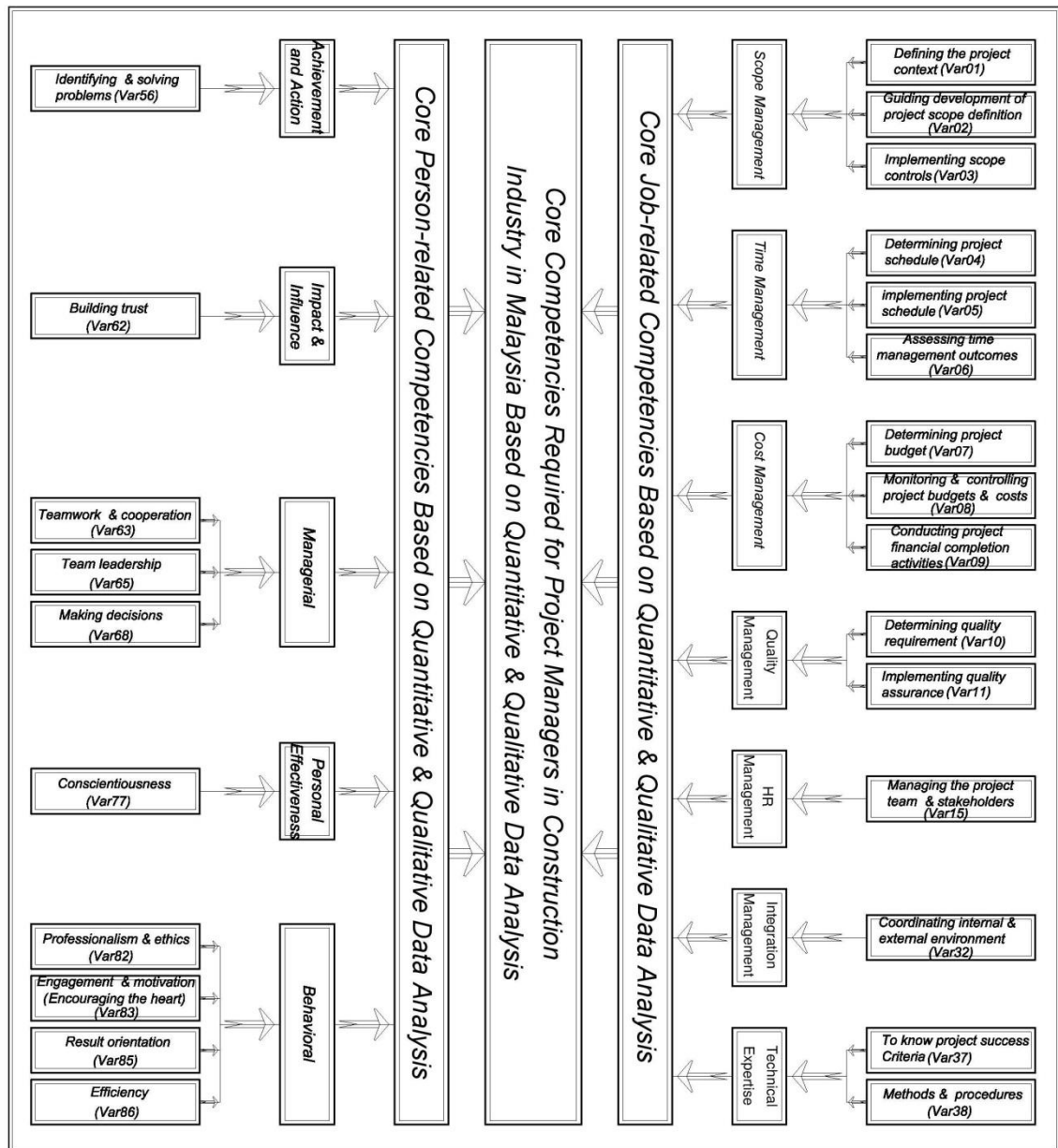


Figure 8.1: Core competencies required for project managers in construction industry in Malaysia based on survey of project managers, senior project managers, and project experts

Note: In order to have a better view, a bigger size of this figure is presented at Appendix I

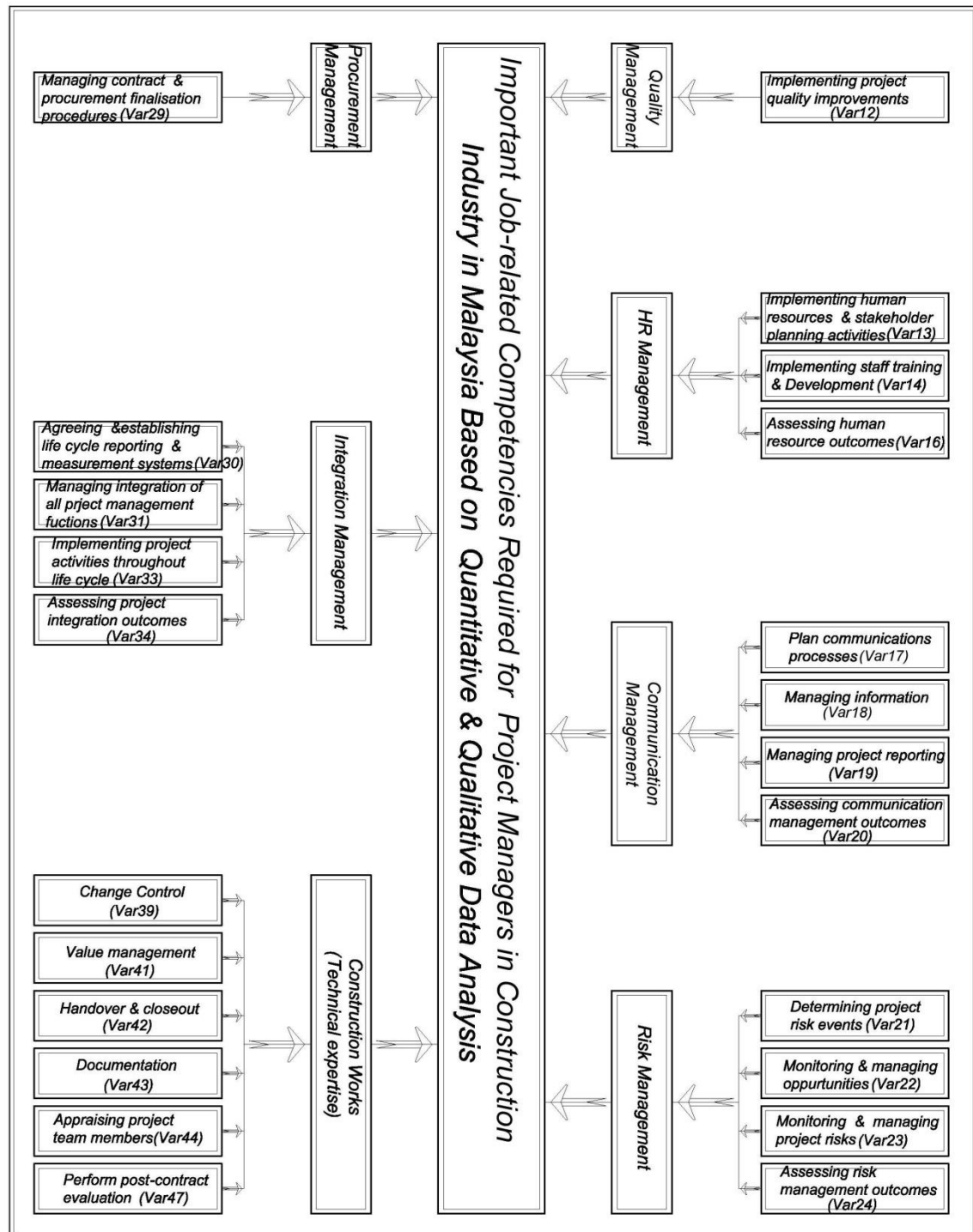


Figure 8.2: Important job-related competencies required for project managers in construction industry in Malaysia based on survey of project managers, senior project managers, and project experts

Note: In order to have a better view, a bigger size of this figure is presented at Appendix J

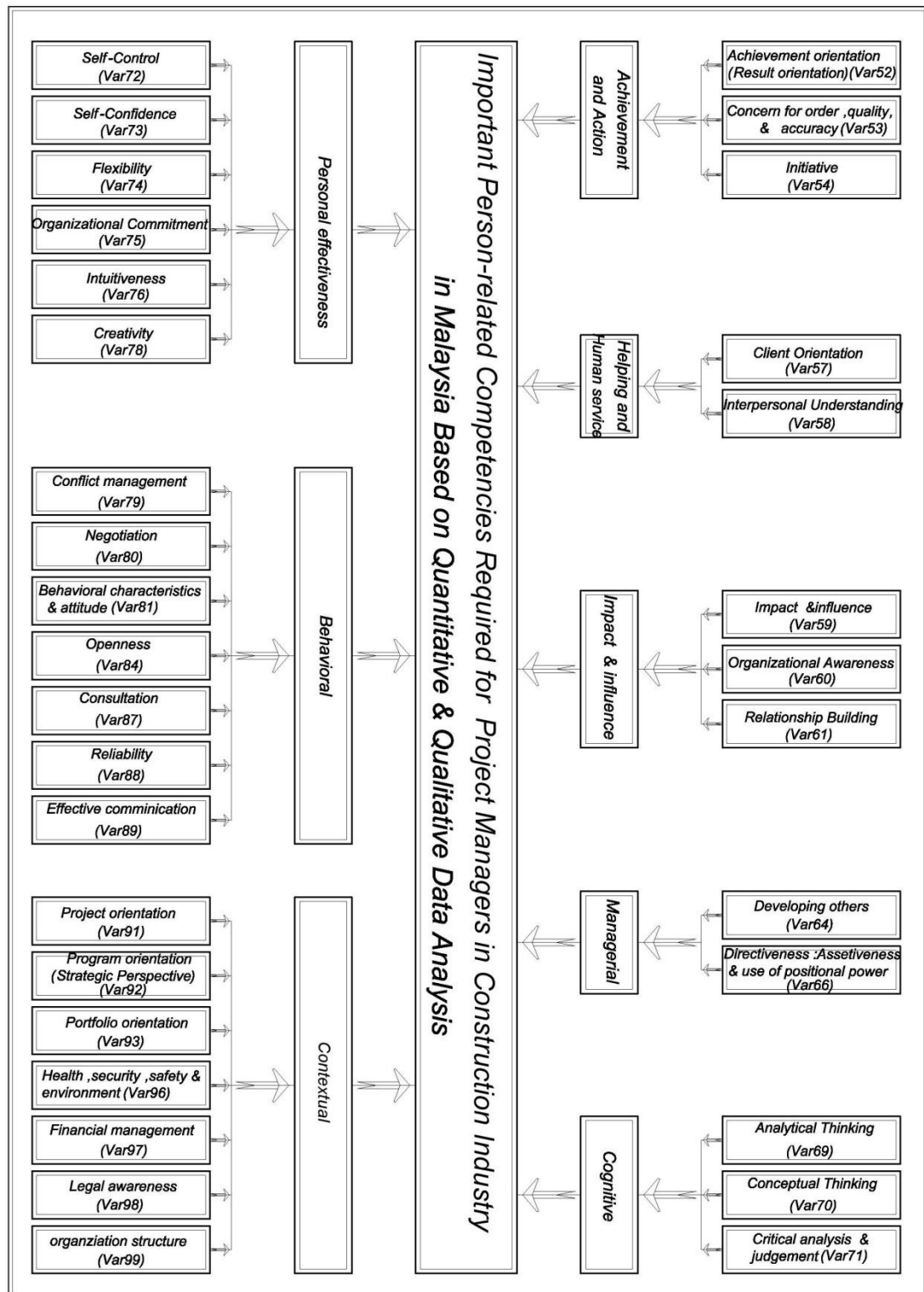


Figure 8.3: Important person-related competencies required for project managers in construction industry in Malaysia based on survey of project managers, senior project managers, and project experts

Note: In order to have a better view, a bigger size of this figure is presented at Appendix K

8.3.8 RELATIONSHIP BETWEEN CORE JOB-RELATED AND CORE PERSON-RELATED COMPETENCIES

- The more project manager's "Building trust (Var62)" competency increased, the more his "Implementing scope controls (Var03)" competency would be increased and vice versa.
- The more project manager's "Team Leadership (Var65)" competency increased, the more his "Implementing scope controls (Var03)" competency would be increased and vice versa.
- The more project manager's "Implementing scope controls(Var03)" competency increased, the more his "Efficiency (Var86)" competency would be increased and vice versa
- The more project manager's "Defining the project context (Var01)" competency increased, the more his "Engagement & motivation (Var83)" competency would be increased and vice versa.
- The more project manager's "Implementing project schedule (Var05)" competency increased, the more his "Identifying & solving problems (Var56)" competency would be increased and vice versa.
- The more project manager's "Implementing project schedule (Var05)" competency increased, the more his "Conscientiousness (Var77)" competency would be increased and vice versa.
- The more project manager's "Determining project budget(Var07)" competency increased, the more his "Identifying & solving problems(Var56)" competency would be increased and vice versa.
- The more project manager's "Determining project budget (Var07)" competency increased, the more his "Making decisions (Var68)" competency would be decreased and vice versa.

- The more project manager's "Conscientiousness (Var77)" competency increased, the more his "Determining project budget (Var07)" competency would be increased and vice versa.
- The more project manager's "Engagement & motivation (Var83)" competency increased, the more his "Determining project budget (Var07)" competency would be increased and vice versa.
- The more project manager's "Engagement & motivation (Var83)" competency increased, the more his "Conducting project financial completion activities (Var09)" competency would be increased and vice versa.
- The more project manager's "Result orientation (Var85)" competency increased, the more his "Monitoring & controlling project budgets & costs (Var08)" competency would be increased and vice versa.
- The more project manager's "Determining quality requirement (Var10)" competency increased, the more his "Professionalism & ethics (Var82)" competency would be increased and vice versa.
- The more project manager's "Result orientation (Var85)" competency increased, the more his "Managing the project team & stakeholders (Var15)" competency would be increased and vice versa.
- The more project manager's "Building trust (Var62)" competency increased, the more his "Coordinating internal & external environment (Var32)" competency would be increased and vice versa.
- The more project manager's "Conscientiousness (Var77)" competency increased, the more his "Coordinating internal & external environment (Var32)" competency would be increased and vice versa.

- The more project manager's "Coordinating internal & external environment (Var32)" competency increased, the more his "Result orientation (Var85)" competency would be increased and vice versa.
- The more project manager's "Conscientiousness (Var77)" competency increased, the more his "Methods and procedures (Var38)" competency would be increased and vice versa.

8.4 RECOMMENDATIONS

Below are some suggestions to improve the application of project managers' competencies in construction industry in Malaysia:

- The results of this research revealed the core and important competency elements for project managers in construction industry. This importance degree of competencies can be a base for companies to concentrate on competencies which are more important for project managers. Companies by concentrating of those competency elements with high importance degree, can achieve the highest benefits of training courses.
- Project managers, senior project managers and project experts addressed the importance of preparing and defining a competency framework for project managers in Malaysia. This competency framework will help to adjust project management courses and construction management courses in Malaysia Universities to suit to construction industry demand.
- Besides, contractors and construction companies can use this competency framework in their organizations for recruiting their team members, for training their project managers and for appraising them.

- CIDB as the lead organization in construction industry in Malaysia, needs to apply this competency framework for addressing the market needs for managing their training courses.
- Less experienced project managers as well as engineers who are going to be successful project managers in near future need to adjust their skills and knowledge according to the aforementioned framework.

8.5 LIMITATION OF STUDY

Although the research is conducted successfully, in the process of doing it the researcher faced a problem during data collection. Unfortunately, during data collection, due to the fact that project managers are always very busy in their daily activities, collection of data took longer time than what was expected. There was a need to several times following up with project managers and senior project managers to fill up the questionnaire.

8.6 SUGGESTIONS FOR FUTURE WORKS

The results of this research study revealed required core and important competency elements for project managers in construction industry in Malaysia.

Suggestions for future studies in this topic are:

- An in depth research about the current practices and standards for competent project directors, developing project directors, and areas of expertise that they need trainings.
- An in depth research about required competencies for project managers in other industries such as information technology. For instance, to studies the standards and best practices applied by other countries and comparing them with applied standards in

Malaysia and to try for developing a best competency framework for project managers in other industry sectors rather than construction industry.

- An in depth research study about required competencies for project managers in construction industry who are going to work in global market and international companies either in Malaysia or other overseas.

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